




General catalog 2003-2004

Control solutions
for industry

USA
Lovato
2003-2004

 **Lovato**
electric
100% electricity

AT THE CUSTOMER'S SERVICE



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- 1** Manual motor starters and protectors
- 2** Disconnect switches
- 3** IEC style contactors
- 4** IEC style overload relays
- 5** IEC style starters
- 6** Push buttons and pilot devices, 22mm
- 7** Limit and safety switches
- 8** Rotary cam switches
- 9** Timers
- 10** Digital metering instruments
- 11** AC motor drives, VFD
- 12** Automatic power factor regulators





**Mini-contactors BGF
with Faston termination.**
Pages 3 - 4
3 - 6
3 - 11



**Reversing
contactor assemblies
BGR - BGT - BGU.**
Pages 3 - 8
3 - 9



Three pole contactors BF 110.
Page 3 - 4



Limit switches KB - KM.
Pages 7 - 2 to 7 - 12



**Push-push buttons.
Joysticks.
Three-button operators.**
Pages 6 - 3
6 - 6
6 - 9
6 - 12



SM1B 56
Manual motor
starters
24-32A
Page 1-2



BGXF
Faston auxiliary
contact blocks for
BGF mini-contactors
Page 3-12



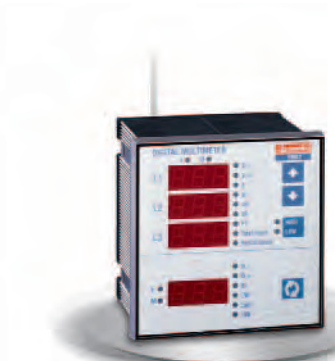
**LM2T SL13
LP2T SL13**
Illuminated selectors
with new positions
Pages 6-7 and 6-14



LM2T A185
Protection for
knob selectors
Page 6-21



Rotary cam switches GX.
Pages 8 - 2 to 8 - 7



Digital multimeters DMK.
Section 10



AC motor drives, VFD.
Section 11



Automatic power factor regulators DCRK and DCRJ.
Section 12



LM2T CF
Auxiliary contacts with Faston termination for pilot device
Page 6-17



LM2T MB
Flashing LED-integrated lamp-holders
Page 6-18



RS-TL
Rope-pull safety switches
Page 7-24



C...
Connection for remote control/supervision
Pages 10-3 and 10-5
12-2 and 12-3



PX1
RS-232 / RS-485 converter module
Pages 10-3 and 10-5

WORLDWIDE STANDING AND QUALITY

The presence of Lovato Electric in the most important world markets is the result of the company's constant international strategy.

Lovato Electric Italy, together with the 10 Corporate offices and 53 official sales affiliates, represent the reference point for the distribution of the Lovato Electric products in more than 79 countries.



LOVATO ELECTRIC S.p.A. (Italy)

LOVATO ELECTRIC Inc. (USA)

LOVATO Deltec (Germany)

LOVATO U.K. (England)

LOVATO SRO (Czech Rep.)

LOVATO ELECTRIC S.L. (Spain)

LOVATO Rez (Latvia)

LOVATO ELECTRIC de Mexico (Mexico)

LOVATO do Brasil (Brazil)

LOVATO Asia (Hong Kong)

LOVATO China (China)



Our products comply with all the major international standard requirements.

Lovato Electric was among the first in Italy, in 1992, to hold the certification of the company's quality management system. In compliance with ISO 9001 standards, Lovato Electric has obtained the ISO 14001 certification for the environment management system, as well.

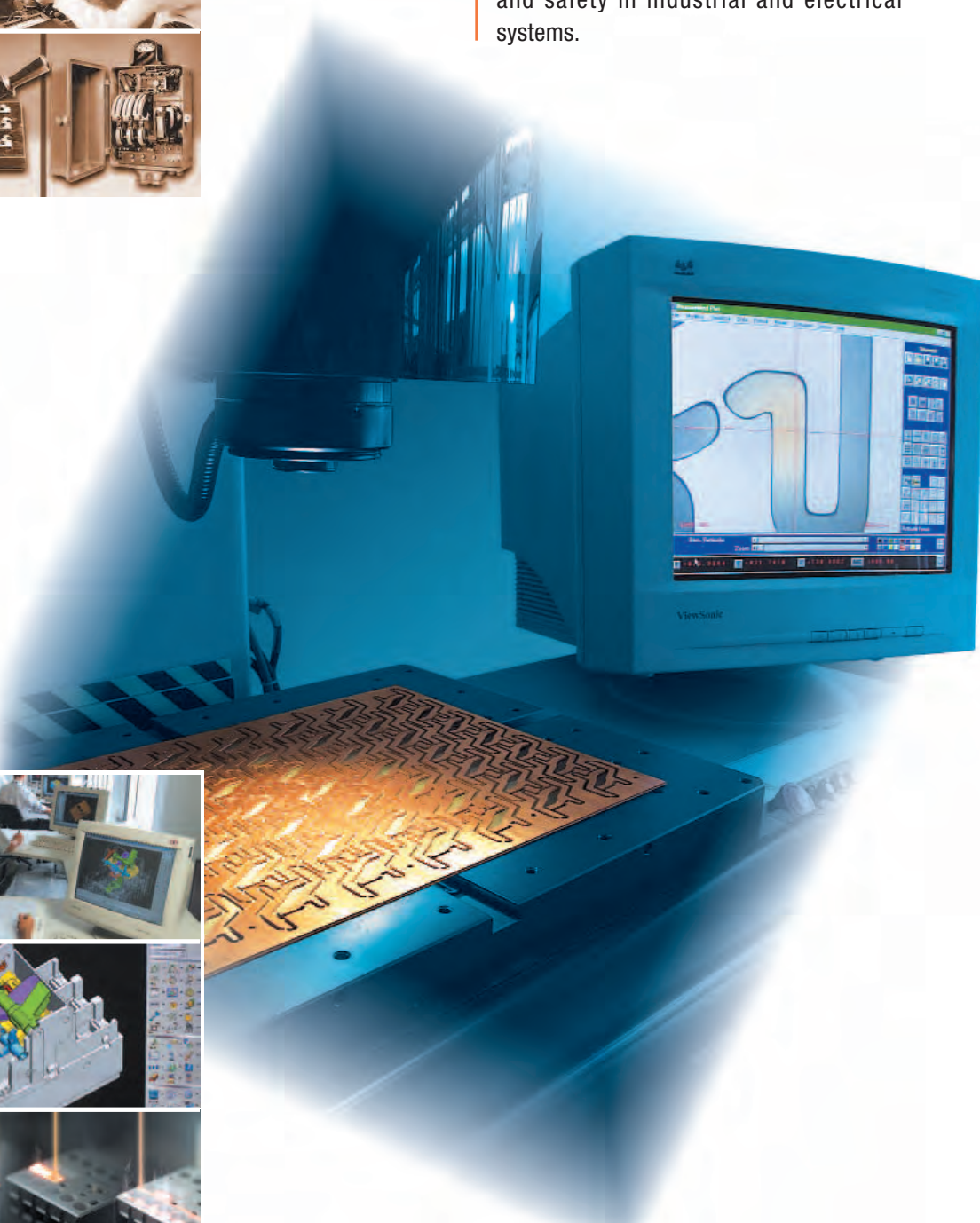
The company's laboratories are, in addition, qualified and certified to conduct type testing, under ACAE direct control, for the emission of ACAE/LOVAG certifications.

TRADITION AND INNOVATION

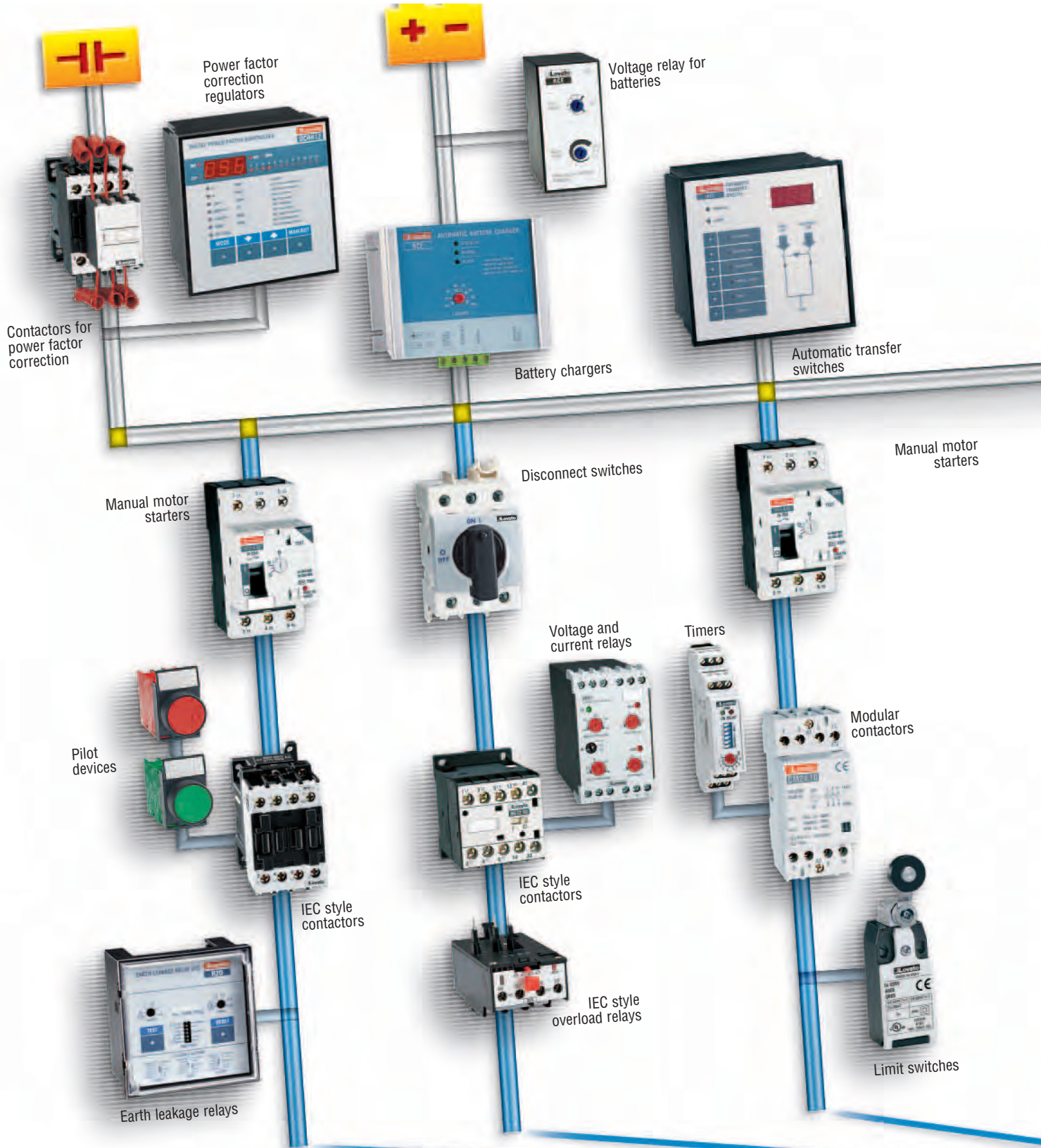


Lovato Electric, solid tradition with over 80 years of on-going activity, is a leader in electromechanical and automation product manufacturing for industry.

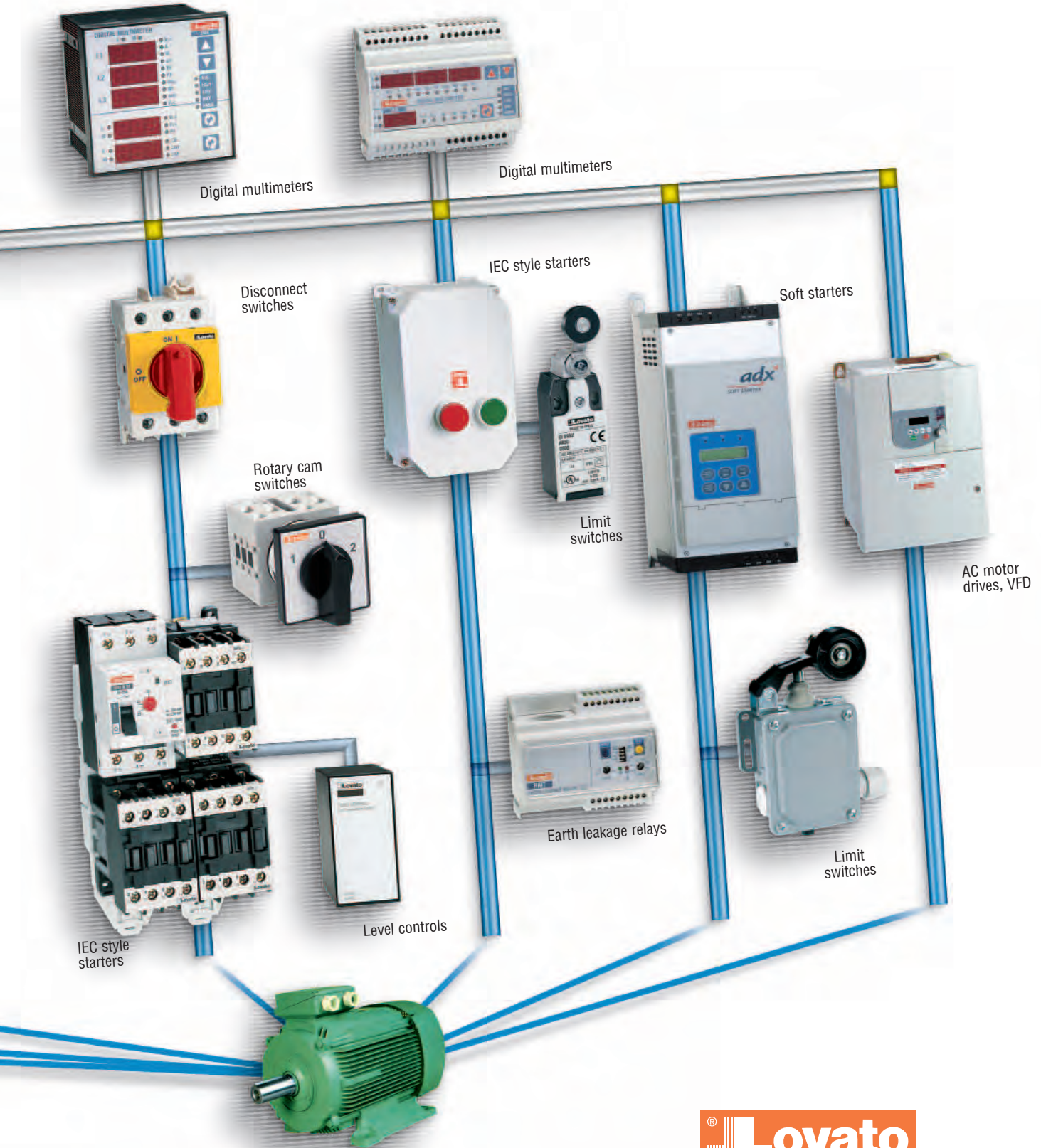
Utilizing modern technology for research, development, design and manufacture, Lovato Electric provides products and solutions to enhance efficiency, reliability and safety in industrial and electrical systems.



SOLUTIONS AND PRODUCTS



FOR INDUSTRIAL AUTOMATION





PAGE 1-2

SM1B

- Thermal trip adjustment ranges 0.1-32A (15 choices).



PAGE 1-3

SM2A

- Thermal trip adjustment ranges 22-50A (4 choices).



PAGE 1-3

SM3A

- Thermal trip adjustment ranges 45-100A (4 choices).

- Complete range from 0.1 to 100 Amps
- Control and protection for individual or group motor applications
- Adjustable, phase sensitive Class 10 internal overload relay
- Short circuit protection
- Single lever circuit breaker type handle
- Terminals are IP20 touch-safe design
- Separate trip indicator/reset and test button
- Extensive assortment of accessories available



PLANET - SWITCH

With thermal and magnetic trip releases

	Sec.	PAGE
Manual starters SM1B	1-	2
Manual starters SM2A and SM3A	1-	3
Add-on blocks and accessories for SM1B	1-	4
Add-on blocks and accessories for SM2A and SM3A	1-	8

Manual motor starters SM1B up to 32A



11 SM1B

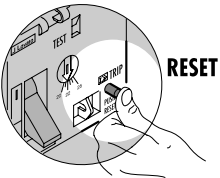
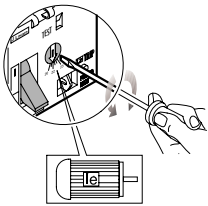
Setting range of thermal trip ①	UL maximum horsepower ratings						Catalog number	Price
	Single-phase ②		Three-phase					
[A]	115-120V	230V	200V	230V	460V	575V		\$
0.1-0.16	–	–	–	–	–	–	11 SM1B 00	104.00
0.16-0.25	–	–	–	–	–	–	11 SM1B 04	104.00
0.25-0.4	–	–	–	–	–	–	11 SM1B 08	104.00
0.4-0.63	–	–	–	–	–	–	11 SM1B 12	118.00
0.63-1	–	–	–	–	1/2	1/2	11 SM1B 16	118.00
1-1.6	–	1/10	–	–	3/4	1	11 SM1B 20	118.00
1.6-2.5	–	1/6	–	1/2	1	1 1/2	11 SM1B 24	118.00
2.5-4	1/8	1/3	1/2	3/4	2	3	11 SM1B 28	118.00
4-6.5	1/4	1/2	3/4	1 1/2	3	5	11 SM1B 32	118.00
6.3-10	1/2	1 1/2	1 1/2	3	5	7 1/2	11 SM1B 36	118.00
9-14	3/4	2	2	3	10	10	11 SM1B 40	147.00
13-18 ③	1	3	5	5	10	15	11 SM1B 44	147.00
17-23 ③	1 1/2	3	5	7 1/2	15	20	11 SM1B 48	147.00
20-25 ③	2	3	7 1/2	7 1/2	15	20	11 SM1B 52	147.00
24-32 ③	2	5	10	10	20	30	11 SM1B 56	198.00

① The appropriate thermal trip range of the manual starter should be selected on the basis of the motor nameplate full-load current since the horsepower ratings given in the table are for reference only.

② Single-phase horsepower ratings are based on wiring the three poles in series.

③ Not suitable for use with a design E motor.

NOTE: When using these types as a manual combination starter, no separate circuit breaker is required.



General characteristics

The SM1B series is a new generation of manual starters with thermal and magnetic trip releases. Motor control and protection, up to 15HP at 460V, are possible by the choice of suitable adjustment range, 0.1 to 32A.

A magnetic trip indicator integrated on the SM1B starters avoids dangerous closing operations during short-circuit conditions, previously disconnected by the starter.

The SM1B types are suitable for isolation.

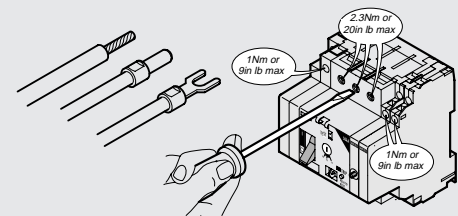
Operational characteristics

- Rated insulation voltage U_i : 690V
- Rated impulse voltage: 6kV
- Rated frequency: 50/60Hz
- Maximum rated current: 32A
- Number of adjustment ranges: 15 (0.1 to 32A)
- Power dissipation per phase: 0.57-1.46W
- Magnetic tripping: 12 le max
- Thermal tripping time class: 10A
- Utilisation category: A
- Single-phase sensitive
- Mechanical life: 100,000 cycles
- Electrical life 32A (AC3): 100,000 cycles
- Mounting on 35mm DIN rail (EN 50022)
- Mounting position: any
- Operating temperature: -4 to 160°F (-20 to +70°C)
- Temperature compensation: -4 to 120°F (-20 to +50°C)
- Degree of protection: IP20
- Wire cross section connectable (1 or 2 conductors) min/max: 1/6 mm² flexible wire or 16/10 AWG type.

Certifications and compliance

- UL listed, for USA and Canada, file E 93602.

Compliant with standards: IEC/EN 60947-2,



Manual motor starters SM2A-SM3A up to 100A



11 SM2A



11 SM3A

Setting range of thermal trip ①	UL maximum horsepower ratings Three-phase				Maximum short circuit current rating		Catalog number	Price
	200	230V	460V	575V	480V	600V		
[A]	[HP]	[HP]	[HP]	[HP]	[kA]	[kA]		\$
22-32	10	10	25	30	50	10	11 SM2A 64	310.00
28-40	10	15	30	40	50	10	11 SM2A 68	331.00
36-45	15	15	30	40	50	10	11 SM2A 72	331.00
40-50	15	20	40	50	50	10	11 SM2A 76	331.00
45-63	20	25	50	60	50	10	11 SM3A 84	360.00
57-75	25	30	60	75	50	10	11 SM3A 88	395.00
70-90	30	30	75	100	50	10	11 SM3A 92	415.00
80-100	30	40	75	100	50	10	11 SM3A 96	465.00

① The appropriate thermal trip range of the manual starter should be selected on the basis of the motor nameplate full-load current since the horsepower ratings given in the table are for reference only.

NOTE: When using these types as per manual combination starter, no separate circuit breaker is required. These types can be used as components in Group Installation as per NEC 430.53 (C). This means that multiple manual starters can be installed below one circuit breaker, with each manual starter controlling and protecting its own motor.

APPROVED AS A UL508 TYPE "E" COMBINATION STARTER WITH THE ADDITION OF A LOVATO ELECTRIC IEC CONTACTOR.

General characteristics

The SM2 and SM3 types are manual motor starters with a wide adjustment range, 22 to 100A, in only two frame sizes enabling motor control and protection up to 60HP at 460V.

A magnetic trip indicator and padlockable operating handle are integrated on the SM2 and SM3 starters. Both are suitable for isolation. Their high breaking capacity consents to exclude protection fuses on the majority of the installations.

Operational characteristics

- Rated insulation voltage U_i : 690V
- Rated impulse voltage: 6kV
- Rated frequency: 50/60Hz
- Maximum rated current: 50A (SM2A) and 100A (SM3A)
- Number of adjustment ranges:
SM2A: 4 (22 to 50A)
SM3A: 4 (45 to 100A)
- Power dissipation per phase
SM2A: 7.1-20W
SM3A: 10-38W
- Mounting:
SM2A - screw fixing or on 35mm DIN rail (EN 50022)
SM3A - screw fixing or on DIN rail 35mm (EN 50022) or 75mm (EN 50023)
- Magnetic tripping: 13 le max
- Thermal tripping time class: 10
- Utilisation category: A
- Single-phase sensitive
- Life (cycles):

	Mechanical	Electrical (le AC3)
SM2A	50,000	25,000
SM3A	50,000	25,000
- Mounting position: Any
- Operating temperature: -4 to 160°F (-20 to +70°C)
- Temperature compensation: -4 to 120°F (-20 to +50°C)
- Degree of protection: IP00
- Wire cross section connectable (1 or 2 conductors):

	Flexible	AWG
SM2A	0.75-25 mm ²	18-3
SM3A	10-50 mm ²	10-1/0.

Certifications and compliance

- UL listed, for USA and Canada, file E 155982
 - CSA certified, file LR 73212
- Compliant with standards: IEC/EN 60947-2, IEC/EN 60947-4-1.



11 SMX11



11 SMX12



11 SMX13 11



11 SMX14



11 SMX15



11 SMX16



11 SMX90 32



11 SMX90 30



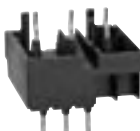
11 SMX18 10



11 SMX90 31



11 SMX90 01



11 SMX90 03

Characteristics	Qty per pkg	Catalog number	Price
	n°		\$

Add-on auxiliary contacts.

Front mount 2NO	10	11 SMX11 20	23.00
Front mount 1NO+1NC	10	11 SMX11 11	23.00
Side mount 1NO+1NC	10	11 SMX12 11	23.00
Side mount 2NO	10	11 SMX12 20	23.00
Side mount 2NC	10	11 SMX12 02	23.00
Side mount indicator contacts 1NO+1NC	10	11 SMX13 11	34.00

Undervoltage trip releases.

110-127VAC 50/60Hz	10	11 SMX14 BC	57.00
220-240VAC 50/60Hz	10	11 SMX14 CL	57.00
380-400VAC 50/60Hz	10	11 SMX14 EA	57.00
220-240VAC 50/60Hz with early-make contacts	5	11 SMX15 CL	72.00
380-400VAC 50/60Hz with early-make contacts	5	11 SMX15 EA	72.00

Shunt trip releases.

24VAC 50/60Hz	5	11 SMX16 AF	57.00
110-127VAC 50/60Hz	5	11 SMX16 BC	57.00
220-240VAC 50/60Hz	5	11 SMX16 CL	57.00
400-480VAC 50/60Hz	5	11 SMX16 EA	57.00

Three-phase connection busbars 1³/₄in (45mm) spacing.

For 2 breakers without side-mount contacts	10	11 SMX90 32	18.00
For 3 breakers without side-mount contacts	10	11 SMX90 33	21.00
For 4 breakers without side-mount contacts	10	11 SMX90 34	24.00
For 5 breakers without side-mount contacts	10	11 SMX90 35	30.00

Three-phase connection busbars 2¹/₈in (54mm) spacing.

For 2 breakers complete with side-mount contacts	10	11 SMX90 42	18.00
For 3 breakers complete with side-mount contacts	10	11 SMX90 43	21.00
For 4 breakers complete with side-mount contacts	10	11 SMX90 44	24.00
For 5 breakers complete with side-mount contacts	10	11 SMX90 45	30.00

Terminal block for busbar supply.

For all types	10	11 SMX90 30	21.00
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Padlockable door interlock rotary operators.

3 padlocks max. Red-yellow color	1	11 SMX18 14	95.00
3 padlocks max. Black color	1	11 SMX18 15	95.00

Safety cover.

For unused busbar terminals	10	11 SMX 90 31	4.00
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Padlockable attachment for operating lever.

3 padlocks max	10	11 SMX18 10	10.00
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Adjuster anti-tamper.

For all types	10	11 SMX18 12	8.00
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SM1-contactor connection.

For BG - BF9 to BF16 (set of 3 wires)	10	11 SMX90 01	8.00
For BF20 to BF40 (set of 3 wires)	10	11 SMX90 02	8.00
For BG (rigid connecting kit)	10	11 SMX90 03	9.00
For BF9 to BF16 (rigid connecting kit)	10	11 SMX90 04	9.00

General and operational characteristics**ADD-ON AUXILIARY BLOCKS**

- Snap on to the front or the right side of the starter
- Maximum combination: 6 auxiliary contacts of which 2 on front and 4 on the side (2 normal contacts and 2 indicators)
- Rated thermal current I_{th}: 6A (2.5A for SMX11...)
- Rated insulation voltage U_i: 690V (250V for SMX11...)
- UL designation: A600 P600 (C300 R300 for SMX11...)
- Wire cross section connectable (1 or 2 conductors) min/max: 0.75/2.5 mm² or AWG 18/14.

UNDERVOLTAGE TRIP RELEASE

- Connectable to the left side of the starter
- Consumption inrush/holding: 12/3.5VA
- Drop-out voltage: 0.35-0.7 Us
- Pick-up voltage: 0.85-1.1 Us
- Wire cross section connectable (1 or 2 conductors) min/max: 0.75/2.5mm² or AWG 18/14.

SHUNT TRIP RELEASE

- Connectable to the left side of the starter
- Inrush consumption: 20VA
- Operating voltage: 0.7-1.1 Us
- Wire cross section connectable (1 or 2 conductors) min/max: 0.75/2.5mm² or AWG 18/14.

THREE-PHASE CONNECTION BUSBAR

- I_{max} 63A
- SMX90 3... 45mm spacing to reduce the width to the minimum
- SMX90 4... 54mm spacing to consent to fit one side-mount auxiliary contact block on the starter
- Wire cross section connectable to terminal block for busbar supply min/max: 4/25mm² or AWG10/4.

TERMINAL BLOCK FOR BUSBAR SUPPLY

- I_{max} 63A
- Wire cross section connectable min/max: 4/25mm² or AWG10/4.

SM1-CONTACTOR CONNECTION

This 3-pole link, SMX90 01 or SMX90 02 type, is composed by three 10 AWG (4mm²) section wires having butt ends and wire tie (to keep them together), 3.3in (85mm) long, providing a quick and easy connection between the manual starter and the contactor. This type of connection is normally used to assemble starters mounted on busbar systems.

The SMX90 03 rigid connecting kit fastens together the SM1B starter and the BG mini-contactor forming a single-unit full-voltage starter for quick installation on 35mm DIN rail (EN 50022).

The SMX90 04 rigid connecting kit fastens together the SM1B starter and the BF9, BF12 or BF16 contactor forming a single-unit full-voltage starter for quick installation on 35mm DIN rail (EN 50022).

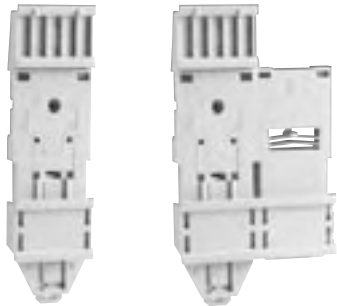
Certifications and compliance

- UL listed, for USA and Canada, file E 93602 (contacts, releases and padlockable attachment).

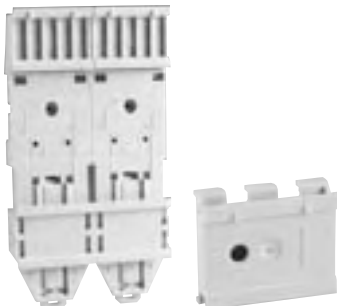
Compliant with standards: IEC/EN 60947-5-1.



11 SMX17 10
11 SMX17 11



11 SMX90 10
11 SMX90 12



11 SMX90 14
11 SMX90 18



11 SMX90 19



11 SMX17 35



11 SMX17 40
11 SMX17 45

Characteristics	Qty per pkg	Catalog number	Price
	n°		\$

Surface mount enclosures.

IP40, 4in (100mm) wide	10	11 SMX17 10	38.00
IP40, 3.3in (85mm) wide	10	11 SMX17 11	32.00

Flush mount enclosure.

IP40, 4in (100mm) wide	10	11 SMX17 20	24.00
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Accessories for enclosures.

Padlockable rotary operators.

IP65. Black color. For SMX17 10 and SMX17 20 enclosures	10	11 SMX17 30 ^①	12.00
IP65. Red-yellow color. For SMX17 10 and SMX17 20 enclosures	10	11 SMX17 35 ^①	12.00

Operator with emergency stop button.

IP65. For SMX17 11 and SMX17 21 enclosures	10	11 SMX17 40 ^①	33.00
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IP65 membrane complete with rim.

For SMX17 11 enclosure	10	11 SMX17 45	12.00
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Neutral connection.

For SMX17 10 and SMX17 20	10	11 SMX17 50	6.00
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Pilot lights.

Green	10	23 NEONV [⊕] V	18.00
Red	10	23 NEONR [⊕] V	18.00

PG adapters for enclosures.

Metal, for PG16 to 1/2" NPT	10	G616	3.00
Plastic, for PG16 to 1/2" NPT	10	G617	9.00

Starter assembly accessories.

Adapter plate for full-voltage starter with SM1B starter and BG or BF9-BF40 contactor	1	11 SMX90 10	14.00
Adapter plate for reversing contactor assembly with SM1B starter and BG or BF9-BF25 contactors	1	11 SMX90 12	24.00
Adapter plate for wye-delta starter with SM1B starter and 45mm wide contactors (BF9-BF25)	1	11 SMX90 14	28.00
DIN rail for wire bypass of contactor used with SMX90 14 plate	1	11 SMX90 18	3.80
DIN rail extension for 55mm wide contactors	1	11 SMX90 19	2.00

① Complete with required voltage.

② The device obtained with this operator is not suitable for isolation per IEC/EN 60947-2 standards.

General and operational characteristics

SURFACE MOUNT ENCLOSURE

- Top or bottom entry
 - PG16 thread for SMX17 10;
 - 22.5mm knockout for SMX17 11
- Rear entry
 - 22.5mm knockout
- Holds a SM1B starter equipped with one side-mount contact block (100mm wide version only), one front-mount block and either one shunt or undervoltage release
- Ground terminal included.

FLUSH MOUNT ENCLOSURE

- Use with starter, complete with 1 front-mount and 1 side-mount blocks and one shunt or undervoltage release
- Ground terminal included
- Cut-out size, 4.02x5.62in (102x142.8mm).

ENCLOSURE ACCESSORIES

Padlockable rotary actuator:

- Raises the degree of protection of the enclosure to IP65
 - 3 padlocks maximum.
- Actuator with emergency push-button:**
- Raises the degree of protection of the enclosure to IP65.

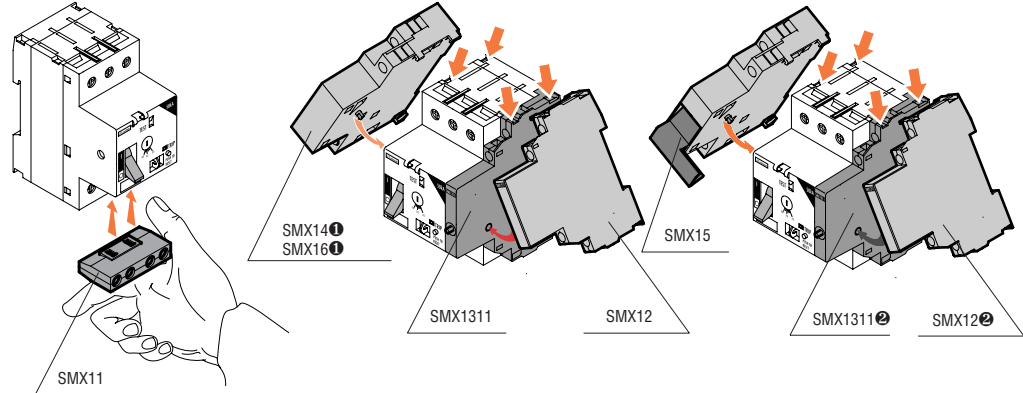
STARTER ASSEMBLY ACCESSORIES

The elements consent to preassemble starters and to form trim and compact single-unit equipment for quick and easy installation.

The starter adapter plates install on 35mm DIN rail (EN 50022).

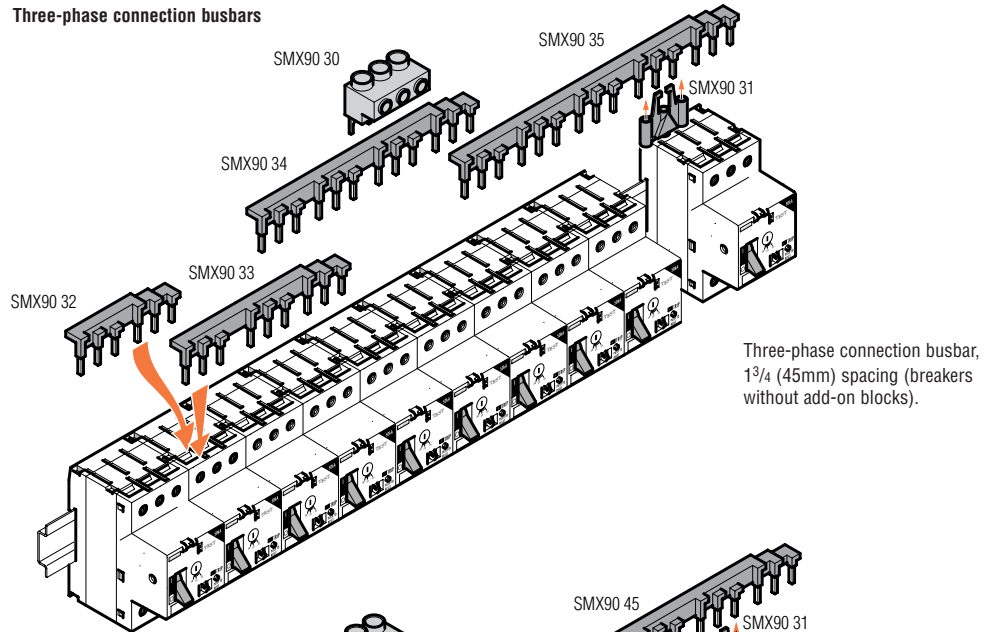
Catalog numbers of rigid connecting kits for reversing and full-voltage starters are given on pages 3-12, 3-16 and 5-6.

Mounting position

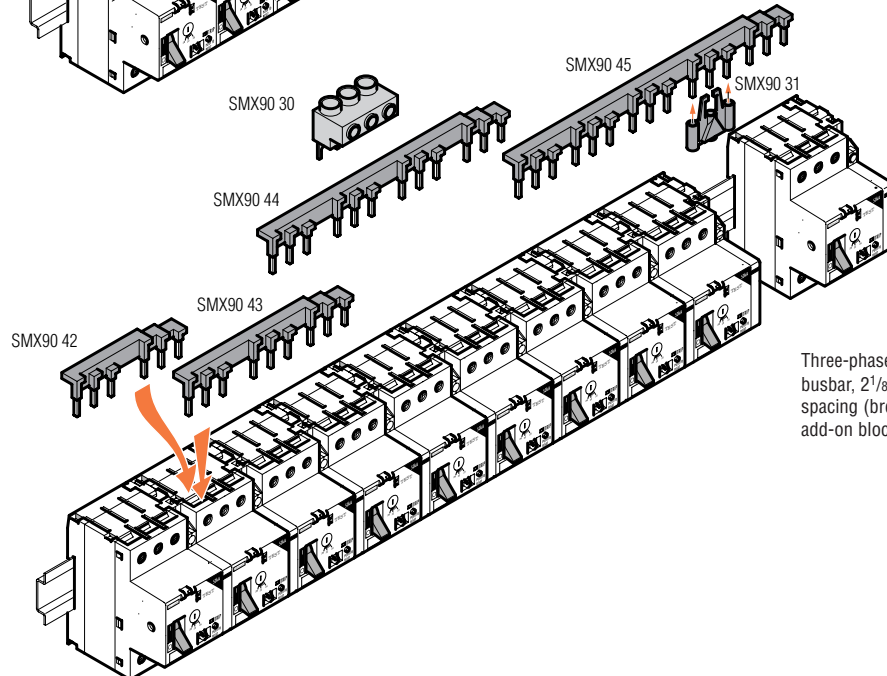


- ① Only one add-on block can be fixed on the left side of the breaker.
- ② One of the following combinations can be mounted on the right side of the breaker:
 - One each of SMX13 11 and SMX12
 - or one only SMX13 11
 - or one only SMX12

Three-phase connection busbars

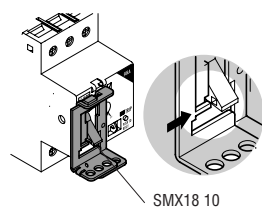


Three-phase connection busbar, 1³/₄ (45mm) spacing (breakers without add-on blocks).

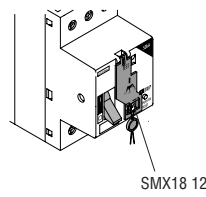


Three-phase connection busbar, 2¹/₈ (54mm) spacing (breakers with add-on blocks).

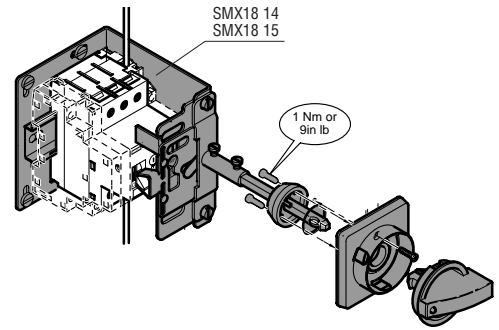
Padlockable attachment for operating lever



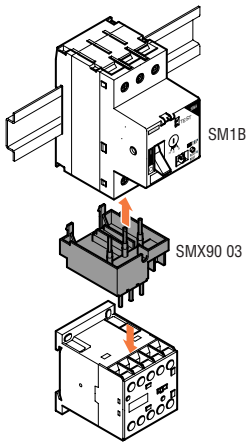
Adjuster sealing kit



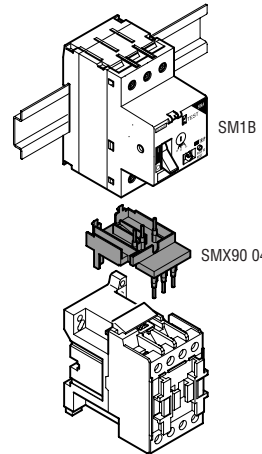
Padlockable door interlock handle



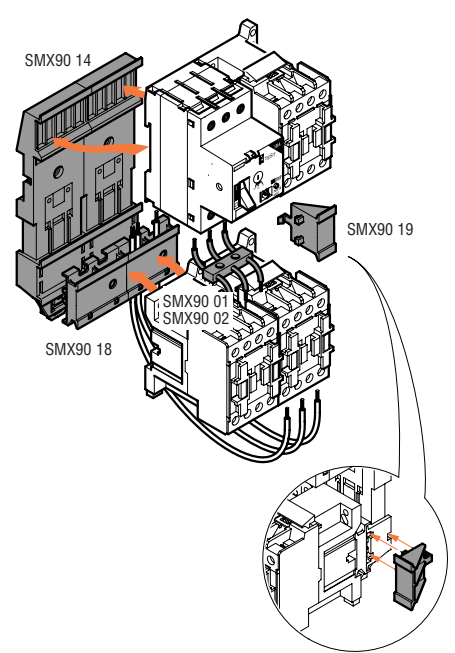
Rigid connecting kit for SM1B breaker and BG mini-contactor



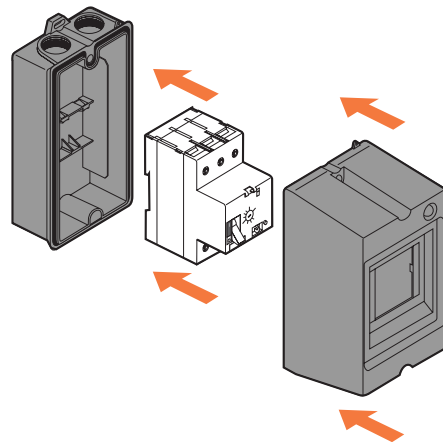
3-pole link for SM1B breaker and a BF9-BF16 contactor



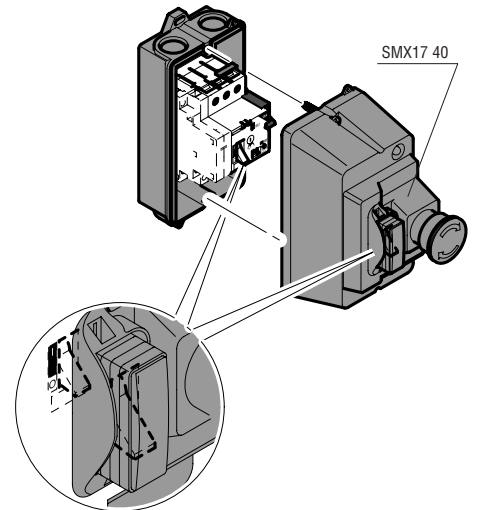
Wye-delta starter adapter plate and connections



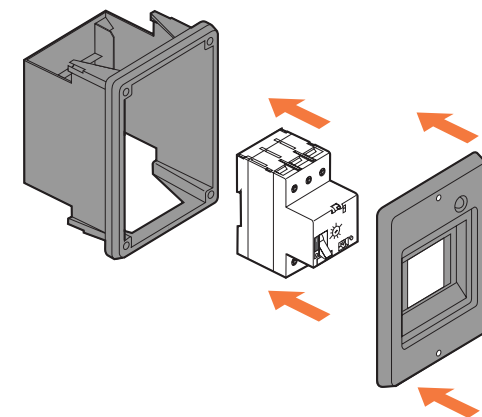
Surface mount enclosure SMX17 10 or SMX17 11



Surface mount enclosure SMX17 11 complete with emergency stop button SMX17 40.



Flush mount enclosure SMX17 20



1



11 SMX20 11
11 SMX21 11



11 SMX22



11 SMX23 11



11 SMX24 - 11 SMX25 -
11 SMX26

Characteristics	Qty per pkg	Catalog number	Price
	n°		\$
Add-on auxiliary contacts.			
Front mount 1 double throw	10	11 SMX20 11	23.00
Front mount 1NO+1NC	10	11 SMX21 11	23.00
Side mount 1NO+1NC	1	11 SMX22 11	23.00
Side mount 2NO	1	11 SMX22 20	23.00
Side mount 2NC	1	11 SMX22 02	23.00
Side mount indicator contacts (1NO+1NC) for thermal trip and (1NO+1NC) for magnetic trip ①	1	11 SMX23 11	34.00
Undervoltage trip releases.			
110-127VAC 50/60Hz	1	11 SMX24 BC	57.00
220-240VAC 50/60Hz	1	11 SMX24 CL	57.00
380-400VAC 50/60Hz	1	11 SMX24 EA	57.00
220-240VAC (50/60Hz) with early-make contacts	1	11 SMX25 CL	72.00
380-400VAC (50/60Hz) with early-make contacts	1	11 SMX25 EA	72.00
Shunt trip releases.			
24VAC 50/60Hz	1	11 SMX26 AF	57.00
110-127VAC 50/60Hz	1	11 SMX26 BC	57.00
220-240VAC 50/60Hz	1	11 SMX26 CL	57.00
400-480VAC 50/60Hz	1	11 SMX26 EA	57.00
Padlockable door interlock rotary operator.			
3 padlocks max, black	1	11 SMX28 05	99.00
3 padlocks max, red/yellow	1	11 SMX28 10	99.00

① See diagram on page W-2 for the exact operation.

General and operational characteristics

ADD-ON AUXILIARY BLOCKS

- Snap on to the front or the left side of the starter
- Maximum combination: 8 auxiliary contacts of which 2 on front and 6 on the side (2 normal contacts and 4 indicators)
- Rated thermal current I_{th}: 10A (2.5A for SMX21 11)
- Rated insulation voltage U_i: 690V (250V for SMX20... and SMX22...)
- UL designation: A600 Q300 (C300 R300 for SMX20... and SMX21...)
- Wire cross section connectable (1 or 2 conductors) min/max: 0.5/2.5mm² and AWG 18/14.

UNDERVOLTAGE TRIP RELEASE

- Snap on to the right side of the starter
- Consumption inrush/holding: 20.2/7.2 VA; 13/2.4 W
- Dropout voltage: 0.35-0.7 Us
- Pickup voltage: 0.85-1.1 Us
- Wire cross section connectable (1 or 2 conductors) min/max: 0.5/2.5mm² and AWG 18/14.

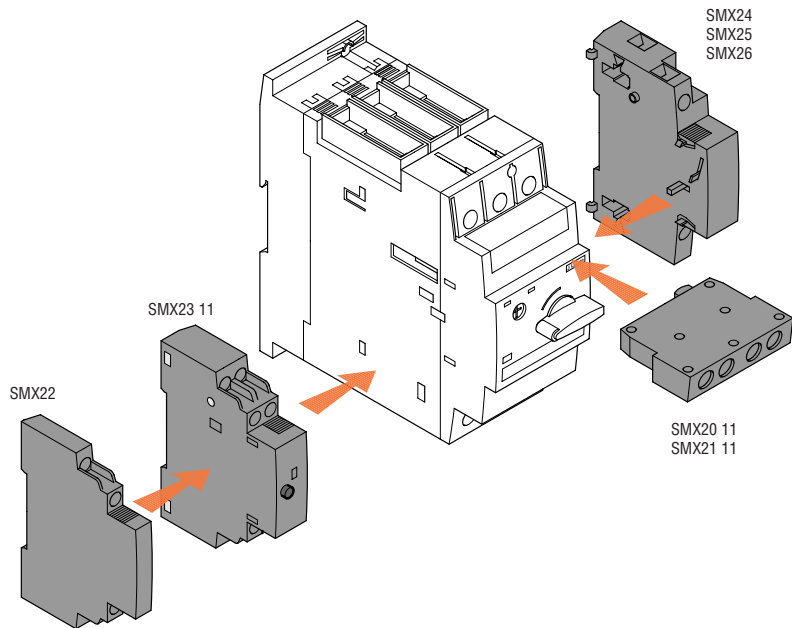
SHUNT TRIP RELEASE

- Snap on to the right side of the starter
- Inrush consumption: 20.2VA; 13W
- Operating voltage: 0.7-1.1 Us
- Wire cross section connectable (1 or 2 conductors) min/max: 0.5/2.5mm² and AWG 18/14.

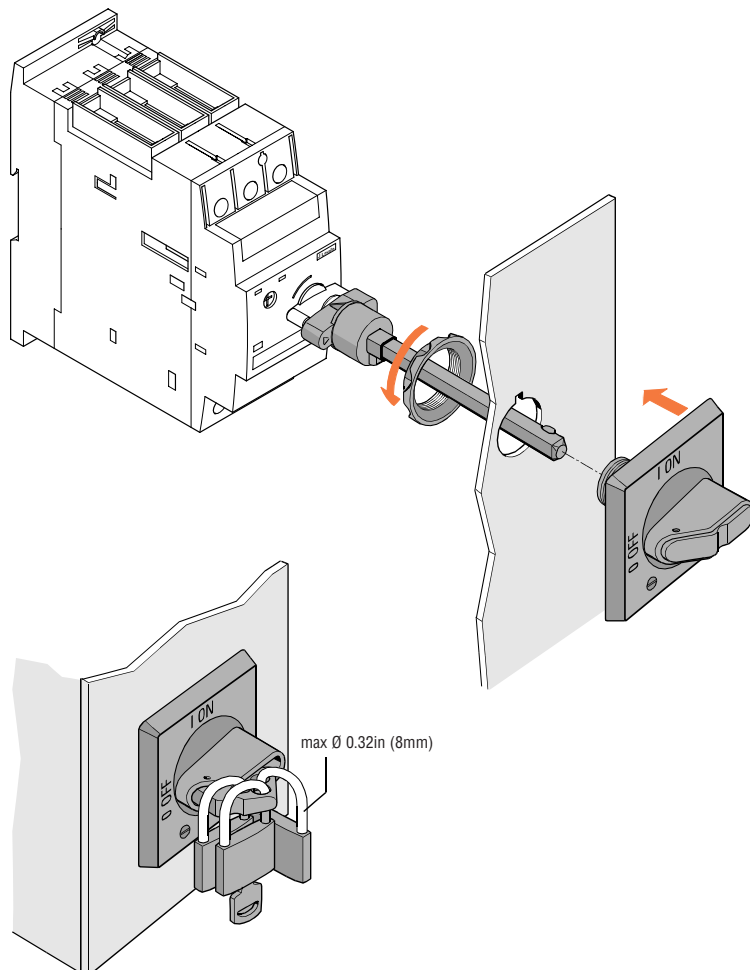
Certifications and compliance

- UL listed, for USA and Canada, file E 93601 for contacts and releases.
 - CSA certified, file LR 703212.
- Compliant with standards: IEC/EN 60947-5-1.

Mounting position



Padlockable door interlock rotary actuator SMX28 05 - SMX28 10





PAGE 2-2

PANEL MOUNTING PLATE VERSION

- 30A to 100A ratings
- To complete with extension and handle.



PAGE 2-3

ACCESSORIES

- Padlockable IP65 handles
- Door interlock extensions.

- 30, 40, 60, 80 and 100 Amp ratings
- Suitable for motor disconnect
- Three-pole door interlock version
- Modular and compact size



PLANET - SWITCH

Disconnect switches

	SEC.	PAGE
Three pole switches	2-	2
Accessories	2-	3

Three-pole switches

2



GUS030A

General purpose	AC23A rating 400V	Description	Catalog number	Price
[A]	[kW]			\$

For panel plate or DIN rail mounting. To be completed with extension and handle. Suitable to break all lines.

30	10	3-pole switch body	GUS030A	50.00
40	13	3-pole switch body	GUS040A	55.30
60	22	3-pole switch body	GUS060A	68.00
80	35	3-pole switch body	GUS080A	82.90
100	37	3-pole switch body	GUS100A	110.20

HORSEPOWER RATINGS

GUS030A motor ratings.

Rated voltage [VAC]	1 phase	2 or 3 phase B, C, D design	3 phase E design
110-120	2	2	2
200-208 230-240	3	7 ¹ / ₂	5
265-277 380-415	3 5	7 ¹ / ₂ 10	5 —
440-480 550-600	7 ¹ / ₂ 10	15 20	10 10

GUS040A motor ratings.

Rated voltage [VAC]	1 phase	2 or 3 phase B, C, D design	3 phase E design
110-120	2	2	2
200-208 230-240	3	7 ¹ / ₂	5
265-277 380-415	3 5	7 ¹ / ₂ 10	5 —
440-480 550-600	7 ¹ / ₂ 10	20 25	10 15

GUS060A motor ratings.

Rated voltage [VAC]	1 phase	2 or 3 phase B, C, D design	3 phase E design
110-120	2	2	2
200-208 230-240	5	10	5
265-277 380-415	5 7 ¹ / ₂	10 15	7 ¹ / ₂ —
440-480	10	25	15

GUS080A motor ratings.

Rated voltage [VAC]	1 phase	2 or 3 phase B, C, D design	3 phase E design
110-120	3	2	2
200-208 230-240	7 ¹ / ₂ 10	15 20	10 15
265-277 380-415	10 15	20 30	15 —
440-480 550-600	20 30	40 50	30 40

GUS100A motor ratings.

Rated voltage [VAC]	1 phase	2 or 3 phase B, C, D design	3 phase E design
110-120	5	2	2
200-208 230-240	10 15	20 25	15 15
265 277 380-415	15 15 20	25 30 40	20 20 —
440-480	30	50	40

General characteristics

- Suitable as motor disconnect and motor controller
- Use with design B, C, D and E motors
- Fixing on panel mounting plate
- Mounting on 35mm DIN rail (EN 50022)
- Padlockable in 0 position with no tools

Operational characteristics

- Rated insulation voltage U_i: 690V
- Rated impulse withstand voltage U_{imp}: 8kV
- Rated short-time withstand current (1s) I_{cw}: 1260A
- Tightening torque: 35 in lb/4Nm
- Maximum voltage for motors, general use and resistive loads
 - 600V for GUS 30, GUS 40 and GUS 80
 - 480V for GUS 60 and GUS 100.

Certifications and compliance

UL listed for USA and Canada, File E 155982.
Compliant with standards: IEC/EN 60947-3 and UL508.

Accessories

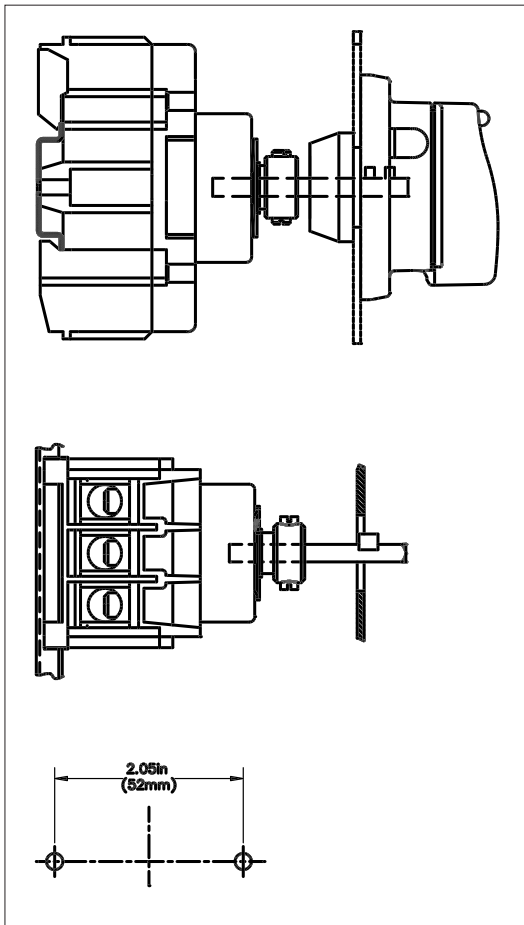


GUSH2



GUSS150

Characteristics	Catalog number	Price
		\$
Handles.		
Black padlockable IP65 handle	GUSH2	21.20
Red/yellow padlockable IP65 handle	GUSH3	21.20
Door interlock extensions.		
3 1/2in (90mm) long	GUSS090	5.60
6in (150mm) long	GUSS150	8.30
8in (200mm) long	GUSS200	8.30
12in (300mm) long	GUSS300	19.30



General characteristics

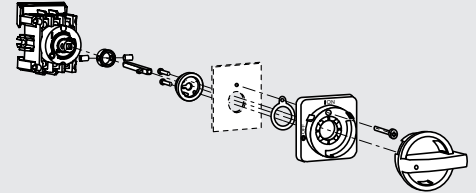
The handle is supplied complete with:

- Front plate (bezel)
- Shaft guide collar
- 3 plastic-threading screws, one of which to attach the front plate to the panel and the other two to attach the collar to the front plate
- Rotary knob with gasket.

Certifications and compliance

UL listed for USA and Canada, File E 155982.

Compliant with standards: IEC/EN 60947-3 and UL508.





PAGE 3-4

THREE-POLE CONTACTORS

- Ith ratings in AC1 duty at ≤40°C: 16A to 1600A
- Ie ratings in AC3 440V duty: 6A to 630A
- Power ratings in AC3 400V duty: 2.2kW to 335kW
- AC or DC control coil.



PAGE 3-6

FOUR-POLE CONTACTORS

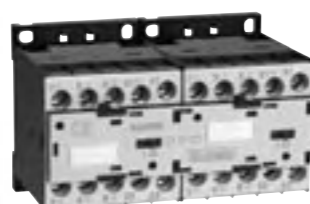
- Ith ratings in AC1 duty at ≤40°C: 20A to 1600A
- Power ratings in AC3 400V duty: 14kW to 950kW
- AC or DC control coil.



PAGE 3-7

FOUR-POLE CONTACTORS WITH 2NO+2NC AND 4NC MAIN POLES

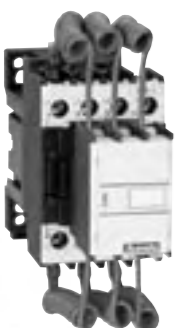
- Ith ratings in AC1 duty at ≤40°C: 20A to 60A
- AC or DC control coil.



PAGE 3-8

REVERSING CONTACTOR ASSEMBLIES

- Unwired and wired versions
- Ie ratings in AC3 440V duty: 9A and 12A
- Power ratings in AC3 400V duty: 4kW and 5.7kW
- AC or DC control coil.



PAGE 3-10

CONTACTORS FOR POWER FACTOR CORRECTION

- With limiting resistors included
- Power ratings at 400V: 8kvar to 60kvar
- AC control coil.

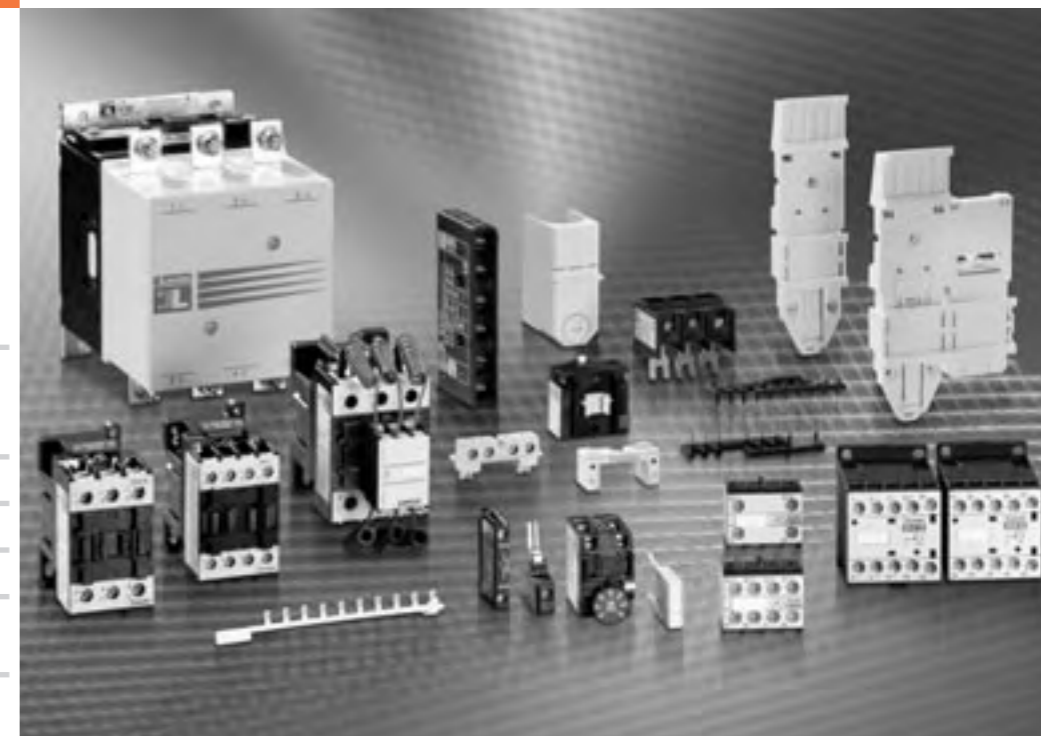


PAGE 3-11

CONTROL RELAYS

- AC, DC or low consumption supply coil
- Screw or Faston termination
- 4, 8 or 12 auxiliary contact composition.

- IEC style contactors - long electrical and mechanical life
- Complete range from mini-contactors to 630 Amp inductive AC3 ratings
- Wide range coils +10% to -30%
- Finger safe terminals
- Four-pole versions available
- 2NO + 2NC and 4NC power pole versions available
- Extensive assortment of add-on blocks and accessories



PLANET - SWITCH

Contactors

	SEC.	PAGE
Three-pole	3-	4
Four-pole	3-	6
Special four-pole	3-	7
Reversing contactor assemblies	3-	8
For power factor correction	3-	10
Control relays	3-	11

Add-on blocks and accessories

For mini-contactors type BG	3-	12
For contactors type CF4 and BF	3-	14
For contactors type B	3-	18
Positively guided contacts	3-	20

Spare parts

AC coils for contactors, type CF4 and BF9-BF40	3-	22
AC coils for contactors, type BF50-BF110	3-	22
DC coils for contactors type BF...C	3-	23
AC/DC coils for contactors, type B115-B1600	3-	24
Main contacts and arc chutes	3-	25

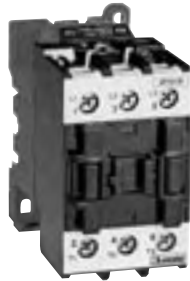
Lovato Electric comprehensive line of contactors can be divided in to three basic configurations. Each of these have unique features but all are designed for long life and have finger-safe protection. Lovato Electric facilities, where these contactors are manufactured, work under ISO 9001 quality conditions, per IQNet certification since 1992 and constantly maintained by passing yearly quality assurance audits. The design and manufacture of the contactors and accessories have taken into consideration the most demanding international standards prescriptions.

BG series 6A/3HP - 12A/7.5HP



- ❑ Highly conductive auxiliary contacts with four contact points
- ❑ AC and DC versions of same size
- ❑ Quick connect - snap on accessory mounting
- ❑ Distinct contact status indication
- ❑ Up to four auxiliary contacts can be mounted
- ❑ Mechanical interlock only 5mm deep
- ❑ Low DC consumption interface version
- ❑ Positively guided contacts (mechanically-linked per IEC)

BF series 9A/5HP - 110A/75HP



- ❑ 4 different contactor frame sizes up to 75HP
- ❑ Anti-shock magnetic core design
- ❑ Straight through wiring
- ❑ Captive raised terminal screws to reduce wiring time
- ❑ Wide coil operating range
- ❑ Coil removable without disconnecting power wiring
- ❑ Oversized main contacts
- ❑ Easy contact inspection and replacement
- ❑ Special main pole configurations
- ❑ Specific version for power factor correction systems
- ❑ Positively guided contacts (mechanically-linked per IEC)

B series 110A/75HP - 630A/500HP



- ❑ 3 frame sizes offering 11 different contactors
- ❑ Coil operate indifferently on AC or DC supply voltage
- ❑ Coil with low in-rush and holding
- ❑ Coil removable without disconnecting power wiring
- ❑ Red indicator when contactor is energized
- ❑ Unique right-angle magnet design - limits contact bounce
- ❑ Safety feature prevents contactor to be energized without arc chute in place and locked
- ❑ Convertible auxiliary contact block (2NO + 1NC or 1NO + 2NC), maximum of 4 blocks per contactor for a total of 12 contacts
- ❑ Contactor terminals furnished with bolt, washer and nut
- ❑ Simple horizontal or vertical interlock
- ❑ Positively guided contacts (mechanically-linked per IEC)



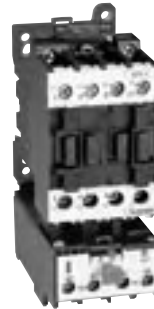
Non-reversing and reversing IEC starters

Non-reversing and reversing IEC starters

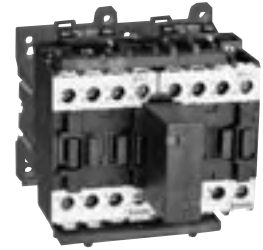
Contactors can be combined with either manual motor starters of the SM series, providing thermal and magnetic protection up to 100A, or single or three-pole thermal bimetallic overload relays, with or without single-phase protection up to 420A, to obtain non-reversing or reversing starters. Equipment can be assembled together or independently mounted through the use of specifically designed accessories.



Non-reversing starter



Non-reversing starter



Reversing contactor

3

Available versions

	3 poles		4 poles	
	AC	DC	AC	DC
BG06	●	●	—	—
BG09	●	●	●	●
BG12	●	●	—	—
BF9	●	●	●	●
BF12	●	●	—	—
BF16	●	●	●	●
BF20	●	●	●	—
BF25	●	●	●	●
BF32	●	●	—	—
BF40	●	●	●	●
BF50	●	●	●	—
BF63	●	●	●	●
BF80	●	●	●	●
BF95	●	●	—	—
BF110	●	●	—	—
B115	●	—	●	—
B145	●	—	●	—
B180	●	—	●	—
B250	●	—	●	—
B310	●	—	●	—
B400	●	—	●	—
B500	●	—	●	—
B630	●	—	●	—
B630 1000	●	—	●	—
B1250	●	—	●	—
B1600	●	—	●	—

MINI-CONTACTORS

CONTACTORS



**BG06
BG09
BG12** **BF9
BF12
BF16** **BF20
BF25** **BF32
BF40** **BF50-BF65
BF80-BF95
BF110** **B115
B145
B180** **B250
B310
B400**

3

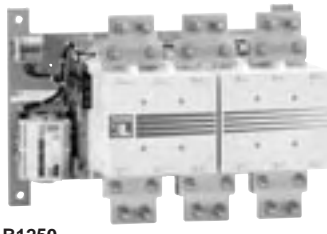
Maximum horsepower ratings		Three phase				UL Amp rating	UL resistive Amps	Maximum current		Incorporated auxiliary contacts		Type of termination
Single phase 115V	230V	200V	230V	460V	575V			Inductive AC3	Resistive AC1	NO	NC	
[HP]	[HP]	[HP]	[HP]	[HP]	[HP]	[A]	[A]	[A]	[A]			
1/3	1	1 1/2	2	3	3	16	—	6	16	1	0	Clamp-screw
										0	1	
1/2	1 1/2	2	3	5	5	20	—	9	20	1	0	Clamp-screw
										0	1	
1/2	1 1/2	2	3	5	5	20	—	9	20	1	0	Clamp-screw
										0	1	
1/2	1 1/2	2	3	5	5	20	—	9	20	1	0	Faston
										0	1	
1/2	1 1/2	2	3	5	5	20	—	9	20	1	0	Faston
										0	1	
1/2	1 1/2	2	3	5	5	20	—	9	20	1	0	PCB solder pin
										0	1	
1/2	1 1/2	3	3	7 1/2	10	20	—	12	20	1	0	Clamp-screw
										0	1	
3/4	2	3	3	5	7 1/2	22	—	12	25	1	0	Clamp-screw
										0	1	
1	2	5	5	7 1/2	10	24	—	12	25	1	0	Clamp-screw
										0	1	
1	2	5	5	7 1/2	10	24	—	16	25	1	0	Clamp-screw
										0	1	
1 1/2	3	5	5	10	15	32	—	20	40	—	—	Clamp-screw
										1	0	
										0	1	
2	5	7 1/2	7 1/2	15	20	40	—	25	40	—	—	Clamp-screw
										1	0	
										0	1	
3	7 1/2	7 1/2	10	20	25	52	—	32	55	—	—	Clamp-screw
3	7 1/2	10	15	30	30	52	—	40	60	—	—	Clamp-screw
5	10	10	15	30	40	90	—	50	90	—	—	Lug-clamp
—	—	20	25	50	60	110	—	65	110	—	—	Lug-clamp
—	—	25	30	60	75	125	—	80	125	—	—	Lug-clamp
—	—	30	30	60	75	125	—	95	125	—	—	Lug-clamp
—	—	30	40	75	100	125	—	110	125	—	—	Lug-clamp
—	—	30	40	75	100	110	160	110	160	—	—	Screw-nut
—	—	50	50	100	125	150	220	150	250	—	—	Screw-nut
—	—	60	75	150	150	180	260	185	275	—	—	Screw-nut
—	—	75	100	200	250	250	350	265	350	—	—	Screw-nut
—	—	100	125	250	300	315	400	320	450	—	—	Screw-nut
—	—	125	150	350	400	400	450	420	550	—	—	Screw-nut
—	—	—	—	—	—	No UL	No UL	520	700	—	—	Screw-nut
—	—	—	—	—	—	No UL	No UL	630	800	—	—	Screw-nut
—	—	—	—	—	—	No UL	No UL	None	1000	—	—	Screw-nut
—	—	—	—	—	—	No UL	No UL	None	1250	2	4	Screw-nut
—	—	—	—	—	—	No UL	No UL	None	1600	2	4	Screw-nut



B500-B630



B630 1000



**B1250
B1600**

Catalog number	Price	Catalog number	Price
AC coil		DC coil	
	\$		\$
11 BG06 10 A ①	49.00	11 BG06 10 D ①	65.00
11 BG06 01 A ①	49.00	11 BG06 01 D ①	65.00
11 BG09 10 A ①⑤	60.00	11 BG09 10 D ①⑤	80.00
11 BG09 01 A ①⑤	60.00	11 BG09 01 D ①⑤	80.00
—	—	11 BG09 10 L ⑤	96.00
—	—	11 BG09 01 L ⑤	96.00
11 BGF09 10 A ①	n.a.	11 BGF09 10 D ①	n.a.
11 BGF09 01 A ①	n.a.	11 BGF09 01 D ①	n.a.
—	—	11 BGF09 10 L ⑤	n.a.
—	—	11 BGF09 01 L ⑤	n.a.
11 BGS09 10 A ①	70.00	11 BGS09 10 D ①	90.00
11 BGS09 01 A ①	70.00	11 BGS09 01 D ①	90.00
11 BG12 10 A ①	76.00	11 BG12 10 D ①	93.00
11 BG12 01 A ①	76.00	11 BG12 01 D ①	93.00
11 BF9 10 ②	81.00	11 BF9C 10 ④	106.00
11 BF9 01 ②	81.00	11 BF9C 01 ④	106.00
11 BF12 10 ②	102.00	11 BF12C 10 ④	131.00
11 BF12 01 ②	102.00	11 BF12C 01 ④	131.00
11 BF16 10 ②	110.00	11 BF16C 10 ④	139.00
11 BF16 01 ②	110.00	11 BF16C 01 ④	139.00
11 BF20 00 ②	117.00	—	—
11 BF20 10 ②	124.00	11 BF20C 10 ④	147.00
11 BF20 01 ②	124.00	11 BF20C 01 ④	147.00
11 BF25 00 ②	130.00	—	—
11 BF25 10 ②	137.00	11 BF25C 10 ④	165.00
11 BF25 01 ②	137.00	11 BF25C 01 ④	165.00
11 BF32 00 ②	154.00	11 BF32C 00 ④	198.00
11 BF40 00 ②	188.00	11 BF40C 00 ④	237.00
11 BF50 00 ②	216.00	11 BF50C 00 ④	276.00
11 BF65 00 ②	280.00	11 BF65C 00 ④	347.00
11 BF80 00 ②	329.00	11 BF80C 00 ④	405.00
11 BF95 00 ②	353.00	11 BF95C 00 ④	451.00
11 BF110 00 ②	385.00	11 BF110C 00 ④	491.00
		11 B115 00 ③	541.00
		11 B145 00 ③	770.00
		11 B180 00 ③	1008.00
		11 B250 00 ③	1318.00
		11 B310 00 ③	1859.00
		11 B400 00 ③	2318.00
		11 B500 00 ③	4522.00
		11 B630 00 ③	6390.00
		11 B630 1000 00 ③	7056.00
11 B1250 24 ⑤	—	—	n.a.
11 B1600 24 ⑤	—	—	n.a.

Positively guided contacts

See page 3-20 or TC-20 for contactors with NC contacts.
See page 3-21 or TC-21 for add-on auxiliary contacts.

n.a. Not Available at time of printing, contact Sales and Technical Support.

Certifications and compliance

Certifications obtained:

Type	U L	C U L u s	C S A	B B J	E Z Ü	Register of shipping				
						R I N A	L R O S	G L	R M R S	
BG06	●									
BG09	●									
BG12	●									
BGF	●									
BGS	●									
BF9	●									
BF9C	●									
BF12	●									
BF12C	●									
BF16	●									
BF16C	●									
BF20	●									
BF20C	●									
BF25	●									
BF25C	●									
BF32	●									
BF32C	●									
BF40	●									
BF40C	●									
BF50	●									
BF50C	●									
BF65	●									
BF65C	●									
BF80	●									
BF80C	●									
BF95	●									
BF95C	●									
BF110	●									
BF110C	▲									
B115	●									
B145	●									
B180	●									
B250	●									
B310	●									
B400	●									
B500	●									
B630	●									

● = Certified equipment.

▲ = Pending completion.

All BG mini-contactors: UL listed for USA and Canada, File E 93602.

All BF and B115-B400 contactors:

— UL listed, File E 93602.

— CSA certified, File LR 54332-1 or LR 54332-26.

Compliant with standards: IEC/EN 60947-4-1.

① Complete catalog number with coil digit per following table.

AC coil digit	Voltage range
02460	24V 60Hz
12060	120V 60Hz
23060	200-240V 60Hz
46060	440-480V 60Hz
57560	575V 60Hz

Other coil voltage and frequency values are available on request.
NOTE: No coil change or replacement is possible.

② Complete catalog number with coil digit per following table.

AC coil digit	Voltage range	
	60Hz	50Hz
02460	24V	22V
12060	120V	110V
23060	200-240V	220V
46060	440-480V	380V
57560	575V	—

Other coil voltage and frequency values are available on request.

③ Complete catalog number with coil digit per following table.

Coil digit	Voltage range	
	AC/DC	
024	24V	
110	110/125V	
220	220/240V	
460	440/480V	

Other coil voltage values are available on request.
24V type is not possible for B500-B1600 contactors.
B120-B1600 types are suitable for AC duty only.

④ Complete the catalog number with coil digit.

Standard voltages (coil digit) are: 024-110V.

Other coil voltage values are available on request.

NOTE: No coil change or replacement is possible for BG mini-contactors

⑤ Low-consumption version.

No additional auxiliary contacts or the mechanical interlock BGX50 00 can be mounted.

Complete the catalog number with coil digit.

Standard voltages (coil digit) are: 024-048V.

NOTE: No coil change or replacement is possible.

MINI-CONTACTORS



BG09 T4

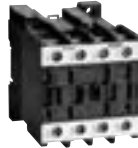
CONTACTORS



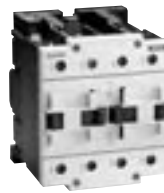
BF9 40
BF16 40



BF25 40



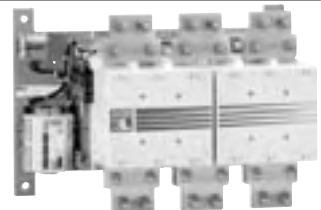
BF40 40



BF50 40
BF65 40
BF80 40



B115 4 - B145 4 - B180 4
B250 4 - B310 4 - B400 4
B500 4 - B630 4



B1250 - B1600

3

UL Amp rating	UL resistive Amps	Maximum current		Operating current (AC1)		Type of termination	Catalog number	Price	Catalog number	Price
		Inductive AC3	Resistive AC1	≤55°C (131°F)	≤70°C (158°F)					
[A]	[A]	[A]	[A]	[A]	[A]			\$		\$
20	—	9	20	18	15	Clamp-screw	11 BG09 T4 A ①	62.00	11 BG09 T4 D ②	82.00
20	—	9	20	18	15	Faston	11 BGF09 T4 A ①	n.a.	11 BGF09 T4 D ②	n.a.
20	—	9	20	18	15	PCB solder pin	11 BGS09 T4 A ①	72.00	11 BGS09 T4 D ②	95.00
22	—	9	25	20	18	Clamp-screw	11 BF9 40 ②	90.00	11 BF9C 40 ③	114.00
24	—	16	25	20	18	Clamp-screw	11 BF16 40 ②	113.00	11 BF16C 40 ③	142.00
32	—	20	40	30	27	Clamp-screw	11 BF20 40 ②	141.00	—	—
40	—	25	40	32	28	Clamp-screw	11 BF25 40 ②	162.00	11 BF25C 40 ③	202.00
52	—	40	60	55	40	Clamp-screw	11 BF40 40 ②	269.00	11 BF40C 40 ③	326.00
90	—	50	90	80	65	Lug-clamp	11 BF50 40 ②	297.00	—	—
110	—	65	110	90	70	Lug-clamp	11 BF65 40 ②	398.00	11 BF65C 40 ③	456.00
125	—	80	125	100	80	Lug-clamp	11 BF80 40 ②	463.00	11 BF80C 40 ③	512.00
110	160	110	160	150	110	Screw-nut	11 B115 4 00 ④	—	—	682.00
150	220	150	250	235	190	Screw-nut	11 B145 4 00 ④	—	—	911.00
180	260	185	275	250	200	Screw-nut	11 B180 4 00 ④	—	—	1398.00
250	350	265	350	300	250	Screw-nut	11 B250 4 00 ④	—	—	1682.00
315	400	320	450	370	300	Screw-nut	11 B310 4 00 ④	—	—	2467.00
400	450	420	550	430	360	Screw-nut	11 B400 4 00 ④	—	—	2841.00
No UL	No UL	520	780	550	500	Screw-nut	11 B500 4 00 ④	—	—	5208.00
No UL	No UL	630	800	640	540	Screw-nut	11 B630 4 00 ④	—	—	7098.00
No UL	No UL	None	1000	850	700	Screw-nut	11 B630 1000 4 00 ④	—	—	7957.00
No UL	No UL	None	1250	1050	880	Screw-nut	11 B1250 4 24 ⑤	—	—	n.a.
No UL	No UL	None	1600	1360	1120	Screw-nut	11 B1600 4 24 ⑤	—	—	n.a.

① Complete catalog number with coil digit per following table.

AC coil digit	Voltage range
02460	24V 60Hz
12060	120V 60Hz
23060	200-240V 60Hz
46060	440-480V 60Hz
57560	575V 60Hz

Other coil voltage and frequency values are available on request.
NOTE: No coil change or replacement is possible.

② Complete catalog number with coil digit per following table.

AC coil digit	Voltage range	
	60Hz	50Hz
02460	24V	22V
12060	120V	110V
23060	200-240V	220V
46060	440-480V	380V
57560	575V	—

Other coil voltage and frequency values are available on request.

③ Complete catalog number with coil digit per following table.

Coil digit	Voltage range	
	AC	DC
024	24V	—
110	110/125V	—
220	220/240V	—
460	440/480V	—

Other coil voltage values are available on request.
24V type is not possible for B500-B1600 contactors.
B1250-B1600 types are suitable for AC duty only.

④ Complete the catalog number with coil digit.
Standard voltages (coil digit) are: 024-110V.
Other coil voltage values are available on request.

Positively guided contacts

See page 3-21 or TC-21 for add-on auxiliary contacts.

n.a. Not available at time of printing, contact Sales & Technical Support.

Certifications and compliance

Type	U	C	C	B	E
	L	U	S	B	Z
		L	A	J	Ü
BG09 T4	●	●			
BGF09 T4	▲				
BGS09 T4	●				
BF9 40	●		●	●	●
BF9C 40	●		●	●	●
BF16 40	●		●	●	●
BF16C 40	●		●	●	●
BF20 40	●		●	●	●
BF25 40	●		●	●	●
BF25C 40	●		●	●	●
BF40 40	●		●	●	●
BF40C 40	●		●	●	●
BF50 40	●		●	●	●
BF65 40	●		●	●	●
BF65C 40	●		●	●	●
BF80 40	●		●	●	●
BF80C 40	●		●	●	●
B115 4	●		●	●	●
B145 4	●		●	●	●
B180 4	●		●	●	●
B250 4	●		●	●	●
B310 4	●		●	●	●
B400 4	●		●	●	●
B500 4				●	●
B630 4				●	●

● = Certified equipment.
▲ = Pending completion.
BG mini-contactors: UL listed for USA and Canada, File E93602.
All BF and B115-B400 contactors:
- UL listed, File E 93602
- CSA certified, File LR 54332-1 or LR 54332-26.
Compliant with standards: IEC/EN 60947-4-1.

Special configurations of power poles (2NO+2NC and 4NC)

MINI-CONTACTORS



11 BG09 T2 A

CONTACTORS



11 BF16 22



11 BF25 04

UL Amp rating	Maximum current		Power pole arrangement		Catalog number	Price
	Inductive AC3	Resistive AC1				
[A]	[A]	[A]	NO	NC		\$

AC coil. With terminals: Clamp-screw.

Mini-contactors.

20	9	20	2	2	11 BG09 T2 A ①	71.00
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Contactors.

24	16	40	2	2	11 BF16 22 ②	120.00
40	25	40	2	2	11 BF25 22 ②	175.00
52	40	60	2	2	11 BF40 22 ②③	287.00
24	16	40	0	4	11 BF16 04 ②	120.00
40	25	40	0	4	11 BF25 04 ②	175.00

DC coil. With terminals: Clamp-screw.

Mini-contactors.

20	9	20	2	2	11 BG09 T2 D ④	86.00
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Contactors.

24	16	40	2	2	11 BF16C 22 ④	151.00
40	25	40	2	2	11 BF25C 22 ④	212.00
52	40	60	2	2	11 BF40C 22 ④⑤	344.00
24	16	40	0	4	11 BF16C 04 ④	151.00
40	25	40	0	4	11 BF25C 04 ④	212.00

① Complete catalog number with coil digit per following table.

AC coil digit	Voltage range
02460	24V 60Hz
12060	120V 60Hz
23060	200-240V 60Hz
46060	440-480V 60Hz
57560	575V 60Hz

Other coil voltage and frequency values are available on request.
NOTE: No coil change or replacement is possible.

② Complete catalog number with coil digit per following table.

AC coil digit	Voltage range	
	60Hz	50Hz
02460	24V	22V
12060	120V	110V
23060	200-240V	220V
46060	440-480V	380V
57560	575V	—

Other coil voltage and frequency values are available on request.

③ No side-mount auxiliary contacts can be added.

④ Complete the catalog number with coil digit.
Standard voltages (coil digit) are: 024-110V.
Other coil voltage values are available on request.
NOTE: No coil change or replacement is possible for BG mini-contactors.

Positively guided contacts

See page 3-21 or TC-21 for add-on auxiliary contacts.

Certifications and compliance

BG mini-contactors:

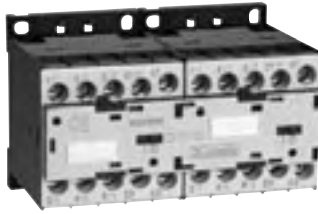
– UL listed for USA and Canada, File E 93602.

BF contactors:

– UL listed, File 93602

– CSA certified, File LR 43332-1.

Compliant with standards: IEC/EN 60947-4-1.



11 BGR09 01A



3

UL maximum horsepower ratings		UL Amp rating		UL resistive Amps	Maximum current Inductive AC3	Resistive AC1	Auxiliary contacts (per contactor)	Catalog number	Price
Single phase 115V	Three phase 230V	200V	230V	460V	575V	[A]	[A]	[A]	[A]
[HP]	[HP]	[HP]	[HP]	[HP]	[HP]	[A]	[A]	NO	NC

Unwired version - AC coil

Reversing mini-contactor assembly, mechanically interlocked. Terminals: clamp screw.

1/3	1	1 1/2	2	3	3	16	—	6	16	1	0	11 BGR06 10 A ①	147.00
										0	1	11 BGR06 01 A ①	147.00
1/2	1 1/2	2	3	5	5	20	—	9	20	1	0	11 BGR09 10 A ①	177.00
										0	1	11 BGR09 01 A ①	177.00
1/2	1 1/2	3	3	7 1/2	10	20	—	12	20	1	0	11 BGR12 10 A ①	203.00
										0	1	11 BGR12 01 A ①	203.00

Reversing contactor assembly, mechanically interlocked.

Terminals: clamp screw for BFU09-BFU40; lug clamp for BFU50-BFU110.

3/4	2	3	3	5	7 1/2	22	—	9	25	1	0	11 BFU9 10 ②	180.00
										0	1	11 BFU9 01 ②	180.00
1	2	5	5	7 1/2	10	24	—	12	25	1	0	11 BFU12 10 ②	222.00
										0	1	11 BFU12 01 ②	222.00
1	2	5	5	7 1/2	10	24	—	16	25	1	0	11 BFU16 10 ②	238.00
										0	1	11 BFU16 01 ②	238.00
1 1/2	3	5	5	10	15	32	—	20	40	0	0	11 BFU20 00 ②	252.00
										1	0	11 BFU20 10 ②	266.00
										0	1	11 BFU20 01 ②	266.00
2	5	7 1/2	7 1/2	15	20	40	—	25	40	0	0	11 BFU25 00 ②	278.00
										1	0	11 BFU25 10 ②	292.00
										0	1	11 BFU25 01 ②	292.00
3	7 1/2	7 1/2	10	20	25	52	—	32	55	0	0	11 BFU32 00 ②	326.00
3	7 1/2	10	15	30	30	52	—	40	60	0	0	11 BFU40 00 ②	394.00
5	10	10	15	30	40	90	—	50	90	0	0	11 BFU50 00 ②	470.00
—	—	20	25	50	60	110	—	65	110	0	0	11 BFU65 00 ②	598.00
—	—	25	30	60	75	125	—	80	125	0	0	11 BFU80 00 ②	696.00
—	—	30	30	60	75	125	—	95	125	0	0	11 BFU95 00 ②	744.00
—	—	30	40	75	100	125	—	110	125	0	0	11 BFU110 00 ②	848.00

AC/DC coil

Reversing contactor assembly, mechanically interlocked. Terminals: Screw nut.

—	—	30	40	75	100	110	160	110	160	0	0	11 BFU115 00 ⑤	1149.00
—	—	50	60	100	125	150	220	150	250	0	0	11 BFU145 00 ⑤	1607.00
—	—	60	75	150	150	180	260	185	275	0	0	11 BFU180 00 ⑤	2083.00

Wired version - AC coil

Reversing mini-contactor assembly, mechanically interlocked, pre-wired with load and line power and auxiliary wiring.

Terminals: clamp screw ④⑤.

1/2	1 1/2	2	3	5	5	20	—	9	20	0	1	11 BGR09 01 A ①	148.00
1/2	1 1/2	3	3	7 1/2	10	20	—	12	20	0	1	11 BGR12 01 A ①	180.00

Reversing contactor assemblies, mechanically interlocked, pre-wired with load and line power wiring. Terminals: clamp screw ⑤.

3/4	2	3	3	5	7 1/2	22	—	9	25	0	1	11 BFT9 01 ②	214.00
1	2	5	5	7 1/2	10	24	—	12	25	0	1	11 BFT12 01 ②	268.00
1	2	5	5	7 1/2	10	24	—	16	25	0	1	11 BFT16 01 ②	285.00
2	5	7 1/2	7 1/2	15	20	40	—	25	40	0	1	11 BFT25 01 ②	311.00

① Complete catalog number with coil digit per following table.

AC coil digit	Voltage range
02460	24V 60Hz
12060	120V 60Hz
23060	200-240V 60Hz
46060	440-480V 60Hz
57560	575V 60Hz

Other coil voltage and frequency values are available on request. NOTE: No coil change or replacement is possible.

② Complete catalog number with coil digit per following table.

AC coil digit	Voltage range	
	60Hz	50Hz
02460	24V	22V
12060	120V	110V
23060	200-240V	220V
46060	440-480V	380V
57560	575V	—

Other coil voltage and frequency values are available on request.

③ Complete catalog number with coil digit per following table.

AC coil digit	Voltage range
	AC/DC
024	24V
120	110/125V
220	200/240V
460	440/480V

Other coil voltage values are available on request.

④ Mini-contactor assembly for mounting on printed circuit boards is available on request. Contact Sales & Technical Support for details.

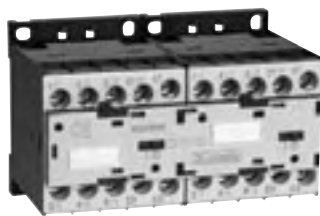
⑤ An overload relay can not be directly mounted on the contactors. Use the RF25 type and the G230 independent mounting base.

Positively guided contacts

See page 3-20 or TC-20 for contactors with NC contacts. See page 3-21 or TC-21 for add-on auxiliary contacts.

Certifications and compliance

BGR types: UL listed for USA and Canada, File E 93602. Compliant with standards: IEC/EN 60947-4-1 and UL508.



11 BGR09 01D



UL maximum horsepower ratings		Single phase				Three phase				UL Amp rating	UL resistive Amps	Maximum Inductive AC3	Resistive AC1	Auxiliary contacts (per contactor)		Catalog number	Price
115V	230V	200V	230V	460V	575V	[HP]	[HP]	[HP]	[HP]					[A]	[A]		

Unwired version - DC coil.

Reversing mini-contactor assembly, mechanically interlocked. Terminals: clamp screw.

1/3	1	1 1/2	2	3	3	16	—	6	16	1	0	11 BGR06 10 D	147.00
										0	1	11 BGR06 01 D	147.00
1/2	1 1/2	2	3	5	5	20	—	9	20	1	0	11 BGR09 10 D	177.00
										0	1	11 BGR09 01 D	177.00
1/2	1 1/2	3	3	7 1/2	10	20	—	12	20	1	0	11 BGR12 10 D	203.00
										0	1	11 BGR12 01 D	203.00

Reversing contactor assembly, mechanically interlocked.

Terminals: clamp screw for BFU9C-BFU40C; lug clamp for BFU50C-BFU110C.

3/4	2	3	3	5	7 1/2	22	—	9	25	1	0	11 BFU9C 10	180.00
										0	1	11 BFU9C 01	180.00
1	2	5	5	7 1/2	10	24	—	12	25	1	0	11 BFU12C 10	222.00
										0	1	11 BFU12C 01	222.00
1	2	5	5	7 1/2	10	24	—	16	25	1	0	11 BFU16C 10	238.00
										0	1	11 BFU16C 01	238.00
1 1/2	3	5	5	10	15	32	—	20	40	0	0	11 BFU20C 00	252.00
										1	0	11 BFU20C 01	266.00
										0	1	11 BFU20C 01	266.00
2	5	7 1/2	7 1/2	15	20	40	—	25	40	0	0	11 BFU25C 00	278.00
										1	0	11 BFU25C 10	292.00
										0	1	11 BFU25C 01	292.00
3	7 1/2	7 1/2	10	20	25	52	—	32	55	0	0	11 BFU32C 00	326.00
3	7 1/2	10	15	30	30	52	—	40	60	0	0	11 BFU40C 00	394.00
5	10	10	15	30	40	90	—	50	90	0	0	11 BFU50C 00	470.00
—	—	20	25	50	60	110	—	65	110	0	0	11 BFU65C 00	598.00
—	—	25	30	60	75	125	—	80	125	0	0	11 BFU80C 00	696.00
—	—	30	30	60	75	125	—	95	125	0	0	11 BFU95C 00	744.00
—	—	30	40	75	100	125	—	110	125	0	0	11 BFU110C 00	848.00

AC/DC coil. Unwired reversing contactors, mechanically interlocked.

—	—	30	40	75	100	110	160	110	160	0	0	11 BFU115 00	1149.00
—	—	50	60	100	125	150	220	150	250	0	0	11 BFU145 00	1607.00
—	—	60	75	150	150	180	260	185	275	0	0	11 BFU180 00	2083.00

Wired version. DC coil.

Reversing mini-contactors assembly, mechanically interlocked, pre-wired with load and line power and auxiliary wiring.

Terminals: clamp screw.

1/2	1 1/2	2	3	5	5	20	—	9	20	0	1	11 BGR09 01 D	188.00
1/2	1 1/2	3	3	7 1/2	10	20	—	12	20	0	1	11 BGR12 01 D	214.00

Reversing contactor assembly, mechanically interlocked, pre-wired with load and line power wiring. Terminals: clamp screw.

3/4	2	3	3	5	7 1/2	22	—	9	25	0	1	11 BFT9C 01	257.00
1	2	5	5	7 1/2	10	24	—	12	25	0	1	11 BFT12C 01	309.00
1	2	5	5	7 1/2	10	24	—	16	25	0	1	11 BFT16C 01	326.00
2	5	7 1/2	7 1/2	15	20	40	—	25	40	0	1	11 BFT25C 01	376.00

① Complete the catalog number with coil digit. Standard voltages (coil digit) are: 024-110V. Other coil voltage values are available on request. NOTE: No coil change or replacement is possible.

② Complete the catalog number with coil digit. Standard voltages (coil digit) are: 024-110V. Other coil voltage values are available on request.

③ Complete catalog number with coil digit per following table.

AC coil digit	Voltage range	
	AC/DC	
024	24V	
120	110/125V	
220	200/240V	
460	440/480V	

Other coil voltage values are available on request.

④ Mini-contactor assembly for mounting on printed circuit boards is available on request. Contact Sales & Technical Support for details.

⑤ An overload relay can not be directly mounted on the contactors. Use the RF25 type with the G230 independent mounting base.

Positively guided contacts

See page 3-20 or TC-20 for contactors with NC contacts.

See page 3-21 or TC-21 for add-on auxiliary contacts.

Certifications and compliance

BGR types: UL listed for USA and Canada, File E 93602. Compliant with standards: IEC/EN 60947-4-1 and UL508.

BF...K contactors (including limiting resistors)



11 BF..K

Maximum operating power ① at			Catalog number	Price
230V	400V	690V		
[kvar]	[kvar]	[kvar]		\$
AC coil.				
4.5	8	10	11 BF9K 10 ①②	134.00
7	12.5	16	11 BF12K 10 ①②	155.00
9	15	20	11 BF20K 00 ①③	175.00
11	20	22	11 BF25K 00 ①③	188.00
17	30	36	11 BF40K 00 ①③	256.00
22	38	46	11 BF50K 00 ①③	290.00
26	45	56	11 BF65K 00 ①③	354.00
34	60	70	11 BF80K 00 ①③	392.00

① Complete catalog number with coil digit per following table.

AC coil digit	Voltage range
02460	24V 60Hz
12060	120V 60Hz
23060	200-240V 60Hz
46060	440-480V 60Hz
57560	575V 60Hz

Other coil voltage and frequency values are available on request.

- ② One normally open (NO) auxiliary contact incorporated.
- ③ No auxiliary contact incorporated.
- ④ Consult Sales & Technical Support for the use at contactors to switch with delta connection.
Refer to page TC-27 for UL ratings.

Operational characteristics

Type	Rated current	Fuse gG
	[A]	[A]
BF9 K	12	16
BF12 K	18	25
BF20 K	23	40
BF25 K	30	40
BF40 K	43	63
BF50 K	58	80
BF65 K	70	100
BF80 K	90	125

Ambient operating temperature: ≤50°C (120°F).
For ambient temperatures higher than 50°C (120°F) and up to 70°C (160°F), the maximum operating power values indicated in the table must be reduced by a percentage equal to the difference between the operating ambient temperature and 50°C (120°F).

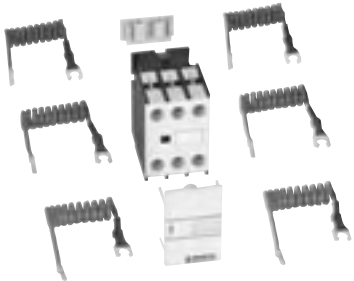
E.g.: Using a BF25K 00 contactor at the ambient temperature of 60°C (140°F), the maximum operating power (at 400V) of the contactor will be equal to 20 kvar – 10% = 18 kvar.

Operating cycle: ≤120 cycles/h
Electrical life: ≥200,000 cycles.

Certifications and compliance

UL listed for USA and Canada, File E 93602.
Compliant with standards: IEC/EN 60947-4-1.

Kits for BF...K contactors



11 G461 - 11 G464

For contactor	Qty per pkg	Catalog number	Price
	n°		\$
BF9 10 - BF12 10 - BF20 00 BF25 00 - BF20 10 BF25 10 - BF40 00	1	11 G460	49.00
BF50 00 - BF65 00 - BF80 00	1	11 G464	68.00

To optimise contactor stock management, a kit is available to transform normal three-pole contactors into BF..K types for power factor correction. The table to the left indicates which kits to purchase depending on the standard contactor in stock.

Control relay



11 BG00



11 BGF00

Number of contacts	Configuration		Catalog number	Price
	NO	NC		
				\$

AC coil. Terminals: clamp-screw.

4	4	0	11 BG00 40 A①	45.00
4	3	1	11 BG00 31 A①	45.00
4	2	2	11 BG00 22 A①	45.00

Terminals: Faston

4	4	0	11 BGF00 40 A①	n.a.
4	3	1	11 BGF00 31 A①	n.a.
4	2	2	11 BGF00 22 A①	n.a.

DC coil. Terminals: clamp-screw.

4	4	0	11 BG00 40 D②	59.00
4	3	1	11 BG00 31 D②	59.00
4	2	2	11 BG00 22 D②	59.00

Terminals: Faston

4	4	0	11 BGF00 40 D②	n.a.
4	3	1	11 BGF00 31 D②	n.a.
4	2	2	11 BGF00 22 D②	n.a.

Low-consumption DC coil. Terminals: clamp-screw.

4	4	0	11 BG00 40 L③	72.00
4	3	1	11 BG00 31 L③	72.00
4	2	2	11 BG00 22 L③	72.00

Terminals: Faston

4	4	0	11 BGF00 40 L③	n.a.
4	3	1	11 BGF00 31 L③	n.a.
4	2	2	11 BGF00 22 L③	n.a.

① Complete catalog number with coil digit per following table.

AC coil digit	Voltage range
02460	24V 60Hz
12060	120V 60Hz
23060	200-240V 60Hz
46060	440-480V 60Hz
57560	575V 60Hz

Other coil voltage and frequency values are available on request.

② Complete the catalog number with coil digit.

Standard voltages (coil digit) are: 024-110V.

Other coil voltage values are available on request.

③ Low-consumption version.

No additional auxiliary contacts or the mechanical interlock BGX50 00 can be mounted.

Complete the catalog number with coil digit.

Standard voltages (coil digit) are: 024-048V.

NOTE: No coil change or replacement is possible.

n.a. Not Available at time of printing. Contact Sales & Technical Support.

Operational characteristics

- Rated insulation voltage Ui 690V
- Rated thermal current Ith 10A
- UL designation: A600-Q600
- Low-consumption version available.

Positively guided contacts

See page 3-20 or TC-20 for control relays with NC contacts. See page 3-21 or TC-21 for add-on auxiliary contacts.

Certifications

UL listed for USA and Canada, File E 93602 for BG00; BGF00 pending completion.

Control relay



11 CF4

Number of auxiliary contacts	Configuration		Qty per pkg	Catalog number	Price
	NO	NC			
			n°		\$

AC coil Terminals: clamp-screw.

4	4	0	10	11 CF4 40 ①	57.00
4	3	1	10	11 CF4 31 ①	57.00
4	2	2	10	11 CF4 22 ①	57.00
4	0	4	10	11 CF4 04 ①	57.00

① Complete catalog number with coil digit per following table.

AC coil digit	Voltage range	
	60Hz	50Hz
02460	24V	22V
12060	120V	110V
23060	200-240V	220V
46060	440-480V	380V
57560	575V	—

Other coil voltage and frequency values are available on request.

Operational characteristics

- Rated insulation voltage Ui 690V
- Rated thermal current Ith 10A
- UL designation: A600-Q600.

Positively guided contacts

See page 3-20 or TC-20 for control relays with NC contacts. See page 3-21 or TC-21 for add-on auxiliary contacts.

Certifications

- UL recognized, File E 93601
- CSA certified, File LR 54332-17.

Add-on blocks



11 BGX10... (20-11-02)



11 BGX10... (40-31-22-13-04)

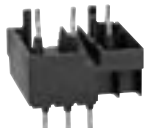
Accessories



11 BGX50 00

11 BGX77... - 11 BGX78 225 -
11 BGX79...

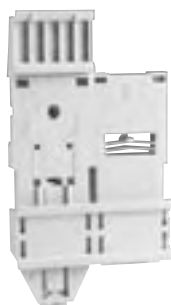
11 SMX90 01



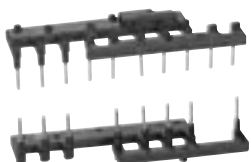
11 SMX90 03



11 SMX90 10



11 SMX90 12



11 SMX90 22

Characteristics	Max number per contactor	Qty per pkg	Catalog number	Price
	n°	n°		\$

Auxiliary contacts with screw terminals.

2NO	1	10	11 BGX10 20	13.80
1NO + 1NC	1	10	11 BGX10 11	13.80
2NC	1	10	11 BGX10 02	13.80
4NO	1	10	11 BGX10 40	24.00
3NO + 1NC	1	10	11 BGX10 31	24.00
2NO + 2NC①	1	10	11 BGX10 22①	24.00
1NO + 3NC①	1	10	11 BGX10 13①	24.00
4NC①	1	10	11 BGX10 04①	24.00
1NO + 1NC	1	10	11 BGX11 11②	13.80
2NO + 2NC	1	10	11 BGX11 22②	24.00

Auxiliary contacts with Faston terminals

2NO	1	10	11 BGXF10 20	n.a.
1NO + 1NC	1	10	11 BGXF10 11	n.a.
2NC	1	10	11 BGXF10 02	n.a.
4NO	1	10	11 BGXF10 40	n.a.
3NO + 1NC	1	10	11 BGXF10 31	n.a.
2NO + 2NC①	1	10	11 BGXF10 22①	n.a.
1NO + 3NC①	1	10	11 BGXF10 13①	n.a.
4NC①	1	10	11 BGXF10 04①	n.a.

Mechanical interlock.

All types	1	10	11 BGX50 00	12.00
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Modular cover⑤.

All types	1	20	11 BGX80 00	3.50
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Quick connect surge suppressors.

Varistor	≤48VAC/DC	10	11 BGX77 048	9.70
	48-125VAC/DC	10	11 BGX77 125	9.70
	125-240VAC/DC	10	11 BGX77 240	9.70
Diode assembly	≤225VDC	10	11 BGX78 225	9.70
RC-element (Resistor-condenser)	≤48VAC	10	11 BGX79 048	9.70
	48-125VAC	10	11 BGX79 125	9.70
	125-240VAC	10	11 BGX79 240	9.70
	240-415VAC	10	11 BGX79 415	9.70

Paralleling links. Clamp-screw terminals.

For 2 poles	10	11 G323⑥	6.90
	10	11 G324	6.90
For 4 poles	10	11 G325⑥	7.90
	10	11 G326	7.90

Starter assembly accessories.

Set of 3 wires for SM1B with BG connection	10	11 SMX90 01	8.00
Rigid connecting kit for SM1B with BG connection	10	11 SMX90 03	9.00
Adapter plate for full-voltage starter with one each of SM1B breaker and BG contactor	1	11 SMX90 10	14.00
Adapter plate for reversing contactor assembly with one SM1B starter and two BG contactors	1	11 SMX90 12	24.00
Rigid connection kit for wye-delta starter with combination of 3 BG mini-contactors	1	11 SMX90 21	14.00
Rigid connecting kit for reversing contactor assembly with two BG contactors ⑦⑧	1⑩	11 SMX90 22	11.00

Operational characteristics for add-on auxiliary contacts

Type		BGX	
Rated thermal current I _{th}	A	10	
Rated insulation voltage U _i	V	690	
Terminals	Screw	M 3	
	Width	mm	6.9 (0.2 in)
	Faston	mm	1-6.3 2-2.8
Max cross section connectable with 1 or 2 conductors	flexible without lug	mm ²	2.5
		flexible with lug	mm ²
	AWG	n°	14
	UL designation	AC	A600
DC		Q600	
Mechanical life (in millions)	cycles	20	

Positively guided contacts

See page 3-21 or TC-21 for blocks with both NO and NC auxiliary contacts.

General characteristics

STARTER ASSEMBLY ACCESSORIES

The SMX90 01 is a 3-pole link, consisting of three 10 AWG (4mm²) section wires having butt ends and wire tie (to keep them together), 3.3in (85mm) long, to provide a quick and each connection between the manual starter and the contactor. This type of connection is normally used to assemble starters mounted on busbar systems. The SMX90 03 rigid connecting kit fastens together the manual starter and the contactor forming a single-unit full-voltage starter for quick installation on 35mm DIN rail (EN 50022).

The starter adapter plates install on 35mm DIN rail (EN 55022).

The elements consent to preassemble starters and to form trim and compact single-unit equipment for quick and easy installation.

Certifications and compliance

- UL recognized, File E 93601 for SMX90 21 and SMX90 22 only.
- UL listed for USA and Canada, File E 93602 for BGX10 and BGX11 contacts, BGX50 00 interlock and all surge suppressors; pending for BGXF and SMX90 03 types

Auxiliary contacts comply with following standards: IEC/EN 60947-5-1.

① Can not be used with BG contactors with DC coil.

② Suitable for left-side mini-contactors only of the BGT reversing assemblies.

③ Can not be used with BGS types. Refer to assembled version given on page 3-10.

④ The cover can be used with BG types with screw termination only and with no auxiliary contacts, surge suppressor or mechanical interlock mounted.

⑤ Can not be used with BGX80 00 cover.

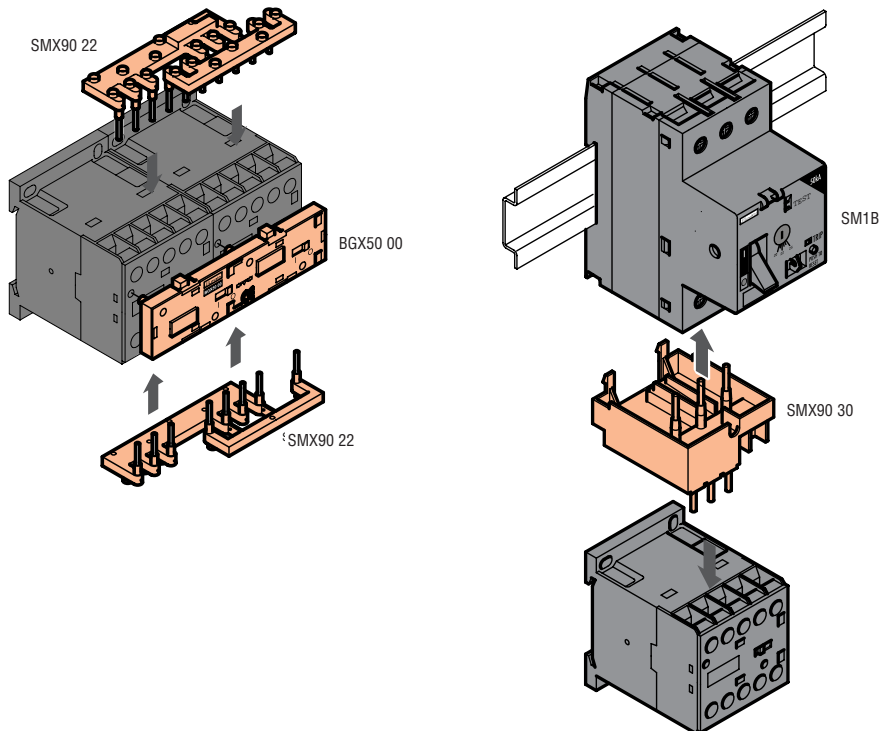
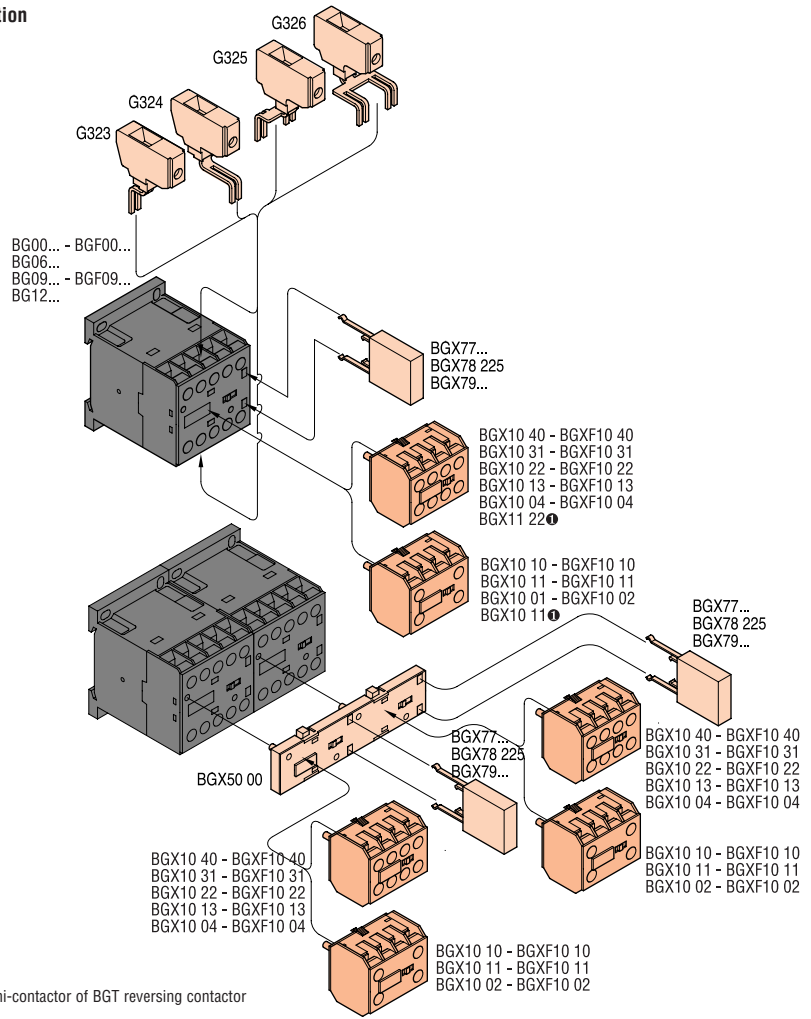
⑥ Set of 2 pieces.

⑦ Normally used with contactors having 1NC auxiliary contact (BG...01).

⑧ The RF9 relay can not be directly mounted on the contactor. Use the RF25 type and the G230 independent mounting base.

n.a. Not Available at time of printing. Contact Sales & Technical Support.

Mounting position



Add-on blocks



11 G480



11 G484



11 G218 - 11 G481
11 G482



11 G418



11 G485 - 11 G486
11 G487

Characteristics	Maximum number per contactor	Qty per pkg	Catalog number	Price
		n°		\$

Instantaneous auxiliary contacts with front center mounting ①. Screw terminals.

1NO + 1NC②	2	10	11 G480 11	16.00
2NO	2	10	11 G480 20	16.00
Make before break ③	2	10	11 G480 1001	16.00
2NO④	1	5	11 G484 20④	17.00
1NO + 1NC④	1	5	11 G484 11④	17.00
2NC④	1	5	11 G484 02④	17.00
3NO④	1	5	11 G484 30④	22.00
2NO + 1NC④	1	5	11 G484 21④	22.00
1NO + 2NC④	1	5	11 G484 12④	22.00
3NC④	1	5	11 G484 03④	22.00

Instantaneous auxiliary contacts with front lateral mounting. Screw terminals.

1NO	2	10	11 G418 10	12.00
1EM early make	2	10	11 G418 10A	12.00
1NC	2	10	11 G418 01	12.00
1LB late break	2	10	11 G418 01D	12.00

Faston terminals.

1NO or 1NC reversible	2	10	11 G218	11.00
2NO	2	10	11 G481 20	15.00
1NO + 1NC	2	10	11 G481 11	15.00
2NC	2	10	11 G481 02	15.00
Double-throw⑤	2	10	11 G482⑤	28.00

Side mount adapters.

For G218	2	10	11 G280	3.20
For G418	2	10	11 G419	n.a.
For G481 and G482	2	10	11 G483	4.20

Delayed auxiliary contacts 1NO + 1NC (pneumatic operation) on energization ⑥. Screw terminals.

3 seconds	1	1	11 G485 3	102.00
6 seconds	1	1	11 G485 6	102.00
15 seconds	1	5	11 G485 15	102.00
30 seconds	1	5	11 G485 30	102.00
60 seconds	1	5	11 G485 60	102.00
120 seconds	1	1	11 G485 120	102.00

Delayed auxiliary contacts 1NO + 1NC (pneumatic operation) on de-energization ⑥. Screw terminals.

3 seconds	1	1	11 G486 3	102.00
6 seconds	1	1	11 G486 6	102.00
15 seconds	1	5	11 G486 15	102.00
30 seconds	1	5	11 G486 30	102.00
60 seconds	1	5	11 G486 60	102.00
120 seconds	1	1	11 G486 120	102.00
70 milliseconds	1	1	11 G487	102.00

- ① The contacts can also be fitted on B type contactors using the adapter G358. See pages 3-18 and 3-19.
- ② Contact block equipped with 1NO+1NC; the normally closed contact is late breaking.
- ③ High conductive contacts.
- ④ The NC contact is highly conductive.
- n.a. Not Available at time of printing. Contact Sales & Technical Support for pricing.

Operational characteristics for add-on auxiliary contacts

Type	G418 G480 G485⑥ G486⑥ G487⑥	G484	G218 G481	G482⑥	
Rated current Ith	A	10	10	10	0.1⑦
Rated insulation voltage Ui	V	690	690	690	690
Terminals: Screw		M 3.5	M 3	—	—
Width	mm	7 (0.2in)	6.9 (0.2in)	—	—
Faston	mm	—	—	1-6.35 2-2.8	1-6.35 2-2.8
Max section connectable with 1 or 2 conductors flexible w/o lug	mm²	2.5	2.5	—	—
flexible c/w lug	mm²	2.5	2.5	2.5	2.5
AWG	n°	14	14	14	14
Terminal protection according to IEC/EN 60529		IP20⑧	IP20	IP20⑧	IP20⑧
UL designation		AC DC	A600 P600⑩	A600 Q600	A600 P600
Mechanical life (in millions)	cycles	10⑪	10	10	10

- ⑤ For particularly severe ambient conditions, contact Sales & Technical Support.
- ⑥ Gold-plated contacts inside tight enclosure for use in pollutant environments.
- ⑦ Referred to 125VAC and 30VDC.
- ⑧ Finger safe IP20 protection is warranted to equipment wired with 0.75mm²/18 AWG minimum cable section for G418 and 1mm²/18 AWG minimum for G480, G485, G486 and G487 types.
- ⑨ Finger safe IP20 protection is warranted to equipment wired with insulated Faston terminals.
- ⑩ Q600 for G418...
- ⑪ 3 million cycles for G485, G486, G487.

Positively guided contacts

See page 3-21 or TC-21 for blocks with both NO and NC auxiliary contacts.

Certifications and compliance

- UL recognized, File E 93601
- CSA certified, File LR 54332-15.
- Compliant with standards: IEC/EN 60947-5-1.

Maximum assembly combination of add-on blocks

See page TC-22.

Add-on blocks and accessories



11 G222 - 11 G272



11 G318 - 11 G319 225
11 G322



11 RE244



11 G477 - 11 G479



11 G265



11 BA135



11 G231



11 G285



11 BA126 2

Characteristics	Maximum number per contactor	Qty per pkg	Catalog number	Price
		n°		\$

Mechanical latch.

CF4, BF9-BF40 (BF40 three-pole only)	1	1	11 G222 ①	74.00
BF40 40, BF50-BF110	1	1	11 G272 ①	74.00

Mechanical interlocks.

CF4, BF9-BF40	1	10	11 G223	8.00
(BF40 three-pole only)	1	10	11 G269 1	24.00
BF40 40, BF50-BF110	1	10	11 G269 2	24.00

Characteristics	Qty per pkg	Catalog number	Price
	n°		\$

Surge suppressors (Faston terminals).

Varistor	≤48VAC/DC	10	11 G318 48	22.00
	48-125VAC/DC	10	11 G318 125	22.00
	125-240VAC/DC	10	11 G318 240	22.00
	240-415VAC/DC	10	11 G318 415	22.00
Diode	≤225VDC	10	11 G319 225	22.00
RC-element (resistor-condenser)	≤48VAC	10	11 G322 48	22.00
	48-240VAC	10	11 G322 220	22.00
	240-415VAC	10	11 G322 380	22.00

Suppressor holder.

For 35 mm DIN rail (EN 50022)	10	11 RE244	4.00
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Surge suppressors ②.

Varistor	≤48VAC/DC	10	11 G477 048	23.00
	48-125VAC/DC	10	11 G477 125	23.00
	125-240VAC/DC	10	11 G477 240	23.00
	240-415VAC/DC	10	11 G477 415	23.00
RC-element (resistor-condenser)	≤48VAC	10	11 G479 048	23.00
	48-125VAC	10	11 G479 125	23.00
	125-240VAC	10	11 G479 240	23.00
	240-415VAC	10	11 G479 415	23.00

Power terminal cover ③.

Finger safe IP20 protection	10	11 G265③	6.50
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Parallel bridges.

2-pole configuration (BF9-BF16)	10	11 BA135	3.00
2-pole configuration (BF20-BF40)	10	11 BA235	4.00
3-pole configuration (BF50-BF110)	10	11 BA435	6.70

Enlarged terminals.

1-6 mm ² /10 AWG (BF9-BF16)	12	11 G231	5.50
1-10 mm ² /8 AWG (BF20-BF25)	12	11 G232	6.50
1-35 mm ² /3 AWG (BF32-BF40)	10	11 G281	25.00
1-50 mm ² /1/0 AWG (BF50-BF110)	10	11 G271	35.00

Auxiliary terminal.

For BF50-BF95	8	11 G285	7.00
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Marking element.

Label for writing	100	11 BA126 2	1.00
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Operational characteristics for mechanical latch

Type		G222	G272
For contactors		BF9-BF40④	BF40-BF110⑤
Control circuit voltage	AC (50/60 Hz)	V 12-380	12-380
	DC	V 12-220	12-220
Power consumption with control	AC	VA 40	40
	DC	W 70	70
Minimum energising	drop-out	ms 10	10
	pick-up	ms 50	100

④ BF40 three-pole only.

⑤ BF40 four-pole only.

Certifications and compliance

– UL recognized, File E 93601

– CSA certified, File LR 54332-15.

Compliant with standards: IEC/EN 60947-5-1.

Maximum assembly combination of add-on blocks

See page TC-24.

① Complete catalog number with voltage digit per following table.

Voltage digit	Voltage range
AC type	
024	50/60Hz 24V
110	110/125V
220	200/240V
DC type	
C024	DC 24V
C110	110/125V
C220	220V

Other coil voltage and frequency values are available on request.

② The G477 and G479 suppressors can only be fitted on BF9-BF25 and CF4 contactors having 3-terminal coil.

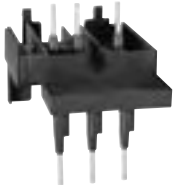
③ For 3-pole contactors, BF50-BF110 types only.
NOTE: Two pieces are required per contactor.

Accessories



11 SMX90 01 - 11 SMX90 02

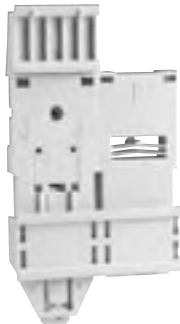
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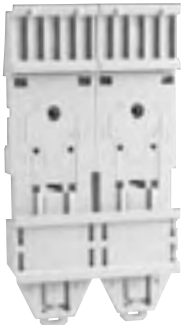
11 SMX90 04



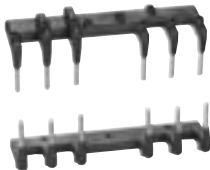
11 SMX90 10



11 SMX90 12



11 SMX90 14



11 SMX90 24

Characteristics	Qty per pkg	Catalog number	Price
	n°		\$

Accessories for full-voltage starter assemblies.			
Adapter plate for SM1B starter and BF9-BF40 contactor	1	11 SMX90 10	14.00
Set of 3 wires for SM1B starter with BF9, BF12 or BF16 contactor	10	11 SMX90 01	8.00
Set of 3 wires for SM1B starter with BF20, BF25, BF32 or BF40 contactor	10	11 SMX90 02	8.00
Rigid connecting kit for SM1B starter with BF9, BF12 or BF16 contactor	10	11 SMX90 04	9.00

Accessories for reversing contactor assemblies.			
Adapter plate for SM1B starter and BF9-BF25 contactors	1	11 SMX90 12	24.00
Rigid connecting kit for BF9, BF12 or BF16 contactors ①②	1	11 SMX90 24	14.00
Rigid connecting kit for two BF20 00 or BF25 00 contactors ②③	1	11 SMX90 26	16.00
Connecting kit for two BF32 or BF40 contactors ②③	1	11 SMX90 28	20.00

Accessories for wye-delta starter assemblies.			
Adapter plate for SM1B breaker and 45mm wide contactors (BF9-BF25)	1	11 SMX90 14	28.00
DIN rail for wire bypass of contactor used with SMX90 14 plate	1	11 SMX90 18	3.80
DIN rail extension for 55mm wide contactors	1	11 SMX90 19	2.00
Rigid connecting kit for 3-contactor side by side combination among BF9, BF12 or BF16 types (not suitable for SMX90 14 plate)	1	11 SMX90 23	16.00
Connecting kit for either two BF20 00 or BF25 00 and one BF9, BF12 or BF16 (wye) contactors	1	11 SMX90 25	18.00
Connecting kit for either two BF20 10, BF25 10, BF32 or BF40 and one BF20 or BF25 (wye) contactors	1	11 SMX90 27	26.00
Connecting kit for either two BF50 to BF110 and one BF32 or BF40 (wye) contactors	1	11 SMX90 29	52.00
Connecting kit for 3-contactor combination among BF50 to BF110 types	1	11 SMX90 20	58.00

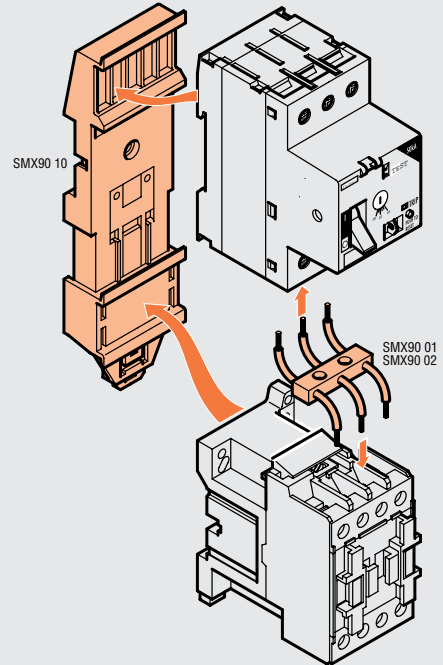
- ① Contactors with one NC auxiliary contact, 01 type, are usually used.
- ② The relay can not be directly mounted on the contactor. Use the RF...25 type and the G230 independent mounting base.
- ③ The relay can not be directly mounted on the contactor. Use the appropriate RF...95 type and the G270 independent mounting base. Remove the links from the RF95 relay and use those supplied with the mounting base.

General characteristics

STARTER ASSEMBLY ACCESSORIES

The SMX90 01 and 02 are 3-pole links, consisting of three 10 AWG (4mm²) section wires having butt ends and wire tie (to keep them together), 3.3in (85mm) long, to provide a quick and easy connection between the starter and the contactor. This type of connection is normally used to assemble starters mounted on busbar systems.

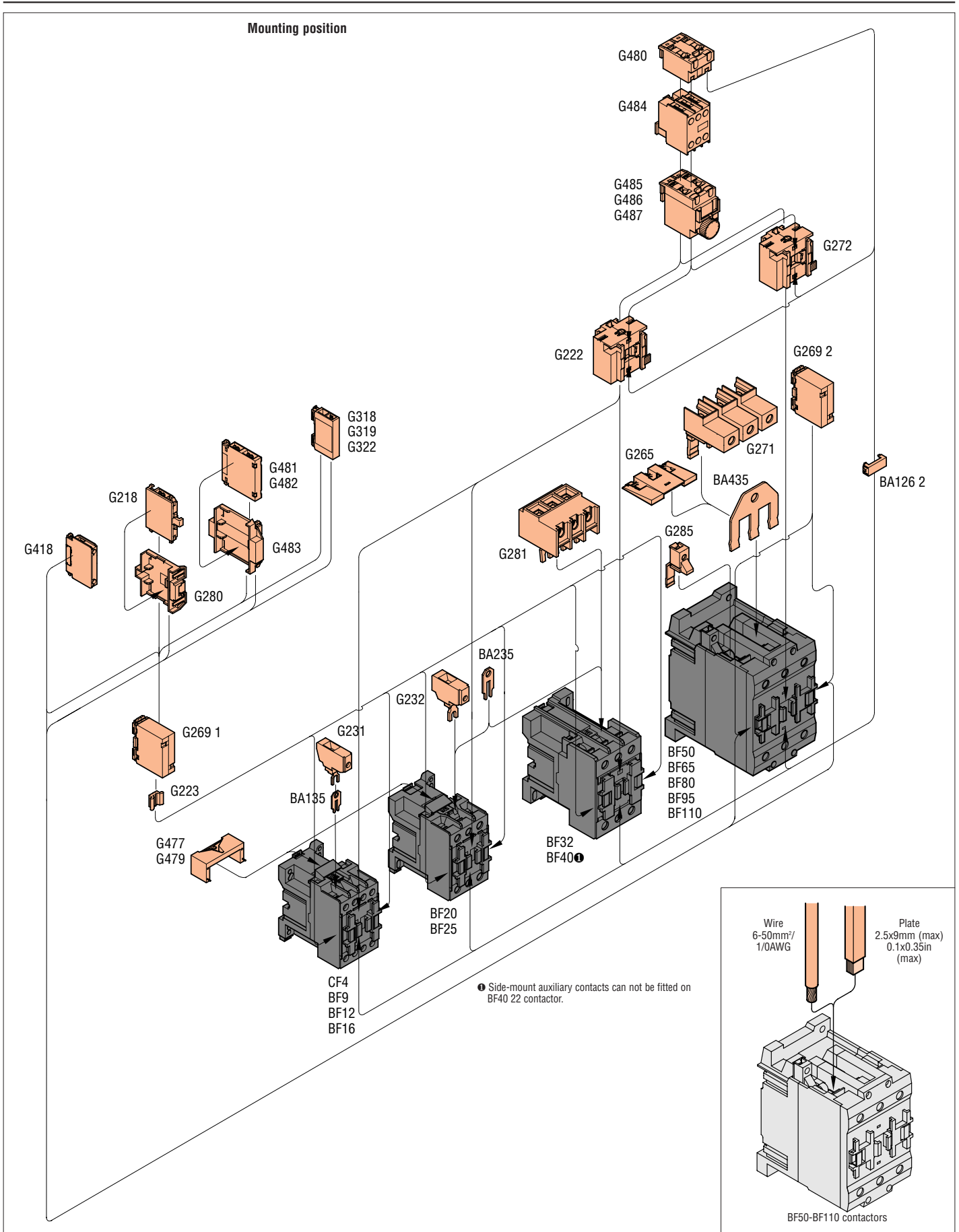
The SMX90 04 rigid connecting kit fastens together the starter and the contactor forming a single-unit starter for quick installation on 35mm DIN rail (EN 50022). The starter adapter plates install on 35mm DIN rail (EN 55022).



Certifications and compliance

UL recognition listed, File E 197069 for SMX90 21, SMX90 22, SMX90 23 and SMX90 24 only; pending for SMX90 04.

Compliant with standards: IEC/EN 60947-5-1.



Add-on blocks and accessories



11 G350 - 11 G354



11 G358



11 G360 - 11 G361 - 11 G363

11 G527 - 11 G528
11 G529 - 11 G530

11 G370



11 G371

Characteristics	Max. no. per contactor	Qty per pkg	Catalog number	Price
		n°		\$
Instantaneous auxiliary contacts.				
2NO+1NC or 1NO+2NC reversible	4①	4	11 G350②	42.00
1NO+1NC	4①	4	11 G354②	34.00
Contact block adapter.				
To fit auxiliary contacts G480, G484, G485, G486 and G487 types, on B115-B630 contactors; see page 3-14.	4	5	11 G358	25.00
Mechanical interlocks.				
Side by side		1	11 G355③	47.00
One on top of other		1	11 G356 1④	96.00
One on top of other		1	11 G356 2④	96.00
One on top of other		1	11 G356 3④	96.00
One on top of other		1	11 G356 4④	96.00
One on top of other		1	11 G356 5④	96.00
One on top of other		1	11 G356 6④⑤	96.00
Power terminal covers.				
For contactor B115		1	11 G360②	12.00
For contactors B145-B180		1	11 G361②	15.00
For contactors B250-B310-B400		1	11 G363②	28.00
For contactors B500		1	11 G527	122.00
For contactors B500 4		1	11 G528	139.00
For contactors B630		1	11 G529	127.00
For contactors B630 4		1	11 G530	144.00
3 pole wye connecting bars.				
For B115-B145-B180		1	11 BA1595	18.00
For B250-B310-B400		1	11 BA1721	22.00
For B500-B630		1	11 BA1846	28.00
2 pole bars for parallel configuration.				
For B115-B145-B180		1	11 BA1594	24.00
For B250-B310-B400		1	11 BA1720	38.00
For B500-B630		1	11 BA1845	54.00
Terminal adapters.				
To individually transform Faston terminals of auxiliary contacts and coils into screw terminals		10	11 G370	4.00
To transform both coil Faston terminals into screw terminals		5	11 G371	14.00
Marking element.				
Label for writing		100	11 BA126 2	1.00

- ① Only one piece can be mounted on B1250 or B1600 type.
 ② For choice and allowed distances see page TC-26. One piece must be used to interlock two contactors of B115-B630 type.
 ③ Two pieces are needed to interlock B1250 or B1600 type.
 ④ Provided for one pole terminal only. Example: For three-pole contactors, purchase 3 pieces for the upper terminals only or 6 pieces for all upper and lower terminals.

Operational characteristics of auxiliary contacts

Type	G350 G354	
Rated thermal current I _{th}	A	16
Rated insulation voltage U _i	V	690
Terminals	Faston	1-6.35 2-2.8
Max cross section connectable with 1 or 2 conductors	flexible c/w lug	mm ² 2.5
	AWG	n° 14
UL designation	AC	A600
	DC	P600
Mechanical life (in millions)	cycles	5

Positively guided contacts

See page 3-21 or TC-21 for blocks with both NO and NC auxiliary contacts.

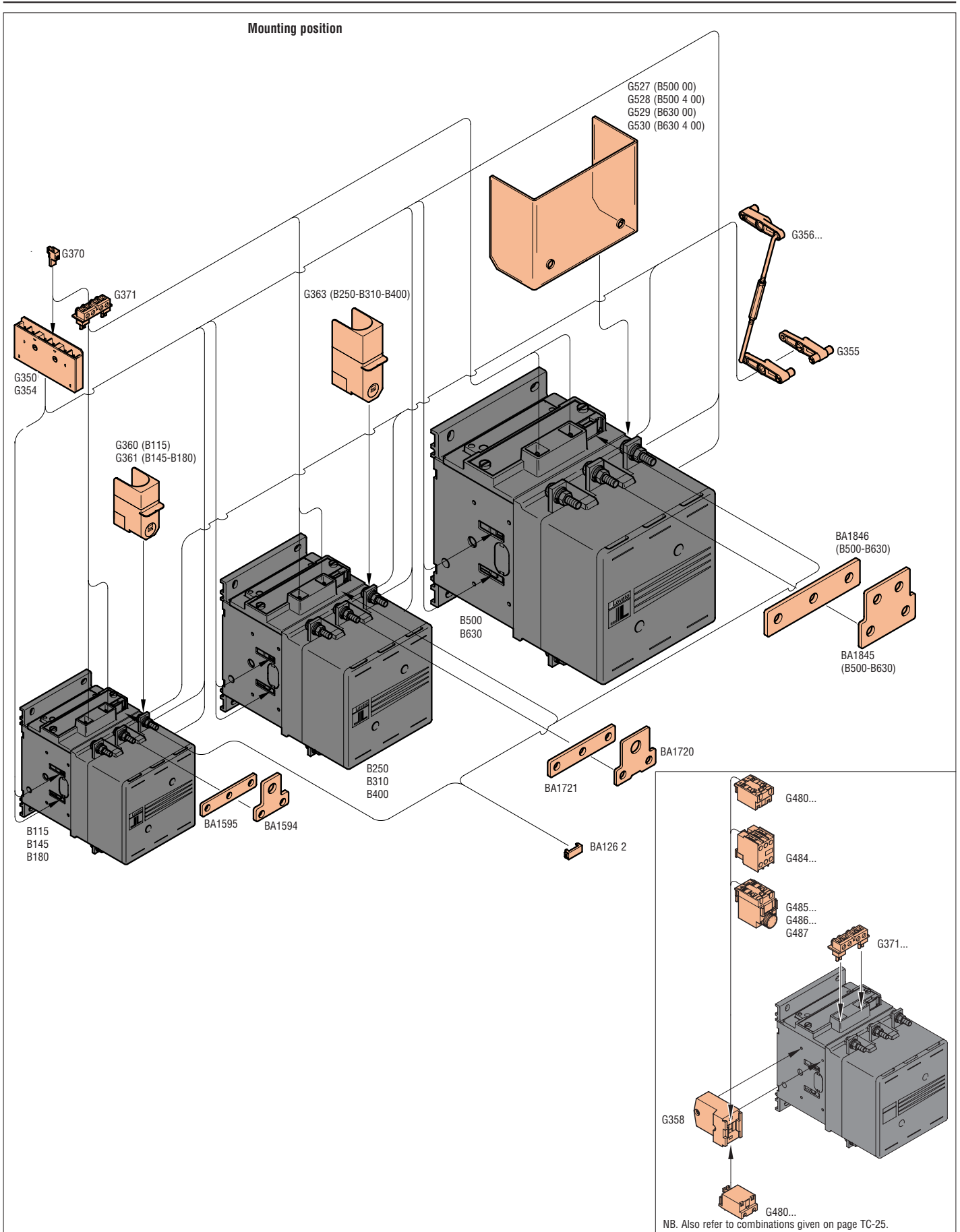
Certifications and compliance

- UL recognized, File E 93601.
 - CSA certified, File LR 54332-15.
- Add-on auxiliary contacts comply with the following standards: IEC/EN 60947-5-1.

Maximum assembly combination

See pages TC-25 to TC-27.

Add-on blocks and accessories for B contactors



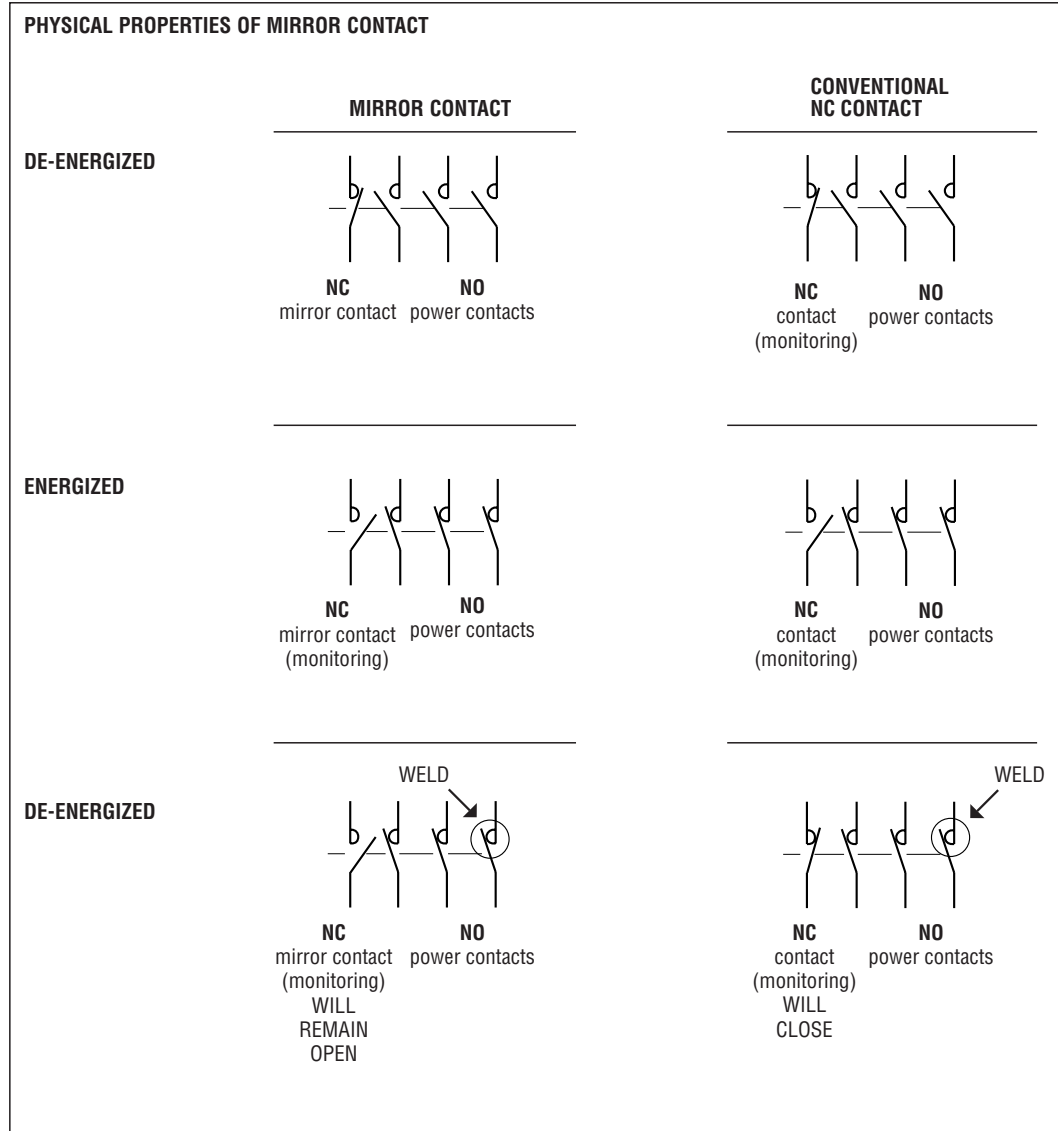
Positively guided contacts for types with incorporated auxiliary contacts

Positively guided contacts are a requirement in safety circuits to correctly monitor the status of normally open contacts. Guided contacts imply that Normally Open (NO) and Normally Closed (NC) will operate together reciprocally but can never be simultaneously closed, even in case of NO contacts weld. This requirement is obtained by particular constructional details, such as reduced gap tolerance through which the mobile contact travels and the points of actuation are closer to the actual contact position. Positively Guided Contacts are also called positively safety contacts, forced contacts, linked contacts, force or positive guided or positively driven contacts. The positively guided contacts assume different meanings and

terminologies in compliance with the product standards which are given below.

IEC 60947-4-1/A1 ed. 2 - Annex F

In this case, positively guided contacts are called auxiliary contacts linked with power contacts (**mirror contact**). The requirement is that when power poles weld, the auxiliary NC contacts remain open. This requirement is standard supplied on all our contactors having an integrated NC auxiliary contacts: **BG..01, BF9..01, BF12..01, BF16..01, BF20..01 or BF25..01 types.**



IEC 60947-5-1/A2 ed. 2 - Annex L

In this case, positively guided contacts are called **mechanically linked contacts**. The requirement is that NO and NC contacts can never be simultaneously closed, even if the NO contact or NC contact welds in closed position. This requirement applies to auxiliary safety contacts included

in control circuit devices where the actuating positively is provided internally; therefore, this does not apply to push buttons or limit switches. Lovato control relays, such as **BG00** and **CF4**, which have at least one NO and one NC contact, fall into this category. (See Physical properties of mechanically linked contacts on page 3-21).

Note: Control circuit devices, operated externally (e.g. push-button or limit-switches) can not have mechanically linked contact elements. Such devices, in safety applications, generally have contacts with Direct Opening Actuation.

Positively guided contacts for add-on auxiliary contact blocks

IEC 60947-5-1/A2 ed. 2 - Annex L

In this case, positively guided contacts are called **mechanically linked contacts**.

The requirement is that NO and NC contacts can never be simultaneously closed, even if the NO contact or NC contact welds in closed position.

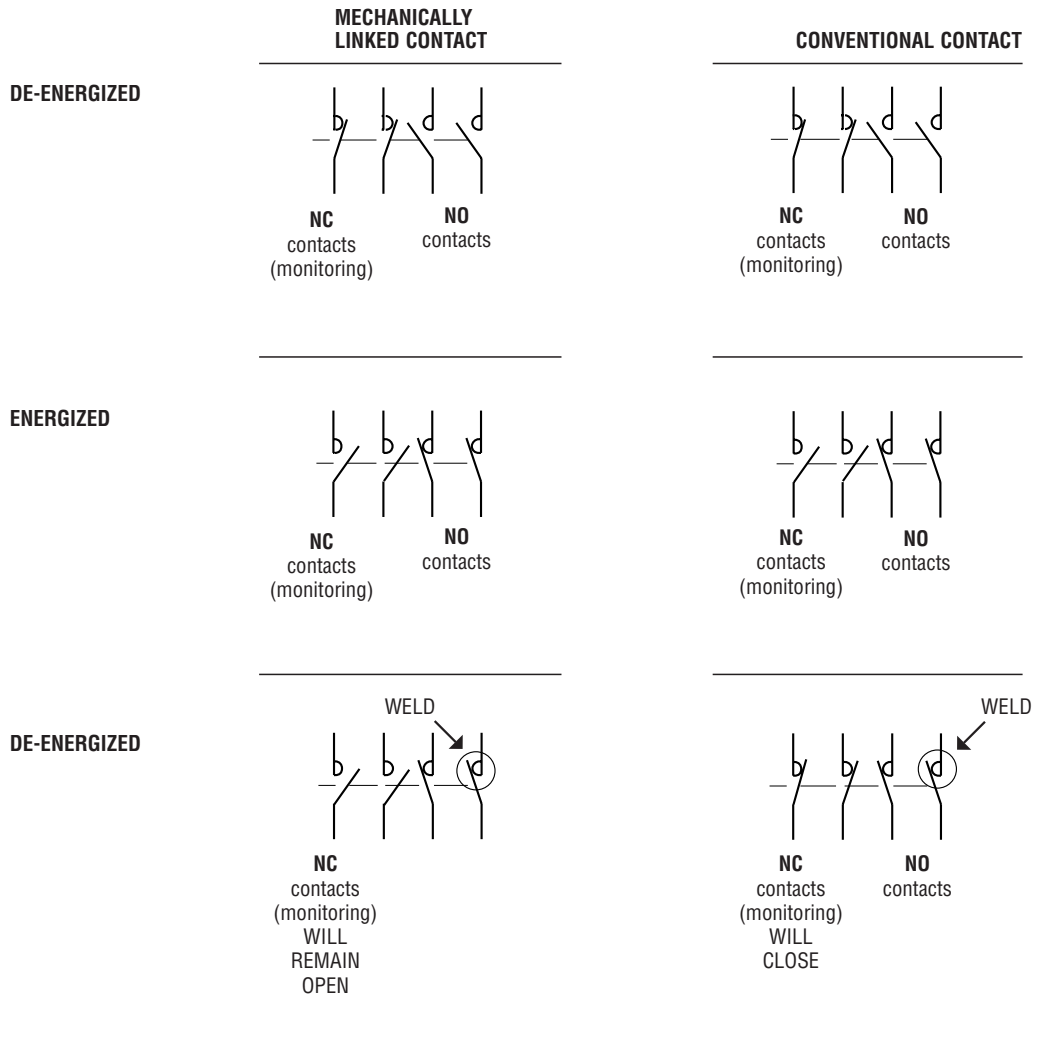
This requirement applies to auxiliary safety contacts included in control circuit devices where the actuating positively is

provided internally; therefore, this does not apply to push buttons or limit switches.

Several auxiliary contact blocks, which have at least one NO and one NC contact, fall into this category. These blocks include:

BGX10 11, BGX10 31, BGX10 22, BGX10 13, BGX11 11, BGX11 12, BGXF10 11, BGXF10 31, BGXF10 22, BGXF10 13, G350, G354, G480 11, G481 11, G484 11, G484 12 and G484 21.

PHYSICAL PROPERTIES OF MECHANICALLY LINKED CONTACTS



AC coils for CF4 relays and BF contactors (standard voltages)



11 BA456

Rated frequency and voltage		Qty per pkg	Catalog number	Price
[Hz]	[V]	n°		\$
For CF4-BF9-BF12-BF16-BF20-BF25 contactors.				
60	24	1	11 BA456 024 60	24.00
	120	1	11 BA456 120 60	24.00
	200-240	1	11 BA456 230 60	24.00
	440-480	1	11 BA456 460 60	24.00
	575	1	11 BA456 575 60	24.00

● 3 terminal coil. Replaces the 2 terminal coil (BA104...).
To order the old BA104 coils, contact our Sales & Technical Support.

NOTE: Other coil voltage and frequency values are available on request.
Contact Sales & Technical Support.

Operational characteristics

AC control			
Rated voltage at 60Hz:	V		12 - 660
Operating limits at 60Hz	pick up	% Us	70 - 110
	drop out	% Us	40 - 55
Consumption	60Hz	in-rush	VA 78
		holding	VA 10.8
Dissipation	W		2.5

Materials

Class F enamelled copper wire.

3



11 BA320

Rated frequency and voltage		Qty per pkg	Catalog number	Price
[Hz]	[V]	n°		\$
For contactors BF32-BF40 (three pole only).				
60	24	1	11 BA320 024 60	32.00
	120	1	11 BA320 120 60	32.00
	200-240	1	11 BA320 230 60	32.00
	440-480	1	11 BA320 460 60	32.00
	575	1	11 BA320 575 60	32.00

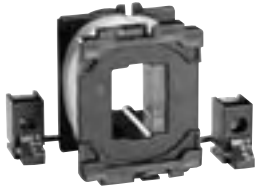
NOTE: Other coil voltage and frequency values are available on request.
Contact Sales & Technical Support.

Operational characteristics

AC control			
Rated voltage at 60Hz:	V		12 - 660
Operating limits at 60Hz	pick up	% Us	70 - 110
	drop out	% Us	40 - 55
Consumption	60Hz	in-rush	VA 92
		holding	VA 12
Dissipation	W		4.5

Materials

Class F enamelled copper wire.



11 BA705

Rated frequency and voltage		Qty per pkg	Catalog number	Price
[Hz]	[V]	n°		\$
For contactors BF40 40 - BF50 to BF110.				
60	24	1	11 BA705 024 60	46.00
	120	1	11 BA705 120 60	46.00
	200-240	1	11 BA705 230 60	46.00
	440-480	1	11 BA705 460 60	46.00
	575	1	11 BA705 575 60	46.00

NOTE: Other coil voltage and frequency values are available on request.
Contact Sales & Technical Support.

Operational characteristics

AC control			
Rated voltage at 60Hz:	V		12 - 660
Operating limits at 60Hz	pick up	% Us	70 - 110
	drop out	% Us	40 - 55
Consumption	60Hz	in-rush	VA 252
		holding	VA 21.6
Dissipation	W		6

Materials

Class F enamelled copper wire.



DC coils for BF...C contactors (standard voltages)



11 BA904



11 BA911

Rated voltage	Qty per pkg	Catalog number	Price
[V]	n°		\$
For BF9C-BF12C-BF16C-BF20C-BF25C-BF32C-BF40C contactors.			
24	1	11 BA904 024	49.00
110	1	11 BA904 110	49.00

NOTE. Other coil voltage values are available on request.
Contact Sales & Technical Support.

Rated voltage	Qty per pkg	Catalog number	Price
[V]	n°		\$
For BF40C 40-BF50C-BF65C-BF80C-BF95C-BF110C contactors.			
24	1	11 BA911 024	74.00
110	1	11 BA911 110	74.00

NOTE. Other coil voltage values are available on request.
Contact Sales & Technical Support.

Operational characteristics

DC control

Rated voltage	V	12 - 660
Operating limits	pick-up	% Us 70 - 120
	drop-out	% Us 15 - 25
Average consumption	W	9

Materials

Class F enamelled copper wire.

Operational characteristics

DC control

Rated voltage	V	12 - 660
Operating limits	pick-up	% Us 70 - 120
	drop-out	% Us 15 - 25
Average consumption	W	15

Materials

Class F enamelled copper wire.



Coils for B115-B630 contactors



Bridge rectifier



Coil protection



Coil assembly

For contactor	Qty per pkg	Catalog number	Price
	n°		§

Bridge rectifier (Faston terminals).

B115-B145-B180	1	11 BA1575 1	81.00
B250-B310-B400	1	11 BA1700 1	95.00
B500-B630-B630 1000 B1250-B1600	1	11 BA1799	172.00

Coil protection.

B115-B145-B180	1	11 BA1533	25.00
B250-B310-B400	1	11 BA1678	45.00
B500-B630-B630 1000 B1250-B1600	1	11 BA1803	97.00

Coil assembly (Coil, rectifier and coil protection).

B115-B145-B180	1	11 BA1546 ①	234.00
B250-B310-B400	1	11 BA1671 ①	378.00
B500-B630-B630 1000 B1250-B1600	1	11 BA1796 ②	670.00

① Complete catalog number with coil digit per following table.

Coil digit	Voltage range
	AC/DC
024	24V
110	110/125V
220	220/240V
460	440/480V

Other coil voltage values are available on request.

② Complete catalog number with coil digit per following table.

Coil digit	Voltage range
	AC/DC
110	110/125V
220	220/240V
460	440/480V

Other coil voltage values are available on request.

Operational characteristics

AC and DC control

For contactor type		B115 - B145 - B180	
Supply voltage		AC and DC	
Rated control voltage	V	24-480	
Operating limits	pick-up	% Us	80-110
	drop-out	% Us	30-60
Consumption	in-rush	VA/W	300
	holding	VA/W	10
Dissipation	W	10	

For contactor type		B250 - B310 - B400	
Supply voltage		AC and DC	
Rated control voltage	V	24-480	
Operating limits	pick-up	% Us	80-110
	drop-out	% Us	30-60
Consumption	in-rush	VA/W	300
	holding	VA/W	10
Dissipation	W	10	

For contactor type		B500 - B630 B630 1000	
Supply voltage		AC and DC	
Rated control voltage	V	48-480	
Operating limits	pick-up	% Us	80-110
	drop-out	% Us	30-60
Consumption	in-rush	VA/W	400
	holding	VA/W	18
Dissipation	W	18	

AC control

For contactor type		B1250 - B1600	
Supply voltage		in AC	
Rated control voltage	V	110-240-480	
Operating limits	pick-up	% Us	80-110
	drop-out	% Us	30-60
Consumption	in-rush	VA/W	800
	holding	VA/W	45
Dissipation	W	40	

Operating limits for ambient temperatures up to 40°C (105°F) are 0.8 to 1.1 times rated voltage.
NOTE: For use at ambient temperatures exceeding 55°C (130°F), contact Sales & Technical Support.

Materials

Class F enamelled copper wire.

Coil assembly

Comprises the coil, bridge rectifier, fixed magnetic core, coil protection, cross piece and fixing screws.

Main contacts and arc chutes



11 G234 - 11 G235 - 11 G236
11 G237 - 11 G470



11 G273 - 11 G279



11 G274 - 11 G275
11 G276 - 11 G475



11 G380 - 11 G381 - 11 G382
11 G383 - 11 G384 - 11 G385
11 G525 - 11 G526



Arc chute

For contactor	Qty per pkg	Catalog number	Price
	n°		\$

Main contacts

3 or 4 pole set complete with screws.

BF9	1	11 G234	18.00
BF9 40	1	11 G234 4	24.00
BF12	1	11 G235	22.00
BF16	1	11 G470	26.00
BF16 40	1	11 G470 4	34.00
BF20	1	11 G236	31.00
BF20 40	1	11 G236 4	41.00
BF25	1	11 G237	35.00
BF25 40	1	11 G237 4	46.00
BF32	1	11 G273	63.00
BF40	1	11 G279	85.00
BF40 40	1	11 G279 4	113.00
BF50	1	11 G274	122.00
BF50 40	1	11 G274 4	161.00
BF65	1	11 G275	155.00
BF65 40	1	11 G275 4	206.00
BF80	1	11 G276	192.00
BF80 40	1	11 G276 4	254.00
BF95	1	11 G475	241.00
BF110	1	11 G476	297.00

Main contacts

3 or 4 pole set complete with Allen screws and key for contact replacement.

B115	1	11 G380	226.00
B115 4	1	11 G380 4	278.00
B145	1	11 G381	330.00
B145 4	1	11 G381 4	395.00
B180	1	11 G382	356.00
B180 4	1	11 G382 4	466.00
B250	1	11 G383	598.00
B250 4	1	11 G383 4	808.00
B310	1	11 G385	728.00
B310 4	1	11 G385 4	998.00
B400	1	11 G384	911.00
B400 4	1	11 G384 4	1231.00
B500	1	11 G525	1414.00
B500 4	1	11 G525 4	2206.00
B630	1	11 G526	2376.00
B630 4	1	11 G526 4	3141.00
B630 1000	1	11 G537	2727.00
B630 1000 4	1	11 G537 4	3510.00
B1250	1	11 G538	2877.00
B1250 4	1	11 G538 4	3839.00
B1600	1	11 G539	4752.00
B1600 4	1	11 G539 4	6338.00

Arc chutes.

B115-B145-B180	1	11 BA1588	96.00
B115 4-B145 4-B180 4	1	11 BA1589	126.00
B250-B310-B400	1	11 BA1713	268.00
B250 4-B310 4-B400 4	1	11 BA1714	308.00
B500-B630 B630 1000	1	11 BA1838	349.00
B500 4-B630 4 B630 1000 4	1	11 BA1839	572.00

ⓘ Proper selection requires date code of contactor. Contact Sales & Technical Support for assistance.

Special versions

For non standard spare contact configurations, contact Sales & Technical Support.

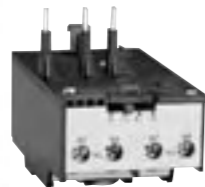
For B1250 and B1600 contactor spares, contact Sales & Technical Support for details.



PAGE 4-2

THREE POLES, SINGLE PHASE SENSITIVE WITH MANUAL RESET FOR 3-PHASE STARTERS

- RF9 type, 0.09-15A, for BG mini-contactors
- RF25 type, 0.09-26A, for BF9 to BF40 contactors
- RF95 type, 14-110A, for BF20 to BF110 contactors
- RF180 type, 60-200A, for B115 to B400 contactors
- RF400 type, 150-420A, for B145 to B400 contactors.



PAGE 4-4

THREE POLES, SINGLE PHASE SENSITIVE WITH AUTOMATIC RESET FOR 3-PHASE STARTERS

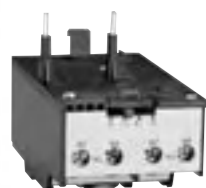
- RFA9 type, 0.09-15A, for BG mini-contactors
- RFA25 type, 0.09-26A, for BF9 to BF40 contactors
- RFA95 type, 14-110A, for BF20 to BF110 contactors
- RFA180 type, 60-200A, for B115 to B400 contactors
- RFA400 type, 150-420A, for B145 to B400 contactors.



PAGE 4-5

TWO POLES WITH MANUAL RESET FOR 1-PHASE STARTERS

- RFS9 type, 0.09-15A, for BG mini-contactors
- RFS25 type, 0.09-26A, for BF9 to BF40 contactors
- RFS95 type, 20-42A, for BF20 to BF40 contactors.



PAGE 4-5

TWO POLES WITH AUTOMATIC RESET FOR 1-PHASE STARTERS

- RFSA9 type, 0.09-15A, for BG mini-contactors
- RFSA25 type, 0.09-26A, for BF9 to BF40 contactors
- RFSA95 type, 20-42A, for BF20 to BF40 contactors.

- IEC style adjustable bimetallic overload relays
- Class 10A thermal overload relays for motor currents from 0.14 and 630A
- Ambient compensated
- Three phase (3-pole) and single phase (2-pole) types
- Three phase units are single phase sensitive for better motor protection
- Automatic or manual reset
- Direct mount to contactor or separate mount



PLANET - SWITCH

IEC style overload relays

	SEC.	PAGE
Three phase, single phase sensitive, with manual reset, RF version	4-	2
Three phase, single phase sensitive, with automatic reset, RFA version	4-	4
Single phase (2 pole) with manual reset, RFS version	4-	5
Single phase (2 pole) with automatic reset, RFSA version	4-	6
Accessories for all versions	4-	7

IEC style overload relays

For three-phase starters

electric

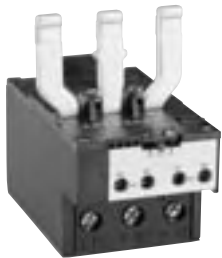
Three phase, single phase sensitive with manual reset



11 RF9



11 RF25



11 RF95

Adjustment range [A]	Qty per pkg n°	Catalog number	Price \$
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For direct mounting on BG06-BG09 and BG12 mini-contactors.

0.14 - 0.23	1	11 RF9 023	50.00
0.2 - 0.33	1	11 RF9 033	50.00
0.3 - 0.5	1	11 RF9 05	50.00
0.45 - 0.75	1	11 RF9 075	50.00
0.6 - 1	5	11 RF9 1	50.00
0.9 - 1.5	5	11 RF9 1V5	50.00
1.4 - 2.3	5	11 RF9 2V3	50.00
2 - 3.3	5	11 RF9 33	50.00
3 - 5	5	11 RF9 5	50.00
4.5 - 7.5	5	11 RF9 75	50.00
6 - 10	5	11 RF9 10	50.00
9 - 15	5	11 RF9 15	50.00

For direct mounting on BF9-BF12-BF16-BF20-BF25-BF32-BF40 contactors. Independent mounting with G230 base.

0.14 - 0.23	1	11 RF25 023	51.00
0.2 - 0.33	1	11 RF25 033	51.00
0.3 - 0.5	1	11 RF25 05	51.00
0.45 - 0.75	1	11 RF25 075	51.00
0.6 - 1	5	11 RF25 1	51.00
0.9 - 1.5	5	11 RF25 1V5	51.00
1.4 - 2.3	5	11 RF25 2V3	51.00
2 - 3.3	5	11 RF25 33	51.00
3 - 5	5	11 RF25 5	51.00
4.5 - 7.5	5	11 RF25 75	51.00
6 - 10	5	11 RF25 10	51.00
9 - 15	5	11 RF25 15	51.00
14 - 23	5	11 RF25 23	57.00
17 - 26	5	11 RF25 26	60.00

For direct mounting on BF20 00-BF25 00 contactors. Independent mounting with G270 base.

14 - 23	1	11 RF95 0 23	75.00
20 - 33	1	11 RF95 0 33	78.00

For direct mounting on BF20 10-BF20 01-BF20 40-BF25 10-BF25 01-BF25 40 contactors. Independent mounting with G270 base.

20 - 33	1	11 RF95 1 33	78.00
28 - 42	1	11 RF95 1 42	81.00

For direct mounting on BF32-BF40 contactors. Independent mounting with G270 base.

20 - 33	1	11 RF95 2 33	106.00
28 - 42	1	11 RF95 2 42	106.00
35 - 50	1	11 RF95 2 50	106.00
46 - 65	1	11 RF95 2 65	121.00

For direct mounting on BF50-BF110 contactors. Independent mounting with G270 base.

20 - 33	1	11 RF95 3 33	106.00
28 - 42	1	11 RF95 3 42	106.00
35 - 50	1	11 RF95 3 50	106.00
46 - 65	1	11 RF95 3 65	121.00
60 - 82	1	11 RF95 3 82	131.00
70 - 95	1	11 RF95 3 95	184.00
90 - 110	1	11 RF95 3 110	204.00

① To use with the G270 base, remove the mounted links and assemble the ones supplied with the G270.

Operational characteristics

- Tripping class: 10A
- Normal operating limits: -4 to +130°F (-20 to +55°C); compensation from 5°F (-15°C)
- Storage temperature: -65 to +160°F (-55 to +70°C)
- Maximum altitude: 9800ft (3000m)
- Mounting position: normally on vertical plane, ±30° admissible
- Fixed to contactor or independent mounting
- Particular features: test button and trip indicator
- Auxiliary contacts: 1NO + 1NC.

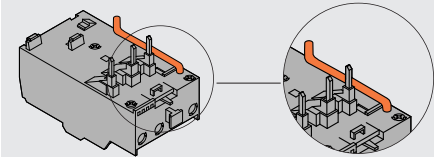
Version without single-phase sensitivity is available on request. Contact Sales & Technical Support for the relative catalog numbers and pricing.

The appropriate adjustment range of the overload relay should be selected on the basis of the motor nameplate full-load current when direct starting is considered.

Certification and compliance

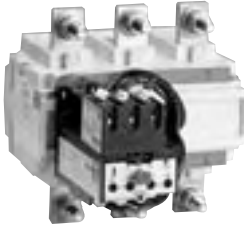
- UL listed, File E 93601 (RF95 3 110 pending completion).
- CSA certified, Files LR 54332-19 and LR 54332-20.
- Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

NOTE: To facilitate connection between the auxiliary NC contact of the thermal relay and terminal A2 of the contactor, insert the wire lead into the appropriate conduit as shown.



IEC style overload relays

For three-phase starters



11 RF180 - 11 RF400

Adjustment range	Qty per pkg	Catalog number	Price
[A]	n°		\$

Separate mounting ①.

60 - 100	1	11 RF180 100	317.00
75 - 125	1	11 RF180 125	317.00
90 - 150	1	11 RF180 150	317.00
120 - 200	1	11 RF180 200	317.00

Separate mounting ①.

150 - 250	1	11 RF400 250	376.00
180 - 300	1	11 RF400 300	376.00
250 - 420	1	11 RF400 420	376.00

① Connecting links between contactor and relay are not included.

Direct mounting on contactor is possible with the following links:

G372 to fix RF180 on B115-B145-B180

G373 to fix RF180 on B250-B310-B400

G375 to fix RF400 on B145-B180

G376 to fix RF400 on B250-B310-B400.

See page 4-7 for connecting link details.

NOTE: Contact Sales & Technical Support for overload relays to be used with B500-B630 contactors.

Operational characteristics

- Tripping class: 10A
- Normal operating limits: -4 to +130°F (-20 to +55°C); compensation from 5°F (-15°C)
- Storage temperature: -65 to +160°F (-55 to +70°C)
- Maximum altitude: 9800ft (3000m)
- Mounting position: normally on vertical plane, ±30° admissible
- Fixed to contactor or independent mounting
- Particular features: test button and trip indicator
- Auxiliary contacts: 1NO + 1NC.

Version without single-phase sensitivity is available on request. Contact Sales & Technical Support for the relative catalog numbers and pricing.

The appropriate adjustment range of the overload relay should be selected on the basis of the motor nameplate full-load current when direct starting is considered.

Certification and compliance

- UL listed, File E 93601.
- CSA certified, Files LR 54332-19 and LR 54332-20.
- Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

IEC style overload relays

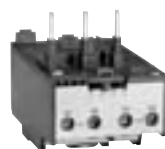
For three-phase starters

electric

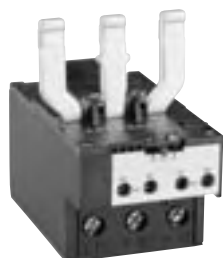
Three phase, single phase sensitive with automatic reset



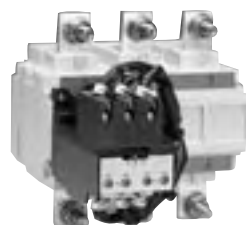
11 RFA9



11 RFA25



11 RFA95



11 RFA180 - 11 RFA400

Adjustment range [A]	Qty per pkg n°	Catalog number	Price \$
For direct mounting on BG06-BG09 and BG12 mini-contactors.			
0.14 - 0.23	1	11 RFA9 023	50.00
0.2 - 0.33	1	11 RFA9 033	50.00
0.3 - 0.5	1	11 RFA9 05	50.00
0.45 - 0.75	1	11 RFA9 075	50.00
0.6 - 1	1	11 RFA9 1	50.00
0.9 - 1.5	1	11 RFA9 1V5	50.00
1.4 - 2.3	1	11 RFA9 2V3	50.00
2 - 3.3	1	11 RFA9 33	50.00
3 - 5	1	11 RFA9 5	50.00
4.5 - 7.5	1	11 RFA9 75	50.00
6 - 10	1	11 RFA9 10	50.00
9 - 15	1	11 RFA9 15	50.00
For direct mounting on BF9-BF12-BF16-BF20-BF25-BF32-BF40 contactors. Independent mounting with G230 base.			
0.14 - 0.23	1	11 RFA25 023	51.00
0.2 - 0.33	1	11 RFA25 033	51.00
0.3 - 0.5	1	11 RFA25 05	51.00
0.45 - 0.75	1	11 RFA25 075	51.00
0.6 - 1	1	11 RFA25 1	51.00
0.9 - 1.5	1	11 RFA25 1V5	51.00
1.4 - 2.3	1	11 RFA25 2V3	51.00
2 - 3.3	1	11 RFA25 33	51.00
3 - 5	1	11 RFA25 5	51.00
4.5 - 7.5	1	11 RFA25 75	51.00
6 - 10	1	11 RFA25 10	51.00
9 - 15	1	11 RFA25 15	51.00
14 - 23	1	11 RFA25 23	57.00
17 - 26	1	11 RFA25 26	60.00
For direct mounting on BF20 00-BF25 00 contactors. Independent mounting with G270 base.			
14 - 23	1	11 RFA95 0 23	75.00
20 - 33	1	11 RFA95 0 33	78.00
For direct mounting on BF20 10 - BF20 01 - BF20 40 - BF25 10 - BF25 01 - BF25 40 contactors. Independent mounting with G270 base.			
20 - 33	1	11 RFA95 1 33	78.00
28 - 42	1	11 RFA95 1 42	81.00
For direct mounting on BF32-BF40 contactors. Independent mounting with G270 base.			
20 - 33	1	11 RFA95 2 33	106.00
28 - 42	1	11 RFA95 2 42	106.00
35 - 50	1	11 RFA95 2 50	106.00
46 - 65	1	11 RFA95 2 65	121.00
For direct mounting on BF50-BF110 contactors. Independent mounting with G270 base.			
20 - 33	1	11 RFA95 3 33	106.00
28 - 42	1	11 RFA95 3 42	106.00
35 - 50	1	11 RFA95 3 50	106.00
46 - 65	1	11 RFA95 3 65	121.00
60 - 82	1	11 RFA95 3 82	131.00
70 - 95	1	11 RFA95 3 95	184.00
90 - 110	1	11 RFA95 3 110	204.00
Separate mounting.			
60 - 100	1	11 RFA180 100	317.00
75 - 125	1	11 RFA180 125	317.00
90 - 150	1	11 RFA180 150	317.00
120 - 200	1	11 RFA180 200	317.00
Separate mounting.			
150 - 250	1	11 RFA400 250	376.00
180 - 300	1	11 RFA400 300	376.00
250 - 420	1	11 RFA400 420	376.00

Operational characteristics

- Tripping class: 10A
- Normal operating limits: -4 to +130°F (-20 to +55°C); compensation from 5°F (-15°C)
- Storage temperature: -65 to +160°F (-55 to +70°C)
- Maximum altitude: 9800ft (3000m)
- Mounting position: normally on vertical plane, ±30° admissible
- Fixed to contactor or independent mounting
- Particular features: test button and trip indicator
- Auxiliary contacts: 1NO + 1NC.

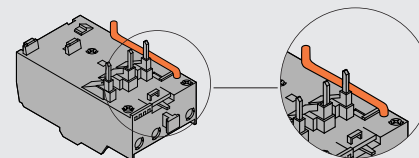
Version without single-phase sensitivity is available on request. Contact Sales & Technical Support for the relative catalog numbers and pricing.

The appropriate adjustment range of the overload relay should be selected on the basis of the motor nameplate full-load current when direct starting is considered.

Certification and compliance

- UL listed, File E 93601 (RF95 3 110 pending completion).
- CSA certified, Files LR 54332-19 and LR 54332-20.
- Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

NOTE: To facilitate connection between the auxiliary NC contact of the thermal relay and terminal A2 of the contactor, insert the wire lead into the appropriate conduit as shown.



① To use with the G270 base, remove the mounted links and assemble the ones supplied with the G270.

② Connecting links between contactor and relay are not included. Direct mounting on contactor is possible with the following links: G372 to fix RFA180 on B115-B145-B180; G373 to fix RFA180 on B250-B310-B400; G375 to fix RFA400 on B145-B180; G376 to fix RFA400 on B250-B310-B400.

See page 4-7 for connecting link details.

NOTE: Contact Sales & Technical Support for overload relays to be used with B500-B630 contactors.

IEC style overload relays

For single-phase starters

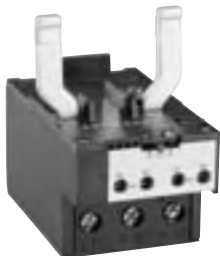
Single phase, (2 pole) with manual reset



11 RFS9



11 RFS25



11 RFS95

Adjustment range	Qty per pkg	Catalog number	Price
[A]	n°		\$
For direct mounting on BG06-BG09 and BG12 mini-contacts.			
0.14 - 0.23	1	11 RFS9 023	45.00
0.2 - 0.33	1	11 RFS9 033	45.00
0.3 - 0.5	1	11 RFS9 05	45.00
0.45 - 0.75	1	11 RFS9 075	45.00
0.6 - 1	1	11 RFS9 1	45.00
0.9 - 1.5	1	11 RFS9 1V5	45.00
1.4 - 2.3	1	11 RFS9 2V3	45.00
2 - 3.3	1	11 RFS9 33	45.00
3 - 5	1	11 RFS9 5	45.00
4.5 - 7.5	1	11 RFS9 75	45.00
6 - 10	1	11 RFS9 10	45.00
9 - 15	1	11 RFS9 15	45.00

For direct mounting on BF9-BF12-BF16-BF20-BF25-BF32-BF40 contactors. Independent mounting with G230 base.			
0.14 - 0.23	1	11 RFS25 023	46.00
0.2 - 0.33	1	11 RFS25 033	46.00
0.3 - 0.5	1	11 RFS25 05	46.00
0.45 - 0.75	1	11 RFS25 075	46.00
0.6 - 1	1	11 RFS25 1	46.00
0.9 - 1.5	1	11 RFS25 1V5	46.00
1.4 - 2.3	1	11 RFS25 2V3	46.00
2 - 3.3	1	11 RFS25 33	46.00
3 - 5	1	11 RFS25 5	46.00
4.5 - 7.5	1	11 RFS25 75	46.00
6 - 10	1	11 RFS25 10	46.00
9 - 15	1	11 RFS25 15	46.00
14 - 23	1	11 RFS25 23	52.00
17 - 26	1	11 RFS25 26	54.00

For direct mounting on BF20 10 - BF20 01 - BF20 40 - BF25 10 - BF25 01 - BF25 40 contactors. Independent mounting with G270 base.			
20 - 33	1	11 RFS95 1 33	73.00
28 - 42	1	11 RFS95 1 42	76.00

Direct mounting on BF32 - BF40 contactors. Independent mounting with G270 base.			
20 - 33	1	11 RFS95 2 33	101.00
28 - 42	1	11 RFS95 2 42	101.00

❶ To use with the G270 base, remove the mounted links and assemble the ones supplied with the G270.

Operational characteristics

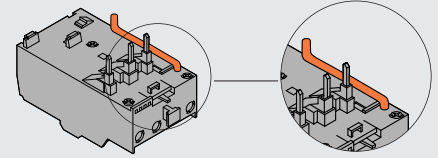
- Tripping class: 10A
- Normal operating limits: -4 to +130°F (-20 to +55°C); compensation from 5°F (-15°C)
- Storage temperature: -65 to +160°F (-55 to +70°C)
- Maximum altitude: 9800ft (3000m)
- Mounting position: normally on vertical plane, ±30° admissible
- Fixed to contactor or independent mounting
- Particular features: test button and trip indicator
- Auxiliary contacts: 1NO + 1NC.

The appropriate adjustment range of the thermal overload relay should be selected on the basis of the motor nameplate full-load current when direct starting is considered.

Certification and compliance

- UL listed, File E 93601.
- CSA certified, Files LR 54332-19 and LR 54332-20.
- Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

NOTE: To facilitate connection between the auxiliary NC contact of the thermal relay and terminal A2 of the contactor, insert the wire lead into the appropriate conduit as shown.



IEC style overload relays

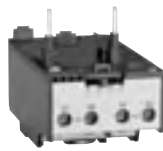
For single-phase starters

electric

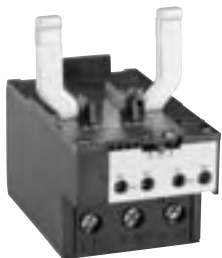
Single phase, (2 pole) with automatic reset



11 RFS A9



11 RFS A25



11 RFS A95

Adjustment range	Qty per pkg	Catalog number	Price
[A]	n°		\$

For direct mounting on BG06-BG09 and BG12 mini-contactors.

0.14 - 0.23	1	11 RFS A9 023	45.00
0.2 - 0.33	1	11 RFS A9 033	45.00
0.3 - 0.5	1	11 RFS A9 05	45.00
0.45 - 0.75	1	11 RFS A9 075	45.00
0.6 - 1	1	11 RFS A9 1	45.00
0.9 - 1.5	1	11 RFS A9 1V5	45.00
1.4 - 2.3	1	11 RFS A9 2V3	45.00
2 - 3.3	1	11 RFS A9 33	45.00
3 - 5	1	11 RFS A9 5	45.00
4.5 - 7.5	1	11 RFS A9 75	45.00
6 - 10	1	11 RFS A9 10	45.00
9 - 15	1	11 RFS A9 15	45.00

For direct mounting on BF9-BF12-BF16-BF20-BF25-BF32-BF40 contactors. Independent mounting with G230 base.

0.14 - 0.23	1	11 RFS A25 023	46.00
0.2 - 0.33	1	11 RFS A25 033	46.00
0.3 - 0.5	1	11 RFS A25 05	46.00
0.45 - 0.75	1	11 RFS A25 075	46.00
0.6 - 1	1	11 RFS A25 1	46.00
0.9 - 1.5	1	11 RFS A25 1V5	46.00
1.4 - 2.3	1	11 RFS A25 2V3	46.00
2 - 3.3	1	11 RFS A25 33	46.00
3 - 5	1	11 RFS A25 5	46.00
4.5 - 7.5	1	11 RFS A25 75	46.00
6 - 10	1	11 RFS A25 10	46.00
9 - 15	1	11 RFS A25 15	46.00
14 - 23	1	11 RFS A25 23	52.00
17 - 26	1	11 RFS A25 26	54.00

For direct mounting on BF20 10 - BF20 01 - BF20 40 - BF25 10 - BF25 01 - BF25 40 contactors. Independent mounting with G270 base.

20 - 33	1	11 RFS 95 1 33	73.00
28 - 42	1	11 RFS 95 1 42	76.00

❶ To use with the G270 base, remove the mounted links and assemble the ones supplied with the G270.

Operational characteristics

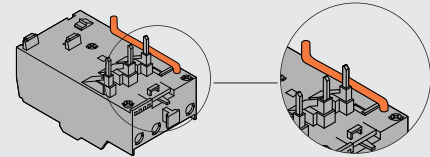
- Tripping class: 10A
- Normal operating limits: -4 to +130°F (-20 to +55°C); compensation from 5°F (-15°C)
- Storage temperature: -65 to +160°F (-55 to +70°C)
- Maximum altitude: 9800ft (3000m)
- Mounting position: normally on vertical plane, ±30° admissible
- Fixed to contactor or independent mounting
- Particular features: test button and trip indicator
- Auxiliary contacts: 1NO + 1NC.

The appropriate adjustment range of the thermal overload relay should be selected on the basis of the motor nameplate full-load current when direct starting is considered.

Certification and compliance

- UL listed, File E 93601.
- CSA certified, Files LR 54332-19 and LR 54332-20.
- Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

NOTE: To facilitate connection between the auxiliary NC contact of the thermal relay and terminal A2 of the contactor, insert the wire lead into the appropriate conduit as shown.



IEC style overload relays

Accessories for overload relays

For relay	Qty per pkg	Catalog number	Price
	n°		\$

Set of links for direct contactor mounting.

RF..95 on:	BF20 00-BF25 00	10	11 G430 ①	7.00
	BF20 10-BF20 01	10	11 G291 ②	7.00
	BF25 10-BF25 01			
	BF20 40-BF25 40			
BF32-BF40		10	11 G260	8.00
	BF50-BF110	10	11 G261	11.00
RF..180 on:	B115-B145-B180	1	11 G372	29.00
	B250-B310-B400	1	11 G373	44.00
RF..400 on:	B145-B180	1	11 G375	39.00
	B250-B310-B400	1	11 G376	46.00

Finger protection for power terminals.

RF..95 c/w BF32-BF40	10	11 G258 ③	4.50
RF..95 c/w BF50-BF110	10	11 G262 ③	4.50
RF..180	1	11 G361	13.00
RF..400	1	11 G363	29.00

Independent mounting.

Screw fixing or 35mm DIN rail (EN 50022) mounting.

RF25	10	11 G230	10.00
RF95	10	11 G270 ④	31.00

Remote reset.

All types	5	11 G228 ⑤	43.00
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Anti-tamper shield.

All types	1	11 G233	2.50
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Electric button with 1NO contact.

All types	10	11 G244	6.00
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Marking element.

All types	100	11 RB6	3.20
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Certification and compliance

- UL recognition listed, File E 93601.
- CSA certified, File LR 54332-36.
- Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-4-1.

Electrical reset (G228) operational characteristics

Control circuit voltage	V	12 - 550
AC (50/60Hz)		
Power consumption in AC	VA	300
Minimum reset time	ms	20

NOTE: Coils can remain supplied for a maximum interval of 500ms; 3 consecutive operations are allowed, followed by a 5 minute interval. It is recommended to use the wiring diagram on page W-4.



11 G244



11 G258



11 G262

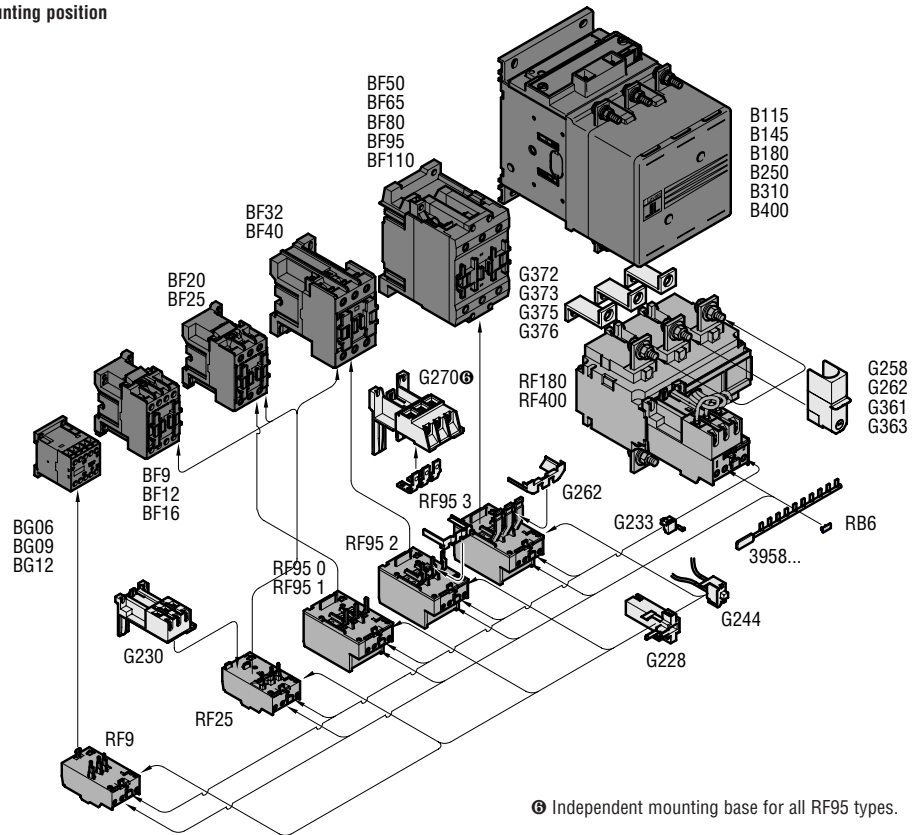


11 G228



11 G230

Mounting position





PAGE 5-2

ENCLOSED COMPACT STARTERS WITH OVERLOAD RELAY

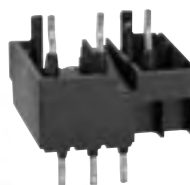
- Single and three-phase motor ratings, 1A to 95A
- With reset button or with start-stop/reset buttons.



PAGE 5-4

EMPTY NON-METALLIC ENCLOSURES

- Versions without pushbuttons, with reset button only or with start-stop/reset buttons
- Suitable to contain BG mini-contactors or BF9 to BF95 contactors, up to 95A rating.



PAGE 5-6

STARTER ASSEMBLY ACCESSORIES

- Set of three connecting cables for SM1 breaker c/w contactor
- Rigid connecting kit for direct-on-line, reversing and wye-delta starter assembly
- Adapter plates for quick assembly of reversing, direct-on-line and star-delta starter assembly.

- *Compact, economical IEC style starters, full voltage non-reversing*
- *Non-metallic enclosures*
- *Available with RESET or START/STOP push buttons in cover*
- *Enclosures available separately for customer assembly*



Full-voltage - across the line - non-reversing starters

	SEC.	PAGE
Enclosed compact starter with overload relay	5-	2
Empty non-metallic enclosures	5-	4
Starter assembly accessories	5-	6

IEC style starters

Full-voltage - across the line - non reversing - three-phase type

electric



11 M0 BRF R



11 M0 BRF P



11 M1 BRF R



11 M1 BRF P

Maximum horsepower ratings						Enclosure		
Single Phase ①		Three Phase				Size	Type	
115V	230V	200V	230V	460V	575V			
M0 ENCLOSURE								
Reset button only								
3/4	2	3	3	5	7 1/2	M0	IP54	
1	2	5	5	7 1/2	10	M0	IP54	
1	2	5	5	7 1/2	10	M0	IP54	
Start - Stop/Reset Pushbuttons								
3/4	2	3	3	5	7 1/2	M0	IP54	
1	2	5	5	7 1/2	10	M0	IP54	
1	2	5	5	7 1/2	10	M0	IP54	
M1 ENCLOSURE								
Reset button only								
3/4	2	3	3	5	7 1/2	M1	IP65	
1	2	5	5	7 1/2	10	M1	IP65	
1	2	5	5	7 1/2	10	M1	IP65	
1 1/2	3	5	5	10	15	M1	IP65	
2	5	7 1/2	7 1/2	15	20	M1	IP65	
Start - Stop/Reset Pushbuttons								
3/4	2	3	3	5	7 1/2	M1	IP65	
1	2	5	5	7 1/2	10	M1	IP65	
1	2	5	5	7 1/2	10	M1	IP65	
1 1/2	3	5	5	10	15	M1	IP65	
2	5	7 1/2	7 1/2	15	20	M1	IP65	
M2 ENCLOSURE								
Reset button only								
3	7 1/2	7 1/2	10	20	25	M2	IP54	
3	7 1/2	10	15	30	30	M2	IP54	
Start - Stop/Reset Pushbuttons								
3	7 1/2	7 1/2	10	20	25	M2	IP54	
3	7 1/2	10	15	30	30	M2	IP54	
M3 ENCLOSURE								
Reset button only								
5	10	10	15	30	40	M3	IP54	
—	—	20	25	50	60	M3	IP54	
—	—	25	30	60	75	M3	IP54	
—	—	30	30	60	75	M3	IP54	
Start - Stop/Reset Pushbuttons								
5	10	10	15	30	40	M3	IP54	
—	—	20	25	50	60	M3	IP54	
—	—	25	30	60	75	M3	IP54	
—	—	30	30	60	75	M3	IP54	

IEC style starters

Full-voltage - across the line - non reversing - three-phase type



11 M2 BRF R
11 M3 BRF R



11 M2 BRF P
11 M3 BRF P

Contactor included	Catalog number ① ② ③	Price \$
BF9 10	11 M0 BRF R11 ① ② ③	184.00
BF12 10	11 M0 BRF R14 ① ② ③	205.00
BF16 10	11 M0 BRF R16 ① ② ③	216.00
BF9 10	11 M0 BRF P11 ① ② ③	191.00
BF12 10	11 M0 BRF P14 ① ② ③	212.00
BF16 10	11 M0 BRF P16 ① ② ③	223.00
BF9 10	11 M1 BRF R11 ① ② ③	194.00
BF12 10	11 M1 BRF R14 ① ② ③	215.00
BF16 10	11 M1 BRF R16 ① ② ③	223.00
BF20 10	11 M1 BRF R23 ① ② ③	247.00
BF25 10	11 M1 BRF R30 ① ② ③	263.00
BF9 10	11 M1 BRF P11 ① ② ③	201.00
BF12 10	11 M1 BRF P14 ① ② ③	222.00
BF16 10	11 M1 BRF P16 ① ② ③	230.00
BF20 10	11 M1 BRF P23 ① ② ③	254.00
BF25 10	11 M1 BRF P30 ① ② ③	270.00
BF32 00	11 M2 BRF R32 ① ② ③	375.00
BF40 00	11 M2 BRF R40 ① ② ③	418.00
BF32 00	11 M2 BRF P32 ① ② ③	387.00
BF40 00	11 M2 BRF P40 ① ② ③	430.00
BF50 00	11 M3 BRF R50 ① ② ③	481.00
BF65 00	11 M3 BRF R65 ① ② ③	570.00
BF80 00	11 M3 BRF R80 ① ② ③	672.00
BF95 00	11 M3 BRF R95 ① ② ③	696.00
BF50 00	11 M3 BRF P50 ① ② ③	496.00
BF65 00	11 M3 BRF P65 ① ② ③	585.00
BF80 00	11 M3 BRF P80 ① ② ③	687.00
BF95 00	11 M3 BRF P95 ① ② ③	711.00

General characteristics

Full-voltage starters in plastic enclosure are supplied complete with three-pole single-phase sensitive thermal relay.

The enclosure has knockout entries. The M0 and M1 versions have all entries with diameter 22.5mm / 0.9in while the M2, diameter 28mm / 1.1in and M3, diameter 37mm / 1.5in. Entries are located on upper, lower and rear surfaces and must be completed with adequate wire conduits to maintain the enclosure degree of protection. Protection fuses are to be mounted externally by the user.

Electrical life

500,000 cycles at the maximum rate of 600 cycles/hour.

Certifications and compliance

CSA certified for Canada and USA, File LR094157-0-000 for M0BRF and M1BRF types. Compliant with standards: IEC/EN 60947-4-1 and UL508.

Overload relay codes ①②

Amp Range	Relay code
0.14 - 0.23	023
0.2 - 0.33	033
0.3 - 0.5	05
0.45 - 0.75	075
0.6 - 1	1
0.9 - 1.5	1V5
1.4 - 2.3	2V3
2 - 3.3	33
3 - 5	5
4.5 - 7.5	75
6 - 10	10
9 - 15	15
14 - 23	23
17 - 26	26
20 - 33	33
28 - 42	42
35 - 50	50
46 - 65	65
60 - 82	82
70 - 95	95

Coil codes ③

Voltage range		Coil Code
60Hz	50Hz	
24V	22V	02460
120V	110V	12060
220-240V	220V	23060
440-480V	380V	46060
575V	—	57560

① For single phase starters, precede overload relay suffix code with "S", i.e., "...S23"
Three-phase starters can be used on single phase provided they are wired properly, refer wiring diagrams on page W-4 or see the instruction leaflet with the starter.

② Complete catalog number by selecting the correct overload relay suffix code from table.

③ After adding the overload relay code, select the coil voltage from coil code table and add to the part number.

Examples of complete the part number:

M1 BRF P11 10 12060 M1 enclosure, Start-Stop/Reset buttons, BF9 contactor, 6-10A overload, 3 phase, and 120VAC coil
M2 BRF R32 S33 23060 M2 enclosure, Reset only, BF32 contactor, 30-33A overload, single phase, and 230VAC coil.

IEC style starters

Full-voltage - across the line - non reversing starters - Accessories

electric

Empty non-metallic enclosures



11 M0



11 M1 P

Contactor type	Degree of protection	Catalog number	Price
			\$

Enclosure without external push-buttons for contactor alone or full-voltage starter with thermal relay having automatic reset (supplied with completion accessories).

BF9-BF12-BF16	IP54	11 M0	28.00
BG, BF9 to BF25	IP65	11 M1	38.00
BF32 - BF40	IP54	11 M2	70.00
BF50 to BF95	IP54	11 M3	130.00

Type of buttons	Degree of protection	Catalog number	Price
			\$

Enclosure with external push-buttons (supplied with completion accessories).

Reset	IP54	11 M0 R	32.00
Start and Stop/Reset	IP54	11 M0 P	39.00
Reset	IP65	11 M1 R	42.00
Start and Stop/Reset	IP65	11 M1 P	49.00
Reset	IP54	11 M2 R	74.00
Start and Stop/Reset	IP54	11 M2 P	95.00
Reset	IP54	11 M3 R	134.00
Start and Stop/Reset	IP54	11 M3 P	155.00

General characteristics

Enclosures are supplied with the following accessories:

- ENCLOSURES WITHOUT PUSH-BUTTONS
Grommets for wire entry, ground terminal, contactor fixing accessories and metal mounting plate for all types except M0.
 - ENCLOSURES WITH RESET PUSH-BUTTON
Grommets for wire entry, ground terminal and contactor fixing accessories for all types, relay fixing bracket for M1R only, metal mounting plate and 2 G285 auxiliary terminals for M3R only.
 - ENCLOSURES WITH START AND STOP/RESET PUSH-BUTTONS
Grommets for wire entry, ground terminal, G244 start button, contactor fixing accessories for all types; relay fixing bracket for M1P only and metal mounting plate and 2 G285 auxiliary terminals for M3P only.
- All the M0 and M1 versions have knockout entries of 22.5mm / 0.9in diameter and are located on upper, lower and rear surfaces. Entries for M2 and M3 enclosures must be drilled as required; refer to Sales & Technical Support for assistance. Entries must be equipped with adequate wire conduits to maintain the enclosure degree of protection.

NOTE: Enclosures can house the following contactors with the relative thermal relay:
M0 = BF9 to BF16
M1 = BG, BF9 to BF25
M2 = BF32 to BF40
M3 = BF50 to BF95

Certifications

CSA certified for Canada and USA, File LR094157-0-000 for M0 and M1 enclosure types only.

Accessories

Enclosure type	Catalog number	Price
		\$

ACCESSORIES TO BE MOUNTED BY THE CUSTOMER

Fastener for start button latch operation.

M0 or MOP	11 G227	5.00
Adapter for BF20 10 and BF25 10 contactors.		
M1 with RF25	BS105	4.00
M1 with RF95	BS114	4.00

Special versions

For versions with auxiliary fuse holder, 3-position selector switch and ON pilot light, contact Sales & Technical Support.

Approximate cross reference of NEMA, UL and CSA versus IEC enclosure type.

This table can not be used to convert IEC classifications to NEMA type numbers.
IEC 60529 has no equivalents to NEMA enclosure type 7, 8, 9, 10 or 11.

Enclosure rating	IP54 - IP55	IP65
Type 12	●	
Type 13		●

Type ratings and IP ratings have only the following in common:

- A degree of protection for persons from hazardous components inside the enclosure.
- A degree of protection for equipment inside the enclosure from ingress of solid foreign objects, including dust.
- A degree of protection for equipment inside the enclosure from ingress of water.

The IP ratings are usually composed of the IP indication followed by two numbers. The first number indicates the protection against solid objects while the second against liquids. The enclosures, indicated in this section, have protection as follows:

First number	Description	Second number	Description
5	Protected against dust (limited ingress, no harmful deposit)	4	Protected against water sprayed from all directions (limited ingress permitted)
6	Totally protected against dust	5	Protected against low pressure jets of water from all directions (limited ingress permitted)

Dimensions
page D-7

Wiring diagrams
page W-4

IEC style starters

Full-voltage - across the line - non reversing - accessories

Composition of complete starters or components to be assembled by the customer.

The customer can choose to purchase the various components as per list below.

The three columns in boldface indicate components for full-voltage starters consenting the customer to assemble different contactor-relay combinations. The column on the extreme right indicates the completely-assembled types given on page 5-2 and 5-3. For catalog numbers of each component, refer to the relevant section; e.g. for contactors, see section 3.



11 M0 BRF R



11 M0 BRF P



11 M1 BRF R



11 M1 BRF P



11 M2 BRF R...
11 M3 BRF R...



11 M2 BRF P...
11 M3 BRF P...

Enclosure	Protection degree	Push buttons	Contactor	Overload Relay		Auxiliary Contacts ①	Complete Starter available
				3-Phase	1-Phase		
M0R	IP54	RESET	BF9 10	RF25	RFS25	1 NO	M0BRF R11
			BF12 10	RF25	RFS25	1 NO	M0BRF R14
			BF16 10	RF25	RFS25	1 NO	M0BRF R16
M0P	IP54	START and STOP/RESET	BF9 10	RF25	RFS25	1 NO	M0BRF P11
			BF12 10	RF25	RFS25	1 NO	M0BRF P14
			BF16 10	RF25	RFS25	1 NO	M0BRF P16
M1R	IP65	RESET	BF9 10	RF25	RFS25	1 NO	M1BRF R11
			BF12 10	RF25	RFS25	1 NO	M1BRF R14
			BF16 10	RF25	RFS25	1 NO	M1BRF R16
			BF16 10	RF25	RFS25	1 NO	M1BRF R16
			BF20 10 ②	RF25	RFS25	1 NO	M1BRF R23
			BF20 10 ②	RF95 1	RFS95 1	1 NO	M1BRF R23
			BF25 10 ②	RF25	RFS25	1 NO	M1BRF R30
			BF25 10 ②	RF95 1	RFS95 1	1 NO	M1BRF R30
			BF25 10 ②	RF25	RFS25	1 NO	M1BRF P11
			BF25 10 ②	RF95 1	RFS95 1	1 NO	M1BRF P14
M1P	IP65	START and STOP/RESET	BF9 10	RF25	RFS25	1 NO	M1BRF P11
			BF12 10	RF25	RFS25	1 NO	M1BRF P14
			BF16 10	RF25	RFS25	1 NO	M1BRF P16
			BF16 10	RF25	RFS25	1 NO	M1BRF P16
			BF20 10 ②	RF25	RFS25	1 NO	M1BRF P23
			BF20 10 ②	RF95 1	RFS95 1	1 NO	M1BRF P23
			BF25 10 ②	RF25	RFS25	1 NO	M1BRF P30
			BF25 10 ②	RF95 1	RFS95 1	1 NO	M1BRF P30
			BF32 00	RF95 2	RFS95 2	—	M2BRF P32
			BF40 00	RF95 2	RFS95 2	—	M2BRF P40
M2R	IP54	RESET	BF32 00	RF95 2	RFS95 2	—	M2BRF P32
			BF40 00	RF95 2	RFS95 2	—	M2BRF P40
M2P	IP54	START and STOP/RESET	BF32 00	RF95 2	RFS95 2	—	M2BRF P32
			BF40 00	RF95 2	RFS95 2	—	M2BRF P40
M3R	IP54	RESET	BF50 00	RF95 3	—	—	M3BRF P50
			BF65 00	RF95 3	—	—	M3BRF P65
			BF80 00	RF95 3	—	—	M3BRF P80
			BF95 00	RF95 3	—	—	M3BRF P95
M3P	IP54	START and STOP/RESET	BF50 00	RF95 3	—	—	M3BRF P50
			BF65 00	RF95 3	—	—	M3BRF P65
			BF80 00	RF95 3	—	—	M3BRF P80
			BF95 00	RF95 3	—	—	M3BRF P95

① All versions are suitable for mounting other NO (normally open) and NC (normally closed) auxiliary contacts. Contact Sales & Technical Support for information about possible configurations.

② A special mounting adapter is required; contact Sales & Technical Support for details.

NOTE: These starters warrant an electric life of at least 500,000 cycles, at the maximum rate of 600 cycles per hour.



IEC style starters

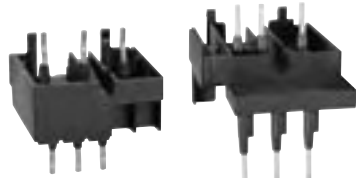
Starter assembly accessories

electric

Accessories

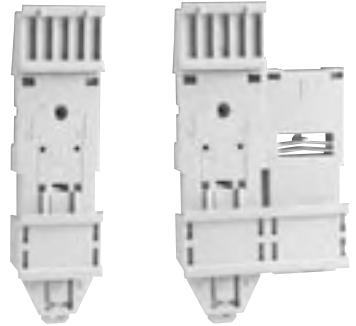


11 SMX90 01 - 11 SMX90 02



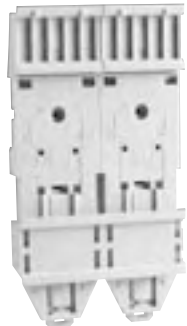
11 SMX90 03

11 SMX90 04

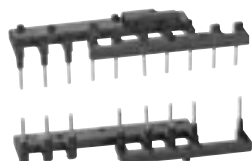


11 SMX90 10

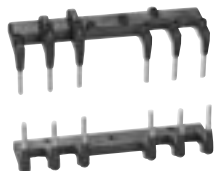
11 SMX90 12



11 SMX90 14



11 SMX90 22



11 SMX90 24

Characteristics	Qty per pkg	Catalog number	Price
	n°		\$

Accessories for full-voltage starter assemblies.

Adapter plate for SM1B starter and BG or BF9-BF40 contactor	1	11 SMX90 10	14.00
Set of 3 connecting wires for SM1B starter with BG, BF9, BF12 or BF16 contactor	10	11 SMX90 01	8.00
Set of 3 connecting wires for SM1B starter with BF20, BF25, BF32 or BF40 contactor	10	11 SMX90 02	8.00
Rigid connecting kit for SM1B starter with BG contactor	10	11 SMX90 03	9.00
Rigid connecting kit for SM1B starter with BF9, BF12 or BF16 contactor	10	11 SMX90 04	9.00

Accessories for reversing contactor assemblies.

Adapter plate for SM1B starter and BG or BF9-BF25 contactors	1	11 SMX90 12	24.00
Rigid connecting kit for two BG contactors ①②	1	11 SMX90 22	11.00
Rigid connecting kit for two BF9, BF12 or BF16 contactors ①②	1	11 SMX90 24	14.00
Rigid connecting kit for two BF20 00 or BF25 00 contactors ②③	1	11 SMX90 26	16.00
Rigid connecting kit for two BF32 or BF40 contactors ②③	1	11 SMX90 28	20.00

Accessories for wye-delta starter assemblies.

Adapter plate for SM1B starter and 45mm wide contactors (BF9-BF25)	1	11 SMX90 14	28.00
DIN rail (EN 50022) for wire bypass of contactor used with SMX90 14 plate	1	11 SMX90 18	3.80
DIN rail extension for 55mm wide contactors	1	11 SMX90 19	2.00
Rigid connecting kit for 3-contactors combination of BG types	1	11 SMX90 21	14.00
Rigid connecting kit for 3-contactor side by side combination among BF9, BF12 or BF16 types (not suitable for SMX90 14 plate)	1	11 SMX90 23	16.00
Connecting kit for either two BF20 00 or BF25 00 and one BF9, BF12 or BF16 (wye) contactors	1	11 SMX90 25	18.00
Connecting kit for either two BF20 10, BF25 10, BF32 or BF40 and one BF20 or BF25 (wye) contactors	1	11 SMX90 27	26.00
Connecting kit for either two BF50 to BF110 and one BF32 or BF40 (wye) contactors	1	11 SMX90 29	52.00
Connecting kit for 3-contactor combination among BF50 to BF110 types	1	11 SMX90 20	58.00

- ① Contactors with one NC auxiliary contact are usually used.
- ② The relay can not be directly mounted on the contactor. Use the RF25 type and the G230 independent mounting base.
- ③ The relay can not be directly mounted on the contactor. Use the RF95 type and the G270 independent mounting base.

General characteristics

SM1 - CONTACTOR ASSEMBLY

The SMX90 01 and 02 are 3-pole links, consisting of three 10AWG (4mm²) section wires having butt ends and wire tie (to keep them together), 3.3in (85mm) long, to provide a quick and easy connection between the starter and the contactor. This type of connection is normally used to assemble starters mounted on busbar systems. The rigid connecting kits form a single-unit starter for quick installation on 35mm DIN rail (EN 50022).

STARTER ASSEMBLY ACCESSORIES

The starter adapter plates install on 35mm DIN rail (EN 55022).

For three-phase connection busbars for manual motor starters, refer to page 1-4 for details.

Certifications

UL recognition listed, File E197069 for SMX90 21, SMX90 22, SMX90 23 and SMX90 24 only; pending for SMX90 04.

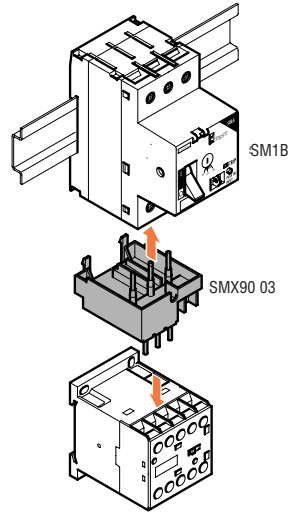
Compliant with standards: IEC/EN 60947-1.

IEC style starters

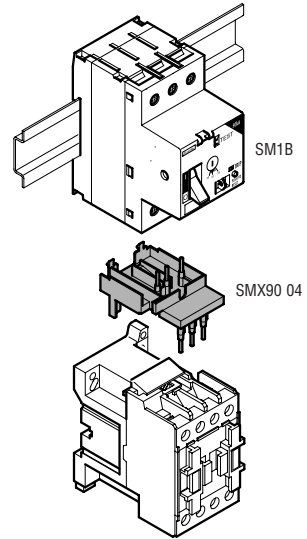
Starter assembly accessories

Mounting positions and combinations

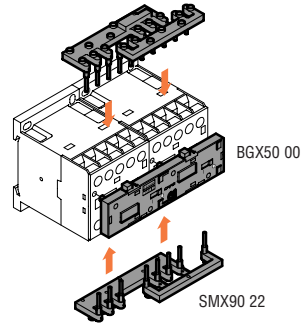
Rigid connecting kit for SM1B breaker with BG mini-contactor



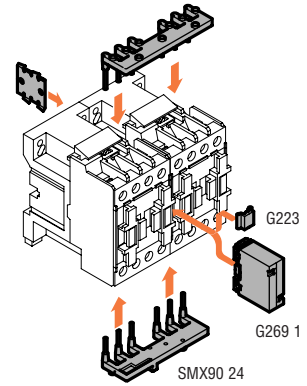
Rigid connecting kit for SM1B breaker with BF9-BF16 contactor



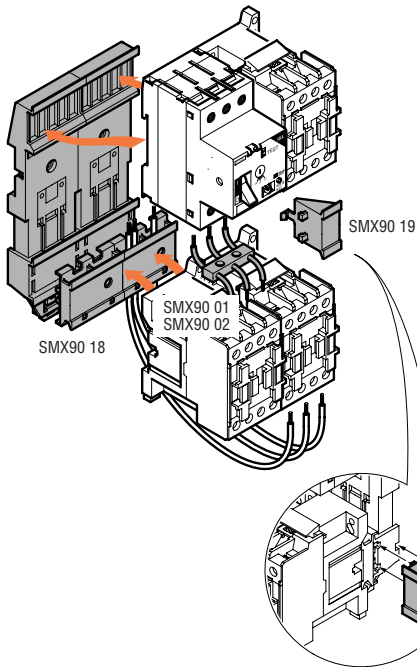
Connections for reversing contactor assembly with BG contactors



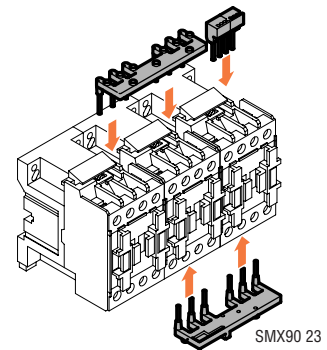
Connections for reversing contactor assembly with BF9-BF16 contactors



Adapter plate for wye-delta starter with SM1B breaker and BF9-BF25 contactors



Connections for wye-delta starters with BF9-BF16 contactors



PUSH BUTTONS AND PILOT DEVICES, 22MM



PAGE 6-2 TO 6

METAL BUTTON OPERATORS

- Flush
- Extended
- Guarded
- Mushroom head
- Mechanical reset
- Illuminated
- Up to 6 auxiliary contacts maximum.



PAGE 6-3 AND 6

METAL PUSH-PUSH OPERATORS

- Flush
- Extended
- Illuminated
- Up to 2 auxiliary contacts maximum.



PAGE 6-4 TO 7

METAL SELECTOR OPERATORS

- Knob
- Lever
- Key
- Illuminated
- 2 or 3 positions
- Maintained or instable positions
- Up to 6 auxiliary contacts maximum.



PAGE 6-8

METAL POTENTIOMETER DRIVES

- Graduated scale
- Variable index.



PAGE 6-9

METAL JOYSTICKS

- 2 directions
- 4 directions
- 2 directions with mechanical interlock
- 4 directions with mechanical interlock
- Complete with auxiliary contacts.



PAGE 6-10 TO 14

PLASTIC BUTTON OPERATORS

- Flush
- Extended
- Guarded
- Mushroom head
- Mechanical reset
- Illuminated
- Up to 6 auxiliary contacts maximum.



PAGE 6-12 AND 15

PLASTIC TWO AND THREE BUTTON OPERATORS

- Double button with or without indicator
- Three button
- Up to 6 auxiliary contacts for two-button maximum
- Up to 4 auxiliary contacts for three-button maximum.



PAGE 6-13 AND 14

PLASTIC SELECTOR OPERATORS

- Knob
- Lever
- Key
- Illuminated
- 2 or 3 positions
- Maintained or instable positions
- Up to 6 auxiliary contacts maximum.

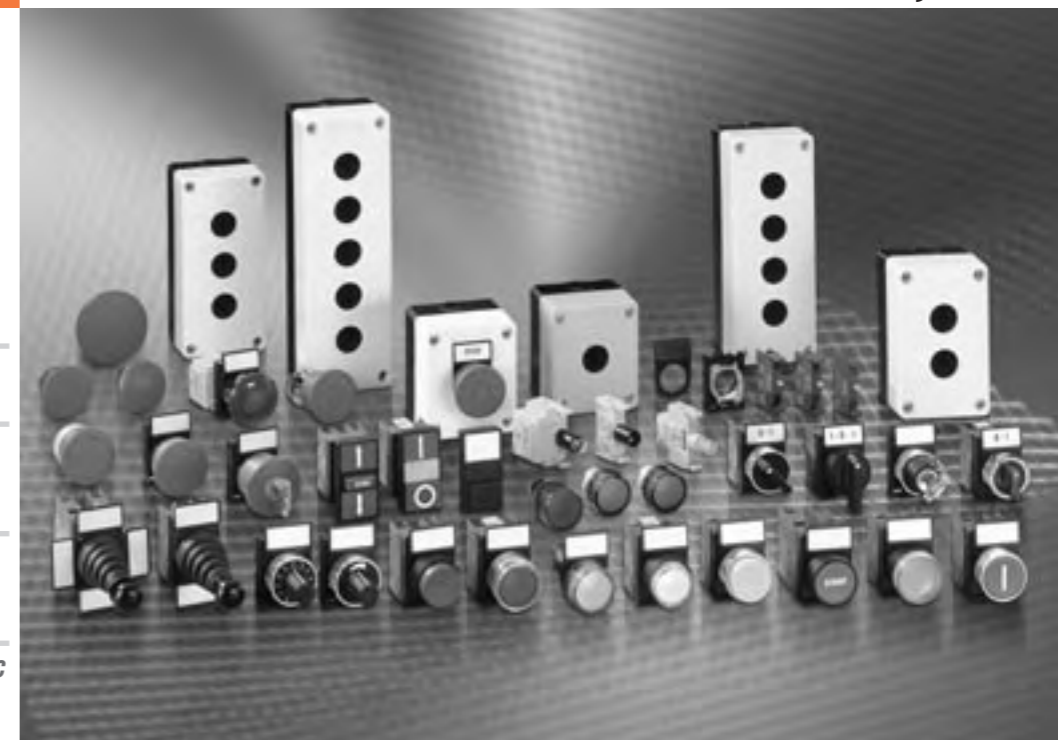


PAGE 6-16

CONTROL STATIONS

- 1 to 5 positions without operators
- Complete units with 1 button.

- *Metal and plastic series*
- *Oil tight and water tight tyoe 4/4X IP65 construction*
- *Rugged, modular construction with rear of panel locking screws on mounting adapter*
- *Contacts with double break, positive opening and self cleaning*
- *Contacts rated for low electronic applications-5 milliamps at 12 volts.*



PLANET - SWITCH

Metal series

	SEC.	PAGE
Push-button operators	6-	2
Push-button operators with inscription	6-	2
Push-push button operators	6-	3
Mushroom-head push-button operators	6-	3
Mechanical reset buttons	6-	4
Selector operators	6-	4
Key selector operators	6-	5
Illuminated button operators	6-	6
Illuminated push-push operators	6-	6
Illuminated mushroom-head operators	6-	6
Illuminated selector operators	6-	7
Pilot light heads	6-	7
Potentiometer drives	6-	8
Joysticks	6-	9

Plastic series

Push-button operators	6-	10
Push-button operators with inscription	6-	10
Mushroom-head push-button operators	6-	11
Mechanical reset buttons	6-	11
Two-button operators	6-	12
Three-button operators	6-	12
Selector operators	6-	13
Illuminated button operators	6-	14
Illuminated mushroom-head operators	6-	14
Two-button operators with indicator	6-	15
Monoblock pilot lights	6-	16

Control stations

Add-on contact elements and blocks

Accessories and spare parts

6-	16
6-	17
6-	19



Push-button operators



8 LM2T B104



8 LM2T B204



8 LM2T B302

Color	Qty per pkg	Catalog number	Price \$
Flush (without mounting adapter), momentary.			
Black	10	8 LM2T B102	6.50
Green	10	8 LM2T B103	6.50
Red	10	8 LM2T B104	6.50
Yellow	10	8 LM2T B105	6.50
Blue	10	8 LM2T B106	6.50
White	10	8 LM2T B108	6.50
Extended (without mounting adapter), momentary.			
Black	10	8 LM2T B202	7.00
Green	10	8 LM2T B203	7.00
Red	10	8 LM2T B204	7.00
Yellow	10	8 LM2T B205	7.00
Blue	10	8 LM2T B206	7.00
White	10	8 LM2T B208	7.00
Guarded (without mounting adapter), momentary.			
Black	10	8 LM2T B302	12.00
Green	10	8 LM2T B303	12.00
Red	10	8 LM2T B304	12.00
Yellow	10	8 LM2T B305	12.00
Blue	10	8 LM2T B306	12.00
White	10	8 LM2T B308	12.00

Push-button operators with inscription



8 LM2T B1104



8 LM2T B2104

Inscription	Color	Qty per pkg	Catalog number	Price \$
Flush (without mounting adapter), momentary.				
O	Black	10	8 LM2T B1102	8.00
	Red	10	8 LM2T B1104	8.00
I	Green	10	8 LM2T B1113	8.00
	White	10	8 LM2T B1118	8.00
II	Green	10	8 LM2T B1123	8.00
	White	10	8 LM2T B1128	8.00
STOP	Black	10	8 LM2T B1132	8.00
	Red	10	8 LM2T B1134	8.00
← ①	Black	10	8 LM2T B1142	8.00
	White	10	8 LM2T B1148	8.00
↑ ②	Black	10	8 LM2T B1152	8.00
	White	10	8 LM2T B1158	8.00
START	Green	10	8 LM2T B1163	8.00
	White	10	8 LM2T B1168	8.00
R	Blue	10	8 LM2T B1176	8.00
	White	10	8 LM2T B1178	8.00
RESET	Blue	10	8 LM2T B1196	8.00
	Black	10	8 LM2T B1502	8.00
→ ←	Black	10	8 LM2T B1512	8.00
	Extended (without mounting adapter), momentary.			
O	Black	10	8 LM2T B2102	9.50
	Red	10	8 LM2T B2104	9.50
STOP	Black	10	8 LM2T B2132	9.50
	Red	10	8 LM2T B2134	9.50

① Arrow inscription can be used to indicate right or left.
 ② Arrow inscription can be used to indicate up or down.

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

An aluminium and zinc alloy (zama) is used for the metal part whereas plastic parts are made of polyamide and polycarbonate.

Mechanical endurance

Operating force: 1.76lb / 0.8kg (operator).
 Mechanical life: 1,000,000 cycles.

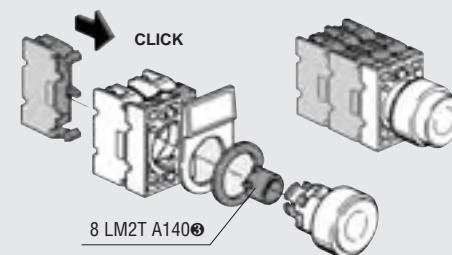
Mounting adapter

See page 4-13.
 Catalog number: 8 LM2T AU120.
 Operators latch onto the mounting adapter with a simple rotation.
 The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 7.1in lb / 0.8 Nm).

Auxiliary contacts

See page 6-17.
 Catalog numbers: 8 LM2T C10 (1NO)
 8 LM2T CF10 (1NO Faston)
 8 LM2T C10A (EM)
 8 LM2T C01 (1NC)
 8 LM2T CF01 (1NC Faston)
 8 LM2T C01D (LB)

Auxiliary contacts snap onto the mounting adapter. Up to 6 auxiliary contacts can be fitted on the mounting adapter: 2 on the left, 2 at the center and 2 on the right. To mount the auxiliary contacts in the center position, use the accessory: LM2T A140 (see page 6-21).



③ The action plug LM2T A140 for the center position is not standard supplied and must be purchased separately.

Push-push button operators



8 LM2T Q10...



8 LM2T Q20...

Color	Qty per pkg	Catalog number	Price \$
Flush (without mounting adapter). Maintained, push to release.			
Black	10	8 LM2T Q102Ⓢ	16.00
Green	10	8 LM2T Q103Ⓢ	16.00
Red	10	8 LM2T Q104Ⓢ	16.00
Yellow	10	8 LM2T Q105Ⓢ	16.00
Blue	10	8 LM2T Q106Ⓢ	16.00
White	10	8 LM2T Q108Ⓢ	16.00
Extended (without mounting adapter). Maintained, push to release.			
Black	10	8 LM2T Q202Ⓢ	19.00
Green	10	8 LM2T Q203Ⓢ	19.00
Red	10	8 LM2T Q204Ⓢ	19.00
Yellow	10	8 LM2T Q205Ⓢ	19.00
Blue	10	8 LM2T Q206Ⓢ	19.00
White	10	8 LM2T Q208Ⓢ	19.00

Ⓢ Use only the early-make type, 8 LM2T C10A.
No normally open contact element, 8 LM2T C10, must be used with this type of button operator.
A maximum of 2 contact elements can be mounted only.

Mushroom head push-button operators



8 LM2T B6144



8 LM2T B6164



8 LM2T B6244



8 LM2T B6344



8 LM2T B6544



8 LM2T B6644

Color	Qty per pkg	Catalog number	Price \$
Momentary. Ø 40 mm (1.6in) (without mounting adapter).			
Black	10	8 LM2T B6142	12.50
Green	10	8 LM2T B6143	12.50
Red	10	8 LM2T B6144	12.50
Yellow	10	8 LM2T B6145	12.50
Blue	10	8 LM2T B6146	12.50
Momentary. Ø 60 mm (2.4in) (without mounting adapter).			
Black	10	8 LM2T B6162	16.00
Green	10	8 LM2T B6163	16.00
Red	10	8 LM2T B6164	16.00
Yellow	10	8 LM2T B6165	16.00
Blue	10	8 LM2T B6166	16.00
Maintained, pull to release. Ø 40 mm (1.6in) (without mounting adapter).			
Black	10	8 LM2T B6242	19.80
Red	10	8 LM2T B6244	19.80
Maintained, twist to release. Ø 40 mm (1.6in) (without mounting adapter).			
Black	10	8 LM2T B6342	22.00
Red	10	8 LM2T B6344	22.00
Maintained, twist key to release. Ø 40 mm (1.6in), keyed (without mounting adapter).			
Black	10	8 LM2T B6542	47.00
	1	8 LM2T B6542G...Ⓢ	50.00
Red	10	8 LM2T B6544	47.00
	1	8 LM2T B6544G...Ⓢ	50.00
Maintained, twist to release, mechanical latching EN418 compliant. Ø 40 mm (1.6in) (without mounting adapter).			
Red	10	8 LM2T B6644	42.00

Ⓢ Versions with different key codes.
Complete with the numeric code of the key. The following versions are available: 501, 502, 503, 504, 505, 506, 507, 508, 509, 510.
Example of complete catalog number: 8 LM2T B6542G505.

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP66 (IP65 only for LM2T B654... operator).

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

An aluminium and zinc alloy (zama) is used for the metal part whereas plastic parts are made of polyamide and polycarbonate.

Mechanical endurance

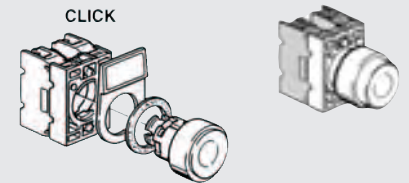
Operating force: 1.76lb / 0.8kg (operator).
Mechanical life for alternate-push operators: 500,000 cycles.
Mechanical life for mushroom head buttons: 1,000,000 cycles.
Mechanical life for mushroom head latch buttons: 300,000 cycles.

Mounting adapter

See page 6-17.
Catalog number: 8 LM2T AU120.
Operators latch onto the mounting adapter with a simple rotation.
The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 7.14in lb / 0.8 Nm).

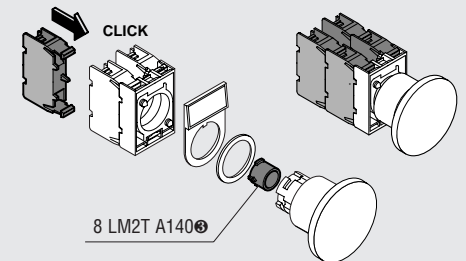
Auxiliary contacts for push-push operators

See page 6-17.
Auxiliary contacts snap onto the mounting adapter.
Catalog numbers: 8 LM2T C10A (EM)
8 LM2T C01 (1NC)
Up to 2 auxiliary contacts can be fitted on the mounting adapter: 1 each on the right and left.



Auxiliary contacts for mushroom-head button operators

Catalog numbers: 8 LM2T C10 (1NO)
8 LM2T CF10 (1NO Faston)
8 LM2T C10A (EM)
8 LM2T C01 (1NC)
8 LM2T CF01 (1NC Faston)
8 LM2T C01D (LB)
Up to 4 auxiliary contacts can be fitted on the mounting adapter with LM2T B624... and LM2T B6644 types.
Up to 6 auxiliary contacts can be fitted on the mounting adapter with all the other types: 2 on the left, 2 at the center LM2T A140 (see page 6-21).
To mount the auxiliary contacts in the center position on LM2T B614... and LM2T B616... types only, use the action plug LM2T A140 (see page 6-21).



Ⓢ The action plug LM2T A140 for the center position is not standard supplied and must be purchased separately.

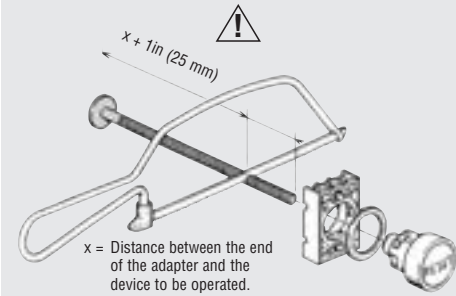
Mechanical reset buttons, complete unit, momentary



8 LM2T R1006

Color	Qty per pkg	Catalog number	Price \$
Flush (0.12in / 5.2 mm stroke). Adjustable length 0-5in (0-123 mm).			
Black	10	8 LM2T R1002	12.00
Green	10	8 LM2T R1003	12.00
Red	10	8 LM2T R1004	12.00
Blue	10	8 LM2T R1006	12.00
Blue (RESET)	10	8 LM2T R1196①	13.00
Extended (0.12in / 5.2 mm stroke). Adjustable length 0-5in (0-123 mm).			
Red	10	8 LM2T R2004	13.00

Complete with mounting adapter as well as the rod.
 ① With "RESET" inscription on operator.



Selector switch operators, knob



8 LM2T S1

Type of positions	Qty per pkg	Catalog number	Price \$
2 position (without mounting adapter).			
∨	10	8 LM2T S120	11.80
∨	10	8 LM2T S121	14.00
3 position (without mounting adapter).			
∨	10	8 LM2T S130	11.80
∨	10	8 LM2T S131	14.00
∨	10	8 LM2T S132	14.00
∨	10	8 LM2T S133	14.00

Selector switch operators, lever



8 LM2T S2

Type of positions	Qty per pkg	Catalog number	Price \$
2 position (without mounting adapter).			
∨	10	8 LM2T S220	12.60
∨	10	8 LM2T S221	14.50
3 position (without mounting adapter).			
∨	10	8 LM2T S230	12.60
∨	10	8 LM2T S231	14.50
∨	10	8 LM2T S232	14.50
∨	10	8 LM2T S233	14.50

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

An aluminium and zinc alloy (zama) is used for the metal part whereas plastic parts are made of polyamide and polycarbonate.

Mechanical endurance

Operating force for reset buttons: 1.76lb / 0.8kg (operator)
 Mechanical life for reset buttons: 1,000,000 cycles
 Mechanical life for selector operators: 300,000 cycles.

Mounting adapter

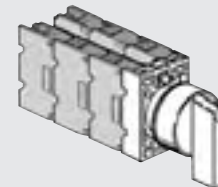
See page 6-17.
 Catalog number: 8 LM2T AU120.
 Operators latch onto the mounting adapter with a simple rotation.
 The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 7.1in lb / 0.8 Nm).

Auxiliary contacts for selector actuators

See page 6-17.

- Catalog numbers:
- 8 LM2T C10 (1NO)
 - 8 LM2T CF10 (1NO Faston)
 - 8 LM2T C10A (EM)
 - 8 LM2T C01 (1NC)
 - 8 LM2T CF01 (1NC Faston)
 - 8 LM2T C01D (LB)

Auxiliary contacts snap onto the mounting adapter. Up to 6 auxiliary contacts can be fitted on the mounting adapter: 3 on the left and 3 on the right.



Positions

- ∨ Maintained position.
- ∨ Spring return position.

Angles

2 position



3 position



Selector switch operators, key



8 LM2T S3

Type of positions	Qty per pkg	Catalog number	Price \$
2 position (without mounting adapter).			
	10	8 LM2T S320	35.00
	1	8 LM2T S320G...①	38.00
	10	8 LM2T S321	35.00
	1	8 LM2T S321G...①	38.00
	10	8 LM2T S340	36.00
	1	8 LM2T S340G...①	39.00
3 position (without mounting adapter).			
	10	8 LM2T S330	35.00
	1	8 LM2T S330G...①	38.00
	10	8 LM2T S331	35.00
	1	8 LM2T S331G...①	38.00
	10	8 LM2T S332②	35.00
	1	8 LM2T S332G...①②	38.00
	10	8 LM2T S333②	35.00
	1	8 LM2T S333G...①②	38.00
	10	8 LM2T S350	36.00
	1	8 LM2T S350G...①	39.00
	10	8 LM2T S360	36.00
	1	8 LM2T S360G...①	39.00
	10	8 LM2T S370②	36.00
	1	8 LM2T S370G...①②	39.00
	10	8 LM2T S380②	36.00
	1	8 LM2T S380G...①②	39.00
	10	8 LM2T S390②	36.00
	1	8 LM2T S390G...①②	39.00

① Versions with different key codes.
 Complete with the numeric code of the key. The following versions are available:
 501, 502, 503, 504, 505, 506, 507, 508, 509, 510.
 Example of complete code: 8 LM2T S320G505.
 ② Available only on specific request.

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

An aluminium and zinc alloy (zama) is used for the metal part whereas plastic parts are made of polyamide and polycarbonate.

Mechanical endurance

Mechanical life for selector operators: 300,000 cycles.

Mounting adapter

See page 6-17.

Catalog number: 8 LM2T AU120.

Operators latch onto the mounting adapter with a simple rotation.

The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 7.1 in lb / 0.8 Nm).

Auxiliary contacts for selector operators

See page 6-17.

Catalog numbers: 8 LM2T C10 (1NO)

8 LM2T CF10 (1NO Faston)

8 LM2T C10A (EM)

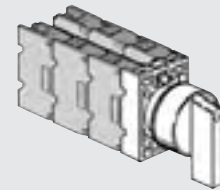
8 LM2T C01 (1NC)

8 LM2T CF01 (1NC Faston)

8 LM2T C01D (LB)

Auxiliary contacts snap onto the mounting adapter.

Up to 6 auxiliary contacts can be fitted on the mounting adapter: 3 on the left and 3 on the right.



Positions

- Maintained position.
- Spring return position.
- Key withdrawal position.

Angles

2 position



3 position



Special versions

Versions with coloured keys are available upon request.
 Contact Sales & Technical Support.

Illuminated button operators



8 LM2T BL104



8 LM2T BL204

Color	Qty per pkg	Catalog number	Price \$
Flush (with side visibility), momentary (without mounting adapter).			
Green	10	8 LM2T BL103	10.50
Red	10	8 LM2T BL104	10.50
Yellow	10	8 LM2T BL105	10.50
Blue	10	8 LM2T BL106	10.50
Transparent	10	8 LM2T BL107	10.50
Extended (without mounting adapter), momentary.			
Green	10	8 LM2T BL203	9.50
Red	10	8 LM2T BL204	9.50
Yellow	10	8 LM2T BL205	9.50
Blue	10	8 LM2T BL206	9.50
Transparent	10	8 LM2T BL207	9.50

Illuminated push-push button operators



8 LM2T QL10...



8 LM2T QL20...

Color	Qty per pkg	Catalog number	Price \$
Flush (without mounting adapter). Maintained, push to release.			
Green	10	8 LM2T QL103	27.00
Red	10	8 LM2T QL104	27.00
Yellow	10	8 LM2T QL105	27.00
Blue	10	8 LM2T QL106	27.00
Transparent	10	8 LM2T QL107	27.00
Extended (without mounting adapter). Maintained, push to release.			
Green	10	8 LM2T QL203	30.00
Red	10	8 LM2T QL204	30.00
Yellow	10	8 LM2T QL205	30.00
Blue	10	8 LM2T QL206	30.00
Transparent	10	8 LM2T QL207	30.00

① Use only the early-make type, 8 LM2T C10A.
No normally open contact element, 8 LM2T C10, must be used with this type of button operator.
A maximum of 2 contact elements can be mounted only.

Illuminated mushroom head button operators



8 LM2T BL6144



8 LM2T BL6245

Color	Qty per pkg	Catalog number	Price \$
Momentary. Ø 40 mm (1.6in) (without mounting adapter).			
Green	10	8 LM2T BL6143	17.00
Red	10	8 LM2T BL6144	17.00
Yellow	10	8 LM2T BL6145	17.00
Blue	10	8 LM2T BL6146	17.00
White	10	8 LM2T BL6148	17.00
Maintained, pull to release. Ø 40mm (1.6in) (without mounting adapter).			
Green	10	8 LM2T BL6243	31.00
Red	10	8 LM2T BL6244	31.00
Yellow	10	8 LM2T BL6245	31.00
Blue	10	8 LM2T BL6246	31.00
White	10	8 LM2T BL6248	31.00

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

An aluminium and zinc alloy (zama) is used for the metal part whereas plastic parts are made of polyamide and polycarbonate.

Mechanical endurance

Operating force: 1.76lb / 0.8kg (operator).
Mechanical life for push-push operators: 500,000 cycles.
Mechanical life for others: 1,000,000 cycles.

Mounting adapter

See page 6-17.
Catalog number: 8 LM2T AU120.
Operators latch onto the mounting adapter with a simple rotation.
The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 7.14in lb / 0.8 Nm).

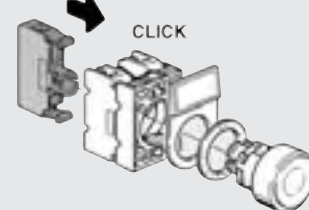
Auxiliary contacts for push-push operators:

See page 6-17. Auxiliary contacts snap on to the mounting adapter.

Catalog number: 8 LM2T C10A (EM)
8 LM2T C01 (1NC)

Up to 2 auxiliary contacts can be fitted on the mounting adapter in a row, 1 each on the right and left, along with the lamp-holder in the center position, of which LM2T DL400, LM2T EL400, LM2T VL230, LM2T ZL230, LM2T L or LM2T M (see page 6-18).

With lamp-holder LM2T XL, LM2T YL, LM2T FL or LM2T GL, one auxiliary contact can be mounted only (see page 6-18).



Auxiliary contacts for button or mushroom-head operators:

See page 6-17. Auxiliary contacts snap on to the mounting adapter.

Catalog numbers: 8 LM2T C10 (1NO)
8 LM2T CF10 (1NO Faston)
8 LM2T C10A (EM)
8 LM2T C01 (1NC)
8 LM2T CF01 (1NC Faston)
8 LM2T C01D (LB)

- Up to 4 auxiliary contacts can be fitted on the mounting adapter, 2 each on the right and left sides, when one of the following types of lamp-holders are used: LM2T DL400, LM2T EL400, LM2T VL230, LM2T ZL230, LM2T L or LM2T M (see page 6-18).

- Up to 2 auxiliary contacts can be fitted on the mounting adapter, one on top of the other of the same type only, when the following types of lamp-holders are used: LM2T L, LM2T M, LM2T YL, LM2T FL or LM2T GL (see page 6-18).

- Up to 2 auxiliary contacts only can be fitted with the actuator type LM2T BL624 whichever lamp-holder type is used.

Lamp-holder elements

See pages 6-18.

Bulbs

Maximum recommended power for push-buttons and selectors: 1.2W. See page 6-20.

Illuminated selector operators



8 LM2T SL1205

Color	Type of positions	Qty per pkg	Catalog number	Price \$
2 position (without mounting adapter).				
Green	✓	10	8 LM2T SL1203	15.00
Red		10	8 LM2T SL1204	15.00
Yellow		10	8 LM2T SL1205	15.00
Blue		10	8 LM2T SL1206	15.00
White		10	8 LM2T SL1208	15.00
Green	✓	10	8 LM2T SL1213	18.00
Red		10	8 LM2T SL1214	18.00
Yellow		10	8 LM2T SL1215	18.00
Blue		10	8 LM2T SL1216	18.00
White		10	8 LM2T SL1218	18.00
3 position (without mounting adapter).				
Green	∨	10	8 LM2T SL1303	15.00
Red		10	8 LM2T SL1304	15.00
Yellow		10	8 LM2T SL1305	15.00
Blue		10	8 LM2T SL1306	15.00
White		10	8 LM2T SL1308	15.00
Green	∨	10	8 LM2T SL1313	18.00
Red		10	8 LM2T SL1314	18.00
Yellow		10	8 LM2T SL1315	18.00
Blue		10	8 LM2T SL1316	18.00
White		10	8 LM2T SL1318	18.00
Green	∨	10	8 LM2T SL1323	18.00
Red		10	8 LM2T SL1324	18.00
Yellow		10	8 LM2T SL1325	18.00
Blue		10	8 LM2T SL1326	18.00
White		10	8 LM2T SL1328	18.00
Green	∨	10	8 LM2T SL1333	18.00
Red		10	8 LM2T SL1334	18.00
Yellow		10	8 LM2T SL1335	18.00
Blue		10	8 LM2T SL1336	18.00
White		10	8 LM2T SL1338	18.00

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

An aluminium and zinc alloy (zama) is used for the metal part whereas plastic parts are made of polyamide and polycarbonate.

Mechanical endurance for selector operators

Mechanical life: 300,000 cycles.

Mounting adapter

See page 6-17.

Catalog number: 8 LM2T AU120.

Operators latch onto the mounting adapter with a simple rotation.

The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 7.1 in lb / 0.8 Nm).

Auxiliary contacts for selector operators

See page 6-17.

Auxiliary contacts snap onto the mounting adapter.

- Catalog numbers:
- 8 LM2T C10 (1NO)
 - 8 LM2T CF10 (1NO Faston)
 - 8 LM2T C10A (EM)
 - 8 LM2T C01 (1NC)
 - 8 LM2T CF01 (1NC Faston)
 - 8 LM2T C01D (LB)

On 2-position illuminated selectors, the following can be fitted on the mounting adapter:

- Up to 4 auxiliary contacts when the following types of lamp-holders are used: LM2T DL400, LM2T VL230, LM2T EL400, LM2T ZL230 (see page 6-14), LM2T L or LM2T M (see page 6-18).
- Up to 2 auxiliary contacts when the following types of lamp-holders are used: LM2T XL, LM2T YL, LM2T FL or LM2T GL (see page 6-18).

On 3-position illuminated selectors, the following can be fitted on the mounting adapter:

- Up to 4 auxiliary contacts when the following types of lamp-holders are used: LM2T DL400, LM2T VL230, LM2T EL400, LM2T ZL230, LM2T L or LM2T M (see page 6-18).

NOTE: The following types of lamp-holders can not be mounted: LM2T XL, LM2T YL, LM2T FL or LM2T GL.

Lamp-holder elements

See page 6-18.

Bulbs

Maximum recommended power for selectors: 1.2W. See page 6-20.

Selector positions

- ✓ Maintained position.
- ✓ Spring return position.

Selector angles

2 position



3 position



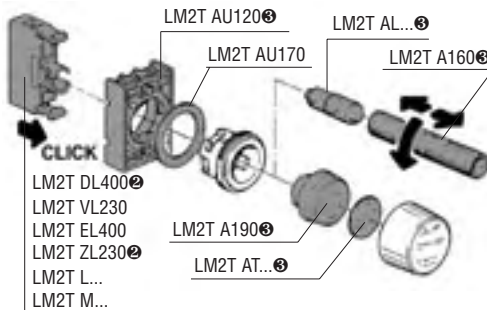
Pilot light head



8 LM2T IL103

Color	Qty per pkg	Catalog number	Price \$
Without mounting adapter.			
Green	10	8 LM2T IL103	5.00
Red	10	8 LM2T IL104	5.00
Yellow	10	8 LM2T IL105	5.00
Blue	10	8 LM2T IL106	5.00
Transparent	10	8 LM2T IL107	5.00
White	10	8 LM2T IL108	5.00
Transparent ⚡	10	8 LM2T IL1187	6.50

⚡ With inscription indicating dangerous voltage (IEC 60417 5036-a).



② The mounting adapter is standard supplied so there is no need to purchase it as a separate accessory.

③ Can be purchased separately. Refer to pages 6-17, 20 and 21.

Potentiometer drive



8 LM2T P100
(complete with mounting adapter)



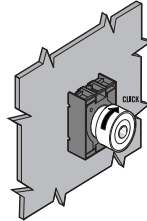
8 LM2T P110
(complete with mounting adapter)

Inscription	Qty per pkg	Catalog number	Price \$
Graduated scale	10	8 LM2T P100	45.40
Variable index	10	8 LM2T P110	45.40

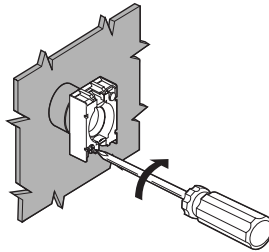
ⓘ Potentiometer not included, for assembly by the user.

Mounting instructions

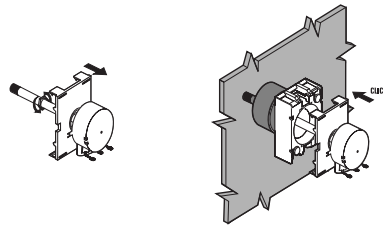
The potentiometer drive latches onto the mounting adapter with a simple rotation.



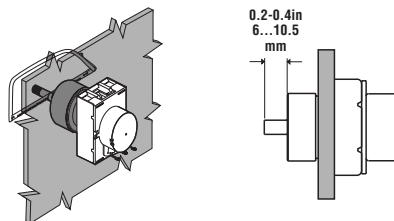
The adapter is fixed to the mounting surface by means of incorporated screws ($T_{max} = 7.1 \text{ in lb} / 0.8 \text{ Nm}$).



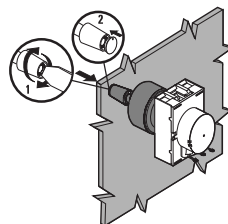
The potentiometer drive is snap onto the mounting adapter with a simple pressure.



Correct the potentiometer length as indicated.



Fix the rotating regulator to the potentiometer by tightening its internal screw.



Operational characteristics

- Suitable for potentiometers with 1/4in (6-6.3mm) diameter shaft
- Minimum 1 1/2in (40mm) shaft length
- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65 (warranted by potentiometers with a cylindrical shaft).

Materials

An aluminium and zinc alloy (zama) is used for the metal part whereas plastic parts are made of polyamide and polycarbonate.

Mechanical endurance

Mechanical life: 300,000 cycles.

Mounting adapter

Standard supply with operator.

Operators latch onto the mounting adapter with a simple rotation.

The adapter is fixed to the mounting surface by means of incorporated screws ($T_{max} = 7.1 \text{ in lb} / 0.8 \text{ Nm}$).

Joysticks



8 LM2T J200
without mechanical interlock



8 LM2T J410
with mechanical interlock

Type of positions	N° auxiliary contacts	Qty per pkg	Catalog number	Price \$
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Without mechanical interlock. Label holder excluded. Complete with auxiliary contacts.

	2	1	8 LM2T J200	51.00
	2	1	8 LM2T J201	51.00
	4	1	8 LM2T J400	62.00
	4	1	8 LM2T J401	62.00

With mechanical interlock in center position. Label holder excluded. Complete with auxiliary contacts.

	2	1	8 LM2T J210	58.00
	2	1	8 LM2T J211	58.00
	4	1	8 LM2T J410	70.00
	4	1	8 LM2T J411	70.00

Operational characteristics

- Ambient operating temperature: -40 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Certifications and compliance

Certifications obtained: cULus pending.
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

An aluminium and zinc alloy (zama) is used for the metal parts whereas plastic parts are made of polyamide and polycarbonate.
The sealing boot is made of NBR rubber.

Mechanical endurance

Mechanical life: 1,000,000 cycles

Mounting adapter and auxiliary contacts

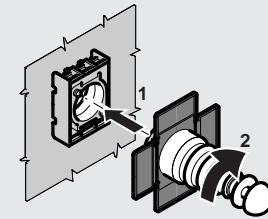
The joystick is standard supplied with the mounting adapter and auxiliary contacts.

The joystick latches onto the mounting adapter with a simple rotation.

The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 7.1in lb / 0.8Nm).

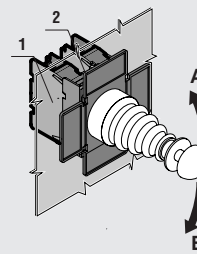
Auxiliary contacts snap onto the mounting adapter. Two LM2T CJ contacts are mounted with the LM2T J2 types while four on the LM2T J4 versions.

Terminal tightening torque: 8.8in lb / 1Nm.
UL designation: A/300, Q/300.

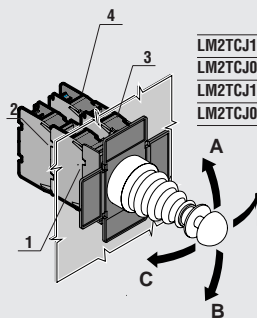


Joystick positions and contact energizing

◊ 2 instable ◊ 2 maintained ◊ - 4 instable ◊ - 4 maintained

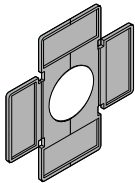


		↑ A	↓ B
LM2TCJ10	1	●	
	2		●



		↑ A	↓ B	← C	→ D
LM2TCJ10	1	●			
LM2TCJ01	2		●		
LM2TCJ10	3				●
LM2TCJ01	4			●	

Accessories



8 LM2T AU101

Description	Qty per pkg	Catalog number	Price \$
2-4 directional holder for adhesive legends	10	8 LM2T AU101	4.00

Push-button operators



8 LP2T B104



8 LP2T B204



8 LP2T B303

Color	Qty per pkg	Catalog number	Price \$
Flush (complete with mounting adapter), momentary.			
Black	10	8 LP2T B102	7.50
Green	10	8 LP2T B103	7.50
Red	10	8 LP2T B104	7.50
Blue	10	8 LP2T B106	7.50
White	10	8 LP2T B108	7.50
Extended (complete with mounting adapter), momentary.			
Black	10	8 LP2T B202	8.00
Green	10	8 LP2T B203	8.00
Red	10	8 LP2T B204	8.00
Blue	10	8 LP2T B206	8.00
White	10	8 LP2T B208	8.00
Guarded (complete with mounting adapter), momentary.			
Black	10	8 LP2T B302	13.00
Green	10	8 LP2T B303	13.00
Red	10	8 LP2T B304	13.00
Blue	10	8 LP2T B306	13.00
White	10	8 LP2T B308	13.00

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

Polyamide and polycarbonate.

Mechanical endurance

Operating force: 1.76lb / 0.8 kg (operator).
Mechanical life: 1,000,000 cycles.

Mounting adapter

Standard supply with the operator.
Operators latch onto the mounting adapter with a simple rotation.
The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 5.3in lb / 0.6 Nm).

Auxiliary contacts

See page 6-17.

- Catalog numbers:
- 8 LM2T C10 (1NO)
 - 8 LM2T CF10 (1NO Faston)
 - 8 LM2T C10A (EM)
 - 8 LM2T C01 (1NC)
 - 8 LM2T CF01 (1NC Faston)
 - 8 LM2T C01D (LB)

Auxiliary contacts snap onto the mounting adapter.

Up to 6 auxiliary contacts can be fitted on the mounting adapter: 2 on the left, 2 at the center and 2 on the right.
To mount the auxiliary contacts in the center position, use the accessory: LM2T A140 (see page 6-21).

Push-button operators with inscription



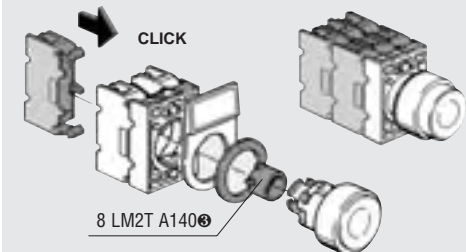
8 LP2T B1104



8 LP2T B2104

Inscription	Color	Qty per pkg	Catalog number	Price \$
Flush (complete with mounting adapter), momentary.				
O	Black	10	8 LP2T B1102	9.00
	Red	10	8 LP2T B1104	9.00
I	Green	10	8 LP2T B1113	9.00
	White	10	8 LP2T B1118	9.00
II	Green	10	8 LP2T B1123	9.00
	White	10	8 LP2T B1128	9.00
STOP	Black	10	8 LP2T B1132	9.00
	Red	10	8 LP2T B1134	9.00
← ①	Black	10	8 LP2T B1142	9.00
	White	10	8 LP2T B1148	9.00
↑ ②	Black	10	8 LP2T B1152	9.00
	White	10	8 LP2T B1158	9.00
START	Green	10	8 LP2T B1163	9.00
	White	10	8 LP2T B1168	9.00
R	Blue	10	8 LP2T B1176	9.00
	White	10	8 LP2T B1178	9.00
RESET	Blue	10	8 LP2T B1196	9.00
↔	Black	10	8 LP2T B1502	9.00
→ ←	Black	10	8 LP2T B1512	9.00
Extended (complete with mounting adapter), momentary.				
O	Black	10	8 LP2T B2102	10.50
	Red	10	8 LP2T B2104	10.50
STOP	Black	10	8 LP2T B2132	10.50
	Red	10	8 LP2T B2134	10.50

- ① Arrow inscription can be used to indicate right or left.
② Arrow inscription can be used to indicate up or down.



- ③ The action plug LM2T A140 for the center position is not standard supplied and must be purchased separately.

Mushroom head button operators



8 LP2T B614...



8 LP2T B616...



8 LP2T B624...



8 LP2T B634...



8 LP2T B654...



8 LP2T B664

Color	Qty per pkg	Catalog number	Price \$
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Momentary, Ø 40 mm (1.6in) (complete with mounting adapter).

Black	10	8 LP2T B6142	14.00
Green	10	8 LP2T B6143	14.00
Red	10	8 LP2T B6144	14.00
Yellow	10	8 LP2T B6145	14.00
Blue	10	8 LP2T B6146	14.00

Momentary, Ø 60 mm (2.4in) (adapter).

Black	10	8 LP2T B6162	17.00
Green	10	8 LP2T B6163	17.00
Red	10	8 LP2T B6164	17.00
Yellow	10	8 LP2T B6165	17.00
Blue	10	8 LP2T B6166	17.00

Maintained, pull to release, Ø 40 mm (1.6in) (complete with mounting adapter).

Black	10	8 LP2T B6242	22.00
Red	10	8 LP2T B6244	22.00

Maintained, twist to release, Ø 40 mm (1.6in) (complete with mounting adapter).

Black	10	8 LP2T B6342	24.00
Red	10	8 LP2T B6344	24.00

Maintained, twist key to release, Ø 40 mm (1.6in), keyed (complete with mounting adapter).

Black	10	8 LP2T B6542	45.00
	1	8 LP2T B6542G... ^①	47.00
Red	10	8 LP2T B6544	45.00
	1	8 LP2T B6544G... ^①	47.00

Maintained, twist to release, mechanical latching EN418 compliant Ø 40 mm (1.6in) (complete with mounting adapter).

Red	10	8 LP2T B6644	40.00
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^① Versions with different key codes. Complete with the numeric code of the key. The following versions are available: 501, 502, 503, 504, 505, 506, 507, 508, 509, 510. Example of complete catalog number: 8 LM2T B6542G505.

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed.
- Degree of protection: IP66 (IP65 only for LP2T B654 operators and LP2T R buttons).

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

Polyamide and polycarbonate.

Mechanical endurance

Operating force: 1.76lb / 0.8 kg (operator).
Mechanical life for mushroom-head and reset buttons: 1,000,000 cycles.
Mechanical life for mushroom-head latch and reset buttons: 300,000 cycles.

Mounting adapter

Standard supply with the operator.
Operators latch onto the mounting adapter with a simple rotation.
The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 5.3in lb / 0.6 Nm).

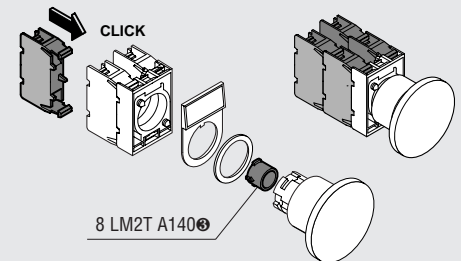
Auxiliary contacts for mushroom-head operators

See page 6-17.

Catalog numbers: 8 LM2T C10 (1NO)
8 LM2T CF10 (1NO Faston)
8 LM2T C10A (EM)
8 LM2T C01 (1NC)
8 LM2T CF01 (1NC Faston)
8 LM2T C01D (LB)

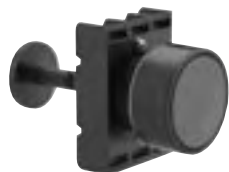
Auxiliary contacts snap onto the mounting adapter
Up to 4 auxiliary contacts can be fitted on the mounting adapter with the LP2T B624... and LP2T B6644 types.
Up to 6 auxiliary contacts can be fitted on the mounting adapter with all the rest: 2 on the left, 2 at the center and 2 on the right.

To mount the auxiliary contacts in the center position on LP2T B614... and LP2T B616... types only, use the action plug LM2T A140 (see page 6-21).



^② The action plug LM2T A140 for the center position is not standard supplied and must be purchased separately.

Mechanical reset buttons, complete unit, momentary



8 LP2T R1006
(complete with mounting adapter and rod)

Color	Qty per pkg	Catalog number	Price \$
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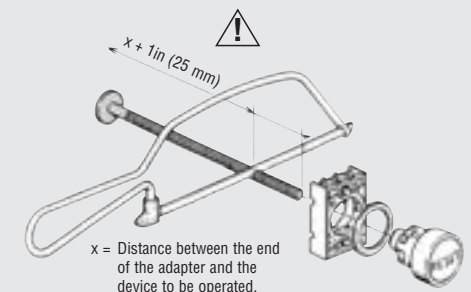
Flush (0.2in / 5.2 mm stroke). Adjustable length 0-5in (0-123 mm).

Black	10	8 LP2T R1002	10.00
Green	10	8 LP2T R1003	10.00
Red	10	8 LP2T R1004	10.00
Yellow	10	8 LP2T R1005	10.00
Blue	10	8 LP2T R1006	10.00
Blue (RESET)	10	8 LP2T R1196 ^②	12.00

Extended (0.2in / 5.2 mm stroke). Adjustable length 0-5in (0-123 mm).

Red	10	8 LP2T R2004	12.00
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^② With "RESET" inscription on the operator.



Two button momentary operators



8 LP2T B7113



8 LP2T B7223

Colors	Marked in white	Qty per pkg	Catalog number	Price \$
Two flush push-buttons (complete with mounting adapter).				
Black/Red	—	10	8 LP2T B7112	10.00
Green/Red	—	10	8 LP2T B7113	10.00
White/Black	—	10	8 LP2T B7114	10.00
Black/Red	I-O	10	8 LP2T B7122	11.00
Green/Red	I-O	10	8 LP2T B7123	11.00
White/Black	I-O	10	8 LP2T B7124	11.00
Green/Red	Start/Stop	10	8 LP2T B7133	11.00
One extended and one flush button (c/w mounting adapter).				
Black/Red	—	10	8 LP2T B7212	10.00
Green/Red	—	10	8 LP2T B7213	10.00
White/Black	—	10	8 LP2T B7214	10.00
Black/Red	I-O	10	8 LP2T B7222	11.00
Green/Red	I-O	10	8 LP2T B7223	11.00
White/Black	I-O	10	8 LP2T B7224	11.00
Green/Red	Start/Stop	10	8 LP2T B7233	11.00

Three button momentary operators



8 LP2T B7355

Colors	Marked in white	Qty per pkg	Catalog number	Price \$
Two external flush and one middle extended buttons. Complete with mounting adapter.				
Green Red Green	↑ STOP ↓	10	8 LP2T B7345	14.00
Green Red Green	↑ STOP ↓	10	8 LP2T B7355	14.00
Green Red Green	→ STOP ←	10	8 LP2T B7365	14.00
Green Red Green	↗ STOP ↖	10	8 LP2T B7375	14.00

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed.
- Degree of protection: IP66 (IP65 for LP2T B654 and IP40 for two button operators).

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

Polyamide and polycarbonate.

Mechanical endurance

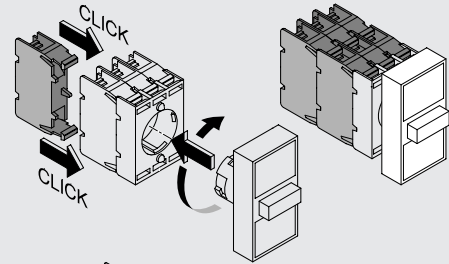
Operating force: 1.76lb / 0.8 kg (operator).
 Mechanical life for mushroom-head and double touch push buttons: 1,000,000 cycles.
 Mechanical life for mushroom-head latch push reset buttons: 300,000 cycles.

Mounting adapter

Standard supply with the operator.
 Operators latch onto the mounting adapter with a simple rotation.
 The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 5.3in lb / 0.6 Nm).

Auxiliary contacts

See page 6-17.
 Auxiliary contacts snap onto the mounting adapter
 Catalog numbers: 8 LM2T C10 (1NO)
 8 LM2T CF10 (1NO Faston)
 8 LM2T C10A (EM)
 8 LM2T C01 (1NC)
 8 LM2T CF01 (1NC Faston)
 8 LM2T C01D (LB)



TWO BUTTON OPERATORS

Up to 4 auxiliary contacts can be fitted on the mounting adapter: 2 on the left and 2 on the right.

THREE BUTTON OPERATORS

Up to 6 auxiliary contacts can be fitted on the mounting adapter: 2 on the left, 2 in the center and 2 on the right.

Push buttons and pilot devices, 22mm

Plastic series

Selector switch operators, knob



8 LP2T S1

Type of positions	Qty per pkg	Catalog number	Price \$
2 position (complete with mounting adapter).			
∨	10	8 LP2T S120	14.00
∨	10	8 LP2T S121	16.00
3 position (complete with mounting adapter).			
∨	10	8 LP2T S130	14.00
∨	10	8 LP2T S131	16.00
∨	10	8 LP2T S132	16.00
∨	10	8 LP2T S133	16.00

Selector switch operators, lever



8 LP2T S2

Type of positions	Qty per pkg	Catalog number	Price \$
2 position (complete with mounting adapter).			
∨	10	8 LP2T S220	14.00
∨	10	8 LP2T S221	16.00
3 position (complete with mounting adapter).			
∨	10	8 LP2T S230	14.00
∨	10	8 LP2T S231	16.00
∨	10	8 LP2T S232	16.00
∨	10	8 LP2T S233	16.00

Selector switch operators, key



8 LP2T S3

Type of positions	Qty per pkg	Catalog number	Price \$
2 position (complete with mounting adapter).			
∨	10	8 LP2T S320	35.00
∨	1	8 LP2T S320G...①	38.00
∨	10	8 LP2T S321	35.00
∨	1	8 LP2T S321G...①	38.00
∨	10	8 LP2T S340	36.00
∨	1	8 LP2T S340G...①	39.00
3 position (complete with mounting adapter).			
∨	10	8 LP2T S330	35.00
∨	1	8 LP2T S330G...①	38.00
∨	10	8 LP2T S331	35.00
∨	1	8 LP2T S331G...①	38.00
∨	10	8 LP2T S332②	35.00
∨	1	8 LP2T S332G...①②	38.00
∨	10	8 LP2T S333②	35.00
∨	1	8 LP2T S333G...①②	38.00
∨	10	8 LP2T S350	36.00
∨	1	8 LP2T S350G...①	40.00
∨	10	8 LP2T S360	36.00
∨	1	8 LP2T S360G...①	40.00
∨	10	8 LP2T S370②	36.00
∨	1	8 LP2T S370G...①②	40.00
∨	10	8 LP2T S380②	36.00
∨	1	8 LP2T S380G...①②	40.00
∨	10	8 LP2T S390②	36.00
∨	1	8 LP2T S390G...①②	40.00

① Versions with different key codes.
Complete with the numeric code of the key. The following versions are available:
501, 502, 503, 504, 505, 506, 507, 508, 509, 510.
Example of complete catalog number: 8 LP2T S320G505.

② Available only on specific request.

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

Polyamide and polycarbonate.

Mechanical endurance

Mechanical life: 300,000 cycles.

Mounting adapter

Standard supply with the operator.

Operators latch onto the mounting adapter with a simple rotation.

The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 5.3in lb / 0.6 Nm).

Auxiliary contacts

See page 6-17.

Auxiliary contacts snap onto the mounting adapter.

Catalog numbers: 8 LM2T C10 (1NO)

8 LM2T CF10 (1NO Faston)

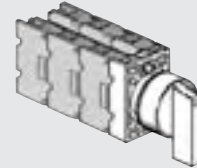
8 LM2T C10A (EM)

8 LM2T C01 (1NC)

8 LM2T CF01 (1NC Faston)

8 LM2T C01D (LB)

Up to 6 auxiliary contacts can be fitted on the mounting adapter: 3 on the left and 3 on the right.



Positions

- ∨ Maintained position.
- ∨ Spring return position.
- ∨ Key withdrawal position.

Angles

2 position



3 position



Special versions

Versions with colored keys are available upon request.
Contact Sales & Technical Support.

Push buttons and pilot devices, 22mm

Plastic series

electric

Illuminated button operators



8 LP2T BL104



8 LP2T BL204

Color	Qty per pkg	Catalog number	Price \$
Flush (with side visibility), momentary (complete with mounting adapter).			
Green	10	8 LP2T BL103	11.00
Red	10	8 LP2T BL104	11.00
Yellow	10	8 LP2T BL105	11.00
Blue	10	8 LP2T BL106	11.00
Transparent	10	8 LP2T BL107	11.00
Extended (complete with mounting adapter), momentary.			
Green	10	8 LP2T BL203	12.00
Red	10	8 LP2T BL204	12.00
Yellow	10	8 LP2T BL205	12.00
Blue	10	8 LP2T BL206	12.00
Transparent	10	8 LP2T BL207	12.00

Illuminated mushroom head button operators



8 LP2T BL6144

Color	Qty per pkg	Catalog number	Price \$
Momentary. Ø 40 mm (complete with mounting adapter).			
Green	10	8 LP2T BL6143	18.00
Red	10	8 LP2T BL6144	18.00
Yellow	10	8 LP2T BL6145	18.00
Blue	10	8 LP2T BL6146	18.00
Transparent	10	8 LP2T BL6147	18.00
White	10	8 LP2T BL6148	18.00

Illuminated selector operators



8 LP2T SL1205

Color	Type of positions	Qty per pkg	Catalog number	Price \$
2 position (complete with mounting adapter).				
Green	∨	10	8 LP2T SL1203	16.00
Red		10	8 LP2T SL1204	16.00
Yellow		10	8 LP2T SL1205	16.00
Blue		10	8 LP2T SL1206	16.00
White		10	8 LP2T SL1208	16.00
Green	∨	10	8 LP2T SL1213	17.00
Red		10	8 LP2T SL1214	17.00
Yellow		10	8 LP2T SL1215	17.00
Blue		10	8 LP2T SL1216	17.00
White		10	8 LP2T SL1218	17.00
3 position (complete with mounting adapter).				
Green	∨	10	8 LP2T SL1303	16.00
Red		10	8 LP2T SL1304	16.00
Yellow		10	8 LP2T SL1305	16.00
Blue		10	8 LP2T SL1306	16.00
White		10	8 LP2T SL1308	16.00
Green	∨	10	8 LP2T SL1313	17.00
Red		10	8 LP2T SL1314	17.00
Yellow		10	8 LP2T SL1315	17.00
Blue		10	8 LP2T SL1316	17.00
White		10	8 LP2T SL1318	17.00
Green	∨	10	8 LP2T SL1323	17.00
Red		10	8 LP2T SL1324	17.00
Yellow		10	8 LP2T SL1325	17.00
Blue		10	8 LP2T SL1326	17.00
White		10	8 LP2T SL1328	17.00
Green	∨	10	8 LP2T SL1333	17.00
Red		10	8 LP2T SL1334	17.00
Yellow		10	8 LP2T SL1335	17.00
Blue		10	8 LP2T SL1336	17.00
White		10	8 LP2T SL1338	17.00

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP65.

Reference standards

Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

Polyamide and polycarbonate.

Mechanical endurance

Operating force: 1.76lb / 0.8kg (operator).
Mechanical life for push-buttons: 1,000,000 cycles.
Mechanical life for selectors: 300,000 cycles.

Mounting adapter

Standard supply with the operator.
Operators latch onto the mounting adapter with a simple rotation.
The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 5.3in lb / 0.6 Nm).

Auxiliary contacts

See page 6-17.
Auxiliary contacts snap onto the mounting adapter.
Catalog numbers: 8 LM2T C10 (1NO)
8 LM2T CF10 (1NO Faston)
8 LM2T C10A (EM)
8 LM2T C01 (1NC)
8 LM2T CF01 (1NC Faston)
8 LM2T C01D (LB)

PUSH-BUTTONS

- Up to 4 auxiliary contacts can be fitted on the mounting adapter when the following types of lamp-holders are used: LM2T EL400, LM2T ZL230, LM2T L or LM2T M (see page 6-18).
- Up to 2 auxiliary contacts can be fitted on the mounting adapter when the following types of lamp-holders are used: LM2T YL or LM2T GL (see page 6-18).

SELECTORS

- On 2-position illuminated selectors, the following can be fitted on the mounting adapter:
- Up to 4 auxiliary contacts when the following types of lamp-holders are used: LM2T EL400, LM2T ZL230, LM2TL or LM2TM (see page 6-18).
 - Up to 2 auxiliary contacts when the following types of lamp-holders are used: LM2T YL or LM2T GL (see page 6-18).

On 3-position illuminated selectors, the following can be fitted on the mounting adapter:

- Up to 4 auxiliary contacts when the following types of lamp-holders are used: LM2T EL400, LM2T ZL230, LM2T L or LM2T M (see page 6-18).

NOTE: The following types of lamp-holders can not be mounted: LM2T YL or LM2T GL.

Lamp-holder elements

See pages 6-18.

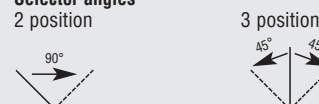
Bulbs

Maximum recommended power for push-buttons and selectors: 1.2W. See page 6-20.

Selector positions

- ∨ Maintained position.
- ∨ Spring return position.

Selector angles



Two button momentary operators with white pilot light



8 LP2T BL7113



8 LP2T BL72123

Direct wire pilot lights (with diffuser)



8 LP2T IL214



8 LP2T IL224



8 LP2T IL234

Color	Marked in white	Qty per pkg	Catalog number	Price \$
Two flush push-buttons (complete with mounting adapter) ①.				
Black/Red	—	10	8 LP2T BL7112	11.00
Green/Red	—	10	8 LP2T BL7113	11.00
White/Black	—	10	8 LP2T BL7114	11.00
Black/Red	I-O	10	8 LP2T BL7122	12.00
Green/Red	I-O	10	8 LP2T BL7123	12.00
White/Black	I-O	10	8 LP2T BL7124	12.00
Green/Red	Start/Stop	10	8 LP2T BL7133	12.00
One extended and one flush button (c/w mounting adapter) ①.				
Black/Red	—	10	8 LP2T BL7212	11.00
Green/Red	—	10	8 LP2T BL7213	11.00
White/Black	—	10	8 LP2T BL7214	11.00
Black/Red	I-O	10	8 LP2T BL7222	12.00
Green/Red	I-O	10	8 LP2T BL7223	12.00
White/Black	I-O	10	8 LP2T BL7224	12.00
Green/Red	Start/Stop	10	8 LP2T BL7233	12.00

① Pilot light colour can be changed; see diffuser at the bottom of page 6-21.

Color	Bulb supplied	Qty per pkg	Catalog number	Price \$
Screw terminals without protection.				
Green	no	10	8 LP2T IL213	6.00
Red	no	10	8 LP2T IL214	6.00
Yellow	no	10	8 LP2T IL215	6.00
Blue	no	10	8 LP2T IL216	6.00
Transparent	no	10	8 LP2T IL217	6.00
White	no	10	8 LP2T IL218	6.00
Screw terminals with protection.				
Green	no	10	8 LP2T IL223	6.00
Red	no	10	8 LP2T IL224	6.00
Yellow	no	10	8 LP2T IL225	6.00
Blue	no	10	8 LP2T IL226	6.00
Transparent	no	10	8 LP2T IL227	6.00
White	no	10	8 LP2T IL228	6.00
Faston terminals without protection ②.				
Green	no	10	8 LP2T IL233	5.00
Red	no	10	8 LP2T IL234	5.00
Yellow	no	10	8 LP2T IL235	5.00
Blue	no	10	8 LP2T IL236	5.00
Transparent	no	10	8 LP2T IL237	5.00
White	no	10	8 LP2T IL238	5.00

NOTE: No light bulb included, to be ordered separately. See page 6-20.

② LP2T IL23... pilot lights have Faston terminals, 1-6.35 or 2-2.8.

Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP40 for double touch actuators IP65 for pilot lights.

Certifications and compliance

Pilot lights: UL listed for USA and Canada, file E 93601. Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Materials

Polyamide and polycarbonate.

Mechanical endurance

Operating force: 1.76lb / 0.8kg (operator). Mechanical life for push-buttons: 1,000,000 cycles.

Mounting adapter

Standard supply with the operator. Operators latch onto the mounting adapter with a simple rotation.

The adapter is fixed to the mounting surface by means of incorporated screws (Tmax = 5.3in lb / 0.6 Nm).

Auxiliary contacts for button operators

See page 6-17.

Catalog numbers: 8 LM2T C10 (1NO)
8 LM2T CF10 (1NO Faston)
8 LM2T C10A (EM)
8 LM2T C01 (1NC)
8 LM2T CF01 (1NC Faston)
8 LM2T C01D (LB)

Auxiliary contacts snap onto the mounting adapter. Up to 4 auxiliary contacts can be fitted on the mounting adapter: 2 on the left and 2 on the right.

Lamp-holder elements for button operators

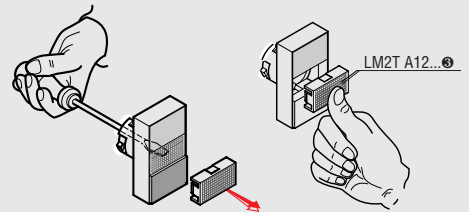
Use lamp-holder type LM2T EL400, LM2T ZL230, LM2T L or LM2T M for two button operators. See page 6-18.

Bulbs

Maximum recommended power for button operators: 1.2W. Maximum recommended power for monoblock pilot lights: 2.6W.

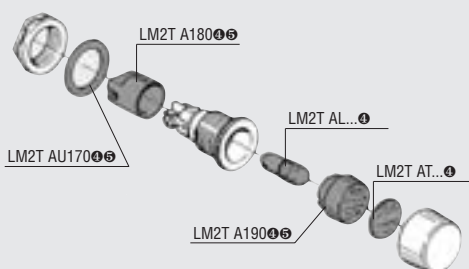
See page 6-20.

Diffuser for two button operators



③ The operator is standard supplied with a white diffuser. Colored diffusers LM2T A12 can be purchased separately. Refer to page 6-21.

Monoblock pilot lights



④ Can be purchased separately. Refer to pages 6-20 and 21.
⑤ Standard supplied with LP2T IL22... only.

Control stations - Add-on blocks

Empty control station enclosures



8 L2PP 2A8

Description	Cover color	Catalog number	Price \$
For 1 operator	Yellow	8 L2PP 1A5	13.00
For 1 operator	White	8 L2PP 1A8	12.00
For 2 operators	White	8 L2PP 2A8	15.00
For 3 operators	White	8 L2PP 3A8	17.00
For 4 operators	White	8 L2PP 4A8	25.00
For 5 operators	White	8 L2PP 5A8	30.00

General characteristics

Control stations have wire entry through the top or the bottom and come fitted with a conduit (0.84in / 21.3 mm entry diameter).

Operational characteristics

Degree of protection: IP65 using adequate wire glands, not included in the supply, except 8 L2PP 5A8 (IP52 only). Tightening torque of cover fixing screws: 7.1in lb / 0.8 Nm.

Materials

Self-extinguishing ABS plastic.

Complete control stations



8 L2PP 160

Description Enclosure + operator	Catalog number	Price \$
8 L2PP 1A8 + 8 LP2T B6244	8 L2PP 100	48.00
8 L2PP 1A8 + 8 LP2T B6344	8 L2PP 110	47.00
8 L2PP 1A5 + 8 LP2T B6344	8 L2PP 115	49.00
8 L2PP 1A8 + 8 LP2T B6544	8 L2PP 120	52.00
8 L2PP 1A5 + 8 LP2T B6644	8 L2PP 130 ⓘ	50.00
8 L2PP 1A8 + 8 LM2T B6244	8 L2PP 150	49.00
8 L2PP 1A8 + 8 LM2T B6344	8 L2PP 160	48.00
8 L2PP 1A5 + 8 LM2T B6344	8 L2PP 165	49.00
8 L2PP 1A8 + 8 LM2T B6544	8 L2PP 170	65.00
8 L2PP 1A5 + 8 LM2T B6644	8 L2PP 180 ⓘ	58.00

ⓘ Red mushroom head, twist to release, yellow cover (EN418 compliant), no label and no label holder.

General characteristics

Control stations are supplied assembled and complete with the indicated push-button operator, mounting adapter, legend holder, "STOP" label (except for L2PP 155, L2PP 130, L2PP 165 and L2PP 180) and one NC auxiliary contact. Control stations have wire entry through the top of the bottom and come fitted with a fairlead (0.84in / 21.3 mm entry diameter).

Operational characteristics

Degree of protection: IP65 using adequate wire glands, not included in the supply. Tightening torque of cover fixing screws: 7.1in lb / 0.8 Nm.

Materials

Self-extinguishing ABS plastic.

Push buttons and pilot devices, 22mm

Add-on contact elements

Mounting adapter

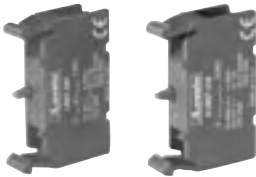


8 LM2T AU120

Description	Qty per pkg	Catalog number	Price \$
Only for metal series operators.			
Mounting adapter	10	8 LM2T AU120	4.00

Metal series operators are supplied without mounting adapter. Plastic series operators are supplied complete with mounting adapter (type LP2T AU120).

Contact elements



8 LM2T C



8 LM2T E



8 LM2T CF10



8 LM2T CF01

Function	Qty per pkg	Catalog number	Price \$
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Screw termination without mounting adapter.

 1.3 NO ①	10	8 LM2T C10 ①	6.00
 1.7 EM ②	10	8 LM2T C10A	7.00
 1.1 NC ③ ⊖	10	8 LM2T C01	6.00
 1.5 LB ④ ⊖	10	8 LM2T C01D ④	7.00

Screw termination with mounting adapter (only for metal series operators LM2T).

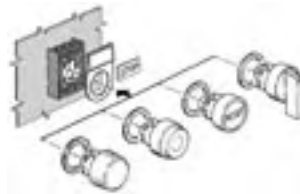
 1.3 NO ①	10	8 LM2T E10 ①	10.00
 1.1 NC ③ ⊖	10	8 LM2T E01	10.00

Faston connection. Without mounting adapter.

 1.3 NO ①	10	8 LM2T CF10 ①	7.60
 1.1 NC ③ ⊖	10	8 LM2T CF01	7.60

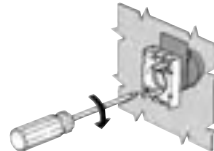
- ① Not suitable for push-push operators Use LM2T C10A (EM) or LM2T C01 (NC) type only with alternate-push operators.
- ② Normally open contact with early make operation.
- ③ Direct (positive) opening operation per IEC/EN 60947-5-1 ⊖.
- ④ Normally closed contact with late break operation.

Assembly

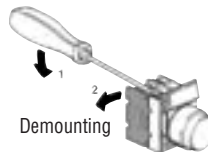
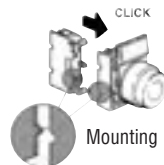


Operators latch onto the mounting adapter with a simple rotation.

Fixing to the mounting surface is by means of incorporated screws (Tmax = 7.1in lb / 0.8 Nm).



Auxiliary contacts snap onto the mounting adapter.



Operational characteristics

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP 20 for contacts elements with screw termination IP00 for contact elements with Faston connection.

Certifications and compliance

Certifications obtained: UL listed for USA and Canada, File E 93601; pending for LM2T CF10 and LM2T CF01. Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

General characteristics of the auxiliary contacts

Self-cleaning with dual effect, wiping and oscillating.

Rated insulation voltage: 690V.

Rated thermal current Ith: 10A.

UL designation: A600 Q600

Operational power in AC15:

[V]	12	24	48	120	240	400	480
[A]	6	6	6	6	3	1.9	1.5

Operational power in DC13:

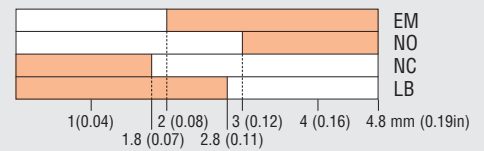
[V]	12	24	48	125	250	440
[A]	3	3	1.5	0.55	0.27	0.15

Contact capacity: ≤20 mΩ.

Terminals: screw with washer; Faston 1 - 0.25in (6.35mm) or 2 - 0.11in (2.8mm).

Maximum tightening torque: 8.8in lb / 1Nm (Faston excluded).

Stroke of auxiliary contacts [mm (in)]



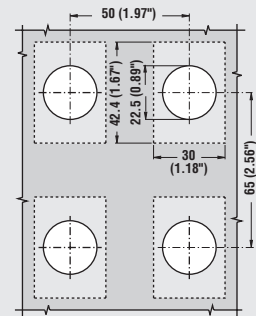
Maximum wire cross section

1 or 2 12 AWG / 2.5 mm² conductors.

Mechanical and electrical endurance

Operating force: 1 lb / 0.5 kg (auxiliary contacts).

Electrical life	LM2T C10	1,000,000 cycles
	LM2T CF10	1,000,000 cycles
	LM2T C01	1,000,000 cycles
	LM2T CF01	1,000,000 cycles
	LM2T C10A	600,000 cycles
	LM2T C01D	600,000 cycles



Lamp-holders

Lamp-holders without mounting adapter



8 LM2T EL400
8 LM2T ZL230

8 LM2T YL
8 LM2T GL



8 LM2T T100

Voltage	Bulb supplied	Qty per pkg	Catalog number	Price \$
For operators of plastic and metal series.				
Direct supply type				
≤415V	no	10	8 LM2T EL400	8.00
Resistor-diode type				
230V 50/60Hz	yes 130V (2W)	10	8 LM2T ZL230	9.00
Transformer type				
110-120V 50/60Hz	yes 24V (1.2W)	1	8 LM2T YL110	30.00
220-240V 50/60Hz	yes 24V (1.2W)	1	8 LM2T YL230	30.00
380-415V 50/60Hz	yes 24V (1.2W)	1	8 LM2T YL400	32.00
Flashing type				
24-48V	no	1	8 LM2T GL048	25.00
110-230V	no	1	8 LM2T GL230	25.00
Test element for lamp-holders				
Test element		10	8 LM2T T100	12.00

Lamp-holders with mounting adapter



8 LM2T DL400
8 LM2T VL230



8 LM2T XL
8 LM2T FL

Voltage	Bulb supplied	Qty per pkg	Catalog number	Price \$
Only for operators of metal series.				
Direct supply type				
≤415V	no	10	8 LM2T DL400	11.00
Resistor-diode type				
230V 50/60Hz	yes 130V (2W)	10	8 LM2T VL230	13.00
Transformer type				
110-120V 50/60Hz	yes 24V (1.2W)	1	8 LM2T XL110	35.00
220-240V 50/60Hz	yes 24V (1.2W)	1	8 LM2T XL230	35.00
380-415V 50/60Hz	yes 24V (1.2W)	1	8 LM2T XL400	37.00
Flashing type				
24-48V	no	1	8 LM2T FL048	30.00
110-230V	no	1	8 LM2T FL230	30.00

LED integrated lamp-holders without mounting adapter. Steady or flashing light.



8 LM2T LM3

Voltage	LED color	Catalog number for steady	Price \$	Catalog number for flashing	Price \$
18-30V AC/DC	Green	8 LM2T LB3	9.50	8 LM2T MB3	19.00
	Red	8 LM2T LB4	9.50	8 LM2T MB4	19.00
	Yellow	8 LM2T LB5	9.50	8 LM2T MB5	19.00
	Blue	8 LM2T LB6	9.50	8 LM2T MB6	19.00
	White	8 LM2T LB8	9.50	8 LM2T MB8	19.00
85-140V AC/DC	Green	8 LM2T LE3	13.50	8 LM2T ME3	27.00
	Red	8 LM2T LE4	13.50	8 LM2T ME4	27.00
	Yellow	8 LM2T LE5	13.50	8 LM2T ME5	27.00
	Blue	8 LM2T LE6	13.50	8 LM2T ME6	27.00
	White	8 LM2T LE8	13.50	8 LM2T ME8	27.00
187-265V AC/DC	Green	8 LM2T LM3	13.50	8 LM2T MM3	27.00
	Red	8 LM2T LM4	13.50	8 LM2T MM4	27.00
	Yellow	8 LM2T LM5	13.50	8 LM2T MM5	27.00
	Blue	8 LM2T LM6	13.50	8 LM2T MM6	27.00
	White	8 LM2T LM8	13.50	8 LM2T MM8	27.00

③ Steady light 9-15VAC/DC types are available on request. Contact Sales & Technical Support.

④ Not suitable for use with test element LM2T T100.

⑩ Sold in multi-packs of 10 pieces each.

Operational characteristics

Common to all types

- Ambient operating temperature: -10 to +140°F (-25 to +60°C)
- Ambient storage temperature: -40 to +160°F (-40 to +70°C)
- Any mounting position is allowed
- Degree of protection: IP 20
- Maximum tightening torque: 8.8in lb/1Nm.

For LED integrated lamp-holders only

- Over-voltage protection
 - Inverse polarity protection
 - Shock and vibration insensitivity
 - Front and side visibility
 - Power consumption at maximum admissible voltage: 1W maximum
 - Electric life: 100,000 hours.
- For test element only
- To periodically test light bulbs
 - AC circuits are tested with half wave so bulb luminosity is low
 - With DC circuits, L2 must be connected to positive (+) terminal of LM2T T100.

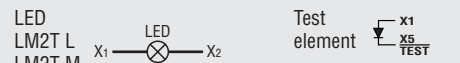
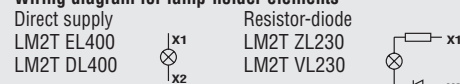
Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-5-1.

Maximum wire cross section

1 or 2 12 AWG / 2.5 mm² conductors.

Wiring diagram for lamp-holder elements

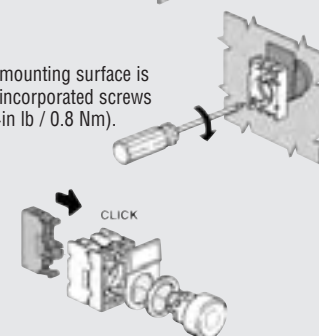


Assembly

Operators latch onto the mounting adapter with a simple rotation.



Fixing to the mounting surface is by means of incorporated screws (Tmax = 7.14in lb / 0.8 Nm).



① Filament bulb, BA9s U_s≤130V max 2.6W (not supplied); max dimensions 11x28 mm (0.4x1.1in). For higher voltages, use neon bulbs.

② Not suitable for 3-position selectors.

③ Filament bulb, BA9s (not supplied); max dimensions 11x28 mm (0.4x1.1in). Suitable for AC duty only.

Use bulbs with rated voltage equal to that of the power supply. E.g.: With LM2T FL230 use 120V bulbs if power supply is 120V and 230V bulbs if power supply 230V. 2.6W max bulb rating.

④ MultiLED bulbs must not be fitted.

⑤ In case of test circuits for lamp-holders having load in parallel, two LM2T T100 elements are required for each bulb. Refer to the wiring diagram attached to the product or contact Sales & Technical Support.

⑥ In case of neon bulbs, contact Sales & Technical Support.

⑦ Not suitable for use with LED integrated LM2T L and LM2T M types.

Labels with text for 8 LM2T AU100 legend holder



8 LM2T AGB230

Inscription	Qty per pkg	Catalog number	Price \$
General use.			
Blank for writing	50	8 LM2T AU206	1.00
Custom printed inscription	50	8 LM2T AU208	2.50
CLOSE	50	8 LM2T AGB216	1.50
EMERGENCY	50	8 LM2T AGB220	1.50
FAST	50	8 LM2T AGB231	1.50
FAULT	50	8 LM2T AGB263	1.50
FORWARD	50	8 LM2T AGB215	1.50
LEFT	50	8 LM2T AGB228	1.50
LOWER	50	8 LM2T AGB218	1.50
OFF	50	8 LM2T AGB221	1.50
ON	50	8 LM2T AGB223	1.50
OPEN	50	8 LM2T AGB211	1.50
POWER ON	50	8 LM2T AGB229	1.50
RAISE	50	8 LM2T AGB227	1.50
RESET	50	8 LM2T AGB226	1.50
REVERSE	50	8 LM2T AGB222	1.50
RIGHT	50	8 LM2T AGB217	1.50
RUNNING	50	8 LM2T AGB241	1.50
SLOW	50	8 LM2T AGB224	1.50
START	50	8 LM2T AGB225	1.50
STOP	50	8 LM2T AGB230	1.50
STOP RESET	50	8 LM2T AGB214	1.50
THERMAL FAULT	50	8 LM2T AGB240	1.50
TRIP	50	8 LM2T AGB237	1.50
For selector switches.			
AUTO-MAN	50	8 LM2T AI233	1.50
AUTO-O-MAN	50	8 LM2T AI234	1.50
MAN-AUTO	50	8 LM2T AI241	1.50
MAN-O-AUTO	50	8 LM2T AI242	1.50
FWD-O-REV	50	8 LM2T AGB235	1.50
OFF-ON	50	8 LM2T AGB236	1.50
STOP-START	50	8 LM2T AGB232	1.50
International labels for push-buttons.			
O	50	8 LM2T AU200	1.50
I	50	8 LM2T AU201	1.50
II	50	8 LM2T AU202	1.50
International labels for selector switches.			
O-I	50	8 LM2T AU203	1.50
I-II	50	8 LM2T AU204	1.50
I-O-II	50	8 LM2T AU205	1.50

General characteristics

The labels have indelible scratch-proof black lettering on metalized grey polycarbonate background (adhesive).

Special versions

Labels in different languages are available.
Contact Sales & Technical Support.

Plastic disks for mushroom-head push-buttons

Inscription	Qty per pkg	Catalog number	Price \$
EMERGENCY STOP Ø90mm	10	8 LM2T AU113	3.00
EMERGENCY STOP Ø60mm	10	8 LM2T AU115	3.00

90mm = 3.5in; 60mm = 2.4in

General characteristics

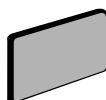
The disks are made of non-adhesive plastic.

Special versions

The disk text in different languages is available.
Contact Sales & Technical Support.

Accessories and spare parts

Accessories and spare parts



8 LM2T AU108
8 LM2T AU106



8 LM2T AU170



8 LM2T AL...



8 LM2T AU100



8 LM2T AU105

Description	Qty per pkg	Catalog number	Price \$
Rod for mechanical reset button (l=5in/123mm)	10	8 LM2T A150	3.00
BA9s bulb extractor	10	8 LM2T A160	0.50
30mm hole size adapter for 22mm units (2 per hole)	10	8 LM2T A161	1.00
IP66 cap for flush push-buttons	10	8 LM2T AU130 ^①	2.50
IP66 cap for extended and illuminated push-buttons	10	8 LM2T AU140 ^①	2.50
Transparent protective cap for 8 L...2T B634 buttons	10	8 LM2T AU167	15.00
Spare key set for selector or mushroom head button	1	8 LM2T A170	5.00
Spare key set for G series selector or mushroom-head button	1	8 LM2T A170G ^②	5.00
Diffuser for pilot light	10	8 LM2T A190	1.00
Blank plastic label for engraving (for LM2T AU105)	50	8 LM2T AU108	1.00
Blank paper label for writing (for LM2T AU105)	50	8 LM2T AU106	0.20
Operator gasket ring	10	8 LM2T AU170	0.50
Filament bulb BA9s BA9s 24V - 1.2W 10x28mm	50	8 LM2T ALA024	1.50
Filament bulb BA9s 24V - 2W 10x28mm	50	8 LM2T ALB024	1.50
Filament bulb BA9s 48V - 2W 10x28mm	50	8 LM2T ALB048	1.50
Filament bulb BA9s 130V - 2W 10x28mm	50	8 LM2T ALB130	3.00
MultiLED bulb BA9s 24VAC/DC 10x28mm	10	8 LM2T ALL024 ^③	23.00
MultiLED bulb BA9s 48VAC/DC 10x28mm	10	8 LM2T ALL048 ^③	23.00
MultiLED bulb BA9s 6VAC/DC 10x28mm	10	8 LM2T ALL006 ^③	23.00
Neon bulb ^④ BA9s 110/125VAC 10x28mm	50	8 LM2T ALN130 ^⑤	8.00
Neon bulb ^④ BA9s 220/250VAC 10x28mm	50	8 LM2T ALN250 ^⑤	8.00
Neon bulb ^④ BA9s 380/400VAC 10x28mm	50	8 LM2T ALN400 ^⑤	8.00
Neon bulb ^④ BA9s 110/125VAC 10x28mm	50	8 LM2T ALP130 ^⑥	1.50
Neon bulb ^④ BA9s 220/250VAC 10x28mm	50	8 LM2T ALP250 ^⑥	1.50
Neon bulb ^④ BA9s 380/400VAC 10x28mm	50	8 LM2T ALP400 ^⑥	1.50

- ^① For push-buttons, add the digit of the required color:
2 (black); 3 (green); 4 (red); 5 (yellow); 6 (blue); 7 (transparent); 8 (white).
For illuminated push-buttons, add only digit 7 (transparent).
- ^② Versions with different key code. Complete with the numeric code of the key. The following versions are available: 501, 502, 503, 504, 505, 506, 507, 508, 509, 510.
Example of complete catalog number: 8 LM2T A170G505.
Coloured key versions are available on request; contact Sales & Technical Support.
- ^③ Add the digit of the selected color: 3 (green); 4 (red); 5 (yellow).
It is advisable to use the same color of bulb as of the actuator to obtain adequate light emission.
Not suitable for resistor-diode lamp-holders.
- ^④ Neon bulbs emit an amber light and may not be suitable for use with green or blue pilot lights and illuminated actuators.
- ^⑤ Glass with diffuser lens.
- ^⑥ Plastic neon bulb.

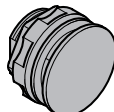
Accessories and spare parts



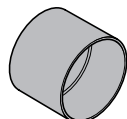
8 LM2T A140



8 LM2T AT...



8 LM2T A130

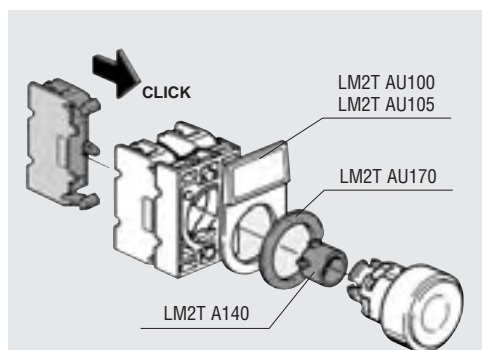


8 LM2T A185

Description	Qty per pkg	Catalog number	Price \$
Legend holder	50	8 LM2T AU100 [Ⓢ]	1.00
Legend holder (for paper or plastic labels)	50	8 LM2T AU105 [Ⓢ]	2.00
Threaded plug for unused holes	10	8 LM2T A130	3.00
Action plug for center contact	50	8 LM2T A140	1.00
Printed label to be inserted in pilot lights and push-buttons	50	8 LM2T AT [Ⓢ]	1.50
Transparent protection for 8 LM2T AU106 label	50	8 LM2T AU107	0.50
Guard for knob selector switches	10	8 LM2T A185	4.80

Ⓢ To preserve operator degree of protection (IP65), place its gasket ring between the legend holder and mounting surface.

Ⓢ Available only on specific request, contact Sales & Technical Support.



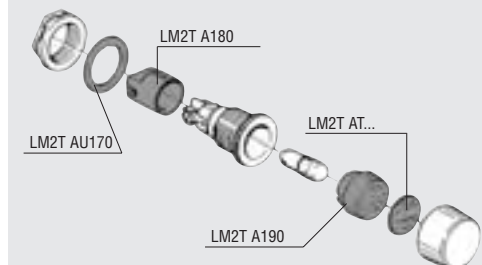
Accessories and spare parts for LP2T (plastic) series only



8 LM2T A180

Description	Qty per pkg	Catalog number	Price \$
Mounting adapter	10	8 LP2T AU120	3.40
IP66 cap for 2 or 3 button operators (transparent)	10	8 LM2T AU157	7.00
IP20 terminal protection for direct supply pilot light	10	8 LM2T A180	0.50
Socket wrench for monoblock pilot light	1	8 LM2T A200	12.00
Colored diffuser for two button operators	10	8 LM2T A12 [Ⓢ]	1.00

Ⓢ Add the digit of the selected color: 3 (green); 4 (red); 5 (yellow); 6 (blue); 7 (transparent); 8 (white).





PAGE 7-2

PLASTIC LIMIT SWITCHES KB SERIES

- Dimensions to EN 50047 standards
- Self-extinguishing polymer thermoplastic housing
- Removable and interchangeable auxiliary contact blocks
- Heads interchangeable and rotatable in 8 different 45° angle positions
- Unique fixing mechanism of operating head
- IP65 protection
- M20 thread entry; 1/2 NPT entry available.



PAGE 7-2

METAL LIMIT SWITCHES KM SERIES

- Dimensions to EN 50047 standards
- Aluminum-zinc alloy housing
- Removable and interchangeable auxiliary contact blocks
- Heads interchangeable and rotatable in 8 different 45° angle positions
- Unique fixing mechanism of operating head
- IP65 protection
- M20 thread entry; 1/2 NPT entry available.



PAGE 7-14

PLASTIC LIMIT SWITCHES RS SERIES

- Dimensions to EN 50047 standards
- Self-extinguishing polyamide thermoplastic housing
- Heads rotatable in 4 different 90° angle positions
- IP65 protection
- PG11 thread entry.



PAGE 7-21

PLASTIC LIMIT SWITCHES T SERIES

- Dimensions to EN 50041 standards
- Self-extinguishing polyamide thermoplastic housing
- Heads rotatable in 4 different 90° angle positions
- IP66 protection
- PG13.5 thread entry.

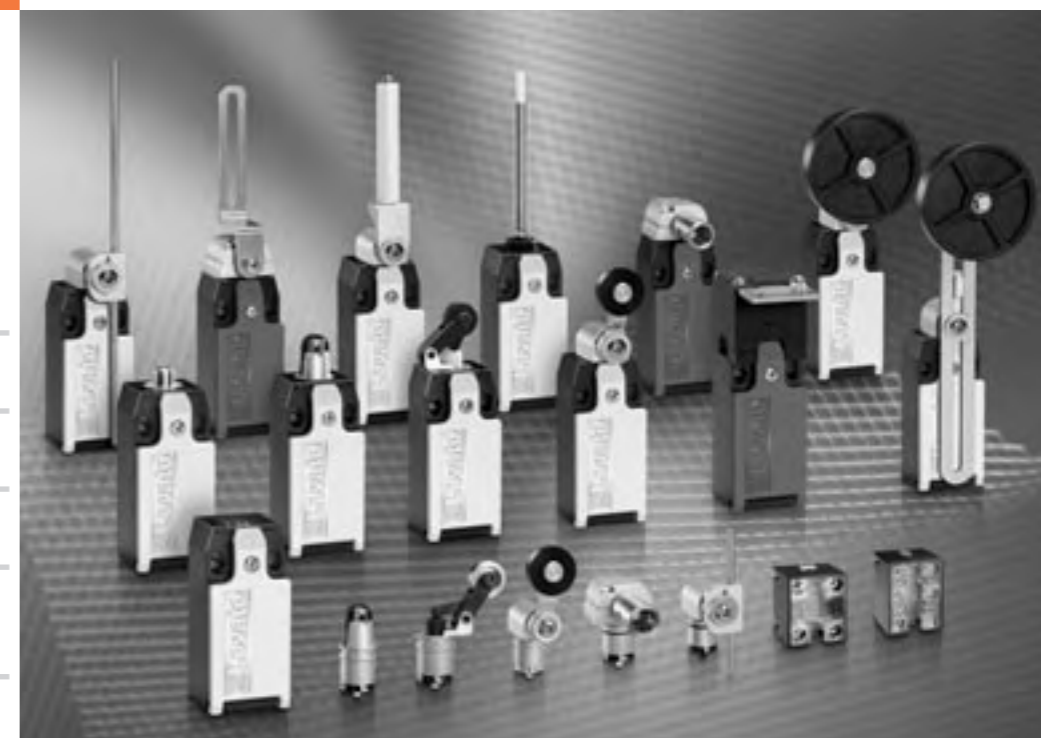


PAGE 7-24

ROPE-PULL SAFETY SWITCHES

- Compliant to EN 418 standards
- IP65 and IP66 protection
- PG11 and PG13.5 thread entry.

- *Dimensions to EN 50047 standards*
- *Dimensions to EN 50041 standards*
- *Direct opening operation of NC contacts*
- *Extensive range of operating heads*
- *Versions complete with interchangeable and rotatable heads*
- *Insertable and interchangeable auxiliary contact blocks.*



PLANET - SWITCH

Metal and plastic series (dimensions to EN 50047)

	SEC.	PAGE	PAGE
Top push rod plunger limit switch	7-	2	14
Top roller push plunger limit switch	7-	3	14
Roller centre push lever limit switch	7-	4	14
Roller side push lever limit switch	7-	5	14
Roller lever limit switch	7-	6	15
Adjustable roller lever limit switch	7-	7	16
Ceramic rod lever limit switch	7-	8	17
Adjustable rod lever limit switch	7-	8	17
Wobble stick, omnidirectional limit switch	7-	9	17
Hinge operating limit switch	7-	10	19
Slotted lever limit switch	7-	10	20
Key operated limit switch	7-	11	18
Rope lever for normal stopping limit switch	7-	-	20
Accessories and spare parts for KB-KM series	7-	12	-

Plastic T series (dimensions to EN 50041)

Top push rod plunger limit switch	7-	-	21
Roller lever limit switch	7-	-	21
Wobble stick, omnidirectional limit switch	7-	-	22
Key operated limit switch	7-	-	22
Hinge operating limit switch	7-	-	23
Slotted lever limit switch	7-	-	23
Rope lever for normal stopping limit switch	7-	-	23

For emergency stopping - EN 418 compliant

Rope-pull lever safety switches	7-	-	24
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Limit and safety switches

KB plastic series and KM metal series

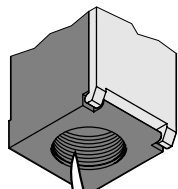
dimensions to EN 50047

electric

Top push rod plunger

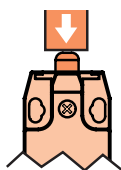


KB A1 S, KB A1 A, KB A1 L
KM A1 S, KM A1 A, KM A1 L



M20 ENTRY

For types with 1/2 NPT entry, add the letter N at the end of the catalog number. E.g. KB A1 S11N



Contacts	Plunger material	Catalog number Plastic body	Catalog number Metal body
1NO+1NC Snap action①	Steel	KB A1 S11	KM A1 S11
2NC Snap action①	Steel	KB A1 S02	KM A1 S02
1NO+1NC Slow break make before break①	Steel	KB A1 A11	KM A1 A11
1NO+1NC Slow break①	Steel	KB A1 L11	KM A1 L11
2NC Slow break①	Steel	KB A1 L02	KM A1 L02
2NO Slow break	Steel	KB A1 L20	KM A1 L20
1NO+2NC Slow break①	Steel	KB A1 L12	KM A1 L12
2NO+1NC Slow break①	Steel	KB A1 L21	KM A1 L21
3NC Slow break①	Steel	KB A1 L03	KM A1 L03

① Direct (positive) operating operation ⊖; safety function according to IEC/EN 60947-5-1.

② Contact Sales & Technical Support for details and pricing.

General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability.

The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles.

The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

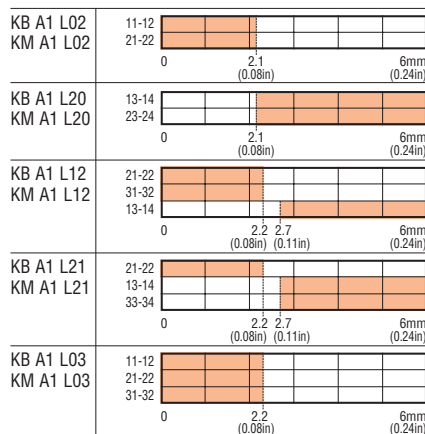
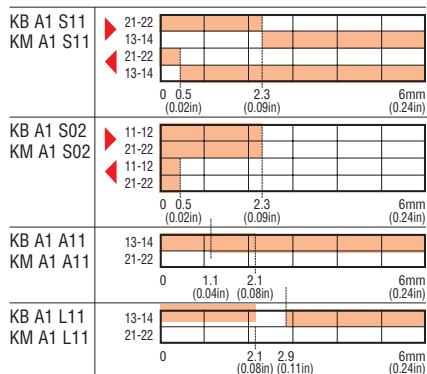
Operational characteristics

- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 18 oz / 5N
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.

▶ Forward travel of snap action contacts □ open
◀ Return travel of snap action contacts ■ closed



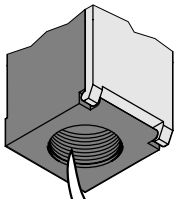
Limit and safety switches

KB plastic series and KM metal series dimensions to EN 50047

Top roller push plunger



KB B1, KB B2
KM B1, KM B2



M20 ENTRY

For types with 1/2 NPT entry, add the letter N at the end of the catalog number. E.g. KB B1 S11N

Contacts	Roller material	Catalog number [Ⓜ]	
		Plastic body	Metal body
	Ø11x4mm		
1NO+1NC Snap action [Ⓛ]	Plastic	KB B1 S11	KM B1 S11
	Metal	KB B2 S11	KM B2 S11
2NC Snap action [Ⓛ]	Plastic	KB B1 S02	KM B1 S02
	Metal	KB B2 S02	KM B2 S02
1NO+1NC Slow break make before break [Ⓛ]	Plastic	KB B1 A11	KM B1 A11
	Metal	KB B2 A11	KM B2 A11
1NO+1NC Slow break [Ⓛ]	Plastic	KB B1 L11	KM B1 L11
	Metal	KB B2 L11	KM B2 L11
2NC Slow break [Ⓛ]	Plastic	KB B1 L02	KM B1 L02
	Metal	KB B2 L02	KM B2 L02
2NO Slow break	Plastic	KB B1 L20	KM B1 L20
	Metal	KB B2 L20	KM B2 L20
1NO+2NC Slow break [Ⓛ]	Plastic	KB B1 L12	KM B1 L12
	Metal	KB B2 L12	KM B2 L12
2NO+1NC Slow break [Ⓛ]	Plastic	KB B1 L21	KM B1 L21
	Metal	KB B2 L21	KM B2 L21
3NC Slow break [Ⓛ]	Plastic	KB B1 L03	KM B1 L03
	Metal	KB B2 L03	KM B2 L03

Ø11x4mm = 0.43x0.16in

[Ⓛ] Direct (positive) operating operation ⊖; safety function according to IEC/EN 60947-5-1.

[Ⓜ] Contact Sales & Technical Support for details and pricing.

General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability.

The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles.

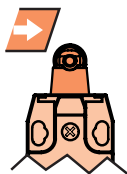
The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

Operational characteristics

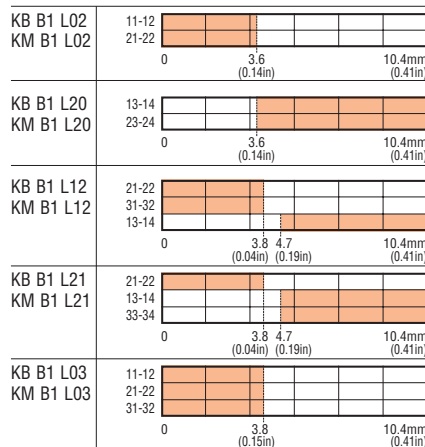
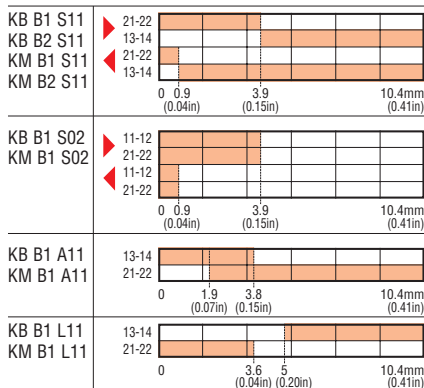
- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 18 oz / 5N
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.



▶ Forward travel of snap action contacts □ open
◀ Return travel of snap action contacts ■ closed



Limit and safety switches

KB plastic series and KM metal series

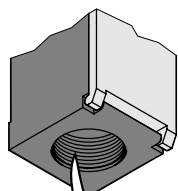
dimensions to EN 50047

electric

Roller center push lever



KB C1, KB C2
KM C1, KM C2



M20 ENTRY

For types with 1/2 NPT entry, add the letter N at the end of the catalog number. E.g. KB C1 S11N

Contacts	Roller material	Catalog number [Ⓜ]	
		Plastic body	Metal body
	Ø11x4mm		
1NO+1NC Snap action [Ⓛ]	Plastic	KB C1 S11	KM C1 S11
	Metal	KB C2 S11	KM C2 S11
2NC Snap action [Ⓛ]	Plastic	KB C1 S02	KM C1 S02
	Metal	KB C2 S02	KM C2 S02
1NO+1NC Slow break make before break [Ⓛ]	Plastic	KB C1 A11	KM C1 A11
	Metal	KB C2 A11	KM C2 A11
1NO+1NC Slow break [Ⓛ]	Plastic	KB C1 L11	KM C1 L11
	Metal	KB C2 L11	KM C2 L11
2NC Slow break [Ⓛ]	Plastic	KB C1 L02	KM C1 L02
	Metal	KB C2 L02	KM C2 L02
2NO Slow break	Plastic	KB C1 L20	KM C1 L20
	Metal	KB C2 L20	KM C2 L20
1NO+2NC Slow break [Ⓛ]	Plastic	KB C1 L12	KM C1 L12
	Metal	KB C2 L12	KM C2 L12
2NO+1NC Slow break [Ⓛ]	Plastic	KB C1 L21	KM C1 L21
	Metal	KB C2 L21	KM C2 L21
3NO Slow break [Ⓛ]	Plastic	KB C1 L03	KM C1 L03
	Metal	KB C2 L03	KM C2 L03

Ø11x4mm = 0.43x0.16in

[Ⓛ] Direct (positive) operating operation ⊖; safety function according to IEC/EN 60947-5-1.

[Ⓜ] Contact Sales & Technical Support for details and pricing.

General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability.

The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles.

The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

Operational characteristics

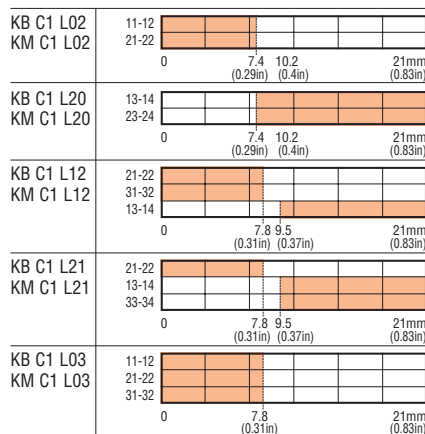
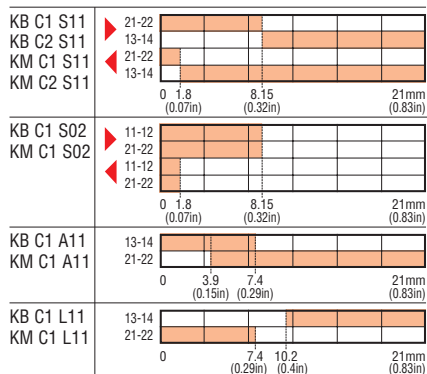
- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 29 oz / 6N
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.



▶ Forward travel of snap action contacts □ open
◀ Return travel of snap action contacts ■ closed



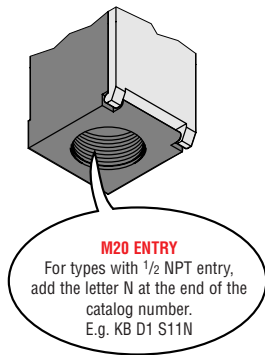
Limit and safety switches

KB plastic series and KM metal series dimensions to EN 50047

Roller side push lever



KB D1, KB D2
KM D1, KM D2



Contacts	Roller material	Catalog number [Ⓜ]	
		Plastic body	Metal body
1NO+1NC Snap action [Ⓛ]	Plastic	KB D1 S11	KM D1 S11
	Metal	KB D2 S11	KM D2 S11
2NC Snap action [Ⓛ]	Plastic	KB D1 S02	KM D1 S02
	Metal	KB D2 S02	KM D2 S02
1NO+1NC Slow break make before break [Ⓛ]	Plastic	KB D1 A11	KM D1 A11
	Metal	KB D2 A11	KM D2 A11
1NO+1NC Slow break [Ⓛ]	Plastic	KB D1 L11	KM D1 L11
	Metal	KB D2 L11	KM D2 L11
2NC Slow break [Ⓛ]	Plastic	KB D1 L02	KM D1 L02
	Metal	KB D2 L02	KM D2 L02
2NO Slow break	Plastic	KB D1 L20	KM D1 L20
	Metal	KB D2 L20	KM D2 L20
1NO+2NC Slow break [Ⓛ]	Plastic	KB D1 L12	KM D1 L12
	Metal	KB D2 L12	KM D2 L12
2NO+1NC Slow break [Ⓛ]	Plastic	KB D1 L21	KM D1 L21
	Metal	KB D2 L21	KM D2 L21
3NC Slow break [Ⓛ]	Plastic	KB D1 L03	KM D1 L03
	Metal	KB D2 L03	KM D2 L03

Ø11x4mm = 0.43x0.16in

[Ⓛ] Direct (positive) operating operation ⊖; safety function according to IEC/EN 60947-5-1.

[Ⓜ] Contact Sales & Technical Support for details and pricing.

General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability.

The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles.

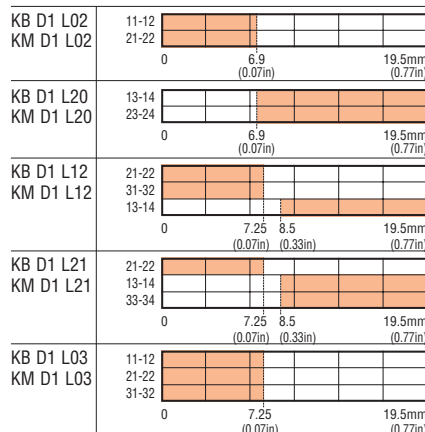
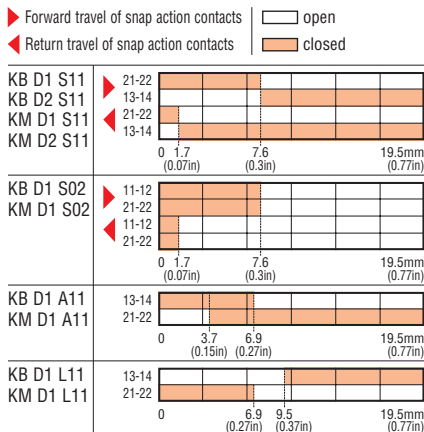
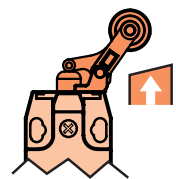
The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

Operational characteristics

- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 29 oz / 6N
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.



Limit and safety switches

KB plastic series and KM metal series

dimensions to EN 50047

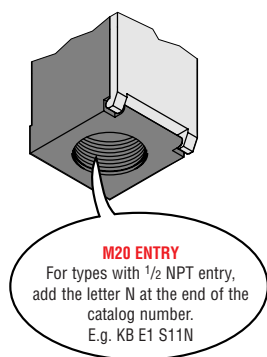
electric

Roller lever plunger



KB E1, KB E2
KM E1, KM E2

KB E3
KM E3



Contacts	Roller material	Catalog number ^①	
		Plastic body	Metal body
1NO+1NC Snap action ^②	Plastic ^③	KB E1 S11	KM E1 S11
	Metal ^④	KB E2 S11	KM E2 S11
	Rubber ^⑤	KB E3 S11	KM E3 S11
2NC Snap action ^②	Plastic ^③	KB E1 S02	KM E1 S02
	Metal ^④	KB E2 S02	KM E2 S02
	Rubber ^⑤	KB E3 S02	KM E3 S02
1NO+1NC Slow break make before break ^⑥	Plastic ^③	KB E1 A11	KM E1 A11
	Metal ^④	KB E2 A11	KM E2 A11
	Rubber ^⑤	KB E3 A11	KM E3 A11
1NO+1NC Slow break ^⑥	Plastic ^③	KB E1 L11	KM E1 L11
	Metal ^④	KB E2 L11	KM E2 L11
	Rubber ^⑤	KB E3 L11	KM E3 L11
2NC Slow break ^⑥	Plastic ^③	KB E1 L02	KM E1 L02
	Metal ^④	KB E2 L02	KM E2 L02
	Rubber ^⑤	KB E3 L02	KM E3 L02
2NO Slow break	Plastic ^③	KB E1 L20	KM E1 L20
	Metal ^④	KB E2 L20	KM E2 L20
	Rubber ^⑤	KB E3 L20	KM E3 L20
1NO+2NC Slow break ^⑥	Plastic ^③	KB E1 L12	KM E1 L12
	Metal ^④	KB E2 L12	KM E2 L12
	Rubber ^⑤	KB E3 L12	KM E3 L12
2NO+1NC Slow break ^⑥	Plastic ^③	KB E1 L21	KM E1 L21
	Metal ^④	KB E2 L21	KM E2 L21
	Rubber ^⑤	KB E3 L21	KM E3 L21
3NC Slow break ^⑥	Plastic ^③	KB E1 L03	KM E1 L03
	Metal ^④	KB E2 L03	KM E2 L03
	Rubber ^⑤	KB E3 L03	KM E3 L03

- ① Ø19x5mm = Ø0.75x0.2in
- ② Ø50x10mm = Ø1.97x0.39in
- ③ Direct (positive) operating operation ⊕; safety function according to IEC/EN 60947-5-1.
- ④ Contact Sales & Technical Support for details and pricing.

General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability.

The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles.

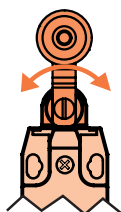
The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

Operational characteristics

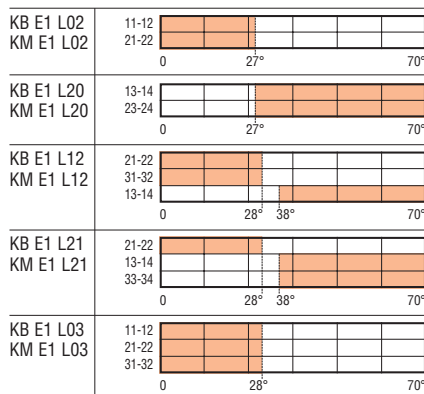
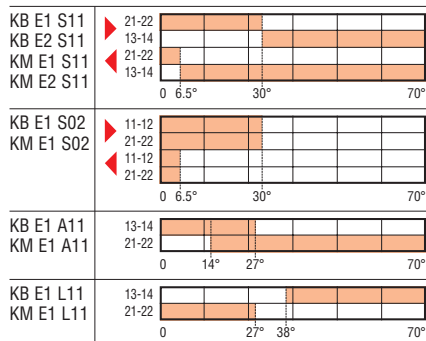
- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 27 in oz / 3Ncm
- Lever inclination, 360° adjustment at 15° angle positions
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.



- ▶ Forward travel of snap action contacts
- ◀ Return travel of snap action contacts
- open
- closed



Limit and safety switches

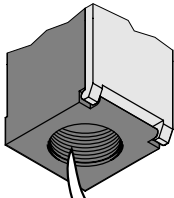
KB plastic series and KM metal series

dimensions to EN 50047

Adjustable Roller lever

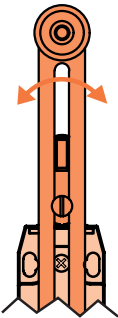


KB F1, KB F2, KB F3, KB F4
KM F1, KM F2, KM F3, KM F4



M20 ENTRY

For types with 1/2 NPT entry, add the letter N at the end of the catalog number. E.g. KB F1 S11N



Contacts	Roller material	Catalog number ^④	
		Plastic body	Metal body
1NO+1NC Snap action ^③	Plastic ^①	KB F1 S11	KM F1 S11
	Metal ^①	KB F2 S11	KM F2 S11
	Rubber ^②	KB F3 S11	KM F3 S11
	Rubber off. align. ^②	KB F4 S11	KM F4 S11
2NC Snap action ^③	Plastic ^①	KB F1 S02	KM F1 S02
	Metal ^①	KB F2 S02	KM F2 S02
	Rubber ^②	KB F3 S02	KM F3 S02
	Rubber off. align. ^②	KB F4 S02	KM F4 S02
1NO+1NC Slow break make before break ^③	Plastic ^①	KB F1 A11	KM F1 A11
	Metal ^①	KB F2 A11	KM F2 A11
	Rubber ^②	KB F3 A11	KM F3 A11
	Rubber off. align. ^②	KB F4 A11	KM F4 A11
1NO+1NC Slow break ^③	Plastic ^①	KB F1 L11	KM F1 L11
	Metal ^①	KB F2 L11	KM F2 L11
	Rubber ^②	KB F3 L11	KM F3 L11
	Rubber off. align. ^②	KB F4 L11	KM F4 L11
2NC Slow break ^③	Plastic ^①	KB F1 L02	KM F1 L02
	Metal ^①	KB F2 L02	KM F2 L02
	Rubber ^②	KB F3 L02	KM F3 L02
	Rubber off. align. ^②	KB F4 L02	KM F4 L02 ^④
2NO Slow break	Plastic ^①	KB F1 L20	KM F1 L20
	Metal ^①	KB F2 L20	KM F2 L20
	Rubber ^②	KB F3 L20	KM F3 L20
	Rubber off. align. ^②	KB F4 L20	KM F4 L20
1NO+2NC Slow break ^③	Plastic ^①	KB F1 L12	KM F1 L12
	Metal ^①	KB F2 L12	KM F2 L12
	Rubber ^②	KB F3 L12	KM F3 L12
	Rubber off. align. ^②	KB F4 L12	KM F4 L12
2NO+1NC Slow break ^③	Plastic ^①	KB F1 L21	KM F1 L21
	Metal ^①	KB F2 L21	KM F2 L21
	Rubber ^②	KB F3 L21	KM F3 L21
	Rubber off. align. ^②	KB F4 L21	KM F4 L21
3NC Slow break ^③	Plastic ^①	KB F1 L03	KM F1 L03
	Metal ^①	KB F2 L03	KM F2 L03
	Rubber ^②	KB F3 L03	KM F3 L03
	Rubber off. align. ^②	KB F4 L03	KM F4 L03

N.B. off. align. = offset alignment.

General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability. The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles. The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

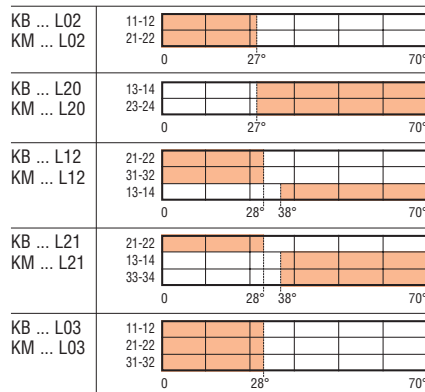
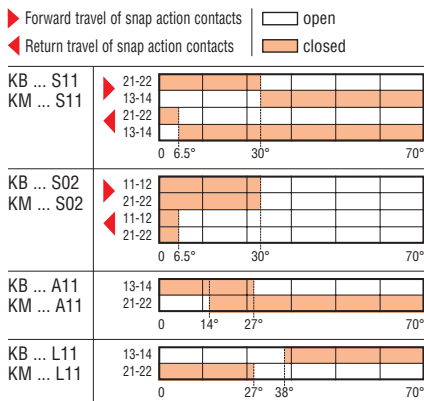
Operational characteristics

- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 27 in oz / 3Ncm
- Lever inclination, 360° adjustment at 15° angle positions
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.

- ① Ø19x5mm = Ø0.75x0.2in
- ② Ø50x10mm = Ø1.97x0.39in
- ③ Direct (positive) operating operation ; safety function according to IEC/EN 60947-5-1.
- ④ Contact Sales & Technical Support for details and pricing.

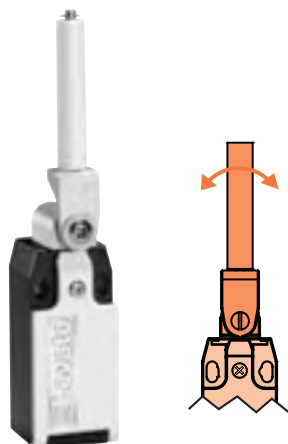


Limit and safety switches

KB plastic series and KM metal series dimensions to EN 50047

electric

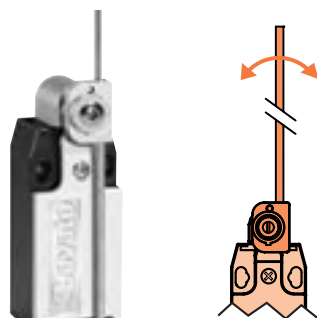
Ceramic rod lever



KB H1 S, KB H1 A, KB H1 L
KM H1 S, KM H1 A, KM H1 L

Contacts	Rod material	Catalog number [Ⓢ] Plastic body	Metal body
Ceramic rod lever.			
1NO+1NC Snap action [Ⓢ]	Ceramic	KB H1 S11	KM H1 S11
2NC Snap action [Ⓢ]	Ceramic	KB H1 S02	KM H1 S02
1NO+1NC Slow break make before break [Ⓢ]	Ceramic	KB H1 A11	KM H1 A11
1NO+1NC Slow break [Ⓢ]	Ceramic	KB H1 L11	KM H1 L11
2NC Slow break [Ⓢ]	Ceramic	KB H1 L02	KM H1 L02
2NO Slow break	Ceramic	KB H1 L20	KM H1 L20
1NO+2NC Slow break [Ⓢ]	Ceramic	KB H1 L12	KM H1 L12
2NO+1NC Slow break [Ⓢ]	Ceramic	KB H1 L21	KM H1 L21
3NC Slow break [Ⓢ]	Ceramic	KB H1 L03	KM H1 L03

Adjustable rod lever

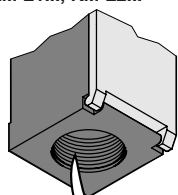


KB L1..., KB L2...
KM L1..., KM L2...

Contacts	Rod material	Catalog number [Ⓢ]	Metal body
Adjustable rod lever.			
1NO+1NC Snap action [Ⓢ]	Plastic	KB L1 S11	KM L1 S11
	Metal	KB L2 S11	KM L2 S11
2NC Snap action [Ⓢ]	Plastic	KB L1 S02	KM L1 S02
	Metal	KB L2 S02	KM L2 S02
1NO+1NC Slow break make before break [Ⓢ]	Plastic	KB L1 A11	KM L1 A11
	Metal	KB L2 A11	KM L2 A11
1NO+1NC Slow break [Ⓢ]	Plastic	KB L1 L11	KM L1 L11
	Metal	KB L2 L11	KM L2 L11
2NC Slow break [Ⓢ]	Plastic	KB L1 L02	KM L1 L02
	Metal	KB L2 L02	KM L2 L02
2NO Slow break	Plastic	KB L1 L20	KM L1 L20
	Metal	KB L2 L20	KM L2 L20
1NO+2NC Slow break [Ⓢ]	Plastic	KB L1 L12	KM L1 L12
	Metal	KB L2 L12	KM L2 L12
2NO+1NC Slow break [Ⓢ]	Plastic	KB L1 L21	KM L1 L21
	Metal	KB L2 L21	KM L2 L21
3NC Slow break [Ⓢ]	Plastic	KB L1 L03	KM L1 L03
	Metal	KB L2 L03	KM L2 L03

Ⓢ Direct (positive) operating operation ⊖ safety function according to IEC/EN 60947-5-1.

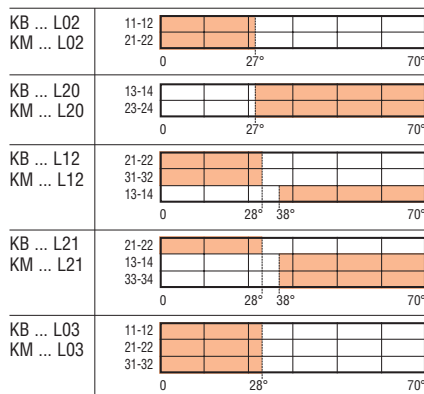
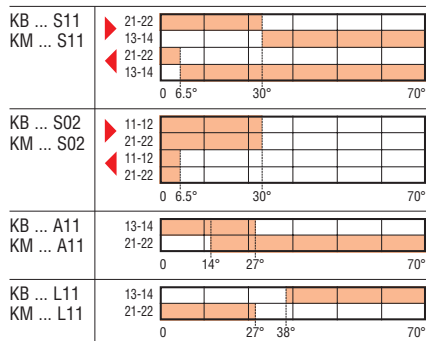
Ⓢ Contact Sales & Technical Support for details and pricing.



M20 ENTRY

For types with 1/2 NPT entry, add the letter N at the end of the catalog number. E.g. KB L1 S11N

▶ Forward travel of snap action contacts □ open
◀ Return travel of snap action contacts ■ closed



General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability. The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles. The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

Operational characteristics

- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 27 in oz / 3Ncm
- Lever inclination, 360° adjustment at 15° angle positions
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.

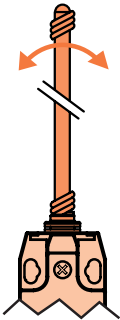
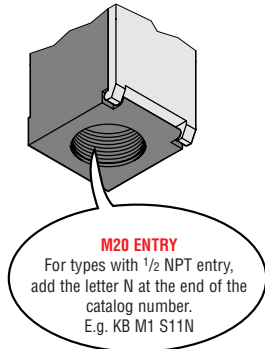
Limit and safety switches

KB plastic series and KM metal series dimensions to EN 50047

Wobble stick, omnidirectional



KB M1, KB M2
KM M1, KM M2



Contacts	Rod material	Catalog number ^①	
		Plastic body	Metal body
1NO+1NC Snap action	Flexible	KB M1 S11	KM M1 S11
	Semirigid	KB M2 S11	KM M2 S11
2NC Snap action	Flexible	KB M1 S02	KM M1 S02
	Semirigid	KB M2 S02	KM M2 S02
1NO+1NC Slow break make before break	Flexible	KB M1 A11	KM M1 A11
	Semirigid	KB M2 A11	KM M2 A11
1NO+1NC Slow break	Flexible	KB M1 L11	KM M1 L11
	Semirigid	KB M2 L11	KM M2 L11
2NC Slow break	Flexible	KB M1 L02	KM M1 L02
	Semirigid	KB M2 L02	KM M2 L02
2NO Slow break	Flexible	KB M1 L20	KM M1 L20
	Semirigid	KB M2 L20	KM M2 L20
1NO+2NC Slow break	Flexible	KB M1 L12	KM M1 L12
	Semirigid	KB M2 L12	KM M2 L12
2NO+1NC Slow break	Flexible	KB M1 L21	KM M1 L21
	Semirigid	KB M2 L21	KM M2 L21
3NC Slow break	Flexible	KB M1 L03	KM M1 L03
	Semirigid	KB M2 L03	KM M2 L03

① Contact Sales & Technical Support for details and pricing.

General characteristics

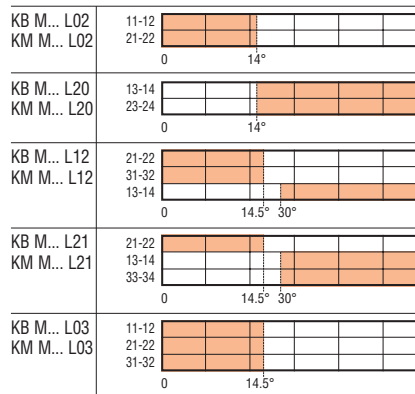
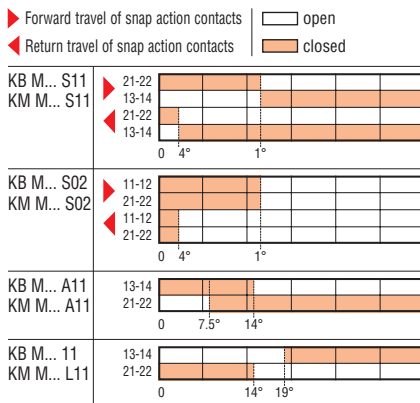
The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability.
The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools.
The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

Operational characteristics

- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer plastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 9 in oz / 1Ncm
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.



Limit and safety switches

KB plastic series and KM metal series

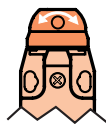
dimensions to EN 50047

electric

Hinge operating



KB P1 L
KM P1 L

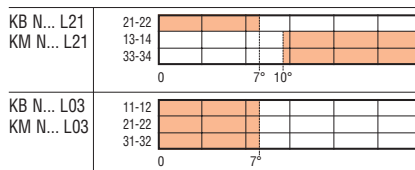
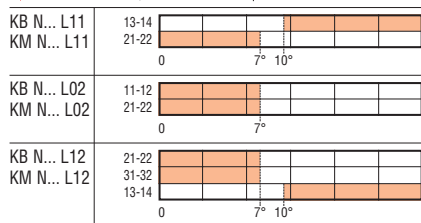


Contacts	Shaft features	Catalog number ^②	
		Plastic body	Metal body
1NO+1NC Slow break ^①	Short cylinder	KB P1 L11	KM P1 L11
2NC Slow break ^①	Short cylinder	KB P1 L02	KM P1 L02
1NO+2NC Slow break ^①	Short cylinder	KB P1 L12	KM P1 L12
2NO+1NC Slow break ^①	Short cylinder	KB P1 L21	KM P1 L21
3NC Slow break ^①	Short cylinder	KB P1 L03	KM P1 L03

^① Direct (positive) operating operation ⊖; safety function according to IEC/EN 60947-5-1.

^② Contact Sales & Technical Support for details and pricing.

▶ Forward travel of snap action contacts open
◀ Return travel of snap action contacts closed



General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability. The body cover has a captive closing screw and is hinged at the bottom and removable. The innovative locking bayonet mechanism consents to remove and reposition the operating head in the required configuration with no tools. The heads have axial rotation of 45° angles. The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic for the KB types or of aluminum-zinc alloy (zama) for the KM types.

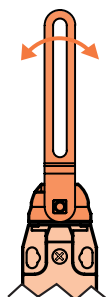
Operational characteristics

- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing:
 - KB series - Self-extinguishing double-insulation polymer thermoplastic
 - KM series - Aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 135 in oz / 15Ncm
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Slotted lever



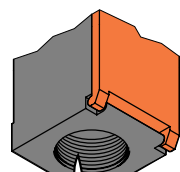
KB Q1 L...
KM Q1 L...



Contacts	Catalog number ^②	
	Plastic body	Metal body
1NO+1NC Slow break ^①	KB Q1 L11	KM Q1 L11
2NC Slow break ^①	KB Q1 L02	KM Q1 L02
1NO+2NC Slow break ^①	KB Q1 L12	KM Q1 L12
2NO+1NC Slow break ^①	KB Q1 L21	KM Q1 L21
3NC Slow break ^①	KB Q1 L03	KM Q1 L03

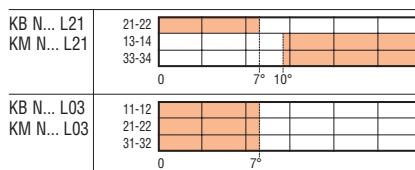
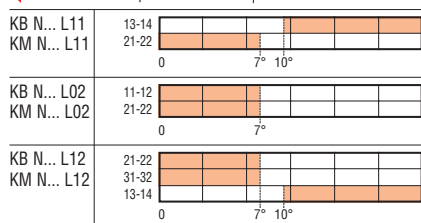
^① Direct (positive) operating operation ⊖; safety function according to IEC/EN 60947-5-1.

^② Contact Sales & Technical Support for details and pricing.



M20 ENTRY
For types with 1/2 NPT entry, add the letter N at the end of the catalog number.
E.g. KB Q1 L11N

▶ Forward travel of snap action contacts open
◀ Return travel of snap action contacts closed



Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.

Limit and safety switches

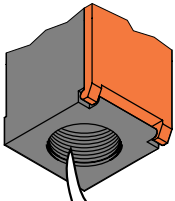
KB plastic series and KM metal series

dimensions to EN 50047

Key operated

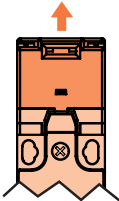


KB N1 L11



M20 ENTRY

For types with 1/2 NPT entry, add the letter N at the end of the catalog number. E.g. KB N1 L11N



Contacts	Key shape [Ⓢ]	Catalog number [Ⓣ] Plastic body
1NO+1NC Slow break [Ⓛ]	Straight	KB N1 L11
	Angled	KB N2 L11
	Straight "T"	KB N3 L11
	Angled "T"	KB N4 L11
2NC Slow break [Ⓛ]	Straight	KB N1 L02
	Angled	KB N2 L02
	Straight "T"	KB N3 L02
	Angled "T"	KB N4 L02
1NO+2NC Slow break [Ⓛ]	Straight	KB N1 L12
	Angled	KB N2 L12
	Straight "T"	KB N3 L12
	Angled "T"	KB N4 L12
2NO+1NC Slow break [Ⓛ]	Straight	KB N1 L21
	Angled	KB N2 L21
	Straight "T"	KB N3 L21
	Angled "T"	KB N4 L21
3NC Slow break [Ⓛ]	Straight	KB N1 L03
	Angled	KB N2 L03
	Straight "T"	KB N3 L03
	Angled "T"	KB N4 L03

- Ⓛ Direct (positive) operating operation ⊖; safety function according to IEC/EN 60947-5-1.
- Ⓣ Contact Sales & Technical Support for details and pricing.
- Ⓢ The key is standard supplied.

General characteristics

The LOVATO ELECTRIC limit switches have been designed to satisfy requirements comprising quick installation, wiring ease, simple setup, modularity, sturdiness and constant reliability. The body cover has a captive closing screw and is hinged at the bottom and removable. The heads have axial rotation in any of 4 positions at 90° angles. The auxiliary contact blocks are removable assuring remarkable wiring simplicity. The heads are made of metal while the body housing of self-extinguishing polymer thermoplastic.

Operational characteristics

- Maximum operating rate: 3600 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Class II insulation
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing
- Operators of aluminum-zinc alloy
- Housing in self-extinguishing double-insulation polymer thermoplastic
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating force: 29 oz / 8N
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

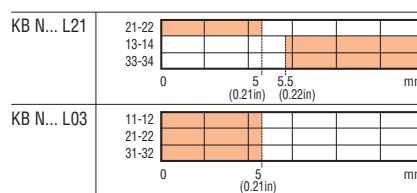
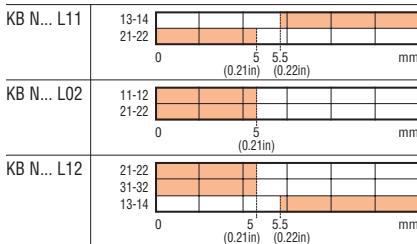
Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.

- ▶ Forward travel of snap action contacts
- ◀ Return travel of snap action contacts

□ open

■ closed

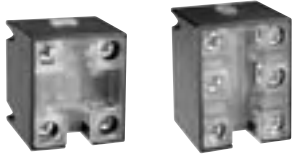


Accessories and spare parts for key operated switches

Contacts	Catalog number [Ⓣ]
Straight key	K X N1
Angled key	K X N2
Straight "T" key	K X N3
Angles "T" key	K X N4
Toggle key	K X N5

- Ⓣ Contact Sales & Technical Support for details and pricing.

Auxiliary contact blocks



K X B

Contacts	Catalog number ^⑥
1NO+1NC Snap action ^{①②}	K X BS11
2NC Snap action ^{①②}	K X BS02
1NO+1NC Slow break, make before break ^{①②}	K X BA11
1NO+1NC Slow break ^②	K X BL11
2NC Slow break ^②	K X BL02
2NO Slow break	K X BL20
1NO+2NC Slow break ^②	K X BL12
2NO+1NC Slow break ^②	K X BL21
3NC Slow break ^②	K X BL03

General characteristics

The KXB contact blocks can be used with the KB and MK series of limit switches. Combinations of 2 contacts with slow-break or snap action and 3 slow-break contacts are available.

The NC contacts have direct opening operation, a specific safety principle.

The particular four-point contacts warrant high conductivity in any sort of application. The removal of the contacts from the limit switch body provides remarkable wiring ease and reduces installation time as well.

Operational characteristics

- Mechanical life: >10 million cycles
- Rated thermal current Ith: 10A
- UL designation: A600 Q300
- Rated thermal current Ith: 10A
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- IP20 degree of protection
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C).

Certifications and compliance

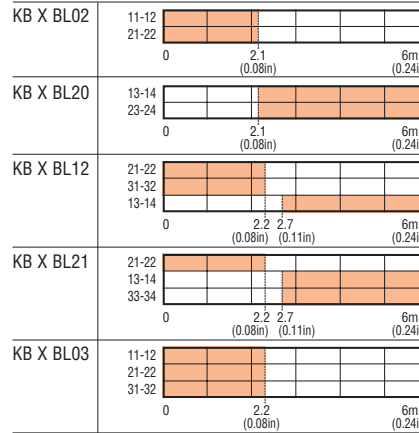
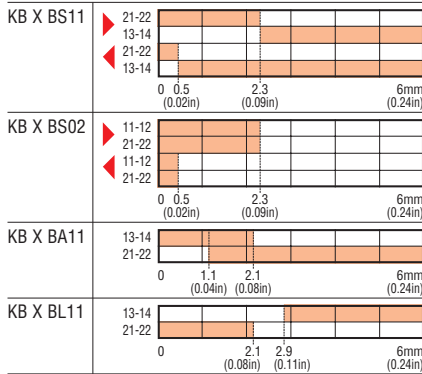
Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.

① Not suitable for key operated KBN, hinged operating KBP / KMP and slotted lever KBQ / KMQ types.

② Direct (positive) operating operation ⊕; safety function according to IEC/EN 60947-5-1.

⑥ Contact Sales & Technical Support for details and pricing.

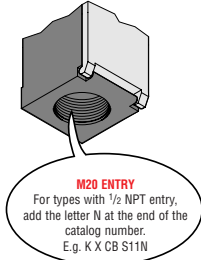
▶ Forward travel of snap action contacts open
 ◀ Return travel of snap action contacts closed



Body complete with auxiliary contacts



K X CB



Contacts	Catalog number ^⑥	
	Plastic body	Metal body
1NO+1NC Snap action ^①	K X CB S11	K X CM S11
2NC Snap action ^①	K X CB S02	K X CM S02
1NO+1NC Slow break, make before break ^①	K X CB A11	K X CM A11
1NO+1NC Slow break ^①	K X CB L11	K X CM L11
2NC Slow break ^①	K X CB L02	K X CM L02
2NO Slow break	K X CB L20	K X CM L20
1NO+2NC Slow break ^①	K X CB L12	K X CM L12
2NO+1NC Slow break ^①	K X CB L21	K X CM L21
3NC Slow break ^①	K X CB L03	K X CM L03

① Direct (positive) operating operation ⊕; safety function according to IEC/EN 60947-5-1.

⑥ Contact Sales & Technical Support for details and pricing.

General characteristics

The K X CB and K X CM bodies, complete with auxiliary contacts, can be used as spare parts for the KB and KM series limit switches or coupled with the K XA operating heads, obtaining complete limit switches in the required configurations.

The body cover has a captive closing screw and is hinged at the bottom and removable to have the best access. Each body includes the innovative locking bayonet mechanism of the operating head. The plastic and metal types are available.

The auxiliary contact blocks are removable assuring remarkable wiring simplicity. Different combinations up to 3 contacts with direct opening operation are offered. The NC contacts have direct opening operation, a specific safety principle.

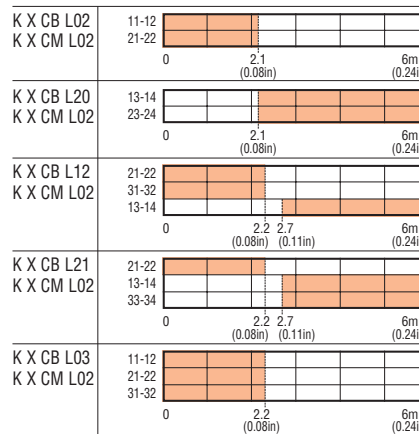
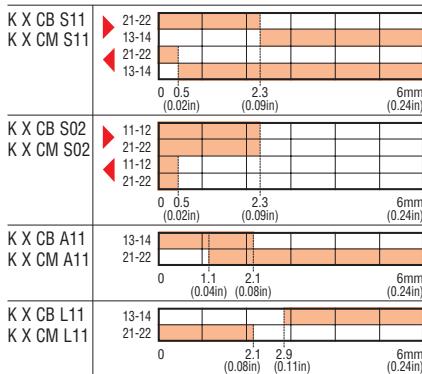
Operational characteristics

- Mechanical life: >10 million cycles
- Rated thermal current: 10A
- UL designation: A600 Q300
- Rated thermal current Ith: 10A
- Rated insulation voltage Ui: 690V
- Rated impulse withstand voltage Uimp: 6kV
- Contact capacity: <10mΩ
- Short-circuit backup protection:
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A gG maximum admissible size
- Wire connection: Self-releasing screw terminal
- Degree of protection:
 - IP20 for terminals
 - IP65 for body housing with mounted operating head
- K X CB ... housing in self-extinguishing double insulation polymer thermoplastic
- K X CM ... housing in aluminum-zinc alloy
- Wire entry: M20 standard supplied; 1/2 NPT available (see the side note for details)
- Operating head fixing: Locking bayonet insert
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Storage temperature: -40° to +160°F (-40 to +70°C).

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-5-1, EN 50047, IEC/EN 60204-1, IEC/EN 60081-1.

▶ Forward travel of snap action contacts open
 ◀ Return travel of snap action contacts closed



Limit and safety switches

Accessories and spare parts for KB and KM series

Operating heads



K XA B1



K XA D2



K XA E1



K XA L2

Contacts	Catalog number ^❶
Operating heads.	
Top push rod plunger	K XA A1
Plastic top roller push plunger	K XA B1
Metal top roller push plunger	K XA B2
Plastic roller centre push lever	K XA C1
Metal roller centre push lever	K XA C2
Plastic roller side push lever	K XA D1
Metal roller side push lever	K XA D2
Plastic roller lever plunger	K XA E1
Metal roller lever plunger	K XA E2
Rubber 50x10 roller lever plunger	K XA E3
Adjustable plastic roller lever	K XA F1
Adjustable metal roller lever	K XA F2
Adjustable rubber 50x10 roller lever	K XA F3
Adjustable offset rubber 50x10 roller lever	K XA F4
Ceramic rod lever	K XA H1
Adjustable plastic rod lever	K XA L1
Adjustable metal rod lever	K XA L2
Flexible wobble stick	K XA M1
Semirigid wobble stick	K XA M2
Entry adapters for KB and KM series.	
Metal, for M20 to 1/2 NPT	G623
Plastic, for M20 to 1/2 NPT	G624

❶ Contact Sales & Technical Support for details and pricing.

General characteristics

The K XA operating heads can be used as spare parts for the KB and KM limit switches or coupled with the KX CB and K X CM bodies obtaining complete limit switches in the required configurations.

The heads are made of metal and warrant sturdiness and operating reliability in all conditions.

The shape of the coupling section with the body of the KB and KM switches consents to orienting the head in any 45° angle position while the initial level and rod position can be adjusted 360° at 15° angle positions.

The head fixing to the body is achieved by the innovative locking bayonet mechanism so there is no need of tooling.

Limit and safety switches

RS plastic series, dimensions to EN 50047 standards



Top push rod plunger



RS1 01 10
RS2 01 10
RS3 01 10

RS4 01 10
RS5 01 10
RS6 01 10

Contacts	Plunger material	Catalog number	Price
			\$

Without reset button.

1NO+1NC ① Snap action	Steel	RS1 01 10	39.00
1NO+1NC ① Slow break	Steel	RS2 01 10	37.00
2NC ① Slow break	Steel	RS3 01 10	39.00

With reset button on front.

1NO+1NC ① Snap action	Steel	RS4 01 10	49.00
1NO+1NC ① Slow break	Steel	RS5 01 10	47.00
2NC ① Slow break	Steel	RS6 01 10	49.00

① Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.

Type	▶ Forward travel of snap action contacts	◀ Return travel of snap action contacts	□ open	■ closed
RS1 01 RS4 01 RS1 02	21-22 13-14 21-22 13-14			
	0		[mm]	6 (0.24in)
RS2 01 RS5 01 RS2 02	21-22 13-14			
	0		[mm]	6 (0.24in)
RS3 01 RS6 01 RS3 02	21-22 11-12			
	0		[mm]	6 (0.24in)
RS1 03	21-22 13-14 21-22 13-14			
	0		[mm]	9.6 (0.38in)
RS2 03	21-22 13-14			
	0		[mm]	9.6 (0.38in)
RS3 03	21-22 11-12			
	0		[mm]	9.6 (0.38in)
RS1 04	21-22 13-14 21-22 13-14			
	0		[mm]	7.5 (0.3in)
RS2 04	21-22 13-14			
	0		[mm]	7.5 (0.3in)
RS3 04	21-22 11-12			
	0		[mm]	7.5 (0.3in)

Top roller plunger



RS... 02

Contacts	Roller material	Catalog number	Price
			\$

1NO+1NC ② Snap action	Plastic Ø11x4	RS1 02 20	47.00
	Metal Ø11x4	RS1 02 21	49.00
1NO+1NC ② Slow break	Plastic Ø11x4	RS2 02 20	45.00
	Metal Ø11x4	RS2 02 21	47.00
2NC ② Slow break	Plastic Ø11x4	RS3 02 20	47.00
	Metal Ø11x4	RS3 02 21	49.00

② Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.
Roller Ø 11x4mm = Ø 0.43x0.16in

Center roller push lever



RS... 03

Contacts	Roller material	Catalog number	Price
			\$

With roller lever on the left.

1NO+1NC ③ Snap action	Plastic Ø14x10	RS1 03 20 S	48.00
	Metal Ø14x10	RS1 03 21 S	50.00
1NO+1NC ③ Slow break	Plastic Ø14x10	RS2 03 20 S	46.00
	Metal Ø14x10	RS2 03 21 S	48.00
2NC ③ Slow break	Plastic Ø14x10	RS3 03 20 S	48.00
	Metal Ø14x10	RS3 03 21 S	50.00

③ Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.
Roller Ø 14x10mm = Ø 0.55x0.39in

Side roller push lever



RS... 04

Contacts	Roller material	Catalog number	Price
			\$

1NO+1NC ④ Snap action	Plastic Ø14x10	RS1 04 20 S	48.00
	Metal Ø14x10	RS1 04 21 S	50.00
1NO+1NC ④ Slow break	Plastic Ø14x10	RS2 04 20 S	46.00
	Metal Ø14x10	RS2 04 21 S	48.00
2NC ④ Slow break	Plastic Ø14x10	RS3 04 20 S	48.00
	Metal Ø14x10	RS3 04 21 S	50.00

④ Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.
Roller Ø 14x10mm = Ø 0.55x0.39in

General characteristics

The RS series limit switches are designed and manufactured per European standards for dimensions and operating characteristics. The double-insulated housing of the limit switch is made of glass-reinforced self-extinguishing polyamide resin to protect internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact. The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 6000 cy/h
- Switching time: 0.5-1.5ms
- Mechanical life: >10 million cycles (100,000 cycles only for reset button versions)
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current Ith: 10A
- Rated insulation voltage Ui: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65
- Cable entry: PG11 (see page 7-20 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 18oz / 5N (RS...01 and RS...02)
- Operating force: 73in oz / 8Ncm (RS...03 only) and 91in oz / 10Ncm (RS...04 only)
- RS...02 have roller plunger with axial rotation in all positions
- RS...03 and RS...04 have lever with axial rotation in any of 4 positions (90°)
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Roller lever plunger



RS1 05 - RS2 05 - RS3 05
(Ø20x5mm)



RS4 05 - RS5 05 - RS6 05
(Ø50x10mm)

Contacts	Roller material	Catalog number	Price
			\$
Without reset button.			
1NO+1NC ① Snap action	Plastic Ø20x5	RS1 05 20 A Ⓢ	45.00
	Metal Ø20x5	RS1 05 21 A	47.00
	Rubber Ø50x10	RS1 05 24 A Ⓢ	49.00
1NO+1NC ① Slow break	Plastic Ø20x5	RS2 05 20 A Ⓢ	43.00
	Metal Ø20x5	RS2 05 21 A	45.00
	Rubber Ø50x10	RS2 05 24 A Ⓢ	47.00
2NC ① Slow break	Plastic Ø20x5	RS3 05 20 A Ⓢ	45.00
	Metal Ø20x5	RS3 05 21 A	47.00
	Rubber Ø50x10	RS3 05 24 A Ⓢ	49.00
With reset button.			
1NO+1NC ① Snap action	Plastic Ø20x5	RS4 05 20 AS Ⓢ	55.00
	Metal Ø20x5	RS4 05 21 AS	57.00
	Rubber Ø50x10	RS4 05 24 AS Ⓢ	59.00
1NO+1NC ① Slow break	Plastic Ø20x5	RS5 05 20 AS Ⓢ	53.00
	Metal Ø20x5	RS5 05 21 AS	55.00
	Rubber Ø50x10	RS5 05 24 AS Ⓢ	57.00
2NC ① Slow break	Plastic Ø20x5	RS6 05 20 AS Ⓢ	55.00
	Metal Ø20x5	RS6 05 21 AS	57.00
	Rubber Ø50x10	RS6 05 24 AS Ⓢ	59.00

- ① Direct (positive) opening operation ⊕, safety function per IEC/EN 60947-5-1.
- ② Roller lever plunger limit switches with 30x5mm plastic roller are available and can be ordered substituting the number 20 with 23 in the above-given catalog numbers.
- ③ Roller lever plunger limit switches with 35x15mm rubber roller are available and can be ordered substituting the number 24 with 22 in the above-given catalog numbers.

Roller sizes:
 Ø 20x5mm = Ø 0.79x0.2in
 Ø 35x15mm = Ø 1.38x0.59in
 Ø 30x5mm = Ø 1.18x0.2in
 Ø 50x10mm = Ø 1.97x0.39in

Type	▶ Forward travel of snap action contacts	◀ Return travel of snap action contacts	□ open	■ closed
RS1 05 RS4 05	21-22 13-14	21-22 13-14		
RS2 05 RS5 05	21-22 13-14			
RS3 05 RS6 05	21-22 11-12			

General characteristics

The RS series limit switches are designed and manufactured per European standards for dimensions and operating characteristics. The double-insulated housing of the limit switch is made of glass-reinforced self-extinguishing polyamide resin to protect internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact. The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 6000 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles (100,000 cycles only for reset button version)
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current Ith: 10A
- Rated insulation voltage Ui: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65
- Cable entry: PG11 (see page 7-20 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 27in oz / 3Ncm
- Axial rotation in any of 4 positions (90°)
- Lever inclination, 360° adjustment
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
 Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Limit and safety switches

RS plastic series, dimensions to EN 50047 standards

Adjustable roller lever



RS1 06 - RS2 06 - RS3 06
(Ø30x5mm)



RS4 06 - RS5 06 - RS6 06
(Ø50x10mm)

Contacts	Roller material	Catalog number	Price
			\$

Without reset button.

1NO+1NC ① Snap action	Plastic Ø20x5	RS1 06 20 A⊕	48.00
	Metal Ø20x5	RS1 06 21 A	50.00
	Rubber Ø50x10	RS1 06 24 A⊕	52.00
	Rubber Ø50x10 offset alignment	RS1 06 25 A	54.00
1NO+1NC ① Slow break	Plastic Ø20x5	RS2 06 20 A⊕	46.00
	Metal Ø20x5	RS2 06 21 A	48.00
	Rubber Ø35x15	RS2 06 22 A⊕	48.00
	Rubber Ø50x10 offset alignment	RS2 06 25 A	52.00
2NC ① Slow break	Plastic Ø20x5	RS3 06 20 A⊕	48.00
	Metal Ø20x5	RS3 06 21 A	50.00
	Rubber Ø35x15	RS3 06 22 A⊕	50.00
	Rubber Ø50x10 offset alignment	RS3 06 25 A	54.00

With reset button on the left ⊕.

1NO+1NC ① Snap action	Plastic Ø20x5	RS4 06 20 AS⊕	58.00
	Metal Ø20x5	RS4 06 21 AS	60.00
	Rubber Ø50x10	RS4 06 24 AS⊕	62.00
	Rubber Ø50x10 offset alignment	RS4 06 25 AS	64.00
1NO+1NC ① Slow break	Plastic Ø20x5	RS5 06 20 AS⊕	56.00
	Metal Ø20x5	RS5 06 21 AS	58.00
	Rubber Ø50x10	RS5 06 24 AS⊕	60.00
	Rubber Ø50x10 offset alignment	RS5 06 25 AS	62.00
2NC ① Slow break	Plastic Ø20x5	RS6 06 20 AS⊕	58.00
	Metal Ø20x5	RS6 06 21 AS	60.00
	Rubber Ø50x10	RS6 06 24 AS⊕	62.00
	Rubber Ø50x10 offset alignment	RS6 06 25 AS	64.00

- ① Direct (positive) opening operation ⊕; safety function per IEC/EN 60947-5-1.
- ② Roller lever plunger limit switches with 30x5mm plastic roller are available and can be ordered substituting the number 20 with 23 in the above-given catalog numbers.
- ③ Roller lever plunger limit switches with 35x15mm rubber roller are available and can be ordered substituting the number 24 with 22 in the above-given catalog numbers.

Roller sizes:

- Ø 20x5mm = Ø 0.79x0.2in
- Ø 35x15mm = Ø 1.38x0.59in
- Ø 30x5mm = Ø 1.18x0.2in
- Ø 50x10mm = Ø 1.97x0.39in

Type	▶ Forward travel of snap action contacts	□ open
	◀ Return travel of snap action contacts	■ closed
RS1 06 RS4 06	21-22 13-14 21-22 13-14	
RS2 06 RS5 06	21-22 13-14	
RS3 06 RS6 06	21-22 11-12	

General characteristics

The RS series limit switches are designed and manufactured per European standards for dimensions and operating characteristics. The double-insulated housing of the limit switch is made of glass-reinforced self-extinguishing polyamide resin to protect internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact. The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 6000 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles (100,000 cycles only for reset buttons versions)
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current I_{th}: 10A
- Rated insulation voltage U_i: 250VAC
- Contact resistance: <10mΩ
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65
- Cable entry: PG11 (see page 7-20 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 27in oz / 3Ncm
- Axial rotation in any of 4 positions (90°)
- Lever inclination, 360° adjustment
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Ceramic rod lever



RS1 07
RS2 07
RS3 07

Contacts	Rod material	Catalog number	Price
			\$
Without reset button			
1NO+1NC ①	Ceramic Snap action	RS1 07 70 A	54.00
1NO+1NC ①	Ceramic Slow break	RS2 07 70 A	52.00
2NC ①	Ceramic Slow break	RS3 07 70 A	54.00

① Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.
② Version with reset button is available. For further assistance, contact Sales & Technical Support.

Type	▶ Forward travel of snap action contacts	◀ Return travel of snap action contacts	□ open	■ closed
RS1 07 RS1 08	21-22 13-14	21-22 13-14		
RS2 07 RS2 08	21-22 13-14			
RS3 07 RS3 08	21-22 11-12			
RS1 09	21-22 13-14	21-22 13-14		
RS2 09	21-22 13-14			
RS3 09	21-22 11-12			

Adjustable rod lever



RS1 08
RS2 08
RS3 08

Contacts	Rod material	Catalog number	Price
			\$
Without reset button			
1NO+1NC ③ Snap action	Rigid	RS1 08 80 A	50.00
	Semirigid	RS1 08 81 A	52.00
1NO+1NC ③ Slow break	Rigid	RS2 08 80 A	48.00
	Semirigid	RS2 08 81 A	50.00
2NC ③ Slow break	Rigid	RS3 08 80 A	50.00
	Semirigid	RS3 08 81 A	52.00

③ Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.
④ Version with reset button is available. For further assistance, contact Sales & Technical Support.

General characteristics

The RS series limit switches are designed and manufactured per European standards for dimensions and operating characteristics.

The double-insulated housing of the limit switch is made of glass-reinforced self-extinguishing polyamide resin to protect internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact.

The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 6000 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current Ith: 10A
- Rated insulation voltage Ui: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65
- Cable entry: PG11 (see page 7-20 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 27in oz / 3Ncm (RS...07 and RS...08); 9in oz / 1Ncm (RS...09 only)
- RS...07 and RS...08 have axial rotation in any of 4 positions (90°)
- RS...07 and RS...08 have lever inclination, 360° adjustment
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Wobble stick, omnidirectional



RS1 09 - RS2 09 - RS3 09

Contacts	Rod material	Catalog number	Price
			\$
1NO+1NC ⑤ Snap action	Rigid	RS1 09 90	45.00
	Semirigid	RS1 09 91	45.00
	Flexible	RS1 09 92	47.00
1NO+1NC ⑤ Slow break	Rigid	RS2 09 90	43.00
	Semirigid	RS2 09 91	43.00
	Flexible	RS2 09 92	45.00
2NC ⑤ Slow break	Rigid	RS3 09 90	45.00
	Semirigid	RS3 09 91	45.00
	Flexible	RS3 09 92	47.00

⑤ Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.

Limit and safety switches

RS plastic series, dimensions to EN 50047 standards

Key operated



RS... 10 13A

Contacts	Key shape ②	Catalog number	Price
			\$
Front key withdrawal ③.			
1NO+1NC ① Snap action	Straight	RS1 10 10 A	65.00
	Angled	RS1 10 11 A	65.00
	Angled "T"	RS1 10 12 A	65.00
	Straight "T"	RS1 10 13 A	65.00
1NO+1NC ① Slow break	Straight	RS2 10 10 A	63.00
	Angled	RS2 10 11 A	63.00
	Angled "T"	RS2 10 12 A	63.00
	Straight "T"	RS2 10 13 A	63.00
2NC ① Slow break	Straight	RS3 10 10 A	65.00
	Angled	RS3 10 11 A	65.00
	Angled "T"	RS3 10 12 A	65.00
	Straight "T"	RS3 10 13 A	65.00

- ① Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.
 - ② The key is standard supplied.
 - ③ Version with key withdrawal on the left or on the right is available; replace the last letter (A) of the order code respectively with S or D (e.g. RS1 10 10S - left or RS1 10 10D - right).
- For further assistance, contact Sales & Technical Support.

Type	▶ Forward travel of snap action contacts	□ open
	◀ Return travel of snap action contacts	■ closed
RS1 10		0 [mm] 4.2 (0.17in)
RS2 10		0 [mm] 4.2 (0.17in)
RS3 10		0 [mm] 4.2 (0.17in)

General characteristics

The RS series limit switches are designed and manufactured per European standards for dimensions and operating characteristics. The double-insulated housing of the limit switch is made of glass-reinforced self-extinguishing polyamide resin to protect internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact. The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 6000 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current I_{th}: 10A
- Rated insulation voltage U_i: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65
- Cable entry: PG11 (see page 7-20 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 29oz / 8N
- Axial rotation in any of 4 positions (90°)
- Key withdrawal: vertical or sideways
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601. Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Accessories and spare parts



A 20746



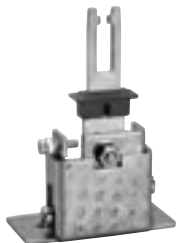
A 20747



P 32753



P 32752



A 20748

Description	Catalog number	Price
		\$
Extra keys.		
Straight key	A 20746	6.00
Angled key	A 20747	6.00
Angled "T" key	P 32753	6.00
Straight "T" key	P 32752	6.00
Toggle key	A 20748	10.00

Hinge operating



RS1 11 10 - RS2 11 10 -
RS3 11 10



RS1 11 12 - RS2 11 12 -
RS3 11 12

Contacts	Shaft features	Catalog number	Price
			\$
Without reset buttonⓂ.			
1NO+1NC ① Snap action	Short cylinder	RS1 11 10 P	85.00
	Long solid shaft	RS1 11 11 P	87.00
	Long solid shaft with reduction	RS1 11 12 P	87.00
1NO+1NC ① Slow break	Short cylinder	RS2 11 10 P	80.00
	Long solid shaft	RS2 11 11 P	82.00
	Long solid shaft with reduction	RS2 11 12 P	82.00
2NC ① Slow break	Short cylinder	RS3 11 10 P	85.00
	Long solid shaft	RS3 11 11 P	87.00
	Long solid shaft with reduction	RS3 11 12 P	87.00

① Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.
Ⓜ Version with reset button is available. For further assistance, contact Sales & Technical Support.

Type	▶ Forward travel of snap action contacts	□ open
	◀ Return travel of snap action contacts	■ closed
RS1 11	21-22	□
	13-14	■
	21-22	□
	13-14	■
0 180°		
RS2 11	21-22	□
	13-14	■
0 180°		
RS3 11	21-22	□
	11-12	■
0 180°		

General characteristics

The RS series limit switches are designed and manufactured per European standards for dimensions and operating characteristics.

The double-insulated housing of the limit switch is made of glass-reinforced self-extinguishing polyamide resin to protect internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact.

The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 6000 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current Ith: 10A
- Rated insulation voltage Ui: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65
- Cable entry: PG11 (see page 7-20 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 27in oz / 3Ncm
- Axial rotation in any of 4 positions (90°)
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Limit and safety switches

RS plastic series, dimensions to EN 50047 standards

Slotted lever



RS1 12
RS2 12
RS3 12

Contacts	Lever position at rest	Catalog number	Price
			\$
Without reset buttonⓈ.			
1NO+1NC Ⓢ Snap action	Center (vertical)	RS1 12 10	80.00
	Left	RS1 12 11	80.00
	Right	RS1 12 12	80.00
1NO+1NC Ⓢ Slow break	Center (vertical)	RS2 12 10	78.00
	Left	RS2 12 11	78.00
	Right	RS2 12 12	78.00
2NC Ⓢ Slow break	Center (vertical)	RS3 12 10	80.00
	Left	RS3 12 11	80.00
	Right	RS3 12 12	80.00

Ⓢ Direct (positive) opening operation Ⓢ; safety function according to IEC/EN 60947-5-1.
Ⓢ Version with reset button is available. For further assistance, contact Sales & Technical Support.

Type	▶ Forward travel of snap action contacts	◀ Return travel of snap action contacts	□ open	■ closed
RS1 12... RS4 12...	21-22 13-14	21-22 13-14		
RS2 12 RS5 12	21-22 13-14			
RS3 12 RS6 12	21-22 11-12			
RS1 13 10	21-22 13-14	21-22 13-14		
RS2 13 10	21-22 13-14			
RS3 13 10	21-22 11-12			

General characteristics

The RS series limit switches are designed and manufactured per European standards for dimensions and operating characteristics.

The double-insulated housing of the limit switch is made of glass-reinforced self-extinguishing polyamide resin to protect internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact.

The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) have direct (positive) opening operation to prevent sticking or welding (all RS...12 types only).

Operational characteristics

- Maximum operating rate: 6000 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current I_{th}: 10A
- Rated insulation voltage U_i: 250VAC
- Contact resistance: <10mΩ
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65
- Cable entry: PG11 (see below for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 27in oz / 3Ncm (RS...12 only)
- Operating force: 90oz / 25N (RS...13 only)
- RS...12 have axial rotation in any of 4 positions (90°)
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Rope lever for normal stopping



RS1 13 10
RS2 13 10
RS3 13 10

Contacts	Ring material	Catalog number	Price
			\$
Without reset buttonⓈ.			
1NO+1NC Snap action	Steel	RS1 13 10	48.00
1NO+1NC Slow break	Steel	RS2 13 10	46.00
2NO Slow break	Steel	RS3 13 10	48.00

Ⓢ Version with reset button is available. For further assistance, contact Sales & Technical Support.

PG adapters for all RS types

Description	Q.ty per pkg	Catalog number	Price
	n°		\$
Metal, for PG11 to 1/2" NPT	10	G611	2.50
Plastic, for PG11 to 1/2" NPT	10	G612	1.50

Limit and safety switches

T plastic series, dimensions to EN 50041 standards

Top push rod plunger



TS1 - TL1...10



TS2 - TL2...10

Contacts	Plunger material	Catalog number	Price
			\$
Without reset button.			
1NO+1NC Snap action	Steel	TS1 01 10	54.00
1NO+1NC Ⓢ Slow break	Steel	TL1 01 10	54.00
With reset button on front.			
1NO+1NC Snap action	Steel	TS2 01 10	64.00
1NO+1NC Ⓢ Slow break	Steel	TL2 01 10	64.00

Ⓢ Direct (positive) opening operation ☺; safety function per IEC/EN 60947-5-1.

Type	▶ Forward travel of snap action contacts	◀ Return travel of snap action contacts	□ open	■ closed
TS1 01 10 TS2 01 10	▶ 21-22 13-14 ▶ 21-22 13-14	◀ 21-22 13-14 ◀ 21-22 13-14	□	■
TL1 01 10 TL2 01 10	▶ 21-22 13-14	◀ 21-22 13-14	□	■
TS1 05 TS2 05	▶ 21-22 13-14 ▶ 21-22 13-14	◀ 21-22 13-14 ◀ 21-22 13-14	□	■
TL1 05 TL2 05	▶ 21-22 13-14	◀ 21-22 13-14	□	■

General characteristics

The TS-TL series limit switches are designed and manufactured per European standards EN 50041 for dimensions.

The insulated housing of the limit switch is made of self-extinguishing thermoplastic giving excellent mechanical stability and is suitable, as a result, for assembly on machinery or installations in the general-purpose industrial field.

The housing sturdiness consents to the mounting of limit switches in heavy duty applications.

The double-insulated housing of the limit switch warrants and protects internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact.

The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) of the TL series have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 1200 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current Ith: 6A
- Rated insulation voltage Ui: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP66
- Cable entry: PG13.5 (see page 7-23 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 29 oz / 6N (TS...01 and TL...01)
- Operating force: 27in oz / 3Ncm (TS...05 and TL...05)
- TS...05 and TL...05 have axial rotation in any of 4 positions (90°)
- TS...05 and TL...05 have lever inclination, 360° adjustment
- Operating temperature: +14° to +131°F (-10 to +55°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Roller lever



TS1 - TL1 05
(Ø 20x5mm)



TS2 - TL2 05
(Ø 35x15mm)

Contacts	Roller material	Catalog number	Price
			\$
Without reset button.			
1NO+1NC Snap action	Plastic 20x5	TS1 05 20 A	62.00
	Metal 20x5	TS1 05 21 A	64.00
	Rubber 50x10	TS1 05 24 A	66.00
1NO+1NC Ⓢ Slow break	Plastic 20x5	TL1 05 20 A	62.00
	Metal 20x5	TL1 05 21 A	64.00
	Rubber 50x10	TL1 05 24 A	66.00
With reset button on the left Ⓢ.			
1NO+1NC Snap action	Plastic 20x5	TS2 05 20 AS	72.00
	Metal 20x5	TS2 05 21 AS	74.00
	Rubber 50x10	TS2 05 24 AS	76.00
1NO+1NC Ⓢ Slow break	Plastic 20x5	TL2 05 20 AS	72.00
	Metal 20x5	TL2 05 21 AS	74.00
	Rubber 50x10	TL2 05 24 AS	76.00

Ⓢ Direct (positive) opening operation ☺; safety function per IEC/EN 60947-5-1.
Ⓢ Version with reset button on the right is available; replace the last two letters (AS) of the order code with AD (e.g. TS2 05 20 AD). For further assistance, contact Sales & Technical Support.

Roller sizes:
 Ø 20x5mm = Ø 0.79x0.2in
 Ø 35x15mm = Ø 1.38x0.59in
 Ø 30x5mm = Ø 1.18x0.2in
 Ø 50x10mm = Ø 1.97x0.39in

Limit and safety switches

T plastic series, dimensions to EN 50041 standards

Wobble stick, omnidirectional



TS1 - TL1 09

Contacts	Rod material	Catalog number	Price
			\$
1NO+1NC	Flexible Snap action	TS1 09 92	62.00
1NO+1NC ①	Flexible Slow break	TL1 09 92	62.00

① Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.

Type	▶ Forward travel of snap action contacts	□ open
	◀ Return travel of snap action contacts	■ closed
TS1 09 92		
TL1 09 92		
TL2 10		

General characteristics

The TS-TL series limit switches are designed and manufactured per European standards EN 50041 for dimensions.

The insulated housing of the limit switch is made of self-extinguishing thermoplastic giving excellent mechanical stability and is suitable, as a result, for assembly on machinery or installations in the general-purpose industrial field.

The housing sturdiness consents to the mounting of limit switches in heavy duty applications.

The double-insulated housing of the limit switch warrants and protects internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact.

The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) of the TL series have direct (positive) opening operation to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 1200 cy/h
- Switching time: 0.5-1.5ms
- Mechanical life: >10 million cycles
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current Ith: 6A
- Rated insulation voltage Ui: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP66
- Cable entry: PG13.5 (see page 7-23 for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 9in oz / 1Ncm (TS1 09... and TL1 09...)
- Operating force: 29 oz / 8N (TL2 10...)
- TL2 10... has axial rotation in any of 4 positions (90°)
- TL2 10... has vertical or sideways key withdrawal
- Operating temperature: +14 to +131°F (-10 to +55°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Key operated



TL2 10

Contacts	Key shape ②	Catalog number	Price
			\$

Front key withdrawal ②.

1NO+1NC ① Slow break	Straight	TL2 10 10	68.00
	Angled	TL2 10 11	68.00
	Angled "T"	TL2 10 12	68.00
	Straight "T"	TL2 10 13	68.00

② Version with key withdrawal on the left or on the right is available; replace the last letter (A) of the order code respectively with S or D (e.g. TS2 10 10S - left or TS2 10 10D - right). For further assistance, contact Sales & Technical Support.

① The key is standard supplied.

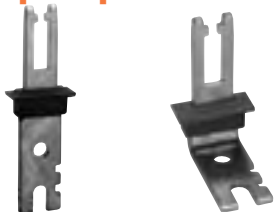
① Direct (positive) opening operation ⊖; safety function per IEC/EN 60947-5-1.

Description	Catalog number	Price
		\$

Extra keys.

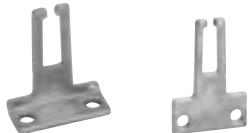
Straight key	A 20746	6.00
Angled key	A 20747	6.00
Angled "T" key	P 32753	6.00
Straight "T" key	P 32752	6.00
Toggle key	A 20748	10.00

Accessories and spare parts



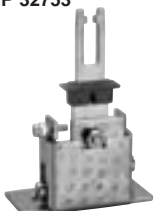
A 20746

A 20747



P 32753

P 32752



A 20748

Hinge operating



TL1 11 10

Contacts	Shaft features	Catalog number	Price
			\$

Without reset buttonⓄ.

1NO+1NC ① Slow break	Short cylinder	TL1 11 10 P	97.00
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- ① Direct (positive) opening operation⊖; safety function per IEC/EN 60947-5-1.
- ② Version with reset button is available. For further assistance, contact Sales & Technical Support.

Type	▶ Forward travel of snap action contacts	◀ Return travel of snap action contacts	□ open	■ closed
TL1 11 TL1 12	21-22 13-14			
	0 180°			
TS1 13 10	21-22 13-14	21-22 13-14		
	0 [mm] 6 (0.24in)			
TL1 13 10	21-22 13-14			
	0 [mm] 6 (0.24in)			

General characteristics

The TS-TL series limit switches are designed and manufactured per European standards EN 50041 for dimensions.

The insulated housing of the limit switch is made of self-extinguishing thermoplastic giving excellent mechanical stability and is suitable, as a result, for assembly on machinery or installations in the general-purpose industrial field.

The housing sturdiness consents to the mounting of limit switches in heavy duty applications.

The double-insulated housing of the limit switch warrants and protects internal circuits against shocks or impacts and industrial environments, against accidental ingress of tools and accidental contact.

The contacts are dimensioned to ensure self cleaning of the silver-alloy contact surfaces. Contacts (NC) of the TL series have direct (positive) opening operation, except for rope lever models, to prevent sticking or welding.

Operational characteristics

- Maximum operating rate: 1200 cy/h
- Switching time: 0.5-1.5m/s
- Mechanical life: >10 million cycles
- Utilisation category (UL designation):
 - DC13 duty: 1.5A 24V (R150)
 - AC15 duty: 6A 250V (B600)
- Rated thermal current Ith: 6A (10A for rope lever types)
- Rated insulation voltage Ui: 250VAC
- Contact resistance: <10mOhm
- Short-circuit backup protection:
 - slow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP66
- Cable entry: PG13.5 (see below for adapter)
- Cable connection: Self-releasing screw terminal
- Operating force: 27in oz / 3Ncm (T...11 and T...12)
- Operating force: 90 oz / 25N (T...13)
- T...11 and T...12 have axial rotation in any of 4 positions (90°)
- Operating temperature: +14° to +131°F (-10 to +55°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certifications and compliance

UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60081-1, EN 50047, IEC/EN 60204-1.

Slotted lever



TL1 12 10

Contacts	Lever position at rest	Catalog number	Price
			\$

Without reset buttonⓄ.

1NO+1NC ② Slow break	Center (vertical)	TL1 12 10	98.00
	Left	TL1 12 11	98.00
	Right	TL1 12 12	98.00

- ② Direct (positive) opening operation⊖; safety function per IEC/EN 60947-5-1.
- ③ Version with reset button is available. For further assistance, contact Sales & Technical Support.

Rope lever for normal stopping



TS1 - TL1 13 10

Contacts	Ring material	Catalog number	Price
			\$

Without reset buttonⓄ.

1NO+1NC	Steel Snap action	TS1 13 10	65.00
1NO+1NC	Steel Slow break	TL1 13 10	63.00

- ④ Version with reset button is available. For further assistance, contact Sales & Technical Support.

PG adapters for all T types

Description	Q.ty per pkg	Catalog number	Price
	n°		\$
Metal, for PG13.5 to 1/2" NPT	10	G613	2.50
Plastic, for PG13.5 to 1/2" NPT	10	G614	1.50



Limit and safety switches

Rope-pull lever safety switches, EN418 compliant

Rope lever for emergency stopping



RS13 13 10



TL13 13 10

Contacts	Force	Qty per pkg	Catalog number	Price
	[N]	n°		\$
With reset button.				
1NO + 1NC	25 (5.6lb)	1	RS13 13 10	54.00
1NO + 1NC	25 (5.6lb)	1	TL13 13 10	69.00

ⓘ Direct (positive) opening operation ☹; safety function according to IEC/EN 60947-5-1.

Type	11-12	21-22	0	6 (0.24in)
RS...	open	closed		
T...	open	closed		

General characteristics

The rope-operated safety switches for emergency stop are mainly suitable for emergency stop or alarm systems for machinery which occupies a large space. This emergency stop can be achieved from any point when the rope is manually pulled each time. The choice of the body, between plastic and metal, can satisfy the most diversified requirements for sturdiness and size.

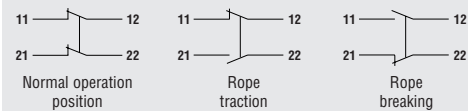
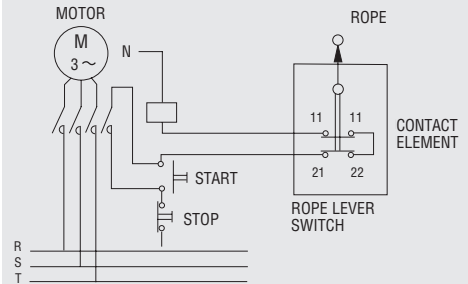
Operational characteristics

- Maximum operating rate: 1800 cy/h
- Mechanical life: 100,000 cycles
- Utilisation category:
 - DC13 duty: 1.5A 24V
 - AC15 duty: 6A 250V
- Rated thermal current Ith: 10A
- Rated insulation voltage Ui: 250VAC
- Contact capacity: <10mOhm
- Short-circuit backup protection
 - slow-blow fuse: 10A aM maximum admissible size
 - quick fuse: 16A SC/gG maximum admissible size
- Degree of protection: IP65 for RS type; IP66 for TL type
- Wire entry: PG11 / PG13.5 (PG11 only for RS). For adapters, see page 7-20 for RS types and page 7-23 for TL type.
- Wire connection: Self-releasing screw terminal suitable for wires up to 2.5mm² / AWG12
- Operating temperature: -13° to +160°F (-25 to +70°C)
- Pollution degree: 3 (suitable for dirty ambient).

Certification and compliance

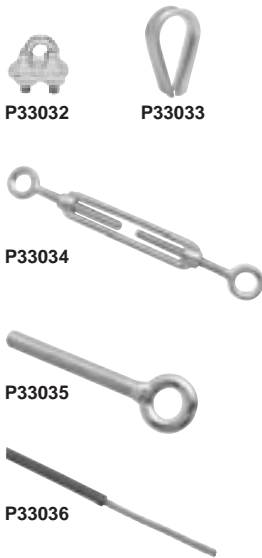
UL listed for USA and Canada, File E 93601.
Compliant with standards: IEC/EN 60947-5-1, IEC/EN 60204-1, EN 418, IEC/EN 60081-1.

Wiring diagram



Limit and safety switches

Accessories and spare parts for rope-pull lever safety switches



Description	Qty per pkg	Catalog number	Price
	n°		\$

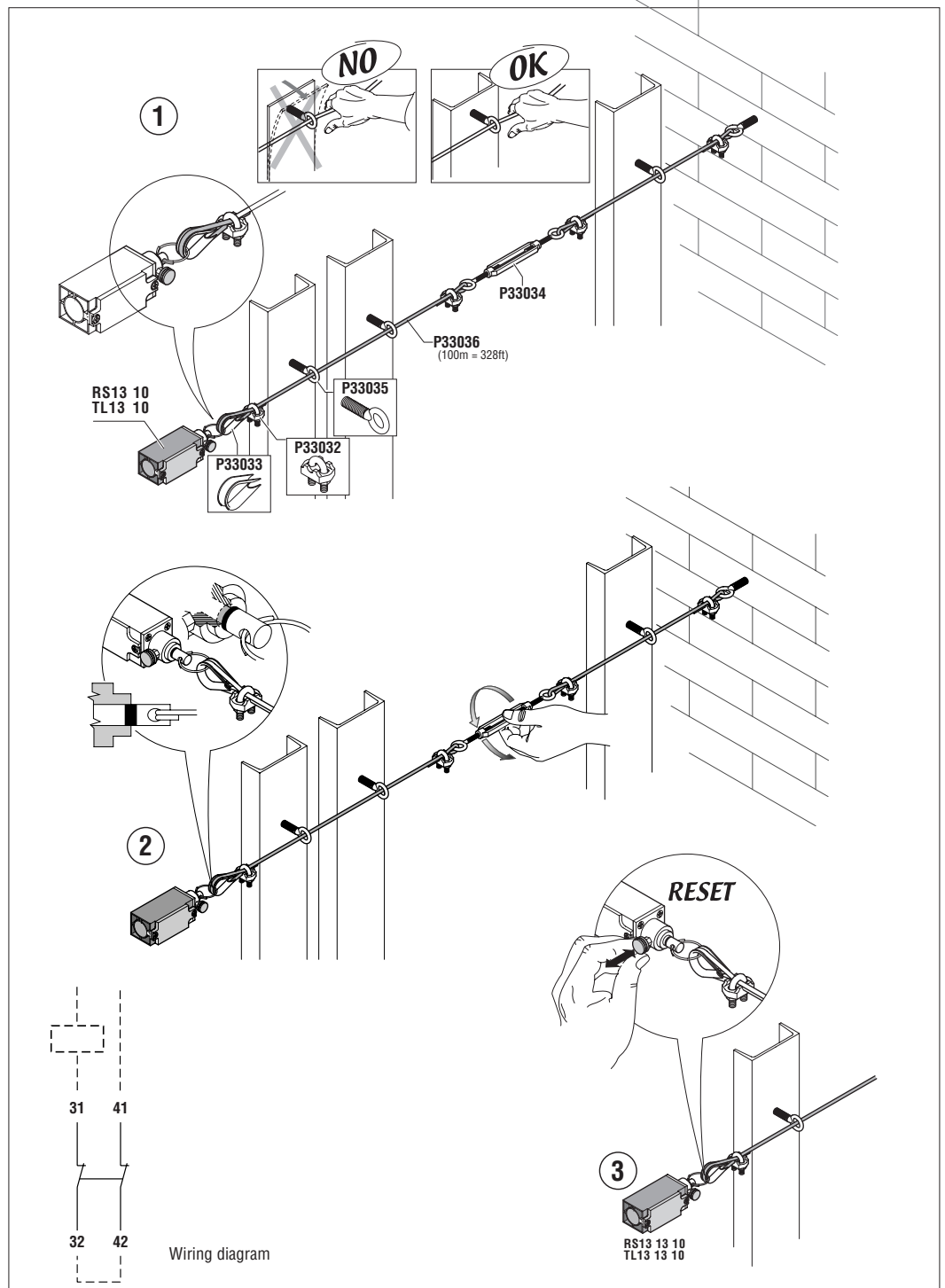
Accessories.			
Rope terminal clamp, Ø5mm	10	P33032	2.50
Rope eye, Ø5mm	10	P33033	2.00
Turnbuckle M6x60	10	P33034	6.50
Eye bolt M8	10	P33035	4.50
Steel rope, Ø5mm	100[m]	P33036	187.00

Ø5mm - Ø 0.2in

❶ The P33036 rope is sold in 100m (328ft) roll.

General characteristics

The accessories for the rope-pull safety switches consent to easy and reliable equipment installation. Precise adjustment of the red pretensioned steel rope can be obtained by using the relative turnbuckles. Refer to the illustration below for general guidance.





PAGE 8-2

GX SERIES

- 16A to 40A capacity
- Square-shaped contact body
- IP20 degree of protection of terminals.



PAGE 8-10

GN SERIES

- 12A to 125A capacity
- Round-shaped contact body
- IP00 degree of protection of terminals.

- Suitable for use as isolation switch for motor or non-motor loads
- General purpose ratings from 10 to 100 Amp
- On/off, Double-Throw, Reversing and custom power switching applications
- Ammeter, voltmeter and custom control switching
- Finger protection, enclosures and other accessories available
- IP65 Type 4/4X protection available

**Front mounting versions**

	SEC.	PAGE	PAGE
		GX	GN
On/Off switches. U version, front mounting	8-	2	8
Double-throw switches with or without O (OFF). U version, front mounting	8-	3	9
Motor switches. U version, front mounting	8-	4	10
Voltmeter switches. Ammeter switches. U version, front mounting	8-	4	11
On/Off switches. U11 version, front mounting with handle operation for 22mm center fixing	8-	5	12
On/Off switches. U12 version, front mounting with key operation for 22mm center fixing	8-	5	12
On/Off switches. U25-U65 version, front mounting with padlock system, red/yellow	8-	5	12

Mounting plate versions

On/Off switches. 088-098-099 version, door-coupling and padlock system, red/yellow	8-	6	13
On/Off switches. 068-078-079 version, door-coupling system	8-	6	13

Versions in enclosure

On/Off switches. Double-throw switches. P version	8-	7	14
Motor switches. P version with rotating handle	8-	7	15
On/Off switches. P25 version with padlockable handle	8-	7	15

Accessories	8-	16	17
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U version front mounting. ON/OFF switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.

One-pole – 1 wafer – scheme 90.

Rated current AC1	Front plate size	Price
12	16 □ 48	GX16 90 U 30.00
15	20 □ 48	GX20 90 U 34.00
32	32 □ 65	GX32 90 U 45.00
40	40 □ 65	GX40 90 U 51.00

Two-pole – 1 wafer – scheme 91.

Rated current AC1	Front plate size	Price
12	16 □ 48	GX16 91 U 35.00
15	20 □ 48	GX20 91 U 39.00
32	32 □ 65	GX32 91 U 51.00
40	40 □ 65	GX40 91 U 58.00

Three-pole – 2 wafers – scheme 10.

Rated current AC1	Front plate size	Price
12	16 □ 48	GX16 10 U 41.00
15	20 □ 48	GX20 10 U 46.00
32	32 □ 65	GX32 10 U 61.00
40	40 □ 65	GX40 10 U 69.00

Four-pole – 2 wafers – scheme 92.

Rated current AC1	Front plate size	Price
12	16 □ 48	GX16 92 U 47.00
15	20 □ 48	GX20 92 U 52.00
32	32 □ 65	GX32 92 U 71.00
40	40 □ 65	GX40 92 U 78.00

Front plate sizes
 48x48mm = 1.9x1.9in
 65x65mm = 2.6x2.6in
 90x90mm = 3.5x3.5in

General characteristics

- 16 to 40A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual-breaking contacts
- IP40 front degree of protection (for IP65, see "Optional" below); IP20 protection of contacts
- Operating temperature: -13° to +131°F (-25° to +55°C)
- Legend marking is standard supplied as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications: cULus pending.
 Compliant to standards: IEC/EN 60947-3,
 IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horse power ratings

See page TC-30.

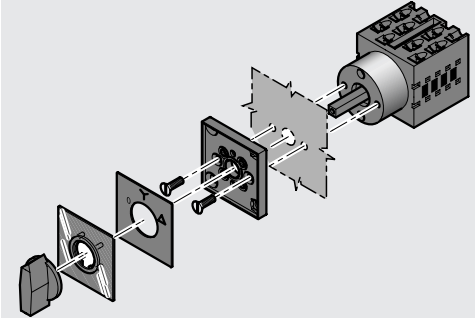
Optional

IP65 protection front plate:
 Add "51" at the end of the catalog number
 E.g. GX16 92 U 51.

Enlarged front plate for GX16-GX20 (65x65mm instead of standard 48x48):
 Add "H" after the switch rating in the order code
 E.g. GX16H 10 U.

Enlarged front plate for GX32-GX40 (90x90mm instead of standard 65x65):
 Add "H" after the switch rating in the catalog number
 E.g. GX32H 10 U.

Example of U version switch mounting



GX Series

**U version
front mounting.
Changeover switches
with 0 position.
Changeover switches
without 0 position**



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

CHANGEOVER SWITCHES WITH 0.

One-pole – 1 wafer – scheme 51.

12	16	□ 48		GX16 51 U	40.00
15	20	□ 48		GX20 51 U	44.00
32	32	□ 65		GX32 51 U	59.00
40	40	□ 65		GX40 51 U	70.00

Two-pole – 2 wafers – scheme 52.

12	16	□ 48		GX16 52 U	48.00
15	20	□ 48		GX20 52 U	51.00
32	32	□ 65		GX32 52 U	68.00
40	40	□ 65		GX40 52 U	81.00

Three-pole – 3 wafers – scheme 53.

12	16	□ 48		GX16 53 U	60.00
15	20	□ 48		GX20 53 U	65.00
32	32	□ 65		GX32 53 U	87.00
40	40	□ 65		GX40 53 U	104.00

Four-pole – 4 wafers – scheme 75.

12	16	□ 48		GX16 75 U	74.00
15	20	□ 48		GX20 75 U	79.00
32	32	□ 65		GX32 75 U	111.00
40	40	□ 65		GX40 75 U	116.00

CHANGEOVER SWITCHES WITHOUT 0.

One-pole – 1 wafer – scheme 54.

12	16	□ 48		GX16 54 U	39.00
15	20	□ 48		GX20 54 U	42.00
32	32	□ 65		GX32 54 U	57.00

Two-pole – 2 wafers – scheme 55.

12	16	□ 48		GX16 55 U	44.00
15	20	□ 48		GX20 55 U	49.00
32	32	□ 65		GX32 55 U	66.00

Three-pole – 3 wafers – scheme 56.

12	16	□ 48		GX16 56 U	59.00
15	20	□ 48		GX20 56 U	65.00
32	32	□ 65		GX32 56 U	87.00

Four-pole – 4 wafers – scheme 69.

12	16	□ 48		GX16 69 U	71.00
15	20	□ 48		GX20 69 U	77.00
32	32	□ 65		GX32 69 U	116.00

Front plate sizes
48x48mm = 1.9x1.9in
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in

General characteristics

- 16 to 40A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual-breaking contacts
- IP40 front degree of protection (for IP65, see "Optional" below); IP20 protection of contacts
- Operating temperature: -13° to +131°F (-25° to +55°C)
- Legend marking is standard supplied as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horse power ratings

See page TC-30.

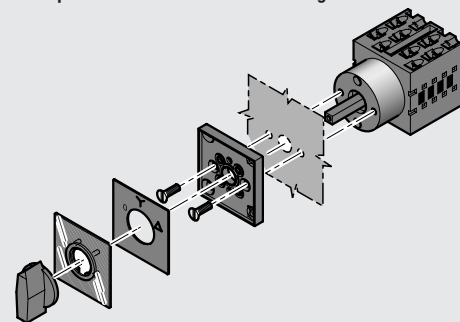
Optional

IP65 protection front plate:
Add "51" at the end of the catalog number
E.g. GX16 75 U 51.

Enlarged front plate for GX16-GX20 (65x65mm instead of standard 48x48):
Add "H" after the switch rating in the catalog number
E.g. GX16H 52 U.

Enlarged front plate for GX32-GX40 (90x90mm instead of standard 65x65):
Add "H" after the switch rating in the catalog number
E.g. GX32H 52 U.

Example of U version switch mounting



U version front mounting. Motor switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

MOTOR SWITCHES.

Reversing switches. Three-pole – 3 wafers – scheme 11.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 11 U	49.00
15	20	□ 48	GX20 11 U	58.00
32	32	□ 65	GX32 11 U	79.00
40	40	□ 65	GX40 11 U	88.00



Pole-changing switches. 4 wafers – scheme 13.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 13 U	70.00
15	20	□ 48	GX20 13 U	78.00
32	32	□ 65	GX32 13 U	110.00
40	40	□ 65	GX40 13 U	116.00



Wye-delta switches. 2 wafers – scheme 12.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 12 U	70.00
15	20	□ 48	GX20 12 U	78.00
32	32	□ 65	GX32 12 U	110.00
40	40	□ 65	GX40 12 U	116.00



3-pole motor reversing switches with spring return to 0.

3 wafers – scheme 26.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 26 U	52.00
15	20	□ 48	GX20 26 U	59.00
40	32	□ 65	GX32 26 U	80.00



See side table for UL horsepower ratings.

U version front mounting. Voltmeter switches. Ammeter switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

VOLTMETER SWITCHES.

Phase-Neutral L1-N/L2-N/L3-N – 2 wafers – scheme 68.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 88 U	51.00



Phase-Phase L1-L2/L2-L3/L3-L1 – 2 wafers – scheme 67.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 67 U	51.00



For 3 phase to phase voltage and 3 phase voltage readings

3 wafers – scheme 66.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 66 U	78.00



For 1 phase voltage and 3 phase to phase voltage readings

3 wafers – scheme 60.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 60 U	78.00



AMMETER SWITCHES.

Direct L1-L2-L3 current readings – 5 wafers – scheme 97.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 97 U	80.00



For L1-L2-L3 readings via 3 CTs – 3 wafers – scheme 98.

Rated current	Front plate size	Front plate size	Catalog number	Price
12	16	□ 48	GX16 98 U	62.00



Front plate sizes
 48x48mm = 1.9x1.9in
 65x65mm = 2.6x2.6in
 90x90mm = 3.5x3.5in

General characteristics

- 16 to 40A capacity for motor switches
- 16A capacity for voltmeter and ammeter switches
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual-breaking contacts
- IP40 front degree of protection (for IP65, see "Optional" below); IP20 contact degree of protection
- Operating temperature: -13° to +131°F (-25° to +55°C)
- Legend marking is standard supplied as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications: cULUS pending.
 Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide

See page TC-30.

Optional

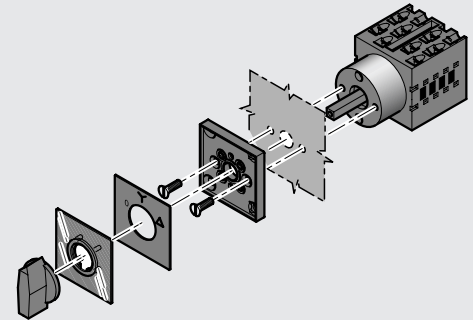
IP65 protection front plate: Add "51" at the end of the catalog number. E.g. GX16 11 U 51.

Enlarged front plate for GX16-GX20 (65x65mm instead of standard 48x48): Add "H" after the switch rating in the catalog number. E.g. GX16H 11 U.

Enlarged front plate for GX32-GX40 (90x90mm instead of standard 65x65): Add "H" after the switch rating in the catalog number. E.g. GX32H 11 U.





Type	UL horsepower ratings						Max AC23 power at 400V [kW]
	1 phase		3 phases				
	115V	230V	120V	240V	480V	600V	
GX16	3/4	1	1 1/2	3	5	5	6.5
GX20	3/4	1 1/2	1 1/2	3	5	5	7.5
GX32	1 1/2	3	3	7 1/2	15	15	15
GX40	2	5	5	10	15	15	18.5

Example of U version switch mounting







U11 version front mounting with handle operation, for central 22mm fixing. ON/OFF switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$
ON/OFF SWITCHES. One-pole – 1 wafer – scheme 90.				
12	16	none	 GX16 90 U11	60.00
Two-pole – 1 wafer – scheme 91.				
12	16	none	 GX16 91 U11	70.00
Three-pole – 2 wafers – scheme 10.				
12	16	none	 GX16 10 U11	80.00
Four-pole – 2 wafers – scheme 92.				
12	16	none	 GX16 92 U11	90.00



U12 version front mounting with key operation, for central 22mm fixing. ON/OFF switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$
ON/OFF SWITCHES. One-pole – 1 wafer – scheme 90.				
12	16	none	 GX16 90 U12	64.00
Two-pole – 1 wafer – scheme 91.				
12	16	none	 GX16 91 U12	74.00
Three-pole – 2 wafers – scheme 10.				
12	16	none	 GX16 10 U12	84.00
Four-pole – 2 wafers – scheme 92.				
12	16	none	 GX16 92 U12	94.00

U25-U65 versions front mounting with red/yellow padlock system. ON/OFF switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price	
[A]	[A]	[mm]		\$	
ON/OFF SWITCHES. Three-pole – 2 wafers – scheme 10.					
12	16	□ 48		GX16 10 U25	43.00
15	20	□ 48		GX20 10 U25	51.00
32	32	□ 65		GX32 10 U25	63.00
40	40	□ 65		GX40 10 U65	74.00
Four-pole – 2 wafers – scheme 92.					
12	16	□ 48		GX16 92 U25	49.00
15	20	□ 48		GX20 92 U25	56.00
32	32	□ 65		GX32 92 U25	73.00
40	40	□ 65		GX40 92 U65	80.00

Front plate sizes
48x48mm = 1.9x1.9in
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in

General characteristics

- 16 to 40A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual-breaking contacts
- IP40 front degree of protection (for IP65, see "Optional" below); IP20 protection of contacts
- Operating temperature: -13° to +131°F (-25° to +55°C)
- Legend marking for U11 and U12 versions is only for reference while for U25 and U65 types standard supplied as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horsepower ratings

See page TC-30.

Optional

IP65 protection front plate:
Add "51" at the end of the catalog number
E.g. GX16 92 U11 51.

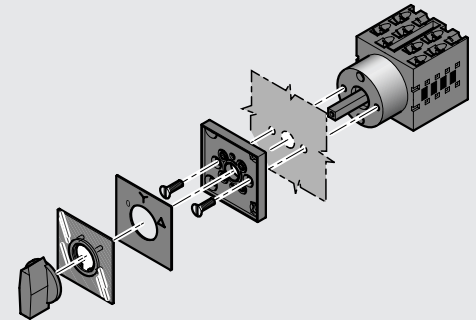
Enlarged front plate for GX16-GX20 (65x65mm instead of standard 48x48):

Add "H" after the switch rating in the catalog number
E.g. GX16H 10 U25.

Enlarged front plate for GX32-GX40 (90x90mm instead of standard 65x65):

Add "H" after the switch rating in the catalog number
E.g. GX32H 10 U25.

Example of U25-U65 switch mounting




**088 - 098 versions
door coupling with
red/yellow padlock
system.
ON/OFF switches**




General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.**Three-pole – 2 wafers – scheme 10.**

12	16	□ 48		GX16 10 088	64.00
15	20	□ 48		GX20 10 088	72.00
32	32	□ 65		GX32 10 088	82.00
40	40	□ 65		GX40 10 088	104.00

Four-pole – 2 wafers – scheme 92.

12	16	□ 48		GX16 92 088	68.00
15	20	□ 48		GX20 92 088	75.00
32	32	□ 65		GX32 92 088	90.00
40	40	□ 65		GX40 92 098	116.00


Front plate sizes
48x48mm = 1.9x1.9in
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in

**068 - 078 versions
door coupling.
ON/OFF switches**




General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.**Three-pole – 2 wafers – scheme 10.**

12	16	□ 48		GX16 10 068	62.00
15	20	□ 48		GX20 10 068	67.00
32	32	□ 65		GX32 10 068	80.00
40	40	□ 65		GX40 10 078	99.00

Four-pole – 2 wafers – scheme 92.

12	16	□ 48		GX16 92 068	66.00
15	20	□ 48		GX20 92 068	72.00
32	32	□ 65		GX32 92 068	85.00
40	40	□ 65		GX40 92 078	114.00

Front plate sizes
48x48mm = 1.9x1.9in
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in

General characteristics

- 16 to 40A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual-breaking contacts
- IP40 front degree of protection (for IP65, see "Optional" below); IP20 contact degree of protection
- Operating temperature: -13° to +131°F (-25° to +55°C)
- Suitable for screw fixing or mounting on 35mm DIN rail (EN 50022)
- Self alignment feature
- Legend marking is standard supplied as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-3,
IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horsepower ratings

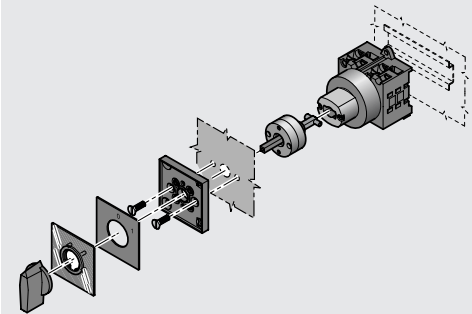
See page TC-30.

Optional

IP65 protection front plate:
Add "51" at the end of the catalog number
E.g. GX16 10 088 51.

Enlarged front plate for GX16-GX20 (65x65mm instead of standard 48x48):
Add "H" after the switch rating in the catalog number
E.g. GX16H 10 088.

Enlarged front plate for GX32-GX40 (90x90mm instead of standard 65x65):
Add "H" after the switch rating in the catalog number
E.g. GX32H 10 088.

Example of 0 version switch mounting

GX Series

P version in enclosure with rotating handle. On/Off switches. Double-throw switches



General purpose	Rated current AC1	Type size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.

Three poles - scheme 10.

Rated current AC1	Type size	Catalog number	Price
12	90x90	GX16 10 P	117.00
15	90x90	GX20 10 P	124.00
32	110x110	GX32 10 P	136.00
40	110x110	GX40 10 P	144.00



Four poles - scheme 92.

Rated current AC1	Type size	Catalog number	Price
12	90x90	GX16 92 P	128.00
15	90x90	GX20 92 P	132.00
32	110x110	GX32 92 P	150.00
40	110x110	GX40 92 P	161.00



DOUBLE-THROW SWITCHES.

Three poles - scheme 53.

Rated current AC1	Type size	Catalog number	Price
12	90x90	GX16 53 P	138.00
15	90x90	GX20 53 P	142.00
32	110x110	GX32 53 P	167.00
40	110x110	GX40 53 P	178.00



Four poles - scheme 75.

Rated current AC1	Type size	Catalog number	Price
12	90x90	GX16 75 P	146.00
15	90x90	GX20 75 P	149.00
32	110x110	GX32 75 P	179.00
40	110x110	GX40 75 P	193.00



P version in enclosure with rotating handle. Motor switches



General purpose	Rated current AC1	Type size	Catalog number	Price
[A]	[A]	[mm]		\$

MOTOR SWITCHES.

Three-pole reversing switches - scheme 11.

Rated current AC1	Type size	Catalog number	Price
12	90x90	GX16 11 P	136.00
15	90x90	GX20 11 P	145.00
32	110x110	GX32 11 P	166.00
40	110x110	GX40 11 P	175.00



① See side table for UL horsepower ratings.

P version in enclosure with padlockable rotating handle. On/Off switches



General purpose	Rated current AC1	Type size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.

Three poles - scheme 10.

Rated current AC1	Type size	Catalog number	Price
12	90x90	GX16 10 P25	124.00
15	90x90	GX20 10 P25	130.00
32	110x110	GX32 10 P25	145.00



Four poles - scheme 92.

Rated current AC1	Type size	Catalog number	Price
12	90x90	GX16 92 P25	132.00
15	90x90	GX20 92 P25	144.00
32	110x110	GX32 92 P25	162.00



Enclosure type sizes
90x90mm = 3.5x3.5in
110x110mm = 4.3x4.3in

General characteristics

- 16 to 40A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual-breaking contacts
- IP65 degree of protection
- Operating temperature: -13° to +131°F (-25° to +55°C)
- Top and bottom entry: 4 PG16 threaded knockouts for 90x90mm types and 4 PG21 for 110x110mm; metric entry available on request
- Legend marking is standard supplied as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications: cULus pending.
Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide

See page TC-30.

Type	UL horsepower ratings						Max AC23 power at 440V [kW]
	1 phase		3 phases				
	115V	230V	120V	240V	480V	600V	
GX16	³ / ₄	1	1½	3	5	5	6.5
GX20	³ / ₄	1½	1½	3	5	5	7.5
GX32	1½	3	3	7½	15	15	15
GX40	2	5	5	10	15	15	18.5

U version front mounting. On/Off switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.

One pole - 1 wafer - scheme 90.

10	15	20	32	35	55	Front plate size [mm]	Catalog number	Price
12	20	25	32	40	63	48	7 GN12 90 U	30.00
						48	7 GN20 90 U	34.00
						48	7 GN25 90 U	39.00
						65	7 GN32 90 U	45.00
						65	7 GN40 90 U	51.00
						65	7 GN63 90 U	68.00

2 poles - 1 wafer - scheme 91.

10	15	20	32	35	55	Front plate size [mm]	Catalog number	Price
12	20	25	32	40	63	48	7 GN12 91 U	35.00
						48	7 GN20 91 U	39.00
						48	7 GN25 91 U	45.00
						65	7 GN32 91 U	51.00
						65	7 GN40 91 U	58.00
						65	7 GN63 91 U	74.00

3 poles - 2 wafers - scheme 10.

10	15	20	32	35	55	100	Front plate size [mm]	Catalog number	Price
12	20	25	32	40	63	90	48	7 GN12 10 U	41.00
							48	7 GN20 10 U	46.00
							48	7 GN25 10 U	53.00
							65	7 GN32 10 U	61.00
							65	7 GN40 10 U	69.00
							65	7 GN63 10 U	97.00
							90	7 GN125 10 U	293.00

4 poles - 2 wafers - scheme 92.

10	15	20	22	35	55	100	Front plate size [mm]	Catalog number	Price
12	20	25	32	40	63	90	48	7 GN12 92 U	47.00
							48	7 GN20 92 U	52.00
							48	7 GN25 92 U	61.00
							65	7 GN32 92 U	71.00
							65	7 GN40 92 U	78.00
							65	7 GN63 92 U	109.00
							90	7 GN125 92 U	313.00

Front plate sizes
 48x48mm = 1.9x1.9in
 65x65mm = 2.6x2.6in
 90x90mm = 3.5x3.5in

General characteristics

- 12 to 125A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- Open type
- IP40 front degree of protection (for IP65 see Optional-front plate), IP00 (contacts)
- Operating temperature: -13 to +131°F (-25 to +55°C)
- Legend marking is per standard supplied, as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications obtained:

Type	cCSAus	KEMA	VDE	LROS	CRS	EZU	UL	BV
GN12	●	●	●	—	●	●	●	●
GN20	●	●	●	●	●	●	●	●
GN25	●	●	●	●	●	●	●	●
GN32	●	●	●	●	●	●	●	●
GN40	●	●	●	—	—	●	●	●
GN63	●	●	●	●	●	●	●	●
GN125	●	—	—	—	—	●	●	●

● = Certified products.

UL listed, File E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horsepower ratings

See page TC-31.

Optional

IP65 front plate

Add "51" at the end of the catalog number.

E.g. 7 GN12 92 U 51.

Enlarged plate for GN12-20-25 (65x65 instead of 48x48)

Add the letter "H" after the switch size of the catalog

number.

E.g. 7 GN12H 10 U.

Enlarged plate for GN32-40-63 (90x90 instead of 65x65)

Add the letter "H" after the switch size of the catalog

number.

E.g. 7 GN32H 10 U.

Special versions

In addition to standard types, particular versions are

available with special operating circuit diagrams.

Contact Sales & Technical Support.

GN Series

U version, front mounting. Double-throw switch with or without 0 (OFF)



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

DOUBLE-THROW SWITCH WITH 0 (OFF).

1 pole - 1 wafer - scheme 51.

10	12	□ 48		7 GN12 51 U	38.00
15	20	□ 48		7 GN20 51 U	44.00
20	25	□ 48		7 GN25 51 U	50.00
32	32	□ 65		7 GN32 51 U	59.00
35	40	□ 65		7 GN40 51 U	70.00
55	63	□ 65		7 GN63 51 U	98.00

2 poles - 2 wafers - circuit diagram 52.

10	12	□ 48		7 GN12 52 U	46.00
15	20	□ 48		7 GN20 52 U	51.00
20	25	□ 48		7 GN25 52 U	59.00
32	32	□ 65		7 GN32 52 U	68.00
35	40	□ 65		7 GN40 52 U	81.00
55	63	□ 65		7 GN63 52 U	112.00
100	125	□ 90		7 GN125 52 U	323.00

3 poles - 3 wafers - circuit diagram 53.

10	12	□ 48		7 GN12 53 U	58.00
15	20	□ 48		7 GN20 53 U	65.00
20	25	□ 48		7 GN25 53 U	76.00
32	32	□ 65		7 GN32 53 U	87.00
35	40	□ 65		7 GN40 53 U	104.00
55	63	□ 65		7 GN63 53 U	154.00
100	125	□ 90		7 GN125 53 U	346.00

4 poles - 4 wafers - circuit diagram 75.

10	12	□ 48		7 GN12 75 U	72.00
15	20	□ 48		7 GN20 75 U	79.00
20	25	□ 48		7 GN25 75 U	95.00
32	32	□ 65		7 GN32 75 U	111.00
35	40	□ 65		7 GN40 75 U	116.00
55	63	□ 65		7 GN63 75 U	190.00
100	125	□ 90		7 GN125 75 U	391.00

DOUBLE-THROW SWITCH WITHOUT 0 (OFF).

1 pole - 1 wafers - scheme 54.

10	12	□ 48		7 GN12 54 U	37.00
15	20	□ 48		7 GN20 54 U	42.00
20	25	□ 48		7 GN25 54 U	57.00

2 poles - 2 wafers - circuit diagram 55.

10	12	□ 48		7 GN12 55 U	42.00
15	20	□ 48		7 GN20 55 U	49.00
20	25	□ 48		7 GN25 55 U	59.00

3 poles - 3 wafers - circuit diagram 56.

10	12	□ 48		7 GN12 56 U	57.00
15	20	□ 48		7 GN20 56 U	65.00
20	25	□ 48		7 GN25 56 U	76.00

4 poles - 4 wafers - circuit diagram 69.

10	12	□ 48		7 GN12 69 U	69.00
15	20	□ 48		7 GN20 69 U	77.00
20	25	□ 48		7 GN25 69 U	91.00

Front plate sizes

48x48mm = 1.9x1.9in

65x65mm = 2.6x2.6in

90x90mm = 3.5x3.5in

Legend marking is per standard supplied, as illustrated.

General characteristics

- 12 to 125A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- Open type
- IP40 front degree of protection (for IP65 see Optional-front plate), IP00 (contacts)
- Operating temperature: -13 to +131°F (-25 to +55°C)
- Legend marking is per standard supplied, as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications obtained:

Type	cCSAus	KEMA	VDE	LROS	CRS	EZU	UL	BV
GN12	●	●	●	—	●	●	●	●
GN20	●	●	●	●	●	●	●	●
GN25	●	●	●	●	●	●	●	●
GN32	●	●	●	●	●	●	●	●
GN40	●	●	●	—	—	●	●	●
GN63	●	●	●	●	●	●	●	●
GN125	●	—	—	—	—	●	●	●

● = Certified products.

UL listed, File E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3,

IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horsepower ratings

See page TC-31.

Optional

IP65 front plate

Add "51" at the end of the catalog number.

E.g. 7 GN12 52 U 51.

Enlarged plate for GN12-20-25 (65x65 instead of 48x48)

Add the letter "H" after the switch size of the catalog

number.

E.g. 7 GN12H 52 U.

Enlarged plate for GN32-40-63 (90x90 instead of 65x65)

Add the letter "H" after the switch size of the catalog

number.

E.g. 7 GN32H 52 U.

Special versions

In addition to standard types, particular versions are

available with special operating circuit schemes.

Contact Sales & Technical Support.

U version front mounting. Motor switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

MOTOR SWITCHES

3-pole reversing switches - 3 wafers - scheme 11.

10	15	20	32	35	55	100	Front plate size [mm]	Catalog number	Price
12	20	25	32	40	63	125	48	7 GN12 11 U	49.00
							48	7 GN20 11 U	58.00
							48	7 GN25 11 U	69.00
							65	7 GN32 11 U	79.00
							65	7 GN40 11 U	88.00
							65	7 GN63 11 U	132.00
							90	7 GN125 11 U	334.00



Pole changing switches - 4 wafers - scheme 13.

10	15	20	32	35	55	100	Front plate size [mm]	Catalog number	Price
12	20	25	32	40	63	125	48	7 GN12 13 U	70.00
							48	7 GN20 13 U	78.00
							48	7 GN25 13 U	95.00
							65	7 GN32 13 U	110.00
							65	7 GN40 13 U	116.00
							65	7 GN63 13 U	187.00
							90	7 GN125 13 U	392.00



Wye-delta switches - 4 wafers - scheme 12.

10	15	20	32	35	55	100	Front plate size [mm]	Catalog number	Price
12	20	25	32	40	63	125	48	7 GN12 12 U	70.00
							48	7 GN20 12 U	78.00
							48	7 GN25 12 U	95.00
							65	7 GN32 12 U	110.00
							65	7 GN40 12 U	116.00
							65	7 GN63 12 U	187.00
							90	7 GN125 12 U	392.00



3-pole reversing switches with spring return to 0 3 wafers - scheme 26.

10	15	20	Front plate size [mm]	Catalog number	Price
12	20	25	48	7 GN12 26 U	52.00
			48	7 GN20 26 U	59.00
			48	7 GN25 26 U	72.00



Pole changing switches with reversing (Dahlander) 6 wafers - scheme 20.

10	15	20	Front plate size [mm]	Catalog number	Price
12	20	25	48	7 GN12 20 U	88.00
			48	7 GN20 20 U	102.00
			48	7 GN25 20 U	128.00



Front plate sizes
48x48mm = 1.9x1.9in
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in

● See side table for UL horsepower ratings.

General characteristics

- 12 to 125A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- Open type
- IP40 front degree of protection (for IP65 see Optional-front plate), IP00 (contacts)
- Operating temperature: -13 to +131°F (-25 to +55°C)
- Legend marking is per standard supplied, as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications:

Type	cCSAus	KEMA	VDE	LROS	CRS	EZU	UL	BV
GN12	●	●	●	—	●	●	●	●
GN20	●	●	●	●	●	●	●	●
GN25	●	●	●	●	●	●	●	●
GN32	●	●	●	●	●	●	●	●
GN40	●	●	●	—	—	●	●	●
GN63	●	●	●	●	●	●	●	●
GN125	●	—	—	—	—	●	●	●

● = Certified products.

UL listed, File E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide

See page TC-31.

Optional

IP65 front plate

Add "51" at the end of the catalog number.

E.g. 7 GN12 11 U 51.

Enlarged plate for GN12-20-25 (65x65 instead of 48x48)

Add the letter "H" after the switch size of the catalog number.

E.g. 7 GN12H 11 U.

Enlarged plate for GN32-40-63 (90x90 instead of 65x65)

Add the letter "H" after the switch size of the catalog number.

E.g. 7 GN32H 11 U.

Special versions

In addition to standard types, particular versions are available with special operating schemes.

Contact Sales & Technical Support.

Type	UL horsepower ratings						Max AC23 power at 440V [kW]
	1 phase		3 phases				
	115V	230V	120V	240V	480V	600V	
GN12	3/4	1	1 1/2	3	—	—	6
GN20	3/4	2	1 1/2	3	—	—	7.5
GN25	1 1/2	3	3	5	10	10	11
GN32	2	5	5	10	15	15	15
GN40	2	5	5	10	20	20	18.5
GN63	5	10	7 1/2	15	25	25	30
GN125	7 1/2	15	15	25	50	40	45

U version, front mounting.
Voltmeter switches.
Ammeter switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

VOLTMETER SWITCHES.

Phase-Neutral L1-N/L2-N/L3-N

2 wafers - scheme 68.

10	12	□ 48		7 GN12 68 U	46.00
15	20	□ 48		7 GN20 68 U	51.00

Phase-Phase L1-L2/L2-L3/L3-L1 -

2 wafers - scheme 67.

10	12	□ 48		7 GN12 67 U	46.00
15	20	□ 48		7 GN20 67 U	51.00

For 3 phase to phase voltages and 3 phase voltages

3 wafers - scheme 66.

10	12	□ 48		7 GN12 66 U	71.00
15	20	□ 48		7 GN20 66 U	78.00

For 1 phase voltage and 3 phase to phase voltages

3 wafers - scheme 60.

10	12	□ 48		7 GN12 60 U	71.00
15	20	□ 48		7 GN20 60 U	78.00

AMMETER SWITCHES.

Direct L1-L2-L3 reading - 5 wafers - scheme 97.

10	12	□ 48		7 GN12 97 U	73.00
15	20	□ 48		7 GN20 97 U	80.00

L1-L2-L3 reading via 3 current transformers -

3 wafers - scheme 98.

10	12	□ 48		7 GN12 98 U	55.00
15	20	□ 48		7 GN20 98 U	62.00

Front plate sizes
48x48mm = 1.9x1.9in
65x65mm = 2.6x2.6in

General characteristics

- 12 and 20A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- Open type
- IP40 front degree of protection (for IP65 see Optional-front plate), IP00 (contacts)
- Operating temperature: -13 to +131°F (-25 to +55°C)
- Legend marking is per standard supplied, as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications obtained:

Type	cCSAus	KEMA	VDE	LROS	CRS	EZU	UL	BV
GN12	●	●	●	—	●	●	●	●
GN20	●	●	●	●	●	●	●	●

● = Certified products.

UL listed, File E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3,

IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide

See page TC-31.

Optional

IP65 front plate

Add "51" at the end of the catalog number.

E.g. 7 GN12 67 U 51.

Enlarged plate for GN12-20-25 (65x65 instead of 48x48)

Add the letter "H" after the switch size of the catalog number.

E.g. 7 GN20H 68 U.

Special versions

In addition to standard types, particular versions are

available with special operating schemes.

Contact Sales & Technical Support.

U11 version front mounting with handle operation for 22mm central fixing. On/Off switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$
ON/OFF SWITCHES. One pole - 1 wafer - scheme 90.				
10	12	none		7 GN12 90 U11 58.00
15	20	none		7 GN20 90 U11 65.00
Two poles - 1 wafer - scheme 91.				
10	12	none		7 GN12 91 U11 68.00
15	20	none		7 GN20 91 U11 75.00
Three poles - 2 wafers - scheme 10.				
10	12	none		7 GN12 10 U11 78.00
15	20	none		7 GN20 10 U11 85.00
Four poles - 2 wafers - scheme 92.				
10	12	none		7 GN12 92 U11 88.00
15	20	none		7 GN20 92 U11 95.00

U12 version front mounting with key operation for central fixing Ø22. On/Off switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$
ON/OFF SWITCHES. One pole - 1 wafer - circuit diagram 90.				
10	12	none		7 GN12 90 U12 62.00
15	20	none		7 GN20 90 U12 69.00
Two poles - 1 wafer - circuit diagram 91.				
10	12	none		7 GN12 91 U12 72.00
15	20	none		7 GN20 91 U12 79.00
Three poles - 2 wafers - circuit diagram 10.				
10	12	none		7 GN12 10 U12 82.00
15	20	none		7 GN20 10 U12 89.00
Four poles - 2 wafers - circuit diagram 92.				
10	12	none		7 GN12 92 U12 92.00
15	20	none		7 GN20 92 U12 99.00

U25-U65 version front mounting with padlock system, red/yellow. On/Off switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$
ON/OFF SWITCHES. Three poles - 2 wafers - scheme 10.				
10	12	□ 65		7 GN12 10 U25 41.00
15	20	□ 65		7 GN20 10 U25 51.00
20	25	□ 65		7 GN25 10 U25 56.00
32	32	□ 65		7 GN32 10 U25 63.00
35	40	□ 65		7 GN40 10 U65 74.00
55	63	□ 65		7 GN63 10 U65 103.00
100	125	□ 90	7 GN125 10 U65 300.00	
Four poles - 2 wafers - scheme 92.				
10	12	□ 65		7 GN12 92 U25 47.00
15	20	□ 65		7 GN20 92 U25 55.00
20	25	□ 65		7 GN25 92 U25 65.00
32	32	□ 65		7 GN32 92 U25 73.00
35	40	□ 65		7 GN40 92 U65 80.00
55	63	□ 65		7 GN63 92 U65 116.00
100	125	□ 90		7 GN125 92 U65 320.00

Front plate sizes
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in

General characteristics

- 12 to 125A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- IP40 front degree of protection (for IP65 see Optional-front plate), IP00 (contacts) and IP20 (incoming contacts for U25 and U65 only)
- Operating temperature: -13 to +131°F (-25 to +55°C)
- Legend marking for U11 and U12 versions is only for reference while for U25 and U65 types standard supplied as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications obtained:

Type	cCSAus	KEMA	VDE	LROS	CRS	EZU	UL	BV
GN12	●	●	●	—	●	●	●	●
GN20	●	●	●	●	●	●	●	●
GN25	●	●	●	●	●	●	●	●
GN32	●	●	●	●	●	●	●	●
GN40	●	●	●	—	—	●	●	●
GN63	●	●	●	●	●	●	●	●
GN125	●	—	—	—	—	—	●	●

● = Certified products.

UL listed, File E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and horsepower ratings

See page TC-31.

Optional

IP65 front plate

Add "51" at the end of the catalog number.

E.g. 7 GN12 92 U25 51.

Enlarged plate for GN32-40-63 (90x90 instead of 65x65)

Add the letter "H" after the switch size of the catalog number.

E.g. 7 GN32H 10 U25.

Special versions

In addition to standard types, particular versions are available with special operating circuit schemes.


088-098-099 version, base mounting, door-coupling and padlock system, red/yellow. On/Off switches (without extension shaft)




General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.

3 poles - 2 wafers - scheme 10.

10	12	□ 65		7 GN12 10 088	64.00
15	20	□ 65		7 GN20 10 088	72.00
20	25	□ 65		7 GN25 10 088	79.00
32	32	□ 65		7 GN32 10 088	82.00
35	40	□ 65		7 GN40 10 098	104.00
55	63	□ 65		7 GN63 10 098	141.00
100	125	□ 90		7 GN125 10 099	346.00

4 poles - 2 wafers - scheme 92.

10	12	□ 65		7 GN12 92 088	68.00
15	20	□ 65		7 GN20 92 088	75.00
20	25	□ 65		7 GN25 92 088	82.00
32	32	□ 65		7 GN32 92 088	90.00
35	40	□ 65		7 GN40 92 098	116.00
55	63	□ 65		7 GN63 92 098	150.00
100	125	□ 90		7 GN125 92 099	387.00

Front plate sizes
45x45mm = 1.9x1.9in
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in


068-078-079 version, base mounting, door-coupling system. On/Off switches (without extension shaft)




General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.

3 poles - 2 wafers - scheme 10.

10	12	□ 48		7 GN12 10 068	62.00
15	20	□ 48		7 GN20 10 068	67.00
20	25	□ 48		7 GN25 10 068	75.00
32	32	□ 65		7 GN32 10 068	80.00
35	40	□ 65		7 GN40 10 078	99.00
55	63	□ 65		7 GN63 10 078	135.00
100	125	□ 90		7 GN125 10 079	351.00

4 poles - 2 wafers - scheme 92.

10	12	□ 48		7 GN12 92 068	66.00
15	20	□ 48		7 GN20 92 068	72.00
20	25	□ 48		7 GN25 92 068	79.00
32	32	□ 65		7 GN32 92 068	85.00
35	40	□ 65		7 GN40 92 078	114.00
55	63	□ 65		7 GN63 92 078	148.00
100	125	□ 90		7 GN125 92 079	382.00

Front plate sizes
45x45mm = 1.9x1.9in
65x65mm = 2.6x2.6in
90x90mm = 3.5x3.5in

General characteristics

- 12 to 125A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- Open type
- IP40 front degree of protection (for IP65 see Optional-front plate), IP20 (incoming contacts only)
- Operating temperature: -13 to +131°F (-25 to +55°C)
- Self alignment feature
- Legend marking is per standard supplied, as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications obtained:

Type	ccSAus	KEMA	VDE	LROS	CRS	EZU	UL	BV
GN12	●	●	●	—	●	●	●	●
GN20	●	●	●	●	●	●	●	●
GN25	●	●	●	●	●	●	●	●
GN32	●	●	●	●	●	●	●	●
GN40	●	●	●	—	—	●	●	●
GN63	●	●	●	●	●	●	●	●
GN125	●	—	—	—	—	●	●	●

● = Certified products.

UL listed, file E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horsepower ratings

See page TC-31.

Optional

IP65 front plate

Add "51" at the end of the catalog number.

E.g. 7 GN12 92 068 51.

Fixing plate for DIN 35mm rail (EN 50022)

Add "18" at the end of the catalog number.

E.g. 7 GN25 10 068 18.

Enlarged plate for GN12-20-25 (65x65 instead of 48x48)

Add the letter "H" after the switch size of the catalog number.

E.g. 7 GN12H 10 068.

Enlarged plate for GN32-40-63 (90x90 instead of 65x65)

Add the letter "H" after the switch size of the catalog number.

E.g. 7 GN32H 10 068.

Special versions

In addition to standard types, particular versions are available with special operating schemes.

Contact Sales & Technical Support.


P version, enclosed On/Off switches. Double-throw switches




General purpose	Rated current AC1	Type size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES.

Three poles - scheme 10.


10	12	65x65		7 GN12 10 P	115.00
15	20	75x75		7 GN20 10 P	124.00
20	25	75x75		7 GN25 10 P	130.00
32	32	90x90		7 GN32 10 P	136.00
35	40	90x90		7 GN40 10 P	144.00
55	63	110x110		7 GN63 10 P	212.00

Four poles - scheme 92.


10	12	65x65		7 GN12 92 P	126.00
15	20	75x75		7 GN20 92 P	132.00
20	25	75x75		7 GN25 92 P	142.00
32	32	90x90		7 GN32 92 P	150.00
35	40	90x90		7 GN40 92 P	161.00
55	63	110x110		7 GN63 92 P	232.00

DOUBLE-THROW SWITCHES.


One pole - scheme 51.

10	12	65x65		7 GN12 51 P	120.00
15	20	75x75		7 GN20 51 P	126.00
20	25	75x75		7 GN25 51 P	132.00
32	32	90x90		7 GN32 51 P	140.00
35	40	90x90		7 GN40 51 P	146.00
55	63	110x110		7 GN63 51 P	221.00


Two poles - scheme 52.

10	12	65x65		7 GN12 52 P	128.00
15	20	75x75		7 GN20 52 P	133.00
20	25	75x75		7 GN25 52 P	142.00
32	32	90x90		7 GN32 52 P	153.00
35	40	90x90		7 GN40 52 P	162.00
55	63	110x110		7 GN63 52 P	241.00

Three poles - scheme 53.

10	12	65x65		7 GN12 53 P	136.00
15	20	75x75		7 GN20 53 P	142.00
20	25	75x75		7 GN25 53 P	152.00
32	32	90x90		7 GN32 53 P	167.00
35	40	110x110		7 GN40 53 P	178.00
55	63	110x110		7 GN63 53 P	253.00

Four poles - scheme 75.

10	12	65x65		7 GN12 75 P	144.00
15	20	75x75		7 GN20 75 P	149.00
20	25	90x90		7 GN25 75 P	165.00
32	32	90x90		7 GN32 75 P	179.00
35	40	110x110		7 GN40 75 P	193.00
55	63	110x110		7 GN63 75 P	275.00

Enclosure type sizes
 65x65mm = 2.6x2.6in
 75x75mm = 3x3in
 90x90mm = 3.5x3.5in
 110x110mm = 4.3x4.3in

General characteristics

- 12 to 63A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- Enclosed type
- IP65 degree of protection (IP54 for GN12 only)
- Operating temperature: -13 to +131°F (-25 to +55°C)
- PG21 entry; NPT adapter is given on page 8-19; metric entry available on request
- Legend marking is per standard supplied, as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications obtained:

Type	cCSAus	KEMA	VDE	LR0S	CRS	EZU	UL	BV
GN12	●	●	●	—	●	●	●	●
GN20	●	●	●	●	●	●	●	●
GN25	●	●	●	●	●	●	●	●
GN32	●	●	●	●	●	●	●	●
GN40	●	●	●	—	—	●	●	●
GN63	●	●	●	●	●	●	●	●

● = Certified products.

UL listed, File E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide and UL horsepower ratings

See page TC-31.

Special versions

In addition to standard types, particular versions are available with special operating schemes. Contact Sales & Technical Support.

P with rotating handle version in enclosure. Motor switches



General purpose	Rated current AC1	Front plate size	Catalog number	Price
[A]	[A]	[mm]		\$

MOTOR SWITCHES

Three-pole reversing switches - circuit scheme 11.

Rated current AC1	Front plate size	Catalog number	Price
10	65x65	7 GN12 11 P	134.00
15	75x75	7 GN20 11 P	145.00
20	75x75	7 GN25 11 P	156.00
32	90x90	7 GN32 11 P	166.00
35	110x110	7 GN40 11 P	176.00
55	110x110	7 GN63 11 P	220.00



See side table for UL horsepower ratings.

P25 version in enclosure with padlock system. On/Off switches



General purpose	Rated current AC1	Type size	Catalog number	Price
[A]	[A]	[mm]		\$

ON/OFF SWITCHES

Three poles - scheme 10.

Rated current AC1	Type size	Catalog number	Price
15	90x90	7 GN20 10 P25	130.00
20	90x90	7 GN25 10 P25	139.00
32	90x90	7 GN32 10 P25	145.00



Four poles - scheme 92.

Rated current AC1	Type size	Catalog number	Price
15	90x90	7 GN20 92 P25	136.00
20	90x90	7 GN25 92 P25	148.00
32	90x90	7 GN32 92 P25	156.00



Enclosure type size:
65x65mm = 2.6x2.6in
75x75mm = 3x3in
90x90mm = 3.5x3.5in
110x110mm = 4.3x4.3in

General characteristics

- 12 to 32A capacity
- Extended mechanical and electrical life
- Switching angles: 30°, 45°, 60° and 90°
- Silver-alloy dual breaking contacts
- Enclosed type
- IP65 degree of protection
- Operating temperature: -13 to +131°F (-25 to +55°C)
- PG21 entry; NPT adapter is given on page 8-19; metric entry available on request
- Legend marking is per standard supplied, as illustrated in the catalog number table; any other on request.

Certifications and compliance

Certifications obtained:

Type	cCSAus	KEMA	VDE	LROS	CRS	EZU	UL	BV
GN20	●	●	●	●	●	●	●	●
GN25	●	●	●	●	●	●	●	●
GN32	●	●	●	●	●	●	—	●

● = Certified products.

UL listed, File E 155982.

CSA certified for Canada and USA, File LR 207767.

Compliant with standards: IEC/EN 60947-3, IEC/EN 60204-1, IEC/EN 61058-1.

Selection guide

See page TC-31.

Special versions

In addition to standard types, particular versions are available with special operating schemes. Contact Sales & Technical Support.

Type	UL horsepower ratings						Max AC23 power at 440V [kW]
	1 phase		3 phases				
	115V	230V	120V	240V	480V	600V	
GN12	³ / ₄	1	1 ¹ / ₂	3	—	—	6
GN20	³ / ₄	2	1 ¹ / ₂	3	—	—	7.5
GN25	1 ¹ / ₂	3	3	5	10	10	11
GN32	2	5	5	10	15	15	15
GN40	2	5	5	10	20	20	18.5
GN63	5	10	7 ¹ / ₂	15	25	25	30
GN125	7 ¹ / ₂	15	15	25	50	40	45



7 A014 - 7 AR114 - 7 AR214



7 AR124 - 7 AR224



7 APRBP



GX M1 - GX M2



GX M5 - GX M6



GX A01 - GX A01H - GX A11

Description	Catalog number	Price
		\$

Black operating handle ❶.

For 48x48mm front plate	7 A014	2.10
For 65x65mm front plate	7 AR114	4.20
For 90x90mm front plate	7 AR214	5.50

Black operating lever ❶.

For 65x65mm front plate	7 AR124	5.50
For 90x90mm front plate	7 AR224	8.00

Adjustable door-coupling extension shaft, 70mm (2.8in) long maximum ❶.

For GX16 to GX40	7 APRBP	5.50
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IP40 face plates ❶.

48x48mm blank face plate	GX M1	3.00
65x65mm blank face plate	GX M2	4.50

IP40 face plates with legend plates.

48x48mm blank face plate with legend plate	GX M5	4.60
65x65mm blank face plate with legend plate	GX M6	4.60

Padlockable handles ❶.

48x48mm yellow/red padlockable handle for GN12-GN20-GN25	GX A01	10.30
65x65mm yellow/red padlockable handle for GN12-GN20-GN25	GX A01H	12.20
65x65mm yellow/red padlockable handle for GN32-GN40-GN63	GX A11	12.20

PG adapter for enclosure entries ❶.

Metal, for PG11 to 1/2" NPT	G611	2.50
Metal, for PG16 to 1/2" NPT	G616	3.00
Metal, for PG21 to 1/2" NPT	G621	3.00
Plastic, for PG11 to 1/2" NPT	G612	1.50
Plastic, for PG16 to 1/2" NPT	G617	n.a.
Plastic, for PG21 to 1/2" NPT	G622	n.a.

For operating handle or lever, plate dimension:

45x45mm = 1.9x1.9in

65x65mm = 2.6x2.6in

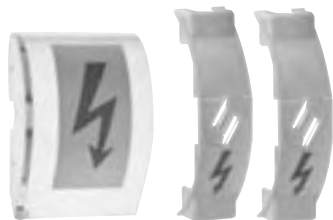
90x90mm = 3.5x3.5in

❶ Also suitable for GN series.

❷ Raises contact degree of protection from IP00 to IP20.

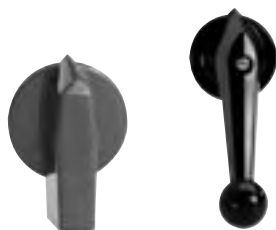
❸ Sold in packs of 10.

n.a. Not Available at time of printing. Contact Sales & Technical Support.



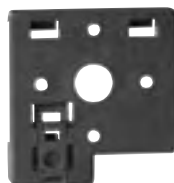
7 A019...
7 A119...

7 A169...



7 AO14
7 AR114
7 AR214

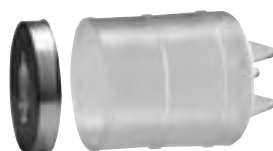
7 AR124
7 AR224



7 A180 - 7 A181



7 APRBP



7 A441 - 7 A442 - 7 A443



GX M1 - GX M2



GX A01 - GX A01H - GX A11

Description	Catalog number	Price
		\$

Finger protection covers for supply terminals.

For GN12-GN20	7 A0191	2.80
For GN25	7 A0192	2.80
For GN32 U version	7 A119U	2.80
For GN32 O version	7 A1190	2.80
For GN40	7 A1691	3.50
For GN63	7 A1692	3.50
For GN125	7 A1693	3.50

Black operating handle ①.

For 48x48mm front plate	7 A014	2.10
For 65x65mm front plate	7 AR114	4.20
For 90x90mm front plate	7 AR214	5.50

Black operating lever ①.

For 65x65mm front plate	7 AR124	5.50
For 90x90mm front plate	7 AR224	8.00

35mm DIN rail (EN 50022) base mounting piece for U version.

For GN12 to GN25	7 A180	3.50
For GN32 to GN63	7 A181	4.50

Adjustable door-coupling extension shaft, 70 mm (2.8in) long maximum ②.

For GN12 to GN63	7 APRBP	5.50
------------------	---------	------

Flexible rubber boot ③.

Ø 58mm (2.3in), 70mm (2.8in) long for GN12 to GN25 with 2 wafers	7 A441	9.00
Ø 58mm (2.3in), 92mm (3.6in) long for GN12 to GN25 with 4 wafers	7 A442	10.00
Ø 58mm (2.3in), 125mm (4.9in), for GN12 to GN25 with 6 wafers	7 A443	11.00

IP40 face plates ④.

48x48mm blank face plate	GX M1	3.00
65x65mm blank face plate	GX M2	4.50

Padlockable handles ⑤.

48x48mm yellow/red padlockable handle for GN12-GN20-GN25	GX A01	10.30
65x65mm yellow/red padlockable handle for GN12-GN20-GN25	GX A01H	12.20
65x65mm yellow/red padlockable handle for GN32-GN40-GN63	GX A11	12.20

PG adapters for enclosure entries ⑥⑦.

Metal, for PG11 to 1/2" NPT	G611	2.50
Metal, for PG13.5 to 1/2" NPT	G613	2.50
Metal, for PG16 to 1/2" NPT	G616	3.00
Metal, for PG21 to 1/2" NPT	G621	3.00
Plastic, for PG11 to 1/2" NPT	G612	1.50
Plastic, for PG13.5 to 1/2" NPT	G614	1.50
Plastic, for PG16 to 1/2" NPT	G617	n.a.
Plastic, for PG21 to 1/2" NPT	G622	n.a.

For operating handle or lever, plate dimension:

45x45mm = 1.9x1.9in

65x65mm = 2.6x2.6in

90x90mm = 3.5x3.5in

① Also suitable for GX series.

② Raises contact degree of protection from IP00 to IP20.

③ Sold in packs of 10.

n.a. Not Available at time of printing. Contact Sales and Technical Support.



PAGE 9-2

DIN RAIL MOUNT TIMERS

- Internal panel mounting
- Time ranges: 0.3 seconds - 768 minutes
- LED indication
- Mounting on 35mm DIN rail
- Screw terminals.

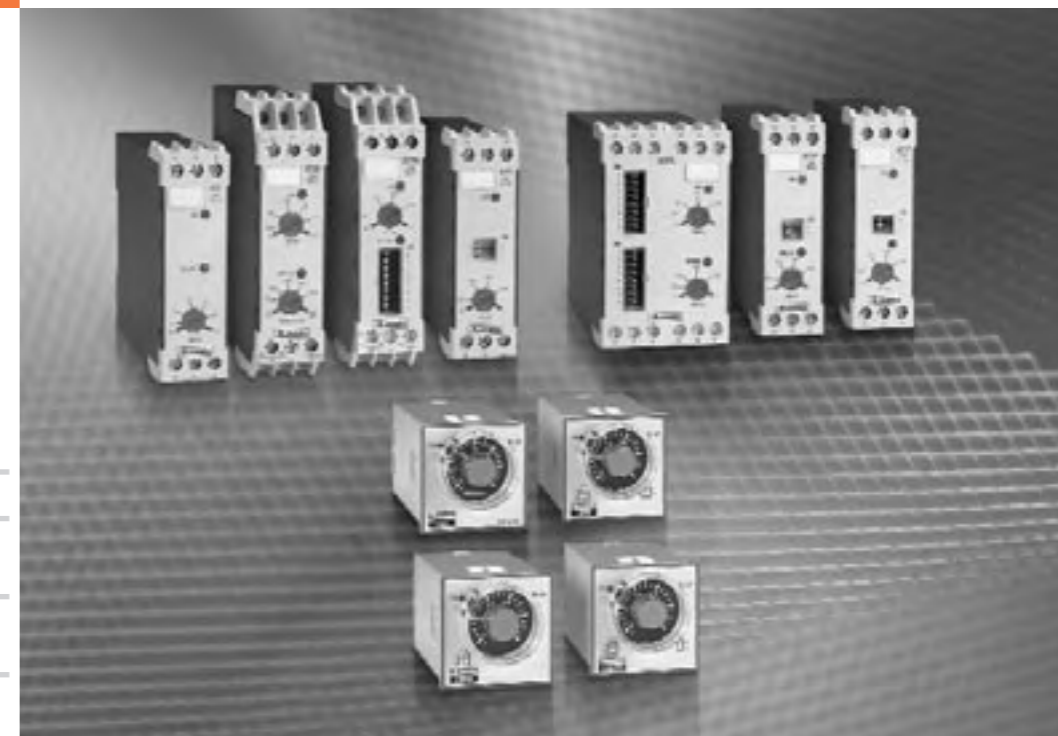


PAGE 9-7

PLUG-IN AND FLUSH-MOUNT TIMERS, 48x48mm

- Flush and internal panel mounting
- Time ranges: 0.05 second - 10 hours
- LED indication
- 8 and 11-pin sockets for panel mounting.

- *Plug-in (8 pin and 11 pin) or flush-mount 48x48mm type*
- *DIN rail mount type*
- *Rugged, reliable, high repeat accuracy*
- *Multi-voltage, single-scale, single-fuction versions*
- *Multi-voltage, multi-scale and multi-fuction versions.*



PLANET - DIN

DIN rail mount timers

	SEC.	PAGE
On delay, single scale, AC supply	9-	2
On delay, single scale, AC/DC supply	9-	2
On delay, multiscale, AC supply	9-	3
On delay, multiscale, AC/DC supply	9-	3
Off delay, multiscale, AC/DC supply	9-	4
Multifunction, multiscale, multivoltage, 1 double-throw contact	9-	4
Multifunction, multiscale, multivoltage, 2 independent double-throw contacts ...	9-	5
Asymmetrical recycle	9-	5
For starters	9-	6
Accessories	9-	6

Plug-in and flush-mount timers

On delay, multiscale, multivoltage	9-	7
On delay, multiscale, single voltage	9-	7
Multifunction, multiscale, multivoltage	9-	7
Accessories	9-	7

Timers

DIN rail mount timers

electric

**On delay.
Single scale.
AC supply**



31 AT1

Time scale range	Supply voltage [V]	Catalog number	Price	
0.3-3s	24VAC 100-240VAC	31 AT1 3S 240	50.00	
0.6-6s		31 AT1 6S 240	50.00	
1.2-12s		31 AT1 12S 240	50.00	
3-30s		31 AT1 30S 240	50.00	
6-60s		31 AT1 60S 240	50.00	
0.3-3min		31 AT1 3M 240	50.00	
0.6-6min		31 AT1 6M 240	50.00	
1.2-12min		31 AT1 12M 240	50.00	
3-30min		31 AT1 30M 240	50.00	
6-60min		31 AT1 60M 240	50.00	
0.3-3s		24VAC 220-440VAC	31 AT1 3S 440	50.00
0.6-6s			31 AT1 6S 440	50.00
1.2-12s			31 AT1 12S 440	50.00
3-30s			31 AT1 30S 440	50.00
6-60s	31 AT1 60S 440		50.00	
0.3-3min	31 AT1 3M 440		50.00	
0.6-6min	31 AT1 6M 440		50.00	
1.2-12min	31 AT1 12M 440		50.00	
3-30min	31 AT1 30M 440		50.00	
6-60min	31 AT1 60M 440		50.00	

General characteristics

- On delay, multivoltage, single scale
- 1 double-throw output contact
- Delay time adjustable on front using potentiometer
- LED indication for power on and relay state
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE106
- Dimensions: see figure 2 on page D-17.

Certifications and compliance

UL listed for USA and Canada, file E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-7.

**On delay.
Single scale.
AC/DC supply**



31 AT1C

Time scale range	Supply voltage [V]	Catalog number	Price	
0.3-3s	12VAC/DC 24VAC/DC	31 AT1C 3S 24	52.00	
0.6-6s		31 AT1C 6S 24	52.00	
1.2-12s		31 AT1C 12S 24	52.00	
3-30s		31 AT1C 30S 24	52.00	
6-60s		31 AT1C 60S 24	52.00	
0.3-3min		31 AT1C 3M 24	52.00	
0.6-6min		31 AT1C 6M 24	52.00	
1.2-12min		31 AT1C 12M 24	52.00	
3-30min		31 AT1C 30M 24	52.00	
6-60min		31 AT1C 60M 24	52.00	
0.3-3s		48-60V AC/DC	31 AT1C 3S 125	52.00
0.6-6s			31 AT1C 6S 125	52.00
1.2-12s			31 AT1C 12S 125	52.00
3-30s			31 AT1C 30S 125	52.00
6-60s	31 AT1C 60S 125		52.00	
0.3-3min	110-125V AC/DC		31 AT1C 3M 125	52.00
0.6-6min	31 AT1C 6M 125		52.00	
1.2-12min	31 AT1C 12M 125		52.00	
3-30min	31 AT1C 30M 125		52.00	
6-60min	31 AT1C 60M 125		52.00	

General characteristics

- On delay, multivoltage, single scale
- 1 double-throw output contact
- Delay time adjustable on front using potentiometer
- LED indication for power on and relay state
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE106
- Dimensions: see figure 2 on page D-17.
- Operating limit:
 - -40% to +30% Ue (DC)
 - -15% to +10% Ue (AC).

Certifications and compliance

UL listed for USA and Canada, file E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-7.

Timers

DIN rail mount timers

On delay. Multiscale. AC supply



31 AT1P

Time scale range	Supply voltage	Catalog number	Price
	[V]		\$
0.3-3s	24VAC	31 AT1P 240	64.00
1.2-12s	100-240VAC		
9.6-96s	24VAC	31 AT1P 440	64.00
76.8-768s	220-440VAC		

Time-range setting



General characteristics

- On delay, multivoltage, multiscale
- 1 double-throw output contact
- Delay time adjustable on front
- Time scale setting using dip switches
- LED indication for power on and relay state
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE106
- Dimensions: see figure 1 on page D-17.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-7.

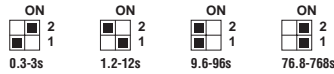
On delay. Multiscale. AC/DC supply



31 AT1CP

Time range range	Supply voltage	Catalog number	Price
	[V]		\$
0.3-3s	12VAC/DC	31 AT1CP 24	64.00
1.2-12s	24VAC/DC		
9.6-96s	48-60VAC/DC	31 AT1CP 125	64.00
76.8-768s	110-125V AC/DC		

Time-range setting



General characteristics

- On delay, multivoltage, multiscale
- 1 double-throw output contact
- Delay time adjustable on front
- Time scale setting using dip switches
- LED indication for power on and relay state
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE106
- Dimensions: see figure 1 on page D-17.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-7.

Timers

DIN rail mount timers

electric

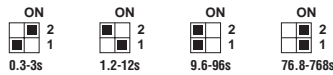
Off delay. Multiscale



31 ATD

Time scale range	Supply voltage	Catalog number	Price
	[V]		\$
0.3-3s	24VAC/DC	31 ATD 24	101.00
1.2-12s	48VAC/DC	31 ATD 48	101.00
9.6-96s	110-127VAC	31 ATD 110	101.00
76.8-768s	220-240VAC	31 ATD 220	101.00

Time-range setting



General characteristics

- True off delay. Does not require continuous power source.
- Single voltage, multiscale
- 1 double-throw output contact
- Delay time adjustable on front
- Time scale setting using dip switches
- LED indication for power on and relay state
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE106
- Dimensions: see figure 1 on page D-17.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-7.

Off delay after external contact opening. Multiscale



31 AT1DP...

Time scale range	Supply voltage	Catalog number	Price
	[V]		\$
With auxiliary power supply.			
0.3-3s	24VAC/DC	31 AT1DP 24⓪	81.00
1.2-12s	48VAC/DC	31 AT1DP 48⓪	81.00
9.6-96s	110-127VAC	31 AT1DP 110	81.00
76.8-768s	220-240VAC	31 AT1DP 220	81.00

⓪ With DC supply, connect (-) polarity to terminal A2.

Time-range setting



General characteristics

- Off delay after external contact opening, single voltage, multiscale
- 1 double-throw output contact
- Delay time adjustable on front using potentiometer
- Time range setting using dip switches
- LED indication for power on and relay state
- 22.5mm wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE106
- Dimensions: see figure 2 on page D-17.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-7.

Multifunction. Multiscale. Multivoltage. 1 double-throw contact

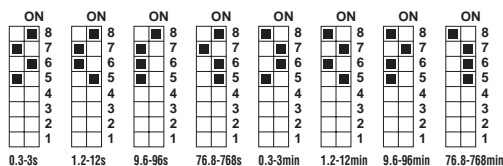


31 BTPM1 220

Time scale range	Supply voltage	Catalog number	Price
	[V]		\$
0.3-3s	24VAC/DC	31 BTPM1 220	116.00
1.2-12s	110-127VAC		
9.6-96s	220-240VAC		
76.8-768s	24-48-60V AC/DC	31 BTPM1 60⓪	116.00
0.3-3min			
1.2-12min			
9.6-96min			
76.8-768min			

⓪ Available on request.

Time-range setting



General characteristics

- Multifunction, multivoltage, multiscale
- 1 double-throw output contact
- Delay time adjustable on front
- Selectable functions: delay on operate, delay on or off after on opening of external contact, pulsing, pulsing on opening of external contact
- Time scale and functions selected by dip switches
- LED indication for power on and relay state
- Time relay resetting possible by using an external contact connected at R1-R2 terminals; 5ms resetting time
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE107
- Dimensions: see figure 2 on page D-17.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-7.

Timers

DIN rail mount timers

**Multifunction.
Multiscale.
Multivoltage.
2 independent
double-throw
contacts**

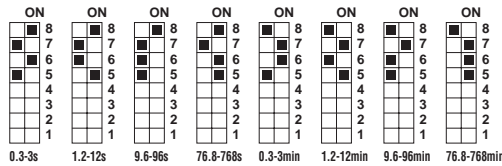


31 BTM 220

Time scale range	Supply voltage [V]	Catalog number	Price
0.3-3s 1.2-12s 9.6-96s 76.8-768s	24VAC/DC 110-127VAC 220-240VAC	31 BTM 220	126.00
0.3-3min 1.2-12min 9.6-96min 76.8-768min	24-48-60V AC/DC	31 BTM 60	126.00

ⓘ Available on request.

Time-range setting



General characteristics

- Multifunction, multivoltage, multiscale
- Two output relays, each with 1 double-throw output contact, programmable by dip switches
- Delay time adjustable on front
- Selectable functions: delay on operate with relay de-energized, delay on operate with relay energized, delay on or off after opening of external contact, pulsing beginning with pause, pulsing beginning with work, pulsing after opening of external contact beginning with pause, pulsing after opening of external contact beginning with work. Possibility, selectable by dip switches, to program an output relay with instantaneous function (21-22-24 output)
- Time scale and functions selected by dip switches
- LED indication for power on and relay state
- Time relay resetting possible by using an external contact connected at R1-R2 terminals; 5ms resetting time
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE107
- Dimensions: see figure 2 on page D-17.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-8.

**Programmable
asymmetrical
recycle timer**

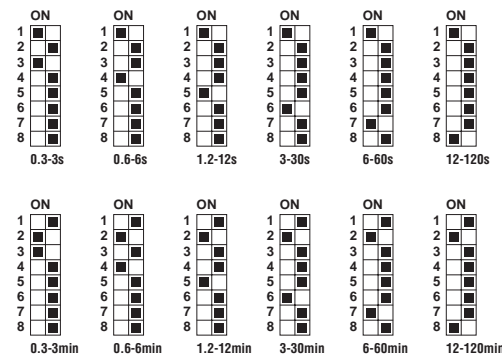


31 DRPL 220

Time scale range	Supply voltage [V]	Catalog number	Price
0.3-3s 0.6-6s 1.2-12s 3-30s 6-60s 12-120s	24VAC/DC 110-127VAC 220-240VAC	31 DRPL 220	132.00
0.3-3min 0.6-6min 1.2-12min 3-30min 6-60min 12-120min	48-60VAC/DC	31 DRPL 60	132.00

ⓘ Available on request.

Time-range setting



General characteristics

- Programmable asymmetrical recycle timers, multivoltage, multiscale
- 2 double-throw output contacts
- Pause and work times adjustable on front
- Time scale selected by independent dip switches
- LED indication for power on and relay state
- Cycle can begin with work interval instead of pause (jumper on S1-S2 terminals)
- 45mm wide housing suitable for mounting on 35mm (1.8in) DIN rail (EN 50022)
- Screw fixing adapter CE106
- Dimensions: see figure 3 on page D-17.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC 61812-1.

Functional diagram

See page W-8.

Timer for starters



31 BT2N

Time scale	Supply voltage	Catalog number	Price
	[V]		\$
0.6-6s	24VAC/DC	31 BT2N 6S 48	129.00
1.2-12s		31 BT2N 12S 48	129.00
3-30s		31 BT2N 30S 48	129.00
6-60s		31 BT2N 60S 48	129.00
0.6-6s	110-127VAC	31 BT2N 6S 110	129.00
1.2-12s		31 BT2N 12S 110	129.00
3-30s		31 BT2N 30S 110	129.00
6-60s		31 BT2N 60S 110	129.00
0.6-6s	24VAC/DC	31 BT2N 6S 220	129.00
1.2-12s		31 BT2N 12S 220	129.00
3-30s		31 BT2N 30S 220	129.00
6-60s		31 BT2N 60S 220	129.00
0.6-6s	220-240VAC	31 BT2N 6S 380	129.00
1.2-12s		31 BT2N 12S 380	129.00
3-30s		31 BT2N 30S 380	129.00
6-60s		31 BT2N 60S 380	129.00
0.6-6s	380-415VAC	31 BT2N 6S 440	129.00
1.2-12s		31 BT2N 12S 440	129.00
3-30s		31 BT2N 30S 440	129.00
6-60s		31 BT2N 60S 440	129.00
0.6-6s	24VAC/DC	31 BT2N 6S 440	129.00
1.2-12s		31 BT2N 12S 440	129.00
3-30s		31 BT2N 30S 440	129.00
6-60s		31 BT2N 60S 440	129.00
0.6-6s	415-440VAC	31 BT2N 6S 440	129.00
1.2-12s		31 BT2N 12S 440	129.00
3-30s		31 BT2N 30S 440	129.00
6-60s		31 BT2N 60S 440	129.00

General characteristics

- Dual voltage, for starters (star-delta, impedance, autotransformer, etc.)
- Two output relays, each with 1 double-throw contact
- Starting time and transition time (20-300ms) adjustable on front
- LED indication for power on and relay state
- 22.5mm (0.9in) wide housing suitable for mounting on 35mm DIN rail (EN 50022)
- Screw fixing adapter CE107
- Dimensions: see figure 3 on page D-17
- Timing starts immediately as soon as voltage is applied to time relay; upon expiry of the interval (starting time), the two output relays are energized in sequence. The first one disables the starting contactor, which opens; the second one, after the time interval which can be adjusted between 20 and 300ms (transition), enables the second contactor to close.
- If the supply is removed before the set time expires, the time already elapsed is reset.

Certifications and compliance

UL listed for USA and Canada, File E93601.
Compliant with standards: IEC/EN 61812-1.

Functional diagram

See page W-8.

Accessories for DIN rail mount timers

Description	Catalog number	Price
		\$
Screw fixing adapter for timers: AT1 - AT1C - AT1P - AT1CP - ATD - AT1DP - DRPL	31 CE106	2.50
Screw fixing adapter for time relays: BTPM1 - BTPM - BT2N	31 CE107	2.50

Timers

Plug-in timers and accessories

Plug-in and flush-mount timers



31 L48TP



31 L48TPB



31 L48M

Time scale range	Supply voltage	Catalog number	Price
			\$

Time relay, on delay. Multiscale and multivoltage, 8-pin.

0.1-780s	24VAC/DC	31 L48TP S 240	50.00
1.8s-780min	110VAC 220-240VAC	31 L48TP M 240	50.00

	A B	A B	A B	A B
	1 0	1 0	1 0	1 0
L48TP S	0.3-3s	1.2-12s	10-100s	78-780s
L48TP M	18s-3m	72s-12m	10s-100m	78s-780m

Time relay, on delay. Multiscale and single voltage, 8-pin.

0.05s-10min	24VAC/DC	31 L48TPB M24	54.00
	110VAC	31 L48TPB M110	54.00
	220-240VAC	31 L48TPB M240	54.00

	A B	A B	A B	A B
	1 0	1 0	1 0	1 0
	0.05-1s	0.1-10s	0.6-1m	6s-10m

Time relay, multifunction, multivoltage and multiscale, 11-pin.

0.05s-10min	24-240V	31 L48M M 240	64.00
0.6s-10h	AC/DC	31 L48M H 240	64.00

	A B	A B	A B	A B
	1 0	1 0	1 0	1 0
L48M M	0.05-1s	0.1-10s	0.6s-1m	6s-10m
L48M H	0.05-1m	0.1-10m	0.6m-1h	1m-10h

Housing size 48x48mm = 1.9x1.9in

General characteristics

- L48TP TIMER**
- On delay, multivoltage, multiscale
 - 1 double-throw output contact
 - Delay time adjustable on front
 - Time scale selected by dip switches for L48TP S: 0.3-3s, 1.2-12s, 10-100s or 78-780s. for L48TP M: 18s-3min, 72s-12min, 10-100min or 78-780min
 - LED indication for power on and relay state
 - Use with 8-pin socket, see below
 - Flush mount bracket, see below.

- L48TPB TIMER**
- On delay, single voltage, multiscale
 - 2 double-throw output contact, adjustable as both delayed at energization or 1 delayed and 1 instantaneous at energization
 - Delay time adjustable on front
 - Time scale selected by dip switches: 0.05-1s, 0.1-10s, 0.6s-1min, 6s-10min
 - LED indication for power on and relay state
 - Use with 8-pin socket, see below
 - Flush mount bracket, see below.

- L48M TIMER**
- Multifunction, multivoltage and multiscale
 - 2 double-throw output contacts
 - Delay time adjustable on front
 - Selectable functions: delay on operate when relay de-energized, delay on operate when relay energized, pulsing beginning with pause, pulsing beginning with work. Time relay resetting is possible on closing of external contact (R) connected to terminals 7-6. Possibility of stopping the time relay saving the elapsed time on closing of external contact (M) connected to terminals 7-5 and then restarting time on opening it. See diagrams on page W-9.
 - Time scale and functions selected by dip switches for L48M M: 0.05-1s, 0.1-10s, 0.6s-1min, 6s-10min for L48M H: 0.05s-1min, 0.1s-10min, 0.6m-1h, 1min-10h
 - LED indication for power on and relay state
 - Use with 11-pin socket, see below
 - Flush mount bracket, see below.

Certifications and compliance

UL Recognized for USA, File E 172189: All types.
UL Recognized for Canada, File E 172189: L48TP and L48TPB types only.
Compliant to standards: IEC/EN 61812-1.

Functional diagrams

See page W-9.

Accessories for plug-in and flush-mount timers

Description	Catalog number	Price
		\$
8-pin socket for screw fixing or on 35mm DIN rail (EN 50022). Screw terminals.	31 S8	5.80
8-pin loose socket. Screw terminals.	31 L48 P8	5.00
11-pin socket for screw fixing or on 35mm DIN rail (EN 50022). Screw terminals.	31 S11	8.80
11-pin loose socket. Screw terminals.	31 L48 P11	6.50
Flush mount bracket.	31 L48AP	3.00

Certifications

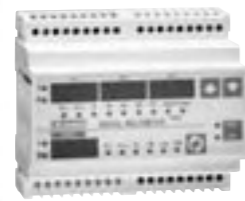
Sockets: CSA certified, File LR 26716.
UL recognized, File E 113714.



PAGE 10-2

**DIGITAL FLUSH-MOUNT MULTIMETER
47 MEASUREMENTS**

- Type DMK20
- Supply voltage: 120VAC
 - Voltage measurement range: 60-830VAC
 - Current measurement range: 0.02-6A
 - Maximum and minimum value log
 - Total and partial hour counter.



PAGE 10-4

**DIGITAL MODULAR MULTIMETER
47 MEASUREMENTS**

- Type DMK50
- Supply voltage: 120VAC
 - Voltage measurement range: 60-830VAC
 - Current measurement range: 0.02-6A
 - Maximum and minimum value log
 - Total and partial hour counter.



PAGE 10-3

**DIGITAL FLUSH-MOUNT MULTIMETER
250 MEASUREMENTS**

- Series DMK3
- Versions:
 - DMK30 basic type
 - DMK31 with 2 programmable outputs
 - DMK32 with 2 programmable outputs and isolated RS-485 port
 - Separate supply voltage limits: 85-265VAC / 93.5-300VDC
 - Voltage measurement range: 20-830VAC
 - Current measurement range: 0.05-6A
 - Maximum and minimum value log
 - Active and reactive power meters
 - Remote control and supervision softwares with Modbus® RTU and ASCII protocols.



PAGE 10-5

**DIGITAL MODULAR MULTIMETER
250 MEASUREMENTS**

- Series DMK6
- Versions:
 - DMK60 basic type
 - DMK61 with 2 programmable outputs
 - DMK62 with 2 programmable outputs and isolated RS-485 port
 - Separate supply voltage limits: 85-265VAC / 93.5-300VDC
 - Voltage measurement range: 20-830VAC
 - Current measurement range: 0.05-6A
 - Maximum and minimum value log
 - Active and reactive power meters
 - Remote control and supervision softwares with Modbus® RTU and ASCII protocols.

DESCRIPTION	DMK20	DMK50	DMK3...	DMK6...
Usage in medium and high voltage			•	•
Current inputs with internal CT			•	•
ARON connection	•	•	•	•
Relay/static outputs			•	•
			(DMK31-DMK32)	(DMK61-DMK62)
RS-485 isolated serial interface			•	•
			(DMK32)	(DMK62)
1 phase, 2 phase, 3 phase with or without neutral	•	•	•	•
4 quadrant measurements			•	•
TRMS voltage and current measurements	•	•	•	•
Averaging filter for stabilized viewing	•	•	•	•
Averaging filter supplement, keypad configurable			•	•
Input voltage frequency measurement	•	•	•	•
L-L voltage measurements, of the system included as well	•	•	•	•
Phase voltage measurement, min./max. (high/low) included	•	•	•	•
System phase voltage measurement	•	•	•	•
Phase current measurement, high/low included	•	•	•	•
Phase integral current measurement, phase max. included			•	•
Phase power current measurement	•	•	•	•
Phase cosphi measurement			•	•
Phase and system apparent power and system high/low apparent power measurements	•	•	•	•
Apparent integral system power measurement, system maximum demand included			•	•
Active import phase power measurement	•	•	•	•
Active export phase power measurement			•	•
Active import system phase power measurement, high/low included	•	•	•	•
Active export system phase power measurement, high/low included			•	•
Active integral system power measurement, max. included			•	•
Reactive import phase power measurement	•	•	•	•
Reactive export phase power measurement			•	•
Reactive import system phase power measurement	•	•	•	•
Reactive export system phase power measurement			•	•
Min.-max. reactive import system phase power measurement	•	•	•	•
Min.-max. reactive export system phase power measurement			•	•
Import-export active energy measurement			•	•
Import-export reactive energy measurement			•	•
Odd harmonic analysis, 1° to 21° order phase voltages			•	•
Even harmonic analysis, 2° to 22° order phase voltages			•	•
Odd harmonic analysis, 1° to 21° order phase currents			•	•
Even harmonic analysis, 2° to 22° order phase currents			•	•
Total harmonic distortion per phase and residual			•	•
Total and partial hour counter	•	•	•	•
Delayed auto-resetting of pre-set measurements	•	•		

- Monitor and measure of 47 and 250 electric parameters
- Single, two, three and balanced three-phase connection
- Ideal for co-generation energy systems, stand-by generating sets or on-board machine tools
- High measurement accuracy
- Totally programmable digital outputs
- RS-485 serial port used with Modbus® RTU or ASCII.



PLANET - LOGIC

Digital multimeters

	SEC.	PAGE
DMK20 flush-mount digital multimeter, 47 measurements	10-	2
DMK3... flush-mount digital multimeters, 250 measurements	10-	3
DMK50 modular digital multimeter, 47 measurements	10-	4
DMK6... modular digital multimeters, 250 measurements	10-	5



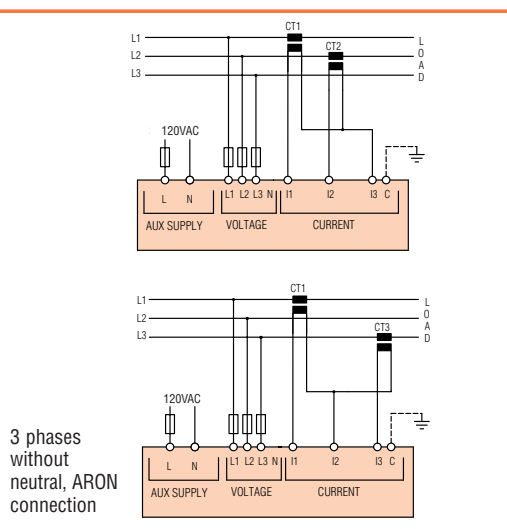
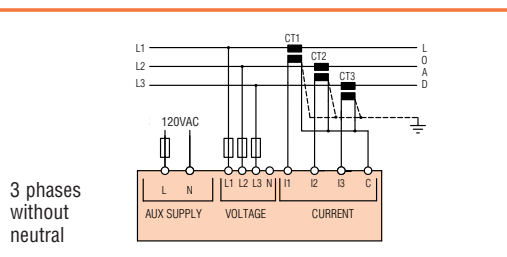
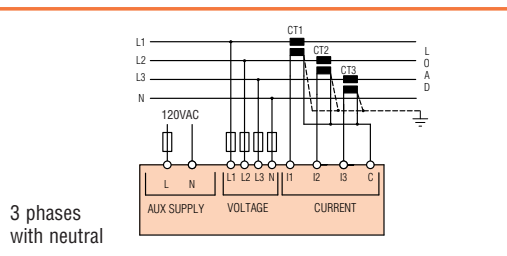
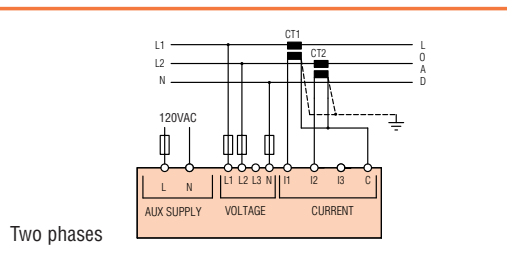
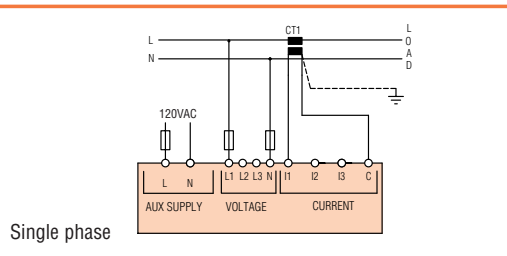
Digital multimeter 47 measurements



DMK20

Characteristics	Catalog number	Price
		\$
Flush-mount multimeter	DMK20 120	398.00
Accessories.		
IP54 protection cover	31 PA96X96	30.00

Wiring diagrams



General characteristics

The DMK20 multimeter monitors and views reliable readings of electric parameters, even in presence of critical operating conditions, such as voltages and currents with high harmonic content and variable frequency. The total and partial hour counter feature provides an interesting feature for electric panels of emergency generating sets.

The diversified and accurate measurements give the multimeter valuable technical and cost effective advantages respect to traditional analog instrumentation. The digital multimeter DMK20 views 47 electrical parameters:

- Voltage: phase, line and system values
- Current: phase values
- Power: active, reactive, phase and total apparent values
- P.F.: Power Factor per phase
- Frequency of measured voltage value
- HIGH/LOW: instantaneous minimum and maximum values of each phase voltage and current, total active power (ΣW), total reactive power (Σvar) and total apparent power (ΣVA) values
- Total hours: non-volatile log clearing
- Partial hours: non-volatile log configuration.

Operational characteristics

- Auxiliary supply: 120VAC (208-240VAC on request)
- Operating range: 78-145VAC
- Voltage measurement range: 60-830VAC
- Current measurement range: 0.05-6A
- Non-volatile total and partial hour counter with separate clearing
- Partial hour counter used as maintenance interval with display alarm
- HIGH and LOW value functions to read and log instantaneous voltage, current and power values
- Delayed automatic resetting of default measurements
- Averaging function to slow down repetitive fluctuations to obtain more stable readouts
- Current connection in ARON configuration via 2 current transformers (CTs) only
- Single, two, three phase with or without neutral and balanced three-phase connection
- TRMS measurements up to 22nd harmonic order
- Flush-mount 96x96mm housing
- Plug-in terminal connection
- Operating temperature: -4° to +140°F (-20 to +60°C).

Certifications and compliance

Certifications obtained: UL listed for USA and Canada, file E93601.

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-1, IEC/EN 61000-6-2, CISPR11/EN 55011.

Note: DMK25 version is available on request. It is a multimeter custom-designed for use with stand-by generating sets and has 9-32VDC supply. Consult Sales & Technical Support for details and pricing.

Digital multimeters 250 measurements



DMK3...



4PX1



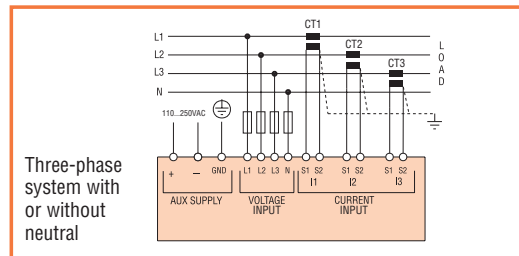
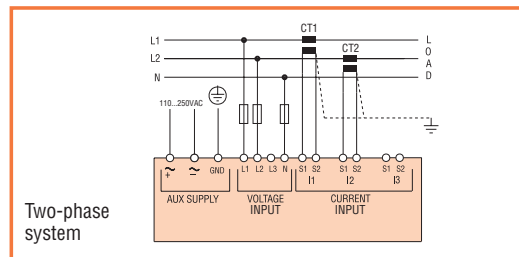
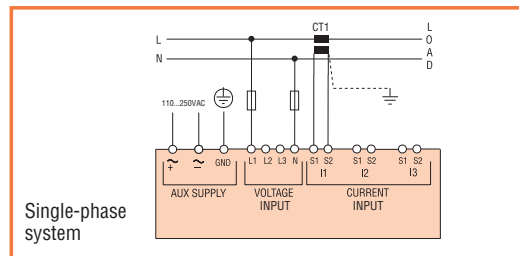
51C4

Characteristics	Catalog number	Price
		\$
Basic version	DMK30	773.00
Version with 2 programmable outputs of which 1 relay and 1 static type	DMK31	936.00
Version with RS-485 port and 2 programmable outputs of which 1 relay and 1 static type	DMK32	1094.00
Accessories.		
PC-DMK32 remote supervision software with Modbus [®] RTU and ASCII protocols and complete with 51 C4 connecting wire	DMK SW	852.00
RS-232/RS-485 converter module	4 PX1 110	580.00
PC-PX1 connecting wire	51 C4	57.00
IP54 front protection cover	31 PA96X96	30.00

Software screen display of supervision and remote control



Wiring diagrams



For connection with ARON configuration, contact Sales & Technical Support for assistance.

General characteristics

The DMK3... multimeter comprises excellent features, superior to devices of the same category currently on the marketplace. Distorted waveform conditions, such as very disturbed electric lines having voltage and currents with high harmonic content and variable frequency, do not influence the high accuracy DMK multimeter readouts because of rigorous design in addition to the use of the latest generation of microprocessor technology. Measurement of the phase angle ($\cos\varphi$) in addition to power factor, harmonics analysis and HIGH-LOW-MAX functions are just a few of those which are difficult to find on higher category equipment. The DMK3... digital multimeter can display more than 250 measurements; a few of these are listed below.

- Voltage: phase, line and system values
- Current: phase and system values
- Power: active, reactive, apparent phase and total values
- Energy: import, export, inductive and capacitive values
- P.F.: power factor per phase
- $\cos\varphi$: phase angle (i.e. power factor related to the harmonic fundamental only)
- Frequency of measured voltage value
- Harmonics (HARM.): residual and total harmonic content for each harmonic order up to the 22nd per phase, both for voltage and current values
- HIGH / LOW: readings of maximum / minimum values of phase voltage and current and ΣW , Σvar and ΣVA power
- Maximum (MAX): demand readings of maximum current and total active power values, both calculated on programmable integration time
- Averaging (AVG): function to slow down repetitive voltage and current fluctuations to obtain more stable readouts.

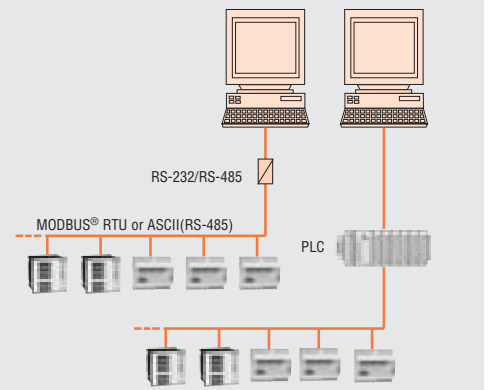
Operational characteristics

- Auxiliary supply: 100-240VAC; 110-250VDC
- Operating range: 85-265VAC; 93.5-300VDC
- Voltage measurement range: 20-830VAC in one model
- Current measurement range: 0.02-6A
- HIGH and LOW value functions to detect and log instantaneous voltage, current and power values
- Current connection in ARON configuration via 2 current transformers only
- Single, two, three phase with or without neutral and balanced three-phase connection via 1 current transformer only
- Usage with voltage transformers for voltages >830VAC
- Operating frequency: 45-65Hz
- TRMS measurements up to 22nd harmonic order, class 1 accuracy
- Power factor and $\cos\phi$ measurements
- Voltage and current harmonic analysis per phase up to 22nd harmonic order
- Electric meters of active energy (import-export)
- Electric meters of reactive energy (inductive-capacitive)
- Flush-mount 96x96mm housing
- Plug-in terminal connection
- Operating temperature: -4° to +140°F (-20 to +60°C).

Certifications and compliance

Certifications obtained: UL listed for USA and Canada, file E93601.

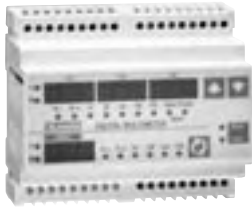
Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-1, IEC/EN 61000-6-2, CISPR11/EN 55011.



Dimensions
page D-17

Technical characteristics
page TC-35

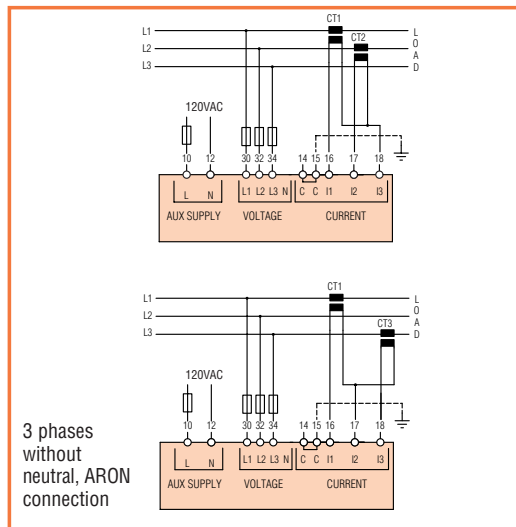
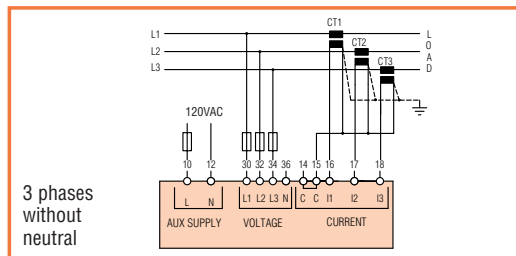
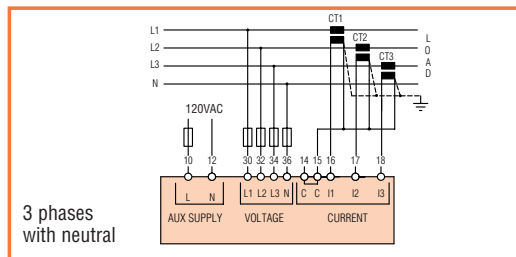
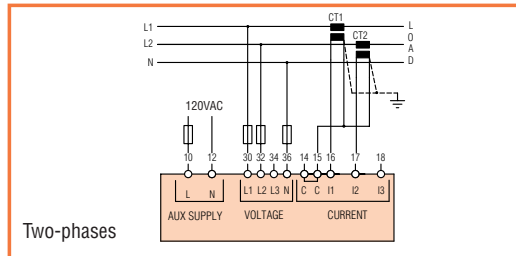
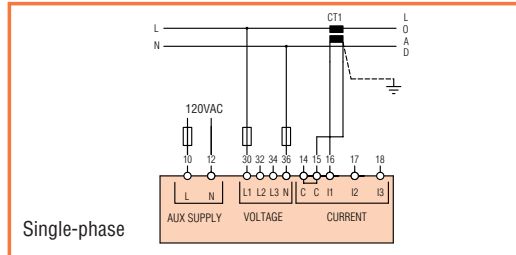
Digital multimeter 47 measurements



DMK50

Characteristics	Catalog number	Price
Modular multimeter	DMK50 120	398.00

Wiring diagrams



General characteristics

The DMK50 multimeter monitors and views reliable readings of electric parameters, even in presence of critical operating conditions, such as voltages and currents with high harmonic content and variable frequency. The total and partial hour counter feature provides an interesting feature for electric panels of emergency generating sets.

The diversified and accurate measurements give the multimeter valuable technical and cost effective advantages respect to traditional analog instrumentation. The digital multimeter DMK50 views 47 electrical parameters:

- Voltage: phase, line and system values
- Current: phase values
- Power: active, reactive, phase and total apparent values
- Power factor (P.F.): each phase values
- Frequency: voltage measured value
- HIGH/LOW: instantaneous minimum and maximum values of each phase voltage and current, total active power (ΣW), total reactive power (Σvar) and total apparent power (ΣVA) values
- Total hours: non-volatile log clearing
- Partial hours: non-volatile log configuration.

Operational characteristics

- Auxiliary supply: 120VAC (208-240VAC on request)
- Operating range: 78-145VAC
- Voltage measurement range: 60-830VAC
- Current measurement range: 0.05-6A
- Non-volatile total and partial hour counter with separate clearing
- Partial hour counter used as maintenance interval with display alarm
- TRMS measurements up to 22° harmonic order
- HIGH and LOW value functions to read and log instantaneous voltage, current and power values
- Delayed automatic resetting of default measurements
- Averaging function to reduce continuous measure variations and for better viewing
- Current connection in ARON configuration via 2 current transformers only
- Single, two, three phase with or without neutral and balanced three-phase connection
- Plug-in terminal connection
- Operating temperature: -4° to +140°F (-20 to +60°C).

Certifications and compliance

Certifications obtained: UL listed for USA and Canada, file E93601.

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-1, IEC/EN 61000-6-2, CISPR11/EN 55011.

Digital multimeters 250 measurements



31 DMK6...



4PX1



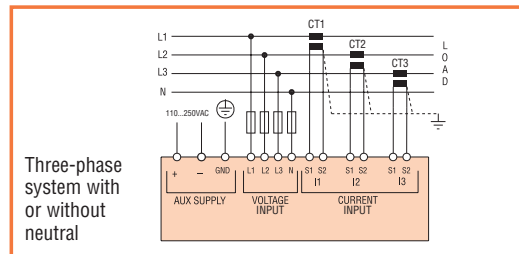
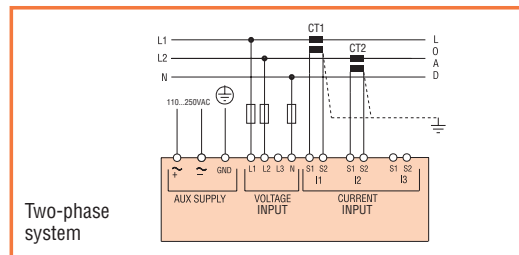
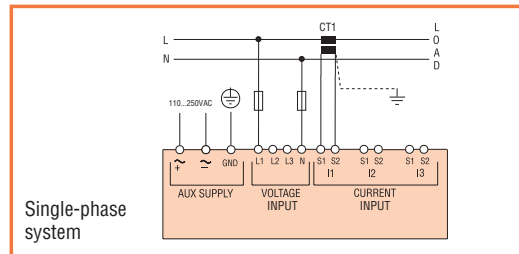
51C4

Characteristics	Catalog number	Price
		\$
Basic version	DMK60	773.00
Version with 2 programmable outputs of which 1 relay and 1 static type	DMK61	936.00
Version with RS-485 port and 2 programmable outputs of which 1 relay and 1 static type	DMK62	1094.00
Accessories		
PC-DMK62 remote supervision software with Modbus® RTU and ASCII protocols and complete with 51 C4 connecting wire	DMK SW	852.00
RS-232/RS-485 converter module	4 PX1 110	580.00
PC-PX1 connecting wire	51 C4	57.00

Software screen display of supervision and remote control



Wiring diagrams



For connection with ARON configuration, contact Sales & Technical Support for assistance.

General characteristics

The DMK6.. multimeter comprises excellent features, superior to devices of the same category currently on the marketplace. Distorted waveform conditions, such as very disturbed electric lines having voltage and currents with high harmonic content and variable frequency, do not influence the high accuracy DMK multimeter readouts because of rigorous design in addition to the use of the latest generation of microprocessor technology. Measurement of the phase angle ($\cos\phi$) in addition to power factor, harmonics analysis and HIGH-LOW-MAX functions are just a few of those which are difficult to find on higher category equipment. The DMK6.. digital multimeter can display more than 250 measurements; a few of these are listed below.

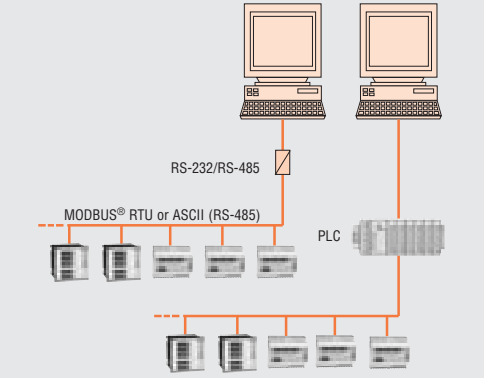
- Voltage: phase, line and system values
- Current: phase and system values
- Power: active, reactive, apparent phase and total values
- Energy: import, export, inductive and capacitive values
- P.F.: power factor per phase
- $\cos\phi$: phase angle (i.e. power factor related to the harmonic fundamental only)
- Frequency of measured voltage value
- Harmonics (HARM.): residual and total harmonic content for each harmonic order up to the 21st per phase, both for voltage and current values
- HIGH / LOW: readings of maximum / minimum values of phase voltage and current and ΣW , Σvar and ΣVA power
- Maximum (MAX): demand readings of maximum current and total active power values, both calculated on programmable integration time
- Averaging (AVG): function to slow down repetitive voltage and current fluctuations to obtain more stable readouts.

Operational characteristics

- Auxiliary supply: 100-240VAC; 110-250VDC
- Operating range: 85-265VAC; 93,5-300VDC
- Voltage measurement range: 20-830VAC in one model
- Current measurement range: 0.02-6A
- HIGH and LOW value functions to detect and log instantaneous voltage, current and power values
- Current connection in ARON configuration via 2 current transformers only
- Single, two, three phase with or without neutral and balanced three-phase connection via 1 current transformer only
- Usage with voltage transformers for voltages >830VAC
- Operating frequency: 45-65Hz
- TRMS measurements up to 22nd harmonic order, class 1 accuracy
- Power factor and $\cos\phi$ measurements
- Voltage and current harmonic analysis per phase up to 22nd harmonic order
- Electric meters of active energy (import-export)
- Electric meters of reactive energy (inductive-capacitive)
- Modular 6U housing, 106x90x58mm size
- Fixed terminal connection
- Operating temperature: -4° to +140°F (-20 to +60°C).

Certifications and compliance

Certifications obtained: UL listed for USA and Canada, file E93601.
Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-1, IEC/EN 61000-6-2, CISPR11/EN 55011.



Dimensions
page D-17

Technical characteristics
page TC-35



PAGE 11-2

VFNC1 ULTRA-COMPACT SERIES

- Single-phase 200/240VAC supply
- Three-phase motor power, 0.27 to 3HP ratings at 230VAC
- On board class B EMC-compliant suppressor for RFI immunity.



PAGE 11-3

VFS9S SERIES

- Single-phase 200/240VAC supply
- Three-phase motor power, 0.54 to 3HP ratings at 230VAC
- On board class A EMC-compliant suppressor for RFI immunity
- Integrated dynamic braking circuit.



PAGE 11-3

VFS9 SERIES

- Three-phase 380/500VAC supply
- Three-phase motor power, 1 to 20HP ratings at 440VAC
- On board class A EMC-compliant suppressor for RFI immunity
- Integrated dynamic braking circuit.



PAGE 11-4

VFP7 SERIES

- Three-phase 380/460VAC supply
- Three-phase motor power 25 to 430HP ratings at 440VAC
- External EMC-compliant suppressor for RFI immunity
- Integrated dynamic braking circuit up to 30HP.



PAGE 11-4

EMC-COMPLIANT SURGE SUPPRESSORS

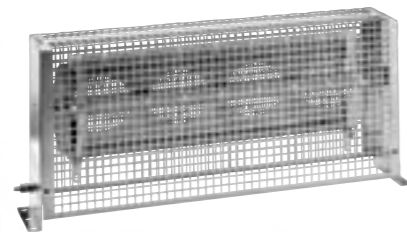
- For three-phase motor power, 25 to 430HP ratings of VFP7 series.



PAGE 11-5

THREE-PHASE INDUCTANCES

- For three-phase motor power, 1 to 20HP ratings.



PAGE 11-5

BRAKING RESISTORS

- Suitable for all applications and regenerated power.

- *Simple installation and programming*
- *Compact size*
- *Automatic tuning function*
- *Flexible choice of sensorless vector control, wide power ratings, programmable inputs/outputs*
- *Special function for pump and fan duty*
- *Active ground leakage protection*
- *Highly reliable operation in heavy-duty conditions*
- *Single and three phase versions.*



PLANET - LOGIC

Motor drives

	SEC.	PAGE
VFNC1 ultra-compact series	11-	2
VFS9S single-phase series and VFS9 three-phase series	11-	3
VFP7 three-phase series	11-	4

Accessories

EMC compliant surge suppressors, for VFP7 types	11-	4
Three-phase inductances	11-	5
Braking resistors	11-	5
Other accessories	11-	5

VFNC1 series ultra-compact



VFNC1S

le ^① ≤50°C (122°F)	3-phase motor power at 230V		Catalog number ^②
[A]	[kW]	[HP]	
Single-phase supply 200-240V 50/60Hz^③.			
1.1	0.2	0.27	VFNC1S 2002PL W
2.1	0.4	0.54	VFNC1S 2004PL W
3.6	0.75	1	VFNC1S 2007PL W
6.8	1.5	2	VFNC1S 2015PL W
9.6	2.2	3	VFNC1S 2022PL W

^① Operation up to 122°F (50°C) without derating.

^② Contact Sales & Technical Support for pricing.

^③ Types with single-phase 110-120V 50/60Hz supply input are available on request. Contact Sales & Technical Support for assistance.



**Side-by-Side
installation**
Multiple units installed
without side clearance
for space saving

Traditional
model

General characteristics

The VFNC1 is an extremely reliable ultra-compact A.C. motor drive with high performance level and meets EMC requirements for residential ambient installation owing to the on-board Class B surge suppressors. Of easy and simple installation, the VFNC1 type is equipped with a control panel with integrated potentiometer for speed adjustment. Suitable for simple and cost effective applications, such as ventilators, suction fans, conveyor belts, machine tools, car washes. The sensorless vector control in open loop warrants the best performance along with elevated motor torque even with minimum operating frequency.

SPEED REFERENCE SIGNALS

Reference signals for speed adjustment are obtained by:

- Front potentiometer
- External potentiometer: 1-10kΩ
- Voltage signal: 0-10V
- Current signal: 4-20mA
- Control panel digital signals
- 15 preset speeds via digital inputs
- TTL serial signals.

PROGRAMMABLE OUTPUTS

- 1 relay with double-throw contact
- 1 static configurable as analog.

PROTECTIONS

- Overcurrent and overvoltage
- Input phase loss
- Output phase loss
- Motor drive overload
- Motor overload
- Reference signal loss.

SPECIAL FUNCTIONS

- PI function for pump and fan application
- Dual set of parameters for two different motor controls
- Automatic restarting and instantaneous speed tuning
- 15 viewable frequency values.

Operational characteristics

- Input voltage: 200-240VAC single-phase^③
- Output voltage: ≤ input voltage
- Rated current: 1.1-9.6A
- Mains voltage: 50/60Hz
- Output frequency: 0.5-200Hz
- Frequency modulation: 2-16kHz
- Method of control: sensorless vector
- Current overload: 150% for 60 seconds
- Degree of protection: IP20
- Operating temperature: +14° to +122°F (-10 to +50°C)
- Maximum altitude: 3280ft (1000m) maximum
- Relative humidity: 20-93% (with no condensation).

Certifications and compliance

UL listed for USA and Canada, File E 204788.

Compliant with standards: EN 50178, IEC/EN 61800-3.

**VFS9S series
single phase
VFS9 series
three phase**

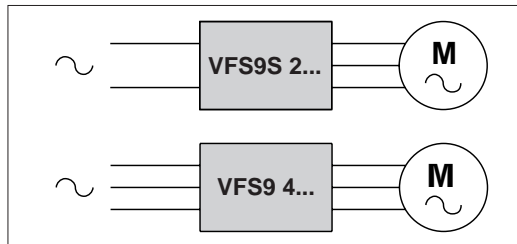


VFS9

le ^① ≤50°C (122°F)	3-phase motor power at 230VAC		Catalog number ^②
[A]	[kW]	[HP]	
Single-phase supply 200-240V 50/60Hz^③			
3.3	0.4	1/2	VFS9S 2004PL WP
4.8	0.75	1	VFS9S 2007PL WP
7.8	1.5	2	VFS9S 2015PL WP
11	2.2	3	VFS9S 2022PL WP

le ^① ≤50°C (122°F)	3-phase motor power at 440VAC		Catalog number ^②
[A]	[kW]	[HP]	
Three-phase supply 380-500V 50/60Hz^③			
2.3	0.75	1	VFS9 4007PL WP
4.1	1.5	2	VFS9 4015PL WP
5.5	2.2	3	VFS9 4022PL WP
9.5	3.7	5	VFS9 4037PL WP
14.3	5.5	7 1/2	VFS9 4055PL WP
17	7.5	10	VFS9 4075PL WP
27.7	11	15	VFS9 4110PL WP
33	15	20	VFS9 4150PL WP

- ① Operation up to 122°F (50°C) without derating.
- ② Contact Sales & Technical Support for pricing.
- ③ Types with other supply input for both single and three phase versions are available on request. Contact Sales & Technical Support for assistance.



Side-by-Side installation
Multiple units installed without
side clearance for space saving

Traditional
model

General characteristics

The VFS9 is a vector control motor drive and meets EMC requirements for industrial ambient installation owing to the on-board Class A surge suppressors. The versatility, dynamic performance and low maintenance consent the VFS9 model to operate in heavy-duty applications. The sensorless vector control with auto-tuning enables to achieve torque values over 150% with frequency values as low as 1Hz. The standard supplied control panel includes a 4-digit 7-segment display, six keys and 1 potentiometer and is used to start the motor and to remote adjust its speed as well as maintain constant control of all the parameters and monitor the main motor parameters.

SPEED REFERENCE SIGNALS

- Reference signals for speed adjustment are obtained by:
- Front potentiometer
 - External potentiometer: 1-10kΩ
 - Voltage signal: 0-10V
 - Current signal: 4-20mA
 - Control panel digital signals
 - 15 preset speeds via digital inputs
 - TTL serial signals.

PROGRAMMABLE OUTPUTS

- 1 relay with double-throw contact
- 1 relay with NO contact
- 1 static
- 1 analog configurable as 0-10VDC or 4-20mA.

PROTECTIONS

- Overcurrent and overvoltage
- Input phase loss
- Output phase loss
- Drive overload
- Motor overload
- Braking resistor overload
- Drive overtemperature
- Excessive torque alarm
- Ground fault.

SPECIAL FUNCTIONS

- PI function for pump and fan application
- Dual set of parameters to control two different motors
- Automatic restarting and instantaneous speed tuning
- 15 viewable frequency values
- DC-Bus access for DC power supply
- Capacitor pre-charge circuit
- Integrated dynamic braking circuit; optional external braking resistor.

Operational characteristics

- Input voltage:
 - VFS9S: 200-240VAC single-phase^③
 - VFS9: 380-500VAC three-phase^③
- Output voltage: ≤ input voltage
- Rated current:
 - VFS9S: 3.3-11A single phase
 - VFS9: 2.3-33A three-phase
- Mains voltage: 50/60Hz
- Output frequency: 0.5-400Hz
- Frequency modulation: 2-16.5kHz
- Method of control: sensorless vector
- Current overload: 150% for 60 seconds, 200% for 0.5 seconds
- Degree of protection: IP20
- Operating temperature: +14 to +122°F (-10 to +50°C)
- Maximum altitude: 3280ft (1000m) maximum
- Relative humidity: 20-93% (with no condensation).

Certifications and compliance

UL listed for USA and Canada, File E 204788.
Compliant with standards: EN 50178, IEC/EN 61800-3.

VFP7 series



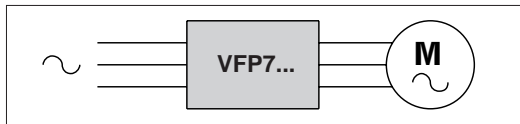
VFP7



External mounting of dissipation section
The heat dissipation section of the drive can be mounted outside the control panel, as illustrated.

le ^① ≤50°C (122°F)	3-phase motor power at 440V		Catalog number ^②
[A]	[kW]	[HP]	
Three-phase supply 380-460V 50/60Hz^③			
37	18.5	25	VFP7 4185P
44	22	30	VFP7 4220P
60	30	40	VFP7 4300P
72	37	50	VFP7 4370P
90	45	60	VFP7 4450P
110	55	75	VFP7 4550P
144	75	100	VFP7 4750P
180	90	125	VFP7 4900P
210	110	150	VFP7 4110KP
255	132	180	VFP7 4132KP
310	160	220	VFP7 4160KP
377	200	270	VFP7 4200KP
420	220	300	VFP7 4220KP
540	280	380	VFP7 4280KP
590	315	430	VFP7 4315KP

- ① Operation up to 122°F (50°C) without derating.
- ② Contact Sales & Technical Support for pricing.
- ③ Types with other supply input are available on request. Contact Sales & Technical Support for assistance.



General characteristics

The VFS7 is a vector control motor drive in open or closed loop. The on-line automatic tuning warrants exceptional performance also in sensorless control, achieving torque values over 150% with frequency values as low as 0.4Hz. The standard supplied control panel has a 4-digit 7-segment display and six keys and is used to start the motor and to remote adjust its speed as well as maintain constant control of all the parameters and monitor the main motor parameters.

SPEED REFERENCE SIGNALS

- Reference signals for speed adjustment are obtained by:
- External potentiometer: 1-10kΩ
 - Voltage signal: 0-10V or -10 to +10V
 - Current signal: 4-20mA
 - Control panel digital signals
 - 15 preset speeds via digital inputs
 - TTL or RS-485 serial signals.

PROGRAMMABLE OUTPUTS

- 1 relay with double-throw contact
- 2 static
- 2 analog configurable as 0-10VDC
- 1 pulse train.

PROTECTIONS

- Overcurrent and overvoltage
- Output short circuit and earth leakage
- Drive, motor and braking resistor overload
- Drive overtemperature
- Current transformer fault
- Excessive torque.

SPECIAL FUNCTIONS

- PI function for pump and fan application
- 4 sets of parameters to control 4 different motors
- Automatic restarting and instantaneous speed tuning
- 4 acceleration and deceleration ramps
- DC-Bus access for DC power supply
- Capacitor pre-charge circuit
- Vector control in closed loop conditions
- On-line auto-tuning.

Operational characteristics

- Input voltage: 380-460VAC three-phase^③
- Output voltage: ≤ input voltage
- Rated current: 37-590A
- Mains voltage: 50/60Hz
- Output frequency: 0.5-400Hz
- Frequency modulation: 2-15kHz
- Method of control: vector
- Current overload: 120% for 60 seconds, 150% for 0.3 seconds
- Degree of protection: IP20 up to 30HP type; IP00 for higher ratings
- Operating temperature: +14 to +122°F (-10 to +50°C)
- Maximum altitude: 3280ft (1000m) maximum
- Relative humidity: 20-93% (with no condensation).

Certifications and compliance

UL listed for USA and Canada, File E 204788.
Compliant with standards: EN 50178, IEC/EN 61800-3.

Surge suppressors, EMC compliant for VFP7 series



FN325...

Description	Qty per pkg	Weight	Catalog number ^①
Motor drive ratings	n°	[kg]	
25HP	1	1.400	FN3258 42 47
30HP	1	1.800	FN3258 55 52
40-50HP	1	3.200	FN3258 75 52
60HP	1	4.300	FN3258 100 35
75HP	1	4.500	FN3258 130 35
100HP	1	6.500	FN3359 150 28
125HP	1	6.500	FN3359 180 28
150HP	1	7.000	FN3359 250 28
180-220HP	1	10.500	FN3359 320 99
270HP	1	10.500	FN3359 400 99
300-380-430HP	1	11.000	FN3359 600 99

① Contact Sales & Technical Support for pricing.

General characteristics

The high actuation EMC compliant SCHAFFNER surge suppressors are used to assure electromagnetic compatibility, class A, to the VFP7 drives.

Operational characteristics

- Input voltage: 440VAC
- Maximum voltage input: 480VAC at 50°C
- Rated frequency: 50-60Hz at 50°C
- Operating temperature: -13 to +212°F (-25 to +100°C)
- Housing: metal.

Certifications and compliance

UL recognition for USA and Canada, File E 64388.
Compliant with standards: UL 1283, CSA 22.2 no.8 1986, EN 133200.

Accessories

Three-phase inductances



IND

le	mH	Description	Catalog number ^①
[A]		Motor drive ratings	
12.5	1	1-5HP	IND2020
25	0.6	7.5-15HP	IND2030
50	0.2	20-30HP	IND3040
100	0.15	40-60HP	IND4040
150	0.08	75-100HP	IND4075
300	0.04	125-150HP	IND4090
400	0.03	180-220HP	IND5060
600	0.02	270-300HP	IND5080
800	0.016	380-430HP	IND7070

① Contact Sales & Technical Support for pricing.

General characteristics

The three-phase inductances are used on the output to limit peak voltages generated by the motor drive on the motor. When mounted on the input, the inductances reduce the mains harmonic distortion.

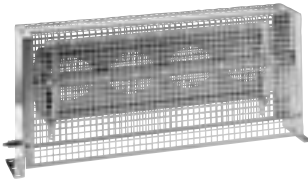
Operational characteristics

- Class: H
- Current: 12.5-800A
- Phase control: 3
- Operating temperature: -13 to +212°F (-25 to +100°C).

Reference standards

Compliant with standards: IEC/EN 60096-2, IEC/EN 60742.

Braking resistors



ROF
ROPPE

Power	Capacity	Catalog number ^②
[W]	[Ω]	
200	75	ROF20075
200	200	ROF20200
350	60	ROF35060
350	150	ROF35150
500	60	ROF50060
800	30	ROF80030
1300	30	ROPPE11430
2220	15	ROPPE12515
4000	18	ROPPE14018
8000	18	ROPPE24018

② Contact Sales & Technical Support for pricing.

Operational characteristics

- Maximum applicable voltage: 1000V
- Connection: With 9.8in (250mm) wire for ROF; directly on the resistor terminal for ROPPE
- Degree of protection: IP54 for ROF; IP20 for ROPPE.

Drive type	Resistor type
VFS9S 2004PL WP	ROF20200
VFS9S 2007PL WP	ROF20200
VFS9S 2015PL WP	ROF20075
VFS9S 2022PL WP	ROF20075
VFS9 4007PL WP	ROF20200
VFS9 4015PL WP	ROF20200
VFS9 4022PL WP	ROF20200
VFS9 4037PL WP	ROF35150
VFS9 4055PL WP	ROF35060
VFS9 4075PL WP	ROF50060
VFS9 4110PL WP	ROF80030
VFS9 4150PL WP	ROF80030
VFP7 4185P	ROPPE11430
VFP7 4220P	ROPPE12515

Accessories



RKP001Z0

Description	Catalog number ^③
[W]	
Remote programming and control panel complete with 6.6ft (2m) long wire	RKP001Z0
Remote control panel complete with 6.6ft (2m) long wire	MITOS B
TTL/RS-232 serial interface without wires	RS2001Z0
Regenerative braking unit for VFP7 series	BU001^{①②}
1kOhm potentiometer 10 turns, complete with operating knob	PT25H101K
1kOhm potentiometer 1 turn, complete with operating knob	PT53H11K

- ① Use the following number of pieces:
 1 unit for drive ratings up to 75HP.
 2 units in parallel for drive ratings, 100 to 150HP.
 3 units in parallel for drive ratings higher than 150HP.

- ② To be used with braking resistors as follows:
 - Resistor ROPPE11430 for standard applications, 1 per printed circuit board
 - Resistor ROPPE24018 for heavy-duty applications, 1 per printed circuit board.

③ Contact Sales & Technical Support for pricing.

POWER FACTOR CORRECTION REGULATORS



PAGE 12-2

DCRK

- Digital programming
- 5 or 7 step configuration in 96x96mm housing
- 8 or 12 step configuration in 144x144mm housing
- Capacitor overload protection
- Internal overheating protection
- TTL/RS-232 serial port
- Automatic set-up function (adjustable)
- Configurable alarms.



PAGE 12-3

DCRJ

- Digital programming
- 7 or 12 step configuration in 144x144mm housing
- Dual display
- Separate voltage measurement input
- Capacitor overload protection
- Internal-external overheating protection
- RS-232 programming and supervision interface
- Voltage and current harmonics measurement
- Event log
- Automatic set-up function (adjustable)
- Configurable alarms
- Suitable for medium voltage systems.

DESCRIPTION

	DCRK	DCRJ
Front plate		
3-digit display	•	•
4-digit display supplement		•
4 operation keys	•	•
1 function key		•
7 LED indicators for main functions and measurements	•	•
14 LED indicators for main functions and measurements		•
Control - Functions		
Automation recognition of current flow	•	•
4-quadrant operation	•	•
Separate voltage input		•
Three-phase voltage control		•
Medium-voltage usage		•
Phase-Neutral connection in 3-phase systems		•
Temperature sensor supplement input		•
TTL/RS-232 communications interface	•	
RS-232 communications interface		•
Automatic set-up function (adjustable)	•	•
Set-up and automatic panel test software	•	•
Isolated RS-435 serial port		•
Remote supervision software		•
Measurements		
Instantaneous power factor displacement (cosphi)	•	•
Instantaneous and average weekly power factor	•	•
Voltage and current	•	•
Reactive power to reach set-point value	•	•
Total reactive power	•	•
Capacitor overload	•	•
Electric panel temperature	•	•
Maximum voltage and current value	•	•
Maximum capacitor overload value	•	•
Maximum panel temperature value	•	•
Maximum capacitor temperature value	•	•
Active and apparent power		•
Current and voltage harmonic analysis		•
Current and voltage harmonic waveform logged at overload events		•
Step "var" value		•
Number of switching per step		•
Protections		
Voltage too high and too low	•	•
Current too high and too low	•	•
Over compensation (capacitors disconnected and cosphi higher than set-point)	•	•
Under compensation (capacitors connected and cosphi lower than set-point)	•	•
Capacitor overload	•	•
Capacitor overload on all 3 phases		•
Over temperature	•	•
No-voltage release protection	•	•
Capacitor bank malfunction		•
Over maximum harmonic distortion level limit		•
Alarm property variation (enable, trip delay, relay energizing, etc.)	•	•

- *Microprocessor supervision and control*
- *Accurate current evaluation with RMS readings*
- *Automatic rational adjustment*
- *Version with 5, 7, 8 or 12 steps*
- *Use in co-generation systems*



Power factor correction regulators

	SEC.	PAGE
DCRK series	12-	2
DCRJ series	12-	3



DCRK Series



DCRK5 and 7



DCRK8 and 12

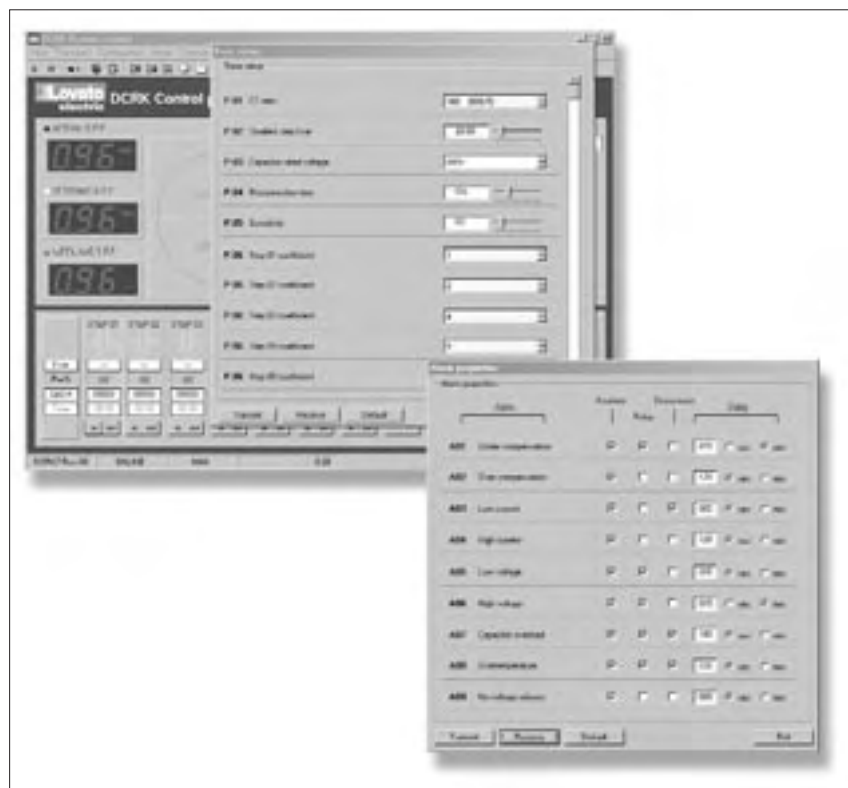
Flush-mount housing size [mm]	Steps n°	Catalog number	Price \$
96x96	5	DCRK 5 460	480.00
96x96	7	DCRK 7 460	540.00
144x144	8	DCRK 8 460	765.00
144x144	12	DCRK 12 460	885.00

96x96mm = 3.78x3.78in
144x144mm = 5.67x5.67in

Accessories

Description	Catalog number	Price \$
Set-up and automatic test software complete with 51 C11 connecting wire	DCRK SW	430.00
PC-DCRK connecting wire for TTL/RS-232 communication port, 9ft (2.8m) long	51 C11	230.00
IP54 front sealable cover for DCRK5 and DCRK7	31 PA 96X96	30.00
IP54 front protective cover for DCRK8 and DCRK12	31 PACR	40.00

Example of main window frame using DCRK SW



General characteristics

- 5, 7, 8 and 12 step versions, the last two of which are programmable as alarm and/or fan control
- Digital microprocessor regulator for automatic power factor correction systems with output relays for the connection and disconnection of capacitor banks
- For co-generation systems; 4 quadrant operation
- Accurate and reliable power factor control of a system even in presence of high current and voltage harmonic content
- Warrants optimal capacitor use for increased life using rational control of the capacitor operation and connection time
- RMS voltage and current measurements
- Average weekly power factor measurement (last 7 days)
- Adjustable tripping sensitivity, integral switching time
- Adjustable reconnection time delay
- No-voltage release protection
- Protection against capacitor overload and panel overheating
- Automatic set-up function
- TTL-RS-232 interface with personal computer for: fast set-up, function and alarm personalizing and automatic electric panel testing
- Installation ease with the use of one external current transformer only.

Operational characteristics

- Voltage circuit
 - Supply and control voltage Ue: 440-480VAC (220-240VAC or 380-415VAC on request)
 - Rated frequency: 50/60Hz ±1% self configurable
 - Power consumption: 5VA (DCRK5 and DCRK7) 8VA (DCRK8 and DCRK12)
- Current circuit
 - Rated current Ie: 5A (1A on request)
 - Operation range: 0.125-6A
 - Overload peak: 20Ie for 10ms
 - Power consumption: 0.64VA
- Measurements and controls
 - Power factor adjustment: 0.8 inductive - 0.8 capacitive
 - Voltage measurement range: -15 to +10% Ue
 - Current measurement range: 2.5 to 120% Ie
 - Temperature measurement range: -40 to +212°F (-40 to +100°C)
 - Capacitor overload current range: 0-250%
 - Type of voltage and current measurement: RMS
 - Reconnection time of same step: 5-240s
 - Tripping sensitivity: 5-600s/step
- Output relays
 - 5, 7, 8 or 12 steps, the last of which is isolated
 - Contact configuration: Normally Open (NO); the last contact of DCRK8-DCRK12 is double throw
 - Rated current Ith: 5A 250VAC (AC1)
 - Maximum capacity of common terminal: 12A
 - Rated operational voltage: 250VAC
 - UL designation: C/250, B/400
 - Maximum switchable voltage: 440VAC
- Housing
 - Flush mounting
 - Degree of protection on front: IP54 for DCRK5 and DCRK7. IP41 for DCRK8 and DCRK12; IP54 with protective cover
- Operating temperature: -4°F to +140°F (-20 to +60°C)
- Connection
 - Type of terminal: removable
 - Maximum cable section: 2.5mm²; AWG 12.

Certifications and compliance

Certifications obtained: cULus pending.
Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, CISPR 11/EN 55011.

Special contactors for power factor correction

See section 3, page 3-10.

DCRJ series



DCRJ8 and 12

Flush-mount housing size	Steps	Catalog number	Price
[mm]	n°		\$
144x144	8	DCRJ 8	n.a.
144x144	12	DCRJ 12	n.a.

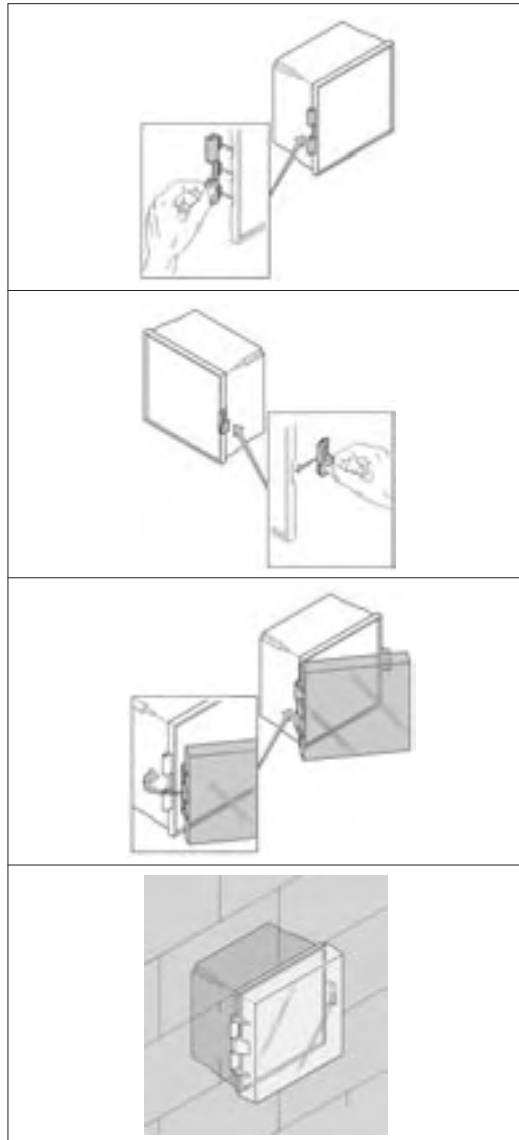
144x144mm = 5.67x5.67in

Accessories

Description	Catalog number	Price
		\$
Set-up / automatic test / remote control software complete with 51 C2 connecting wire	DCRJ SW	430.00
PC-DCRJ connecting cable, 6ft (1.8m) long	51 C2	60.00
IP54 front protective cover for DCRJ8 and DCRJ12	31 PACR	40.00
Temperature sensor to use with DCRJ8 and DCRJ12	NTC01	n.a.

n.a. Not Available at time of printing. Contact Sales & Technical Support.

Mounting of the PACR cover



General characteristics

- 8 and 12 step versions, the last two of which are programmable as alarm and/or fan control
- Digital microprocessor regulator for automatic power factor correction systems with output relays for the connection and disconnection of capacitor banks
- For systems of medium-voltage (separate voltage input) and co-generation (4 quadrant operation)
- Accurate and reliable power factor control of a system even in presence of high current and voltage harmonic content
- Warrants optimal capacitor use for increased life using rational control of the capacitor operation and connection time
- RMS voltage and current measurements
- Measurement of average weekly power factor (last 7 days), capacitor overload, electric panel temperature, voltage and current harmonic content
- Event viewing of harmonic overload limit exceeded only
- Harmonic content analysis of logged events complete with relative waveforms
- Adjustable tripping sensitivity, integral switching time
- Adjustable reconnection time delay
- Micro-breaking protection, no-voltage release
- Protection against capacitor overload and panel overheating
- Measurement of internal and external temperature; external NTC01 sensor on request
- Automatic set-up function
- RS-232/RS-485 serial ports
- Remote supervision software for personal computer interface and supervision for fast set-up, function and alarm customising and automatic electric panel testing
- Installation ease with the use of one external current transformer only.

Operational characteristics

- Supply circuit
 - Dual supply voltage U_e : 110-127 / 220-240VAC
 - Rated frequency: 50/60Hz $\pm 1\%$ self configurable
 - Power consumption: 4VA
- Voltage circuit
 - Three phases without neutral
 - Operating range: 85-760VAC
- Current circuit
 - Rated current I_e : 5A (1A on request)
 - Operation range: 0.125-6A
 - Overload peak: 20 I_e for 10ms
 - Power consumption: 0.27VA
- Measurements and controls
 - Type of voltage and current measurement: RMS
 - Voltage measurement range: 85-760VAC
 - Current measurement range: 2.5-120% I_e
 - Temperature measurement range: -40 to +212°F (-40 to +100°C)
 - Capacitor overload current range: 0-250%
 - Power factor adjustment of which: 0.8 inductive - 0.8 capacitive
 - Reconnection time of same step: 5-240s
 - Tripping sensitivity: 5-600s/step
- Output relays
 - 8 or 12 steps, the last of which is isolated
 - Contact configuration: Normally Open (NO); the last of which is double throw
 - Rated current I_{th} : 5A 250VAC (AC1)
 - Maximum capacity of common terminal: 12A
 - Rated operational voltage: 250VAC
 - UL designation: C/250, B/400
 - Maximum switchable voltage: 440VAC
- Housing
 - Flush mounting
 - Degree of protection on front: IP41; IP54 with protective cover
- Operating temperature: -4° to +140°F (-20 to +60°C)
- Connection
 - Type of terminal: fixed
 - Maximum cable section: 2.5mm²; AWG 12.

Certifications and compliance

Certifications obtained: cULus pending.
Compliant with standards: IEC/EN 61010-1,
IEC/EN 61000-6-2, CISPR 11/EN 55011.

Special contactors for power factor correction

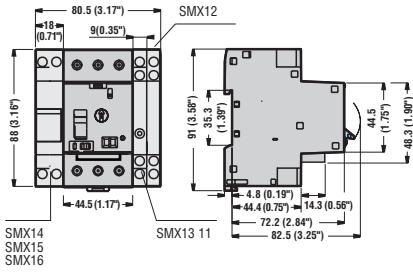
See section 3, page 3-10.

Dimensions

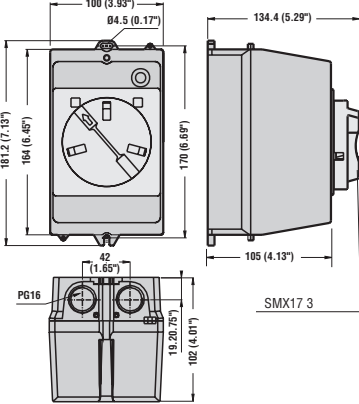


Dimensions

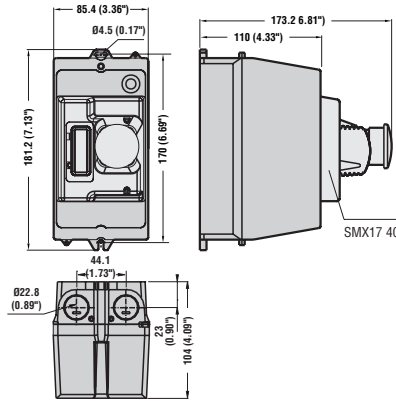
SM1B with SMX1...



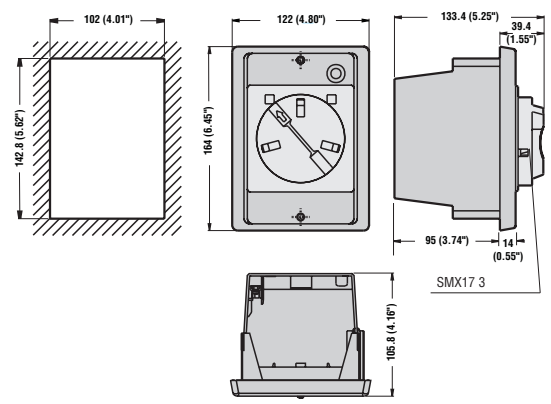
SMX17 10 with SMX17 3...



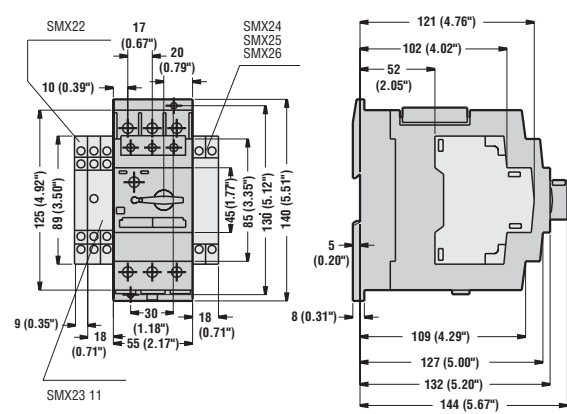
SMX17 11 with SMX17 40



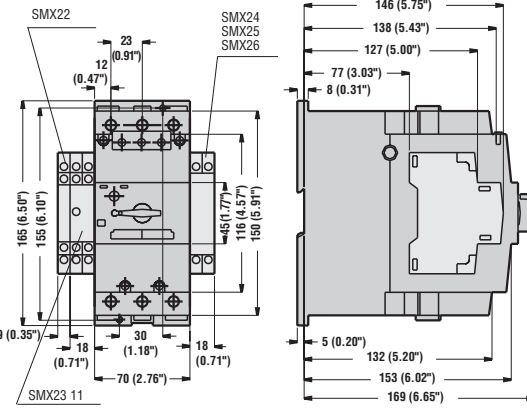
SMX17 20 with SMX17 3...



SM2A with SMX2...

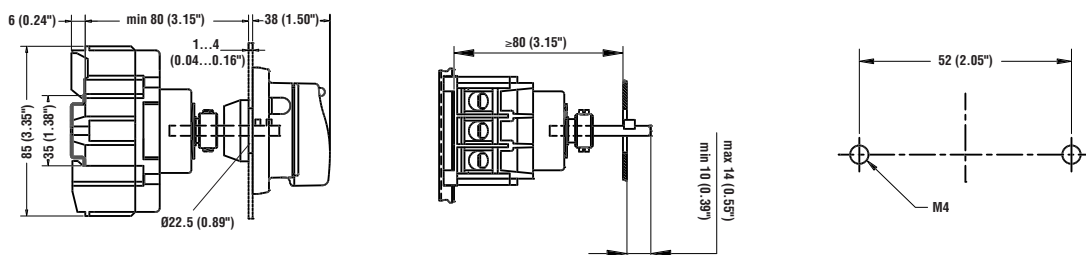


SM3A with SMX2...

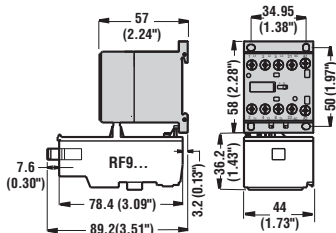


Disconnect switches

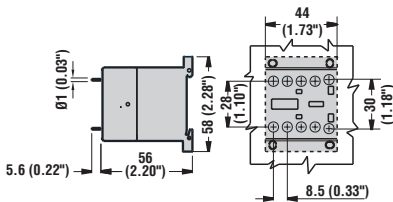
Door coupling version GUS with GUSH and GUSS



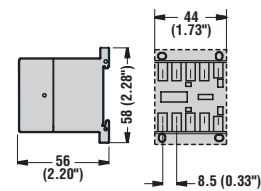
BG with screw terminals



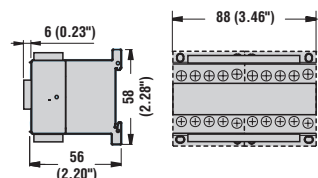
BGS with terminals for printed circuit



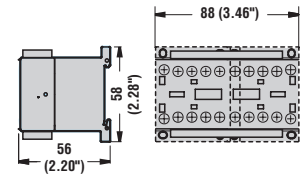
BGF with Faston terminals



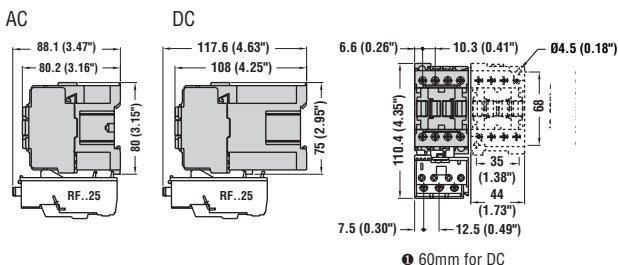
BGR Reversing contactor assembly with power and auxiliary connections



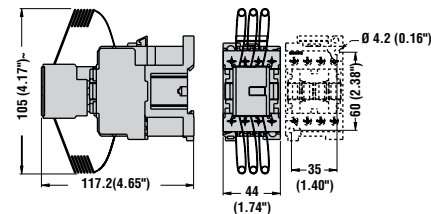
BGT Reversing contactor assembly with power connections



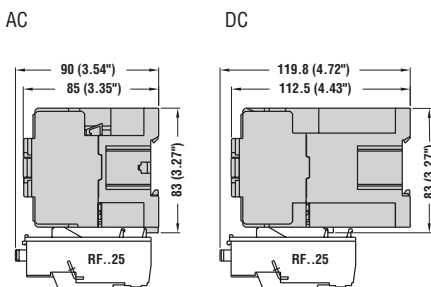
CF4
BF9 - BF12 - BF16 (3 and 4 pole) with RF.25



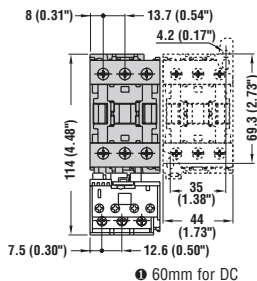
BF9K - BF12K



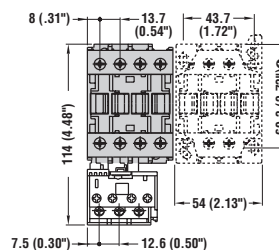
BF20 - BF25 with RF.25



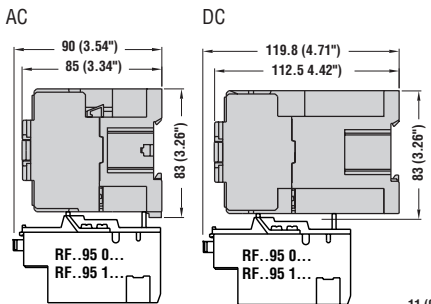
BF20 00
BF25 00



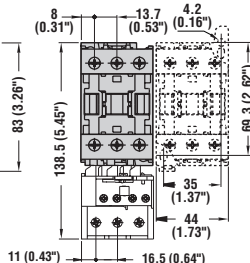
BF20 01 or 10
BF25 01 or 10 and four-pole types



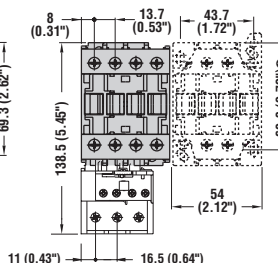
BF20 - BF25 with RF.95



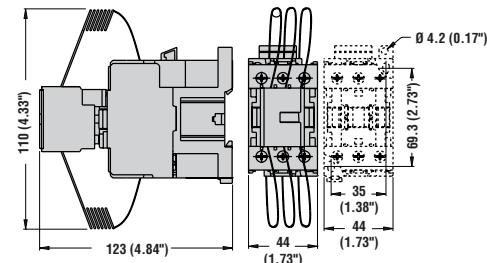
BF20 00
BF25 00



BF20 01 or 10
BF25 01 or 10 and four-pole types



BF20K
BF25K

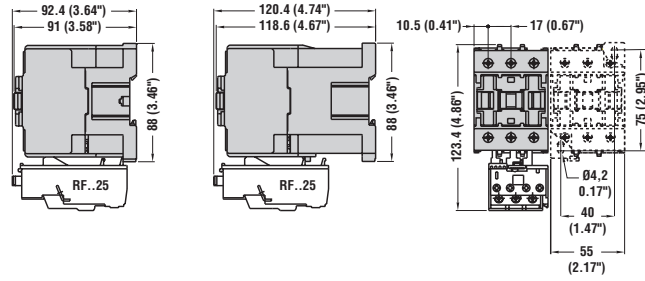


Dimensions [mm (in)]

IEC style contactors

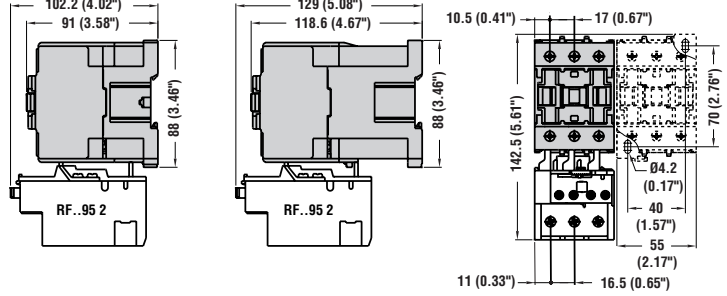
BF32 - BF40 with RF..25

AC DC Three-pole



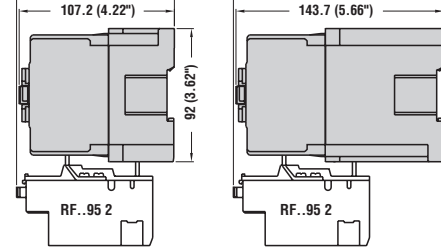
BF32 - BF40 with RF..95 2

AC DC Three-pole

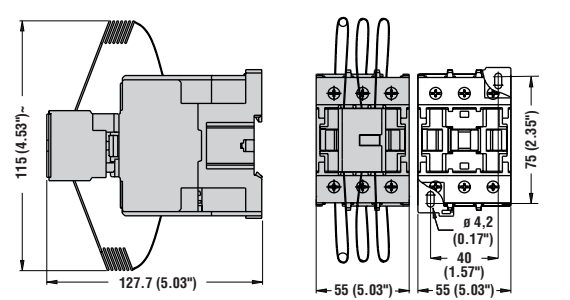


BF40 40 with RF..95 2

AC DC

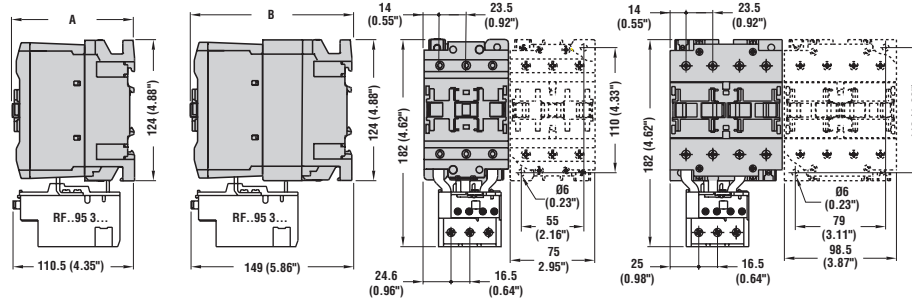


BF40K



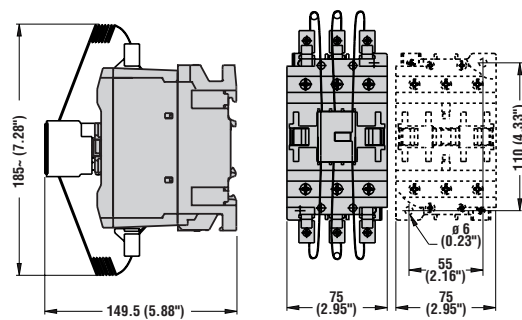
BF50 - BF65 - BF80 - BF95 - BF110 with RF..95 3

AC DC Three-pole Four-pole



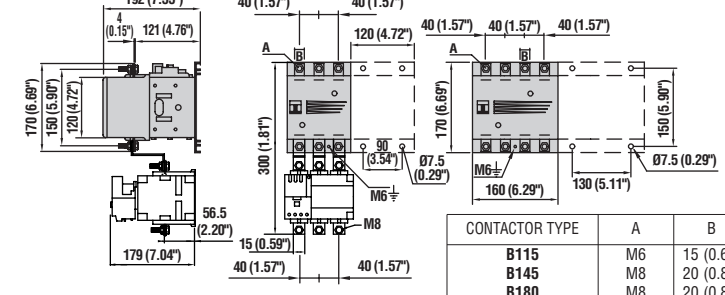
CONTACTOR TYPE	A	B
Three-pole	113.5 (4.46")	150.5 (5.92")
Four-pole	107 (4.21")	144 (5.67")

BF50K - BF65K - BF80K



B115 - B145 - B180 with RF..180

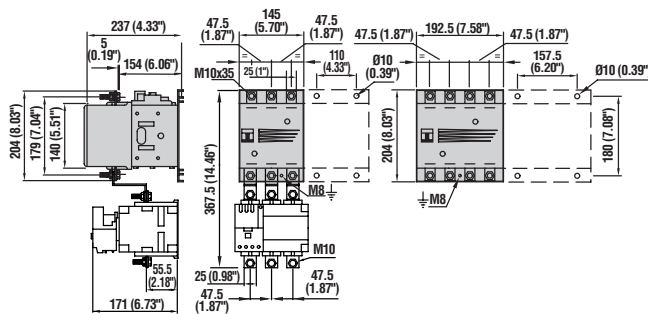
AC/DC Three-pole Four-pole



CONTACTOR TYPE	A	B
B115	M6	15 (0.6")
B145	M8	20 (0.8")
B180	M8	20 (0.8")

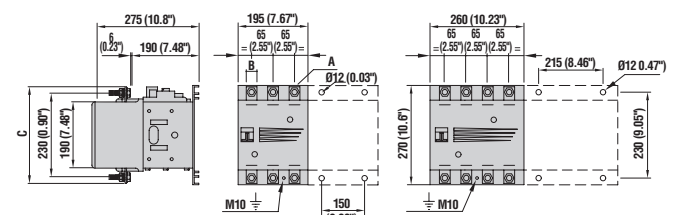
B250 - B310 - B400 with RF..400

AC/DC three-pole Four-pole



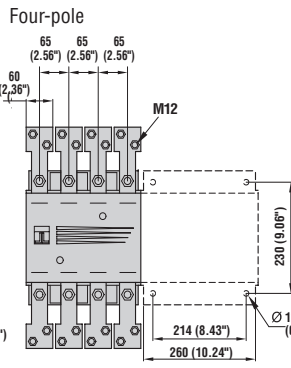
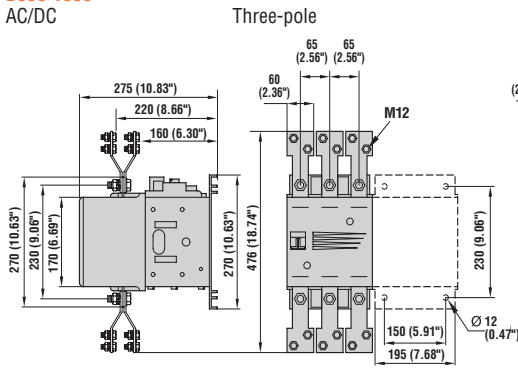
B500 - B630

AC/DC Three-pole Four-pole

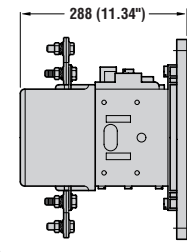


CONTACTOR TYPE	A	B	C
B500	M10	35 (1.38")	265 (10.43")
B630	M12	40 (1.57")	270 (10.63")

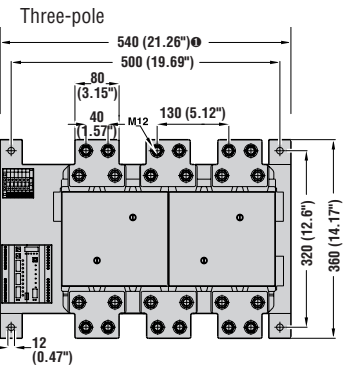
B630 1000
AC/DC



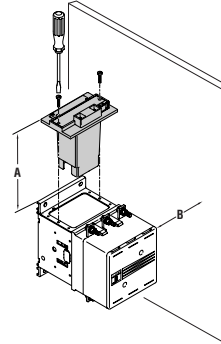
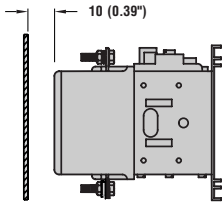
B1250 - B1600
AC



- ① 670mm for 4-pole version.
- ② 630mm for 4-pole version.



B115 - B145 - B180 - B250 - B310 - B400 - B500 - B630

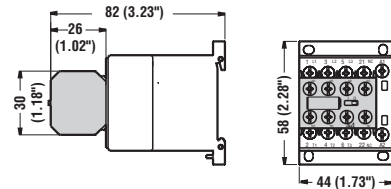


Minimum space needed to replace the coil

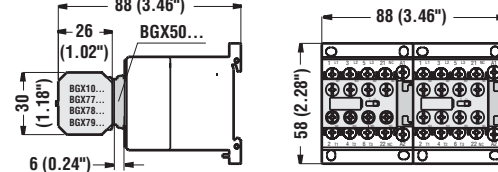
	B115-B145-B180	B250-B310-B400	B500-B630 1000
A	120 (4.7)	145 (5.7)	170 (6.69)
B	100 (3.9)	110 (4.3)	160 (6.29)

If dimension B is respected, coil replacement is possible without removing power connections.

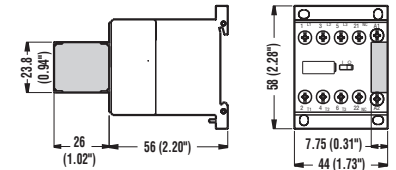
Add-on blocks on BG types
BGX10...



**BGX50 00 with BGX10... or BGX77...,
BGX78... or BGX 79...**

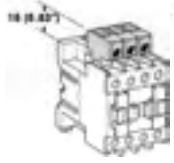


BGX77..., BGX78... or BGX79...

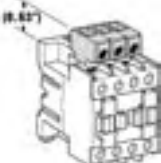


Add-on blocks and accessories on CF4, BF9-BF110

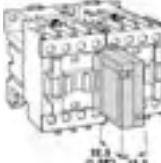
G231 on
BF9-BF16



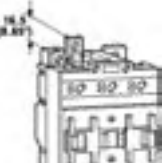
G232 on
BF20-BF25



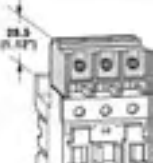
G269 1
G269 2



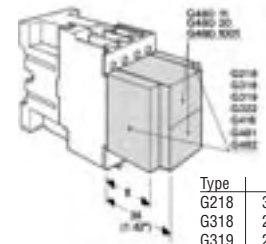
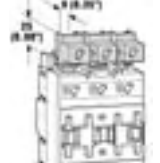
G271 on
BF50-BF110



G281 on
BF32-BF40



G285



Type	X	Y
G218	32 (1.3")	—
G318	23 (0.9")	—
G319	23 (0.9")	—
G322	23 (0.9")	—
G418	28 (1.1")	—
G481	36 (1.4")	—
G482	36 (1.4")	—
G484	—	36.5 (1.4")

Type	X
G218	32 (1.3")
G318	23 (0.9")
G319	23 (0.9")
G322	23 (0.9")
G418	28 (1.1")
G481	36 (1.4")
G482	36 (1.4")

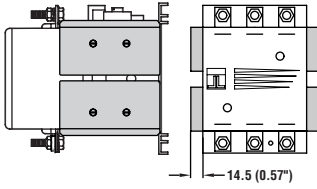
No side-mount auxiliary contacts can be fitted on BF40 22 contactor.
NOTE: See page TC-22 for the various accessory combinations.

① The G280 and G483 adapters projection with respect to contactor height of:
G280 = 5mm (0.2")
G483 = 7.5mm (0.3")

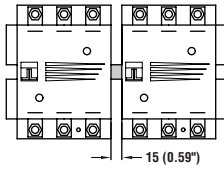
Type	X
G484	36.5 (1.4")

Add-on blocks and accessories on B115-B630

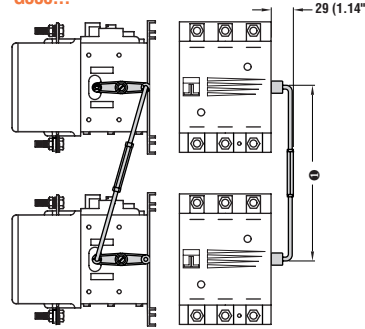
G350, G354



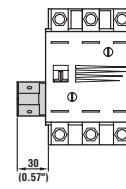
G355



G356...

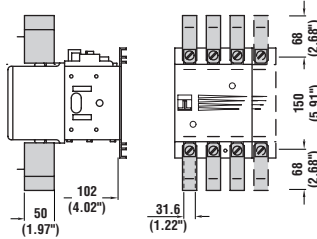


G358

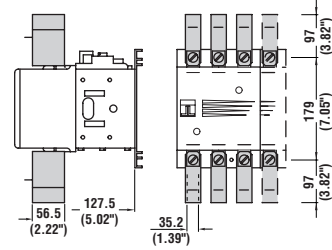


① See dimensions given on page TC-25.

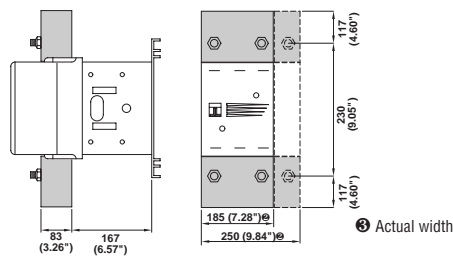
G360 on B115
G361 on B145-B180



G363 on B250-B310-B400



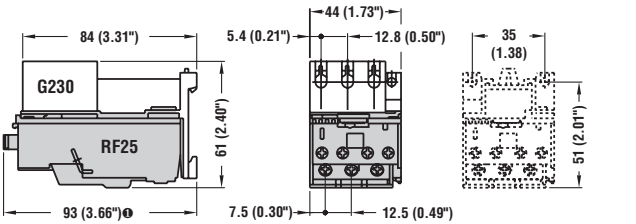
G527, G528 on B500
G529, G530 on B630



② Actual width

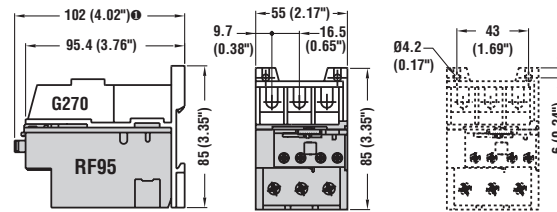
IEC style overload relays

RF.25 on independent mounting base G230



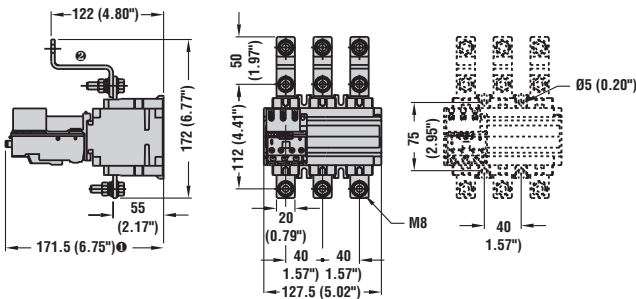
① The depth of the thermal relay decreases 6.5mm (0.25") when automatic reset type.

RF.95 on independent mounting base G270



① The depth of the thermal relay decreases 6.5mm (0.25") when automatic reset type.

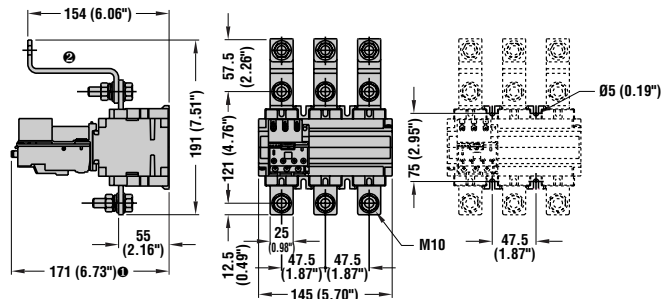
RF.180



① The depth of the thermal relay decreases 6.5mm (0.25") when automatic reset type.

② G372 links

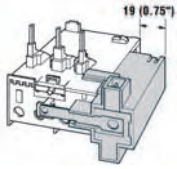
RF.400



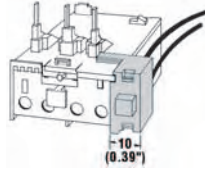
① The depth of the thermal relay decreases 6.5mm (0.25") when automatic reset type.

② G376 links

G228



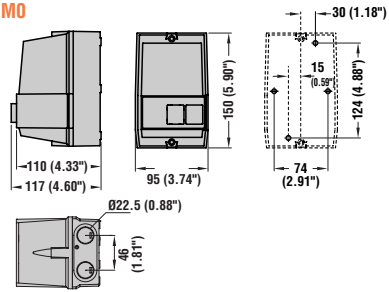
G244



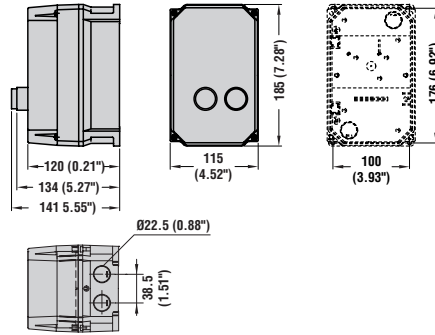
IEC style starters

Full voltage starters

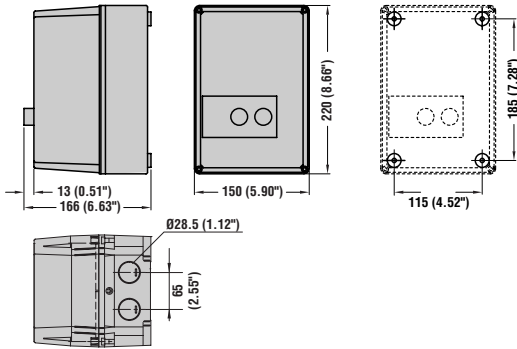
M0



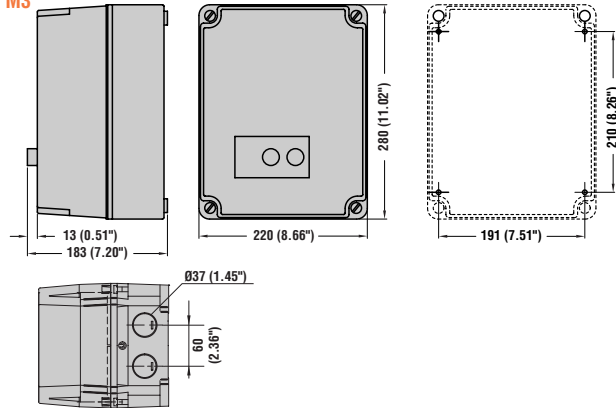
M1



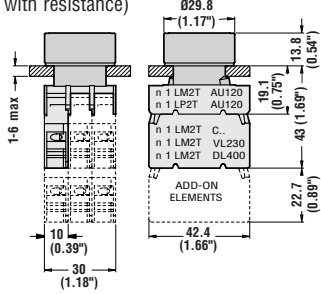
M2



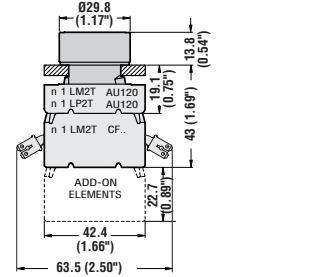
M3



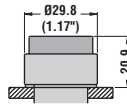
Flush push-button with auxiliary contacts or lamp-holder (direct or with resistance)



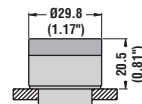
Flush push-button with Faston auxiliary contacts



Push-buttons

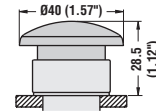


Extended
L...2T B2...
Push-push
LM2T Q...
Illuminated extended
L...2T BL2...

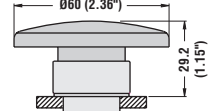


Shrouded
L...2T B30...
Illuminated flush
L...2T BL10...

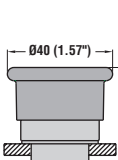
Mushroom-head push-buttons



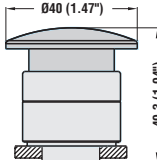
Spring return
L...2T B614...
Illuminated button
L...2T BL614...



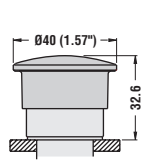
Spring return
L...2T B616...



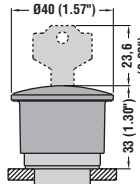
Push-pull
L...2T B624...



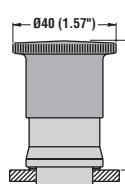
Illuminated
Push-pull
LM2T BL624...



Turn to release
L...2T B634...

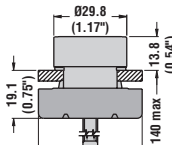


Turn key to release
L...2T B654...



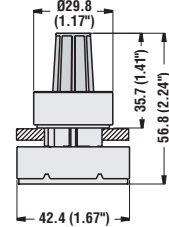
Turn to release
EN418 compliant
L...2T B6644

Reset button



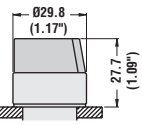
L...2T R1...

Potentiometer drive

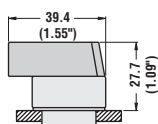


LM2T P100 - LM2T P110

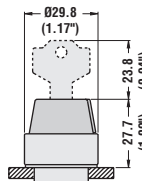
Selectors



Knob
L...2T S1...
Illuminated knob
L...2T SL1...

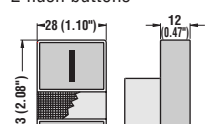


L...2T S2...



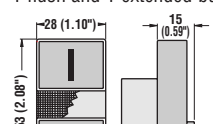
L...2T S3...

Two buttons with or without pilot light
2 flush buttons



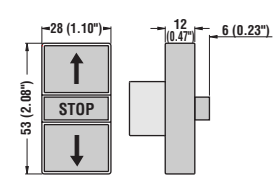
LP2T B71... - LP2T BL71...

Two buttons with or without pilot light
1 flush and 1 extended button



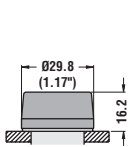
LP2T B72... - LP2T BL72...

Three button



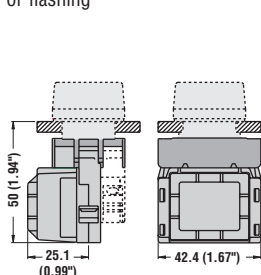
LP2T B73...

Pilot light



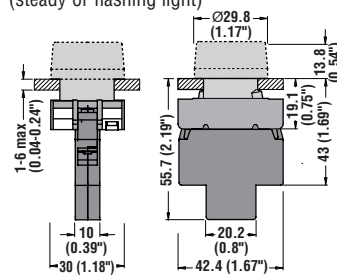
LM2T IL1...

Lamp-holder with transformer or flashing



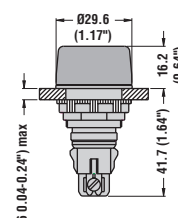
LM2T YL... - LM2T GL...
LM2T XL... - LM2T FL...

LED integrated lamp-holder (steady or flashing light)



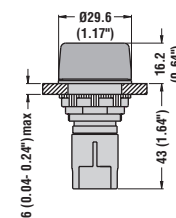
LM2T L
LM2TM

Monoblock pilot light complete with diffuser, without terminal protection



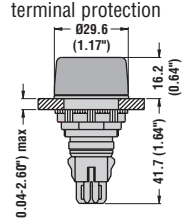
LP2T IL21...

Monoblock pilot light complete with diffuser and terminal protection



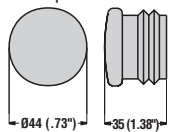
LP2T IL22...

Monoblock pilot light complete with diffuser, 1-6.35 or 2-2.8 Faston terminals without terminal protection



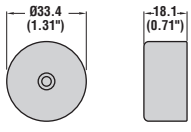
LP2T IL23...

Transparent boot



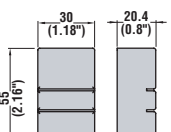
LM2T AU167

Button protection boot



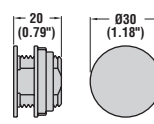
LM2T AU14... LM2T AU13...

Double/triple-button boot



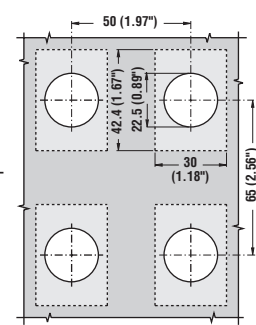
LM2T A185

Threaded plug for unused holes

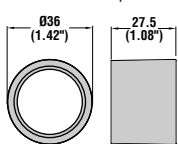


LM2T A130

Drillings - minimum recommended distances

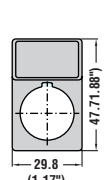


Knob selector protection



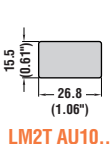
8 LM2T AU157

Label holder



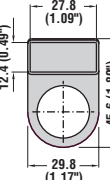
LM2T AU105

Label



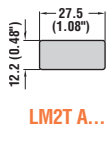
LM2T AU10...

Label holder



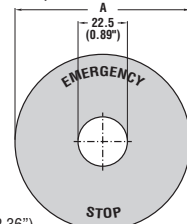
LM2T AU100

Label



LM2T A...

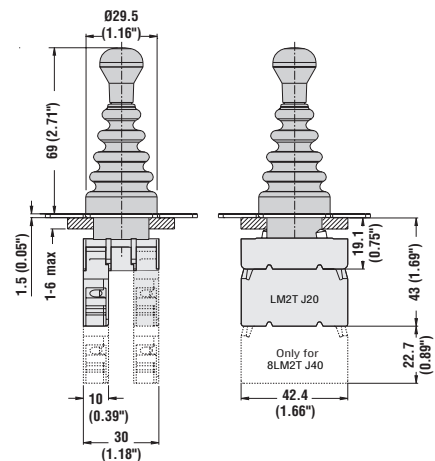
Plastic disk for mushroom-head push-buttons



A = 60mm (2.36")
A = 90mm (3.54")

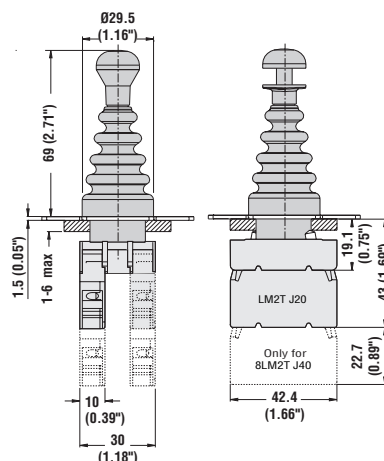
LM2T AU11...

Joystick without mechanical interlock



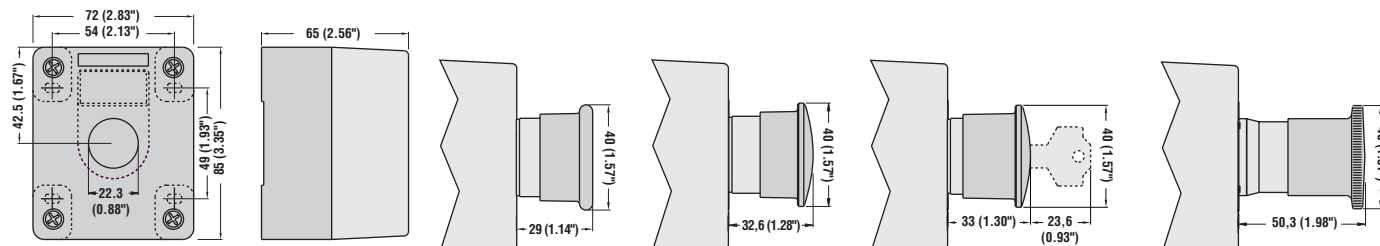
LM2T J20... - LM2T J40...

Joystick with mechanical interlock



LM2T J21... - LM2T J41...

Control station for one operator or complete push button station



L2PP 1A5 - L2PP 1A8

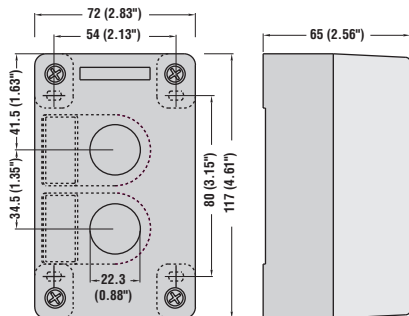
L2PP 100
L2PP 150

L2PP 110
L2PP 115
L2PP 160
L2PP 165

L2PP 120
L2PP 170

L2PP 130
L2PP 180

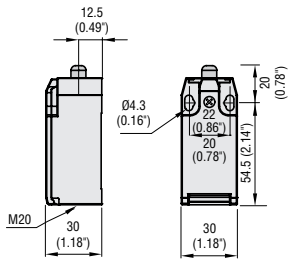
Control station for two operators



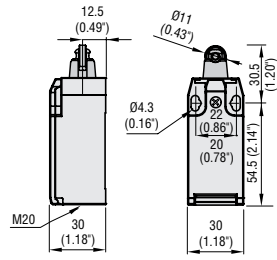
L2PP 2A8

For 3, 4 or 5 operator versions, increase the total length by the pitch between the drillings, 35mm (1.4") for each extra operator.

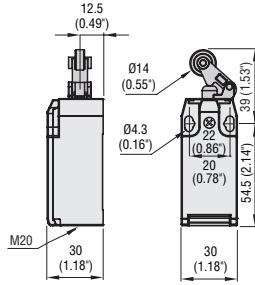
KB A1 S... - KB A1 A... - KB A1 L...
KM A1 S... - KM A1 A... - KM A1 L...



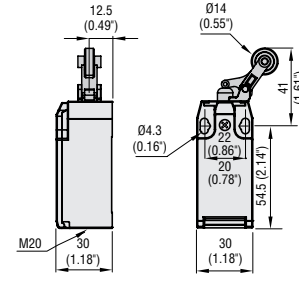
KB B1... - KB B2...
KM B1... - KM B2...



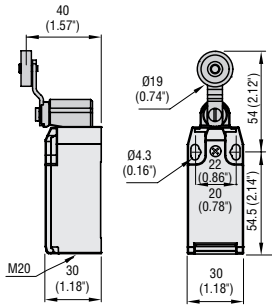
KB C1... - KB C2...
KM C1... - KM C2...



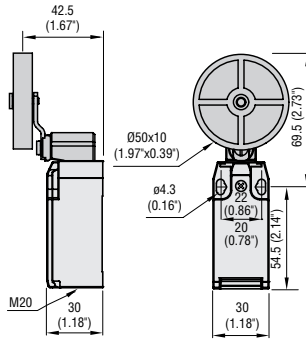
KB D1... - KB D2...
KM D1... - KM D2...



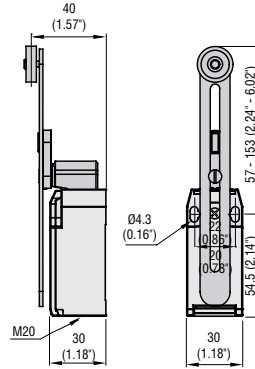
KB E1... - KB E2...
KM E1... - KM E2...



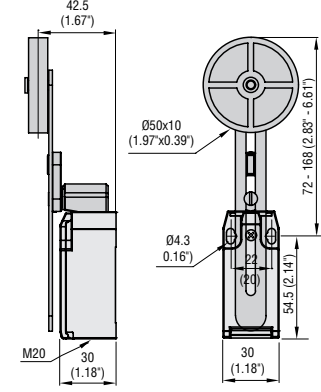
KB E3... - KM E3



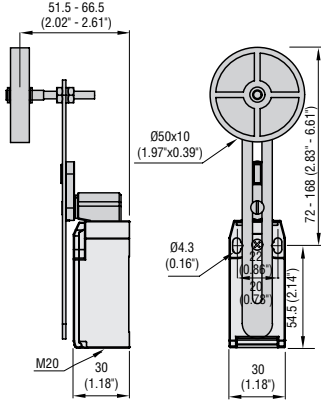
KB F1... - KB F2...
KM F1... - KM F2...



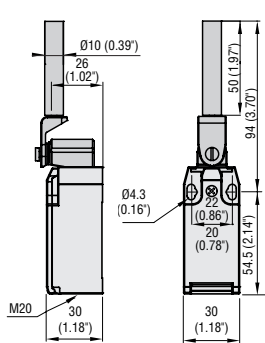
KB F3... - KM F3



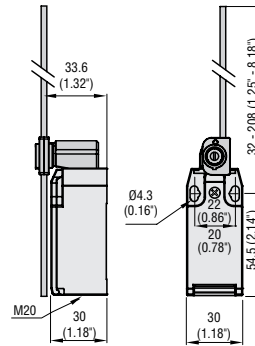
KB F4... - KM F4



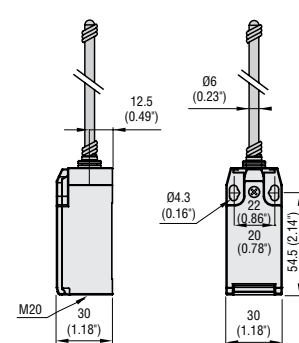
KB H1... - KM H1



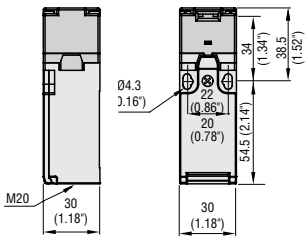
KB L1... - KB L2...
KM L1... - KM L2...



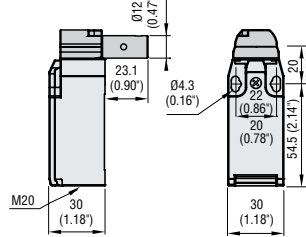
KB M1... - KB M2
KM M1... - KM M2



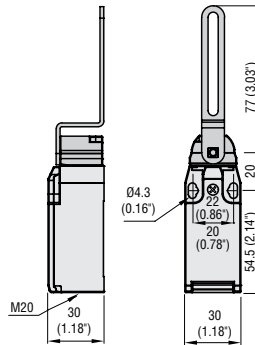
KB N1... - KB N2...
KB N3... - KB N4...



KB P1 L... - KM P1 L...

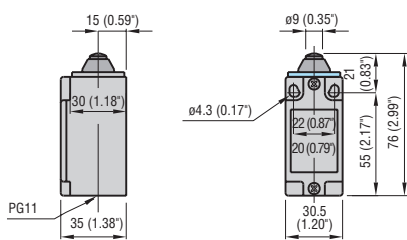


KB Q1 L... - KM Q1 L...

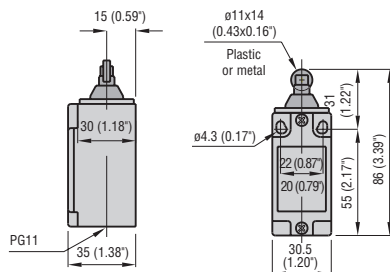


RS series plastic limit switches without reset button

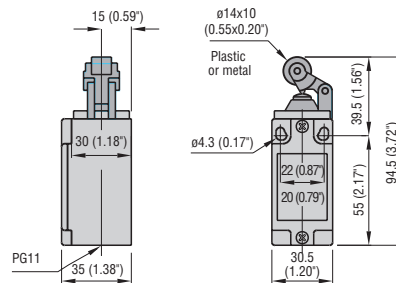
RS1 01 - RS3 01



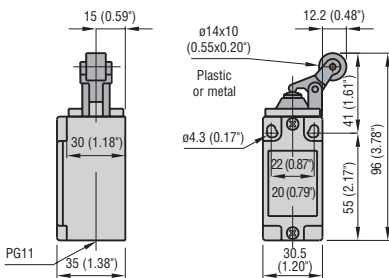
RS1 02 - RS3 02



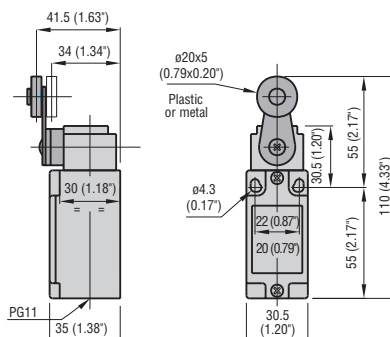
RS1 03 - RS3 03



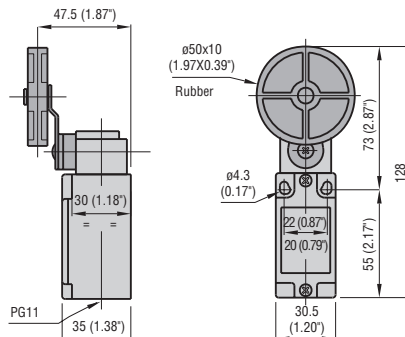
RS1 04 - RS3 04



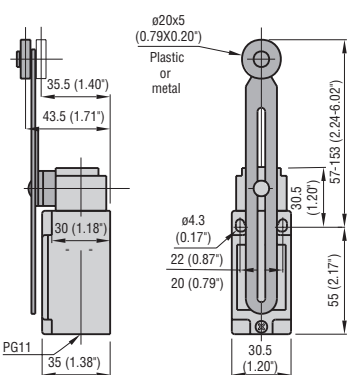
RS1 05 20A - RS3 05 20A
RS1 05 21A - RS3 05 21A



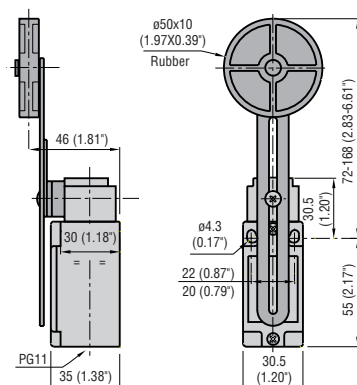
RS1 05 24A - RS3 05 24A



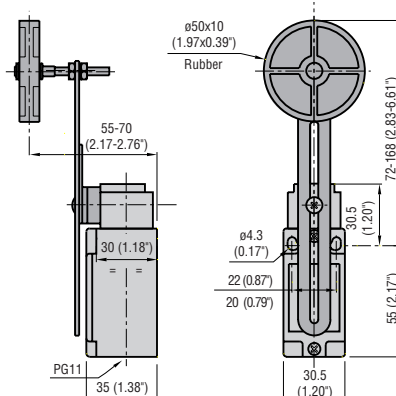
RS1 06 20A - RS3 06 20A
RS1 06 21A - RS3 06 21A



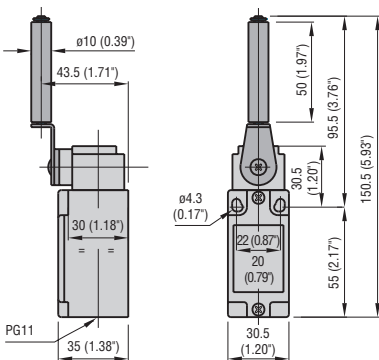
RS1 06 24A - RS3 06 24A



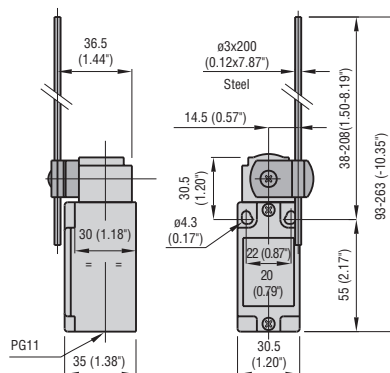
RS1 06 25A - RS3 06 25A



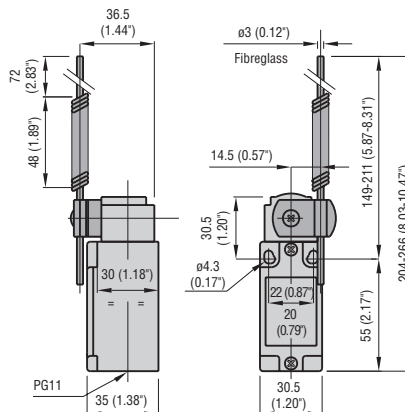
RS1 07 70A - RS3 07 70A



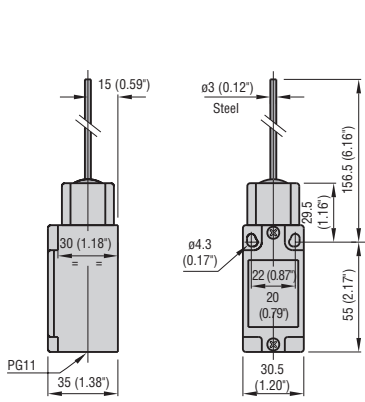
RS1 08 80A - RS3 08 80A



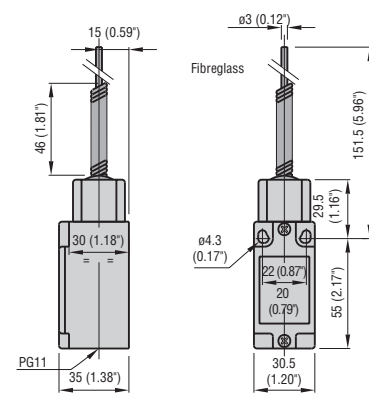
RS1 08 81A - RS3 08 81A



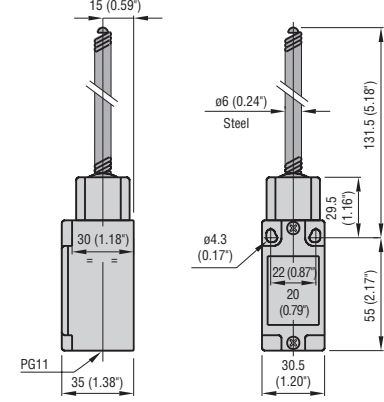
RS1 09 90 - RS3 09 90



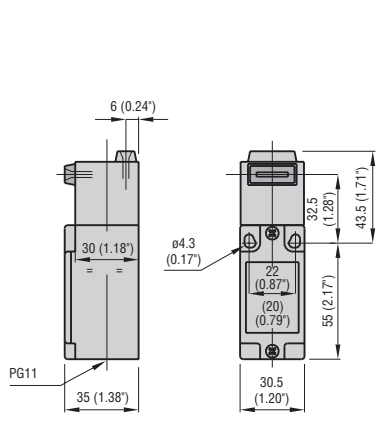
RS1 09 91 - RS3 09 91



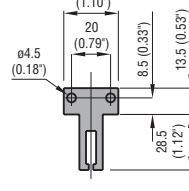
RS1 09 92 - RS3 09 92



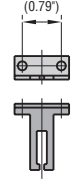
RS1 10... - RS3 10...



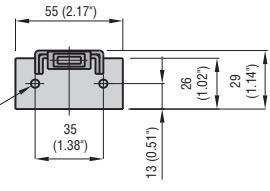
P32752



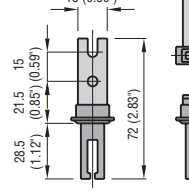
P32753



A20748



A20746



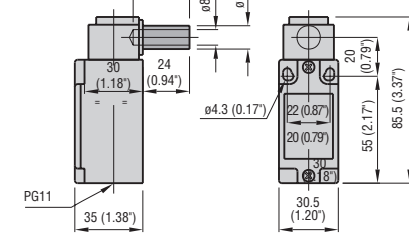
A20747



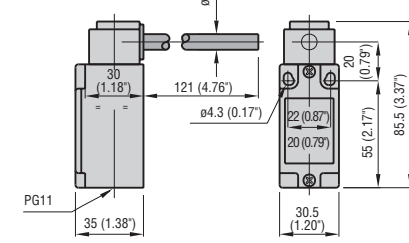
A20748



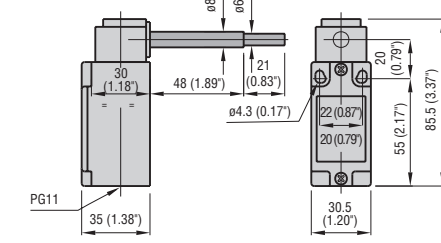
RS1 11 10 P - RS3 11 10 P



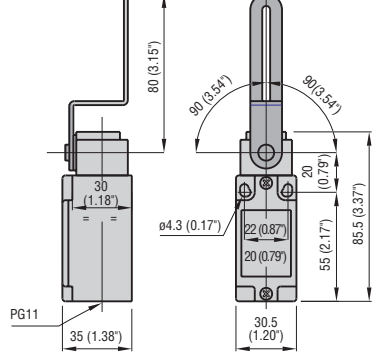
RS1 11 11 P - RS3 11 11 P



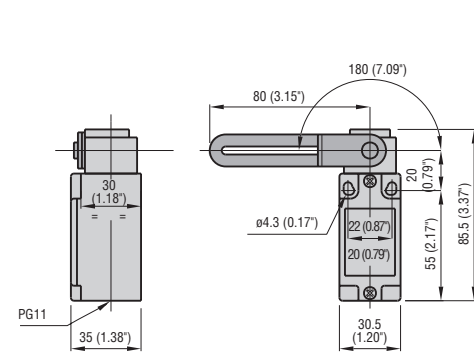
RS1 11 12 P - RS3 11 12 P



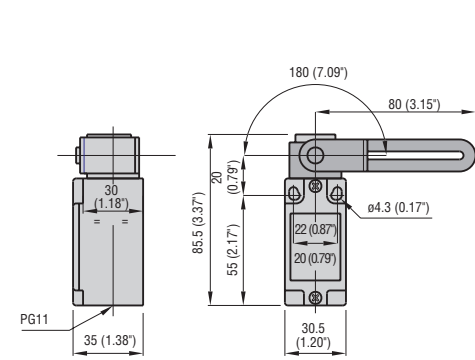
RS1 12 10 P - RS3 12 10 P



RS1 12 11 P - RS3 12 11 P

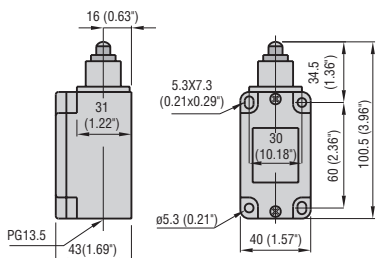


RS1 12 12 P - RS3 12 12 P

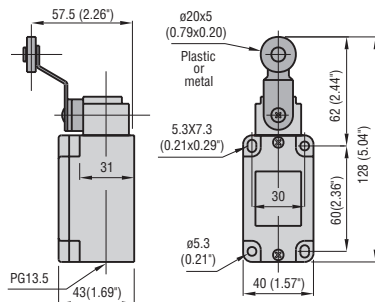


T series plastic limit switches without reset button

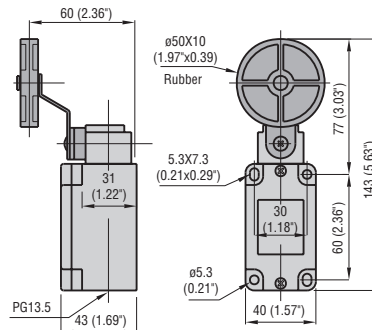
TS1 01... - TL1 01...



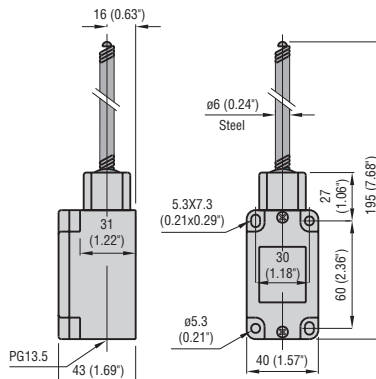
TS1 05 20 - TL1 05 20
TS1 05 21 - TL1 05 21



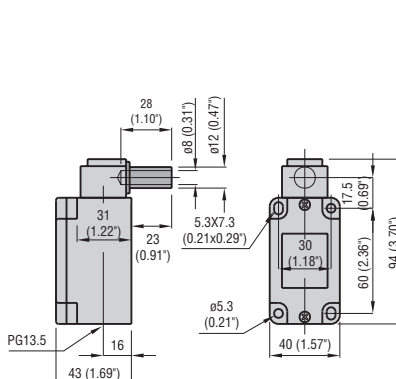
TS1 05 24 - TL1 05 24



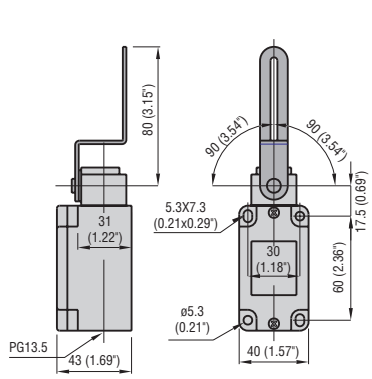
TS1 09... - TL1 09...



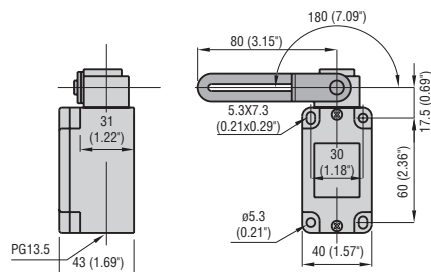
TS1 11... - TL1 11...



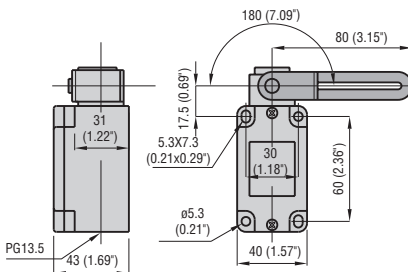
TS1 12 10 - TL1 12 10



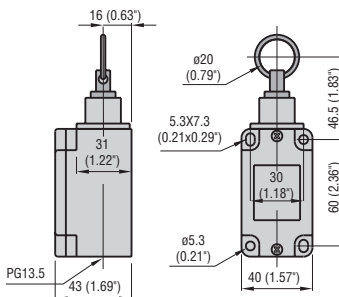
TS1 12 11 - TL1 12 11



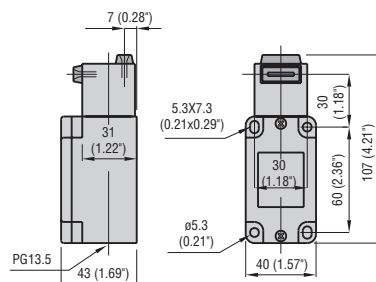
TS1 12 12 - TL1 12 12



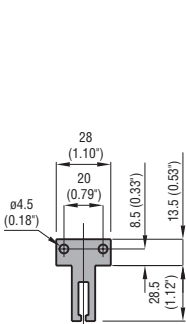
TS1 13 10 - TL1 13 10



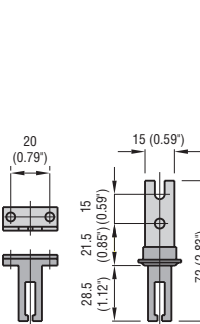
TS2 10... - TL2 10...



P32752

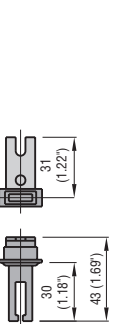


P32753

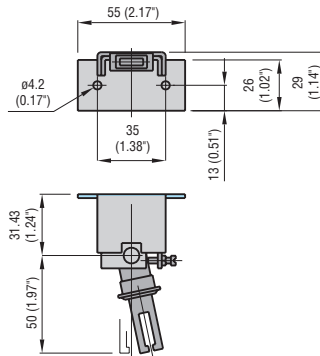


A20746

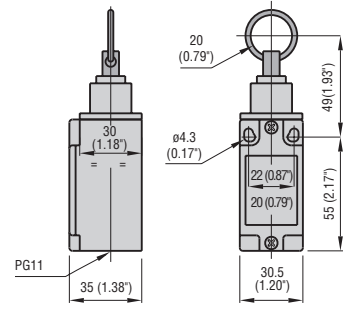
A20747



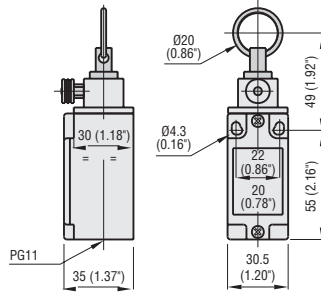
A20748



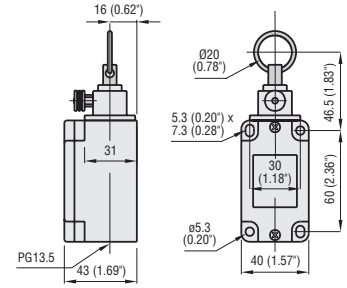
RS1 13 10 - RS3 13 10 for normal stopping



RS13 13 10 safety switch

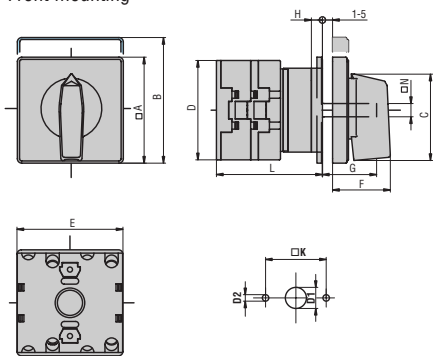


TL13 13 10 safety switch



D

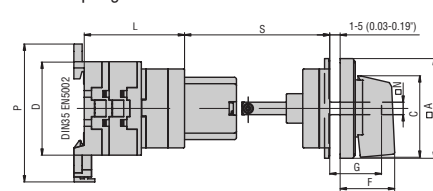
Front mounting



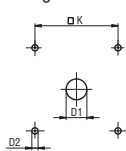
Type	Dimensions												L [mm]						
	A	B	C	D	E	F	G	H	K	M	N	D1	D2	1 wafer	2 wafers	3 wafers	4 wafers	5 wafers	6 wafers
GX16 U	48	—	39.5	45	48	26.5	23.5	8	—	28	6	12	5	42.5	51	59.5	68	76.5	85
GX16 U25	48	60	●	45	48	34	23.5	5	—	28	6	12	5	39.5	48	56.5	65	73.5	82
GX20 U	48	—	39.5	45	48	26.5	23.5	8	—	28	6	12	5	42.5	51	59.5	68	76.5	85
GX20 U25	48	60	●	45	48	34	23.5	5	—	28	6	12	5	39.5	48	56.5	65	73.5	82
GX32 U	65	—	53	58	66	34.5	26	5	—	28	7	14	5	47.5	59.5	71.5	83.5	95.5	107.5
GX32 U25	65	80	●	58	66	38	26	5.5	—	28	7	14	5	48	60	72	84	96	108
GX40 U	65	—	53	58	66	34.5	26	5	—	28	7	14	5	47.5	59.5	71.5	83.5	95.5	107.5
GX40 U25	65	80	●	58	66	38	26	5.5	—	28	7	14	5	48	60	72	84	96	108

● Padlockable handle.

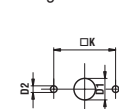
Door coupling O version



Drilling for 4-screw wafer fixing on mounting plate



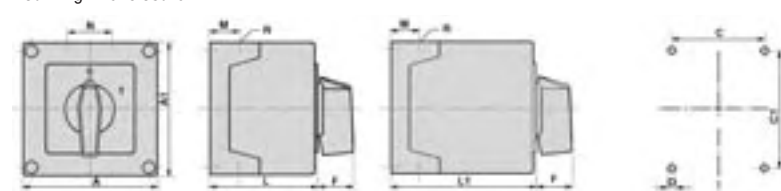
Coupling and front plate fixing on the door



Type	Dimensions												L [mm]							
	A	C	D	E	F	G	K	M	N	O	P	S	D1	D2	1 wafer	2 wafers	3 wafers	4 wafers	5 wafers	6 wafers
GX16 O	48	39.5	45	48	26.5	23.5	—	28	6	52	66.5	48-58	12	5	40	48.5	57	65.5	74	82.5
GX16 O88	48	●	45	48	34	23.5	—	36	6	52	66.5	45-55	12	5	40	48.5	57	65.5	74	82.5
GX20 O	48	39.5	45	48	26.5	23.5	—	28	6	52	66.5	48-58	12	5	40	48.5	57	65.5	74	82.5
GX20 O88	48	●	45	48	34	23.5	—	36	6	52	66.5	45-55	12	5	40	48.5	57	65.5	74	82.5
GX32 O	65	53	58	66	34.5	26	—	28	7	68	78	48-58	14	5	48.7	60.7	72.7	84.7	96.7	108.7
GX32 O88	65	●	58	66	38	26	—	48	7	68	78	45-55	14	5	48.7	60.7	72.7	84.7	96.7	108.7
GX40 O	65	53	58	66	34.5	26	—	28	7	68	78	48-58	14	5	48.7	60.7	72.7	84.7	96.7	108.7
GX40 O88	65	●	58	66	38	26	—	48	7	68	78	45-55	14	5	48.7	60.7	72.7	84.7	96.7	108.7

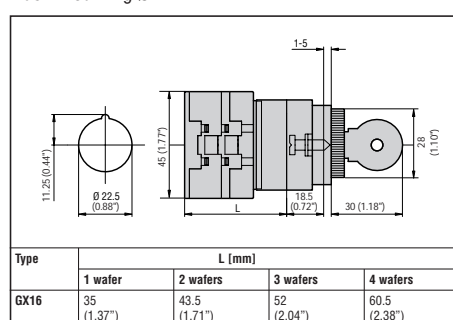
● Padlockable handle.

Mounting in enclosure



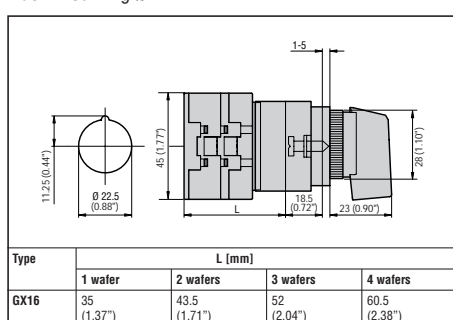
Type	Enclosure size	N° of wafers	L	L1	A	A1	C	C1	D	F	M	N	L	L1	Protection degree	Conduits
GX16	90x90 (3.54"x3.54")	1-2	3-5	90	90	79	63	4.5	25	19	30	71.3	98.3	IP65	4 PG 16	
GX20	110x110 (4.33"x4.33")	1-2	3-4	110	110	98.4	83	4.5	32	21	39.5	85.5	119.5	IP65	4 PG 21 + 2 PG 11	
GX40	110x110 (4.33"x4.33")	1-2	3-4	110	110	98.4	83	4.5	32	21	39.5	85.5	119.5	IP65	4 PG 21 + 2 PG 11	

Flush mounting Ø 22mm



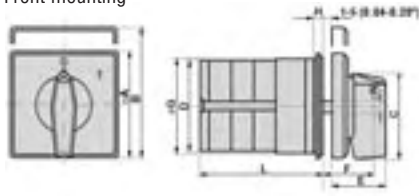
Type	L [mm]			
Type	1 wafer	2 wafers	3 wafers	4 wafers
GX16	35	43.5	52	60.5

Flush mounting Ø 22mm



Type	L [mm]			
Type	1 wafer	2 wafers	3 wafers	4 wafers
GX16	35	43.5	52	60.5

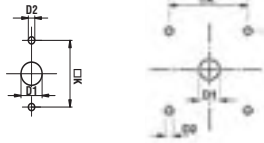
Front mounting



Type	Dimensions															L					
	□ A	B	C	D	D1	D2	D3	E	F	Ø G	H	□ J	□ K	□ M	□ N	1 wafer	2 wafers	3 wafers	4 wafers	5 wafers	6 wafers
GN12	48 (1.89)	60 (2.36)	39.5 (1.55)	38 (1.50)	12 (0.47)	5 (0.20)	4.3 (0.17)	26.5 (1.04)	23.5 (0.92)	38 (1.50)	5 (0.20)	36 (1.42)	36 (1.42)	48 (1.89)	6 (0.24)	32.5 (1.28)	42.1 (1.66)	51.7 (2.03)	61.3 (2.41)	70.9 (2.79)	80.5 (3.17)
GN12A	65 (2.56)	80 (3.15)	53 (2.09)	38 (1.50)	14 (0.55)	5 (0.20)	4.3 (0.17)	34.5 (1.36)	26 (1.02)	58.5 (2.30)	5.5 (0.22)	48 (1.89)	48 (1.89)	65 (2.56)	7 (0.27)	39.2 (1.54)	48.8 (1.92)	58.4 (2.30)	68 (2.68)	77.6 (3.05)	87.2 (3.43)
GN20	48 (1.89)	60 (2.36)	39.5 (1.55)	39 (1.53)	12 (0.47)	5 (0.20)	4.3 (0.17)	26.5 (1.04)	23.5 (0.92)	38 (1.50)	5 (0.20)	36 (1.42)	36 (1.42)	48 (1.89)	6 (0.24)	33.1 (1.30)	42.8 (1.68)	52.5 (2.07)	62.2 (2.45)	71.9 (2.83)	81.6 (3.21)
GN20A	65 (2.56)	80 (3.15)	53 (2.09)	39 (1.53)	14 (0.55)	5 (0.20)	4.3 (0.17)	34.5 (1.36)	26 (1.02)	58.5 (2.30)	5.5 (0.22)	48 (1.89)	48 (1.89)	65 (2.56)	7 (0.27)	39.8 (1.57)	49.5 (1.95)	59.2 (2.33)	68.9 (2.71)	78.6 (3.09)	88.3 (3.48)
GN25	48 (1.89)	60 (2.36)	39.5 (1.55)	43 (1.69)	12 (0.47)	5 (0.20)	4.3 (0.17)	26.5 (1.04)	23.5 (0.92)	38 (1.50)	5 (0.20)	36 (1.42)	36 (1.42)	48 (1.89)	6 (0.24)	37.5 (1.48)	51.1 (2.01)	64.7 (2.55)	78.2 (3.08)	91.9 (3.62)	105.5 (4.15)
GN25A	65 (2.56)	80 (3.15)	53 (2.09)	43 (1.69)	14 (0.55)	5 (0.20)	4.3 (0.17)	34.5 (1.36)	20 (0.79)	58.5 (2.30)	5.5 (0.22)	48 (1.89)	48 (1.89)	65 (2.56)	7 (0.27)	44.2 (1.74)	57.8 (2.27)	71.4 (2.81)	85 (3.35)	98.6 (3.88)	112.2 (4.42)
GN32	65 (2.56)	80 (3.15)	53 (2.09)	56 (2.20)	14 (0.55)	5 (0.20)	4.3 (0.17)	34.5 (1.36)	26 (1.02)	58.5 (2.30)	5.5 (0.22)	48 (1.89)	48 (1.89)	65 (2.56)	7 (0.27)	40.9 (1.61)	54.5 (2.14)	68.1 (2.68)	81.7 (3.22)	95.3 (3.75)	108.9 (4.29)
GN40	65 (2.56)	80 (3.15)	53 (2.09)	58 (2.28)	14 (0.55)	5 (0.20)	4.3 (0.17)	34.5 (1.36)	26 (1.02)	58.5 (2.30)	5.5 (0.22)	48 (1.89)	48 (1.89)	65 (2.56)	7 (0.27)	43.5 (1.71)	58.6 (2.31)	73.7 (2.90)	88.8 (3.50)	103.9 (4.09)	119 (4.68)
GN63	65 (2.56)	80 (3.15)	53 (2.09)	62 (2.44)	14 (0.55)	5 (0.20)	4.3 (0.17)	34.5 (1.36)	26 (1.02)	58.5 (2.30)	5.5 (0.22)	48 (1.89)	48 (1.89)	65 (2.56)	7 (0.27)	47.3 (1.86)	65.4 (2.57)	83.5 (3.29)	101.6 (4.00)	119.7 (4.71)	137.8 (5.42)
GN125	90 (3.54)	110 (4.33)	70.5 (2.77)	86 (3.38)	16 (0.63)	6 (0.24)	5.3 (0.21)	41.5 (1.63)	28 (1.10)	84 (3.31)	7.5 (0.29)	68 (2.68)	68 (2.68)	90 (3.54)	9 (0.35)	67.3 (2.65)	96.4 (3.79)	125.5 (4.94)	154.6 (6.09)	183.7 (7.23)	212.8 (8.38)

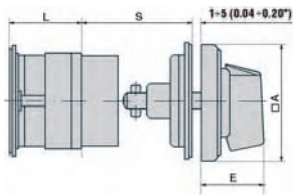
A Dimensions for U06 and U25 versions

Wafer and front plate fixing on the door



2-screw drillings for types up to GN63
4-screw drillings for GN125 only

Door coupling

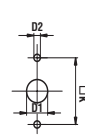


Drillings for 4-screw wafer fixing on mounting plate



All types

Coupling shaft and front plate fixing on the door



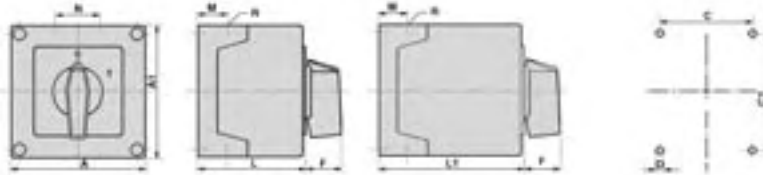
2-screw drillings for types up to GN63



4-screw drillings for GN125 only

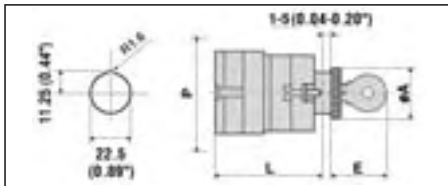
Type	Dimensions						L			
	□ A	D1	D2	E	□ K	S	1 wafer	2 wafers	3 wafers	4 wafers
GN12-088	65 (2.56")	14 (0.55")	5 (0.20")	34.5 (1.36")	48 (1.89")	45-55 (1.77"-2.16")	37.58 (1.48")	47.1 (1.85")	56.7 (2.23")	66.3 (2.61")
GN20-088	65 (2.56")	14 (0.55")	5 (0.20")	34.5 (1.36")	48 (1.89")	45-55 (1.77"-2.16")	38.1 (1.50")	47.8 (1.88")	57.5 (2.26")	67.2 (2.64")
GN25-088	65 (2.56")	14 (0.55")	5 (0.20")	34.5 (1.36")	48 (1.89")	45-55 (1.77"-2.16")	42.5 (1.67")	56.1 (2.21")	65.7 (2.59")	83.2 (3.27")
GN12-068	48 (1.89")	12 (0.47")	5 (0.20")	26.5 (1.04")	36 (1.42")	45-55 (1.77"-2.16")	37.5 (1.48")	47.1 (1.85")	56.7 (2.23")	66.3 (2.61")
GN20-068	48 (1.89")	12 (0.47")	5 (0.20")	26.5 (1.04")	36 (1.42")	45-55 (1.77"-2.16")	38.1 (1.50")	47.8 (1.88")	57.5 (2.26")	67.2 (2.64")
GN25-068	48 (1.89")	12 (0.47")	5 (0.20")	26.5 (1.04")	36 (1.42")	45-55 (1.77"-2.16")	42.5 (1.67")	56.1 (2.21")	65.7 (2.59")	83.2 (3.27")
GN32	65 (2.56")	14 (0.55")	5 (0.20")	34.5 (1.36")	48 (1.89")	45-55 (1.77"-2.16")	49.2 (1.94")	62.8 (2.47")	76.4 (3.00")	90 (3.54")
GN40	65 (2.56")	14 (0.55")	5 (0.20")	34.5 (1.36")	48 (1.89")	45-55 (1.77"-2.16")	45.9 (1.81")	59.5 (2.34")	73.1 (2.88")	86.7 (3.41")
GN63	65 (2.56")	14 (0.55")	5 (0.20")	34.5 (1.36")	48 (1.89")	45-55 (1.77"-2.16")	54.3 (2.14")	72.4 (2.85")	90.5 (3.56")	108.6 (4.27")
GN125	90 (3.54")	16 (0.63")	6 (0.24")	41.5 (1.63")	68 (2.68")	45-55 (1.77"-2.16")	74.8 (2.94")	103.9 (4.09")	133 (5.23")	162.1 (6.38")

Mounting in enclosure



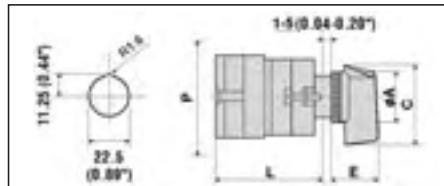
Type	Enclosure size	N° of wafers		Dimensions								Protection degree	Conduits		
		L	L1	A	A1	C	C1	D	F	M	N			L	L1
GN12	65x65 (2.55"x2.55")	1-2	3-4	65 (2.56")	65 (2.56")	54 (2.12")	38 (1.49")	4.3 (0.16")	19 (0.74")	13 (0.51")	25 (0.98")	55.5 (2.18")	75 (2.95")	IP54	4 PG 11
GN12 GN20 GN25	75x75	1-2 1-2 1	3-4 3-4 2-3	75 (2.95")	75 (2.95")	64 (2.51")	50 (1.96")	4.5 (0.17")	19 (0.74")	14 (0.55")	28 (1.10")	57.5 (2.26")	79.8 (3.14")	IP65	4 PG 13.5
GN20 GN25 GN32 GN40	90x90	1-3 1-2 1-2 1	4-6 3-4 3-4 2-3	90 (3.54")	90 (3.54")	63 (2.48")	79 (3.11")	4.5 (0.17")	25 (0.98")	19 (0.74")	30 (1.18")	71.3 (2.80")	98.3 (3.87")	IP65	4 PG 16
GN32 GN40 GN63 GN125	110x110	1-3 1-2 1-2 1	4-5 3-4 3-4 2	125 (4.92")	175 (6.88")	112 (4.40")	146 (5.74")	5.5 (0.21")	32 (1.25")	21 (0.82")	68 (2.67")	84.3 (3.31")	118.3 (4.65")	IP65	4 PG 21 + 2 PG 11

Flush mounting Ø 22mm



Type	Dimensions			L			
	Ø A	E	P	1 wafer	2 wafers	3 wafers	4 wafers
GN12	28 (1.10")	30 (1.18")	58 (2.28")	41.5 (1.63")	51.1 (2.01")	60.7 (2.39")	70.3 (2.77")
GN20	28 (1.10")	30 (1.18")	58 (2.28")	42.1 (1.66")	51.8 (2.04")	61.5 (2.42")	71.2 (2.80")
GN25	28 (1.10")	30 (1.18")	58 (2.28")	46.5 (1.83")	60.1 (2.37")	73.7 (2.90")	87.3 (3.44")

Flush mounting Ø 22mm

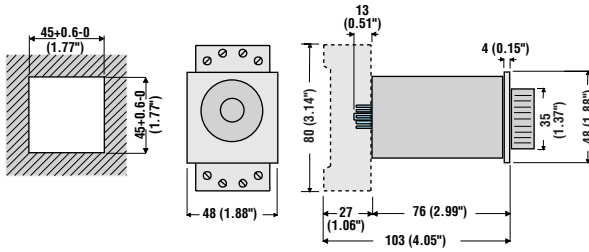


Type	Dimensions			L			
	Ø A	E	P	1 wafer	2 wafers	3 wafers	4 wafers
GN12	28 (1.10")	23 (0.90")	58 (2.28")	41.5 (1.63")	51.1 (2.01")	60.7 (2.39")	70.3 (2.77")
GN20	28 (1.10")	23 (0.90")	58 (2.28")	42.5 (1.67")	51.8 (2.04")	61.5 (2.42")	71.2 (2.80")
GN25	28 (1.10")	23 (0.90")	58 (2.28")	46.5 (1.83")	60.1 (2.37")	73.7 (2.90")	87.3 (3.44")

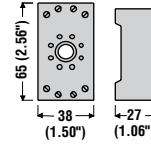
Type	Fig.	DIN mount timers	Accessories for fig. 1 and 2
AT1	1		
AT1C	1		
AT1CP	1		
AT1DP	1		
AT1P	1		
ATD	1		
BT2N	2		
BT2M	2		
BT2P	2		
BTPM1	2		
DRPL...	3		

L48TP - L48TPB - L48M

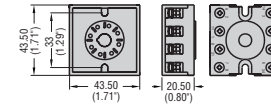
Accessories



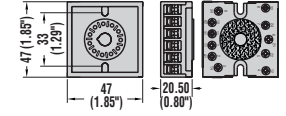
S8 - S11



L48 P8

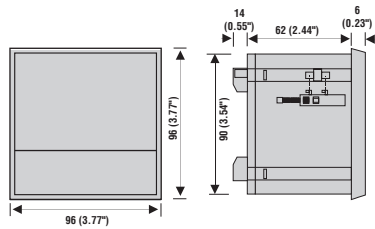


L48 P11

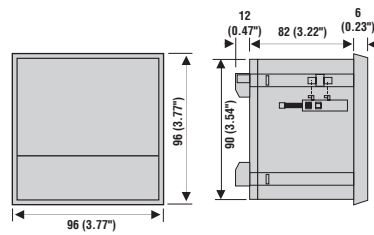


Digital multimeters

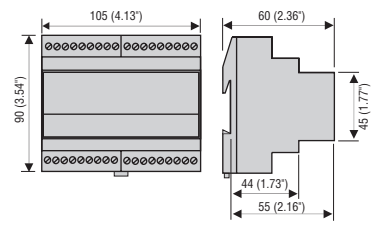
DMK20



DMK3...

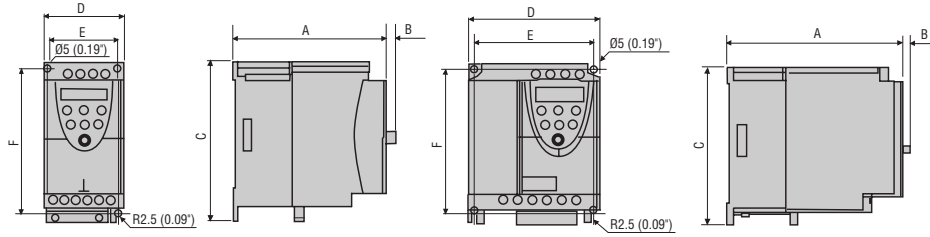


DMK50 - DMK6...



VFNC1S 2002PL W - VFNC1S 2004PL W
VFNC1S 2007PL W

VFNC1S 2015PL W - VFNC1S 2022PL W



	A	B	C	D	E	F
VFNC1S 2002PL W	100 (3.93")	8.5 (0.33")	142 (5.59")	72 (2.83")	60 (2.36")	131 (5.15")
VFNC1S 2004PL W	124 (4.88")	8.5 (0.33")	142 (5.59")	72 (2.83")	60 (2.36")	131 (5.15")
VFNC1S 2007PL W	137 (5.39")	8.5 (0.33")	142 (5.59")	72 (2.83")	60 (2.36")	131 (5.15")
VFNC1S 2015PL W	155 (6.10")	8.5 (0.33")	142 (5.59")	117 (4.60")	106 (4.17")	131 (5.15")
VFNC1S 2022PL W	155 (6.10")	8.5 (0.33")	142 (5.59")	117 (4.60")	106 (4.17")	131 (5.15")

VFS9S

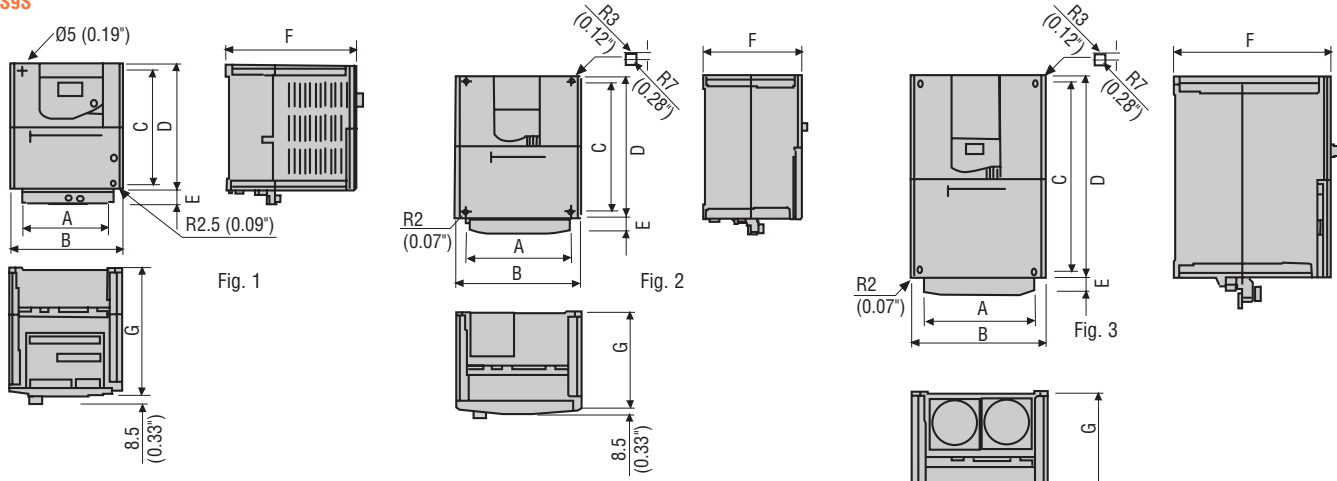


	Fig.	A	B	C	D	E	F	G
VFS9S 2004PL WP	1	93 (3.66")	105 (4.13")	118 (4.64")	130 (5.11")	14 (0.55")	8.5 (0.33")	140 (5.51")
VFS9S 2007PL WP	1	93 (3.66")	105 (4.13")	118 (4.64")	130 (5.11")	14 (0.55")	8.5 (0.33")	140 (5.51")
VFS9S 2015PL WP	1	118 (4.64")	130 (5.11")	138 (5.43")	150 (5.90")	14 (0.55")	8.5 (0.33")	150 (5.90")
VFS9S 2022PL WP	1	126 (4.96")	140 (5.51")	182 (7.16")	195 (7.67")	14 (0.55")	8.5 (0.33")	163 (6.41")
VFS9S 4007PL WP	1	118 (4.64")	130 (5.11")	138 (5.43")	150 (5.90")	14 (0.55")	8.5 (0.33")	150 (5.90")
VFS9S 4015PL WP	1	118 (4.64")	130 (5.11")	138 (5.43")	150 (5.90")	14 (0.55")	8.5 (0.33")	150 (5.90")
VFS9S 4022PL WP	1	126 (4.96")	140 (5.51")	182 (7.16")	195 (7.67")	14 (0.55")	8.5 (0.33")	163 (6.41")
VFS9S 4037PL WP	1	126 (4.96")	140 (5.51")	182 (7.16")	195 (7.67")	14 (0.55")	8.5 (0.33")	163 (6.41")
VFS9S 4055PL WP	2	180 (7.08")	200 (7.87")	255 (10.03")	270 (10.62")	12 (0.47")	8.5 (0.33")	170 (6.69")
VFS9S 4075PL WP	2	180 (7.08")	200 (7.87")	255 (10.03")	270 (10.62")	12 (0.47")	8.5 (0.33")	170 (6.69")
VFS9S 4110PL WP	3	225 (8.85")	245 (9.64")	315 (12.40")	330 (12.99")	12 (0.47")	8.5 (0.33")	195 (7.67")
VFS9S 4150PL WP	3	225 (8.85")	245 (9.64")	315 (12.40")	330 (12.99")	12 (0.47")	8.5 (0.33")	195 (7.67")

VFP7...

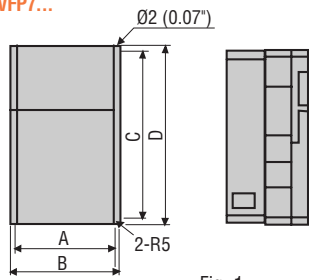


Fig. 1

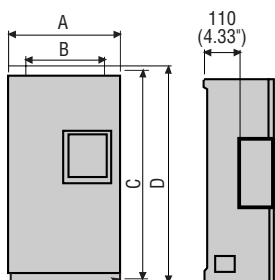


Fig. 2

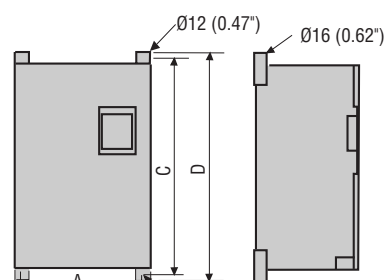


Fig. 3

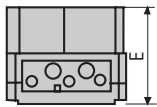


Fig. 4

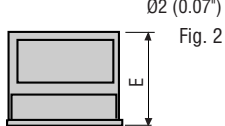


Fig. 5

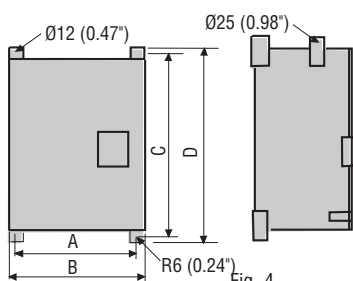


Fig. 4

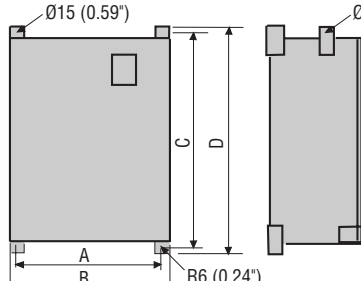


Fig. 5

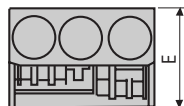


Fig. 4

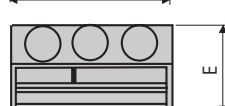
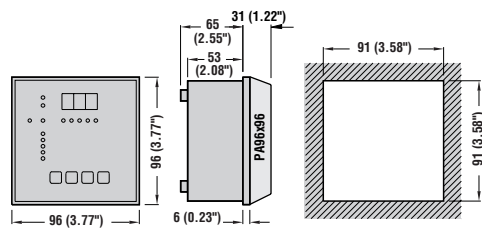


Fig. 5

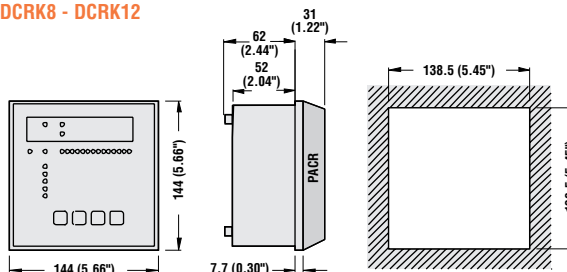
	Fig.	A	B	C	D	E
VFP7 4185P	1	225 (8.85")	245 (9.64")	370 (14.56")	390 (15.35")	207 (8.14")
VFP7 4220P	1	225 (8.85")	245 (9.64")	370 (14.56")	390 (15.35")	207 (8.14")
VFP7 4300P	2	200 (7.87")	300 (11.81")	537 (21.14")	555 (21.85")	197 (7.75")
VFP7 4370P	2	200 (7.87")	300 (11.81")	537 (21.14")	555 (21.85")	197 (7.75")
VFP7 4450P	3	317.5 (12.5")	370 (14.56")	609 (23.97")	630 (24.80")	290 (11.41")
VFP7 4550P	3	317.5 (12.5")	370 (14.56")	609 (23.97")	630 (24.80")	290 (11.41")
VFP7 4750P	3	317.5 (12.5")	370 (14.56")	609 (23.97")	630 (24.80")	290 (11.41")
VFP7 4900P	3	317.5 (12.5")	370 (14.56")	609 (23.97")	630 (24.80")	290 (11.41")
VFP7 4110KP	4	426 (16.77")	480 (18.89")	652 (25.66")	680 (26.77")	330 (12.99")
VFP7 4132KP	4	426 (16.77")	480 (18.89")	652 (25.66")	680 (26.77")	330 (12.99")
VFP7 4160KP	4	426 (16.77")	480 (18.89")	652 (25.66")	680 (26.77")	330 (12.99")
VFP7 4200KP	5	598 (23.54")	680 (26.77")	920 (36.22")	950 (37.44")	370 (14.56")
VFP7 4220KP	5	598 (23.54")	660 (26.77")	920 (36.22")	950 (37.44")	370 (14.56")
VFP7 4280KP	5	598 (23.54")	660 (26.77")	920 (36.22")	950 (37.44")	370 (14.56")
VFP7 4315KP	5	598 (23.54")	660 (26.77")	920 (36.22")	950 (37.44")	370 (14.56")

Power factor regulators

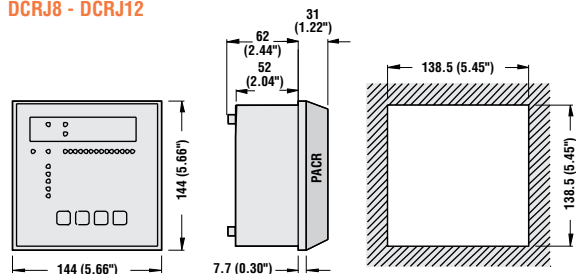
DCRK5 - DCRK7



DCRK8 - DCRK12



DCRJ8 - DCRJ12

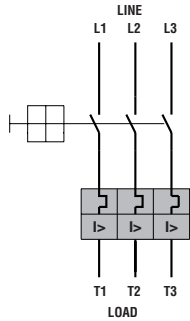


Wiring diagrams

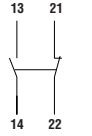


Wiring diagrams

SM1B - SM2A - SM3A



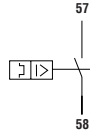
**SMX11 11
SMX21 11**



**SMX14...
SMX24...**



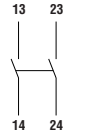
SMX13 11



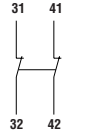
**SMX16...
SMX26...**



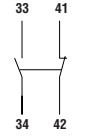
SMX11 20



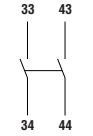
**SMX12 02
SMX22 02**



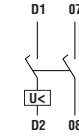
**SMX12 11
SMX22 11**



**SMX12 20
SMX22 20**



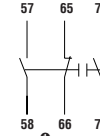
**SMX15
SMX25**



SMX20 11



SMX23 11

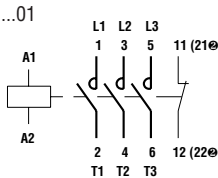
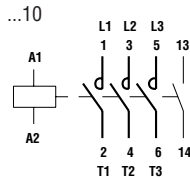


① Change in event of magnetic and/or thermal tripping.
② Change in event of magnetic tripping.
NOTE: In case of the breaker testing, only contacts 57-58 and 65-66 switch.

IEC style contactors

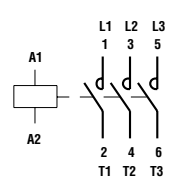
Three-pole contactors

BG06 - BG09 - BG12 - BF9 - BF12 - BF16 - BF20 10 or 01 - BF20C - BF25 10 or 01 - BF25C

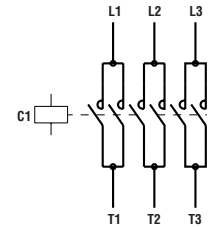


⓪ For BG... types only.

**BF20 00 to BF95 00
B115 to B630 1000⓪**



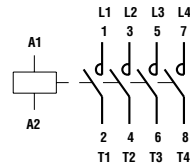
B1250 24 - B1600 24...⓪



① The input electronic circuit of the contactor coil is designed and tested according to IEEEC 62.41 standards and can withstand a 10kV impulse voltage (1.2/50µs) with 50 Joule energy. The use of an auxiliary reduced voltage transformer is recommended for higher values.

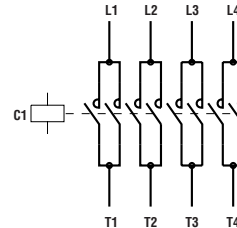
Four-pole contactors

**BG09 T4 - BF9 4 to BF80 4
B115 4 to B630 4 1000 ⓪**

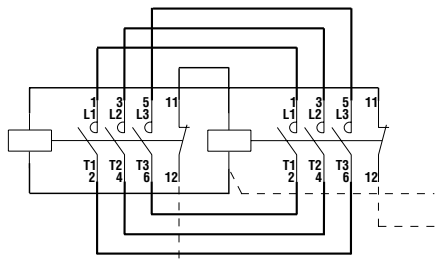


① The input electronic circuit of the contactor coil is designed and tested according to IEEEC 62.41 standards and can withstand a 10kV impulse voltage (1.2/50µs) with 50 Joule energy. The use of an auxiliary reduced voltage transformer is recommended for higher values.

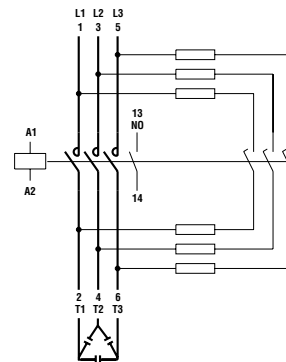
B1250 4 - B1600 4⓪



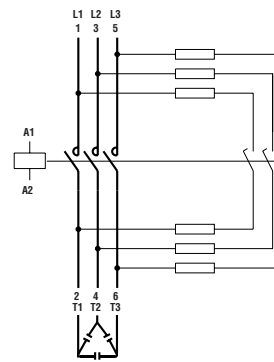
BGR



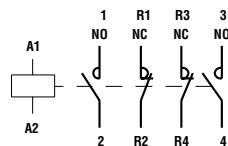
BF9K - BF12K



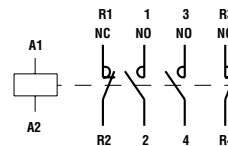
**BF20K - BF25K - BF40K - BF50K
BF65K - BF80K**



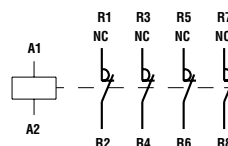
BG09 T2



BF16 22 - BF25 22 - BF40 22



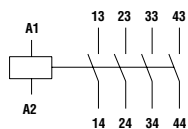
BF16 04 - BF25 04



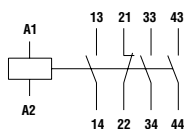
Control relays

BG00 - CF4

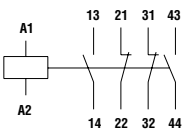
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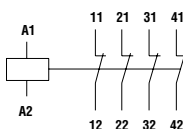
...31



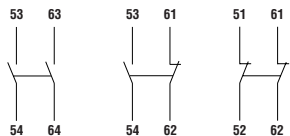
...22 (CF4 only)



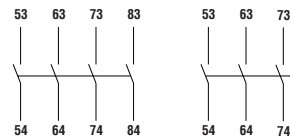
...04 (CF4 only)



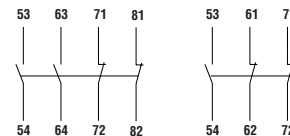
BGX10 20 BGX10 11 BGX10 02



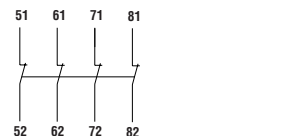
BGX10 40 BGX10 31



BGX10 22 BGX10 13

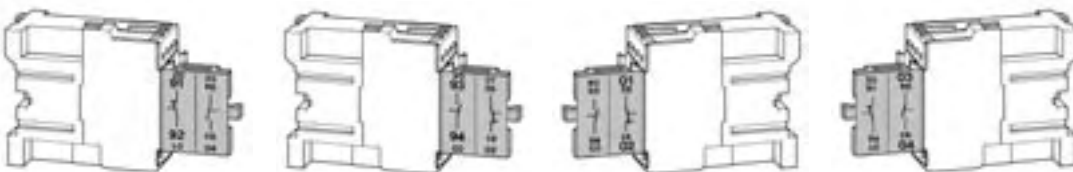


BGX10 04

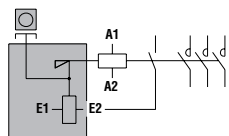


The termination of the G218 auxiliary block has more than one numbering due to the fact that the block can assume various mounting positions. See the numbering in boldface and larger digits for a correct interpretation (side drawings).

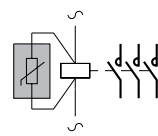
G218



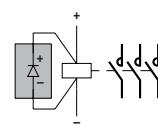
G222 - G272



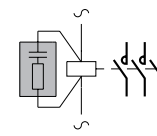
G477 - BGX77



BGX78...

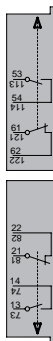


G479 - BGX79



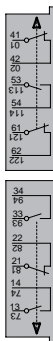
G350 - G354

G354

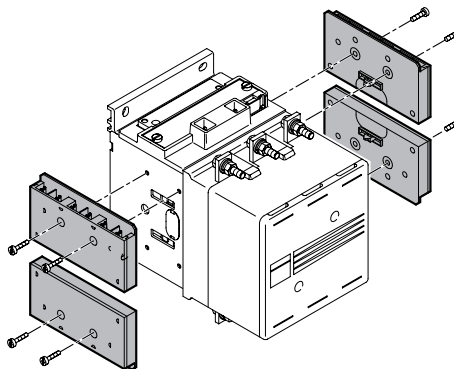


G354

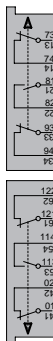
G350



G350



G350



G350

G354



G354

G418 01



G418 01D



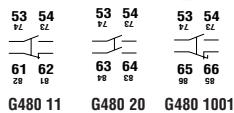
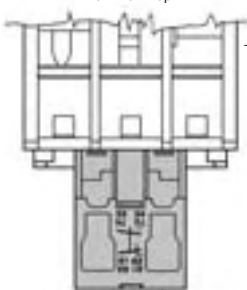
G418 10



G418 10A



View from top



G480 1001



G480 20

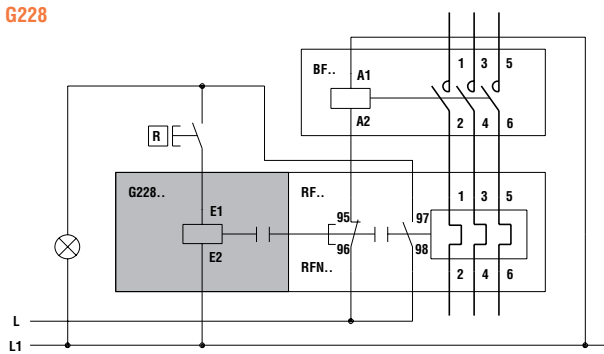
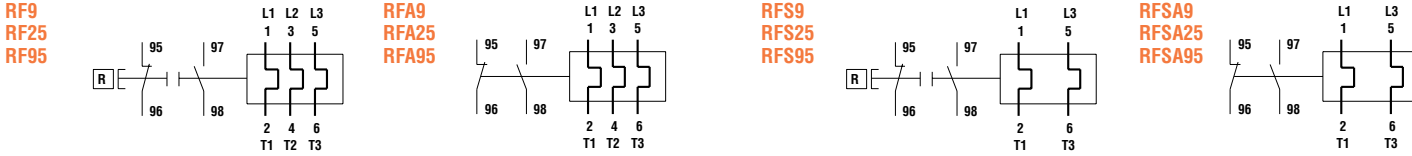
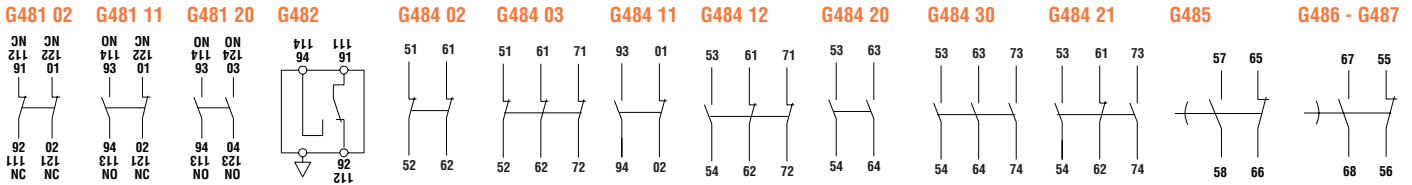


G480 11



The termination of the G480... G481... G482 auxiliary blocks has more than one numbering due to the fact that the blocks can assume various mounting positions. See the numbering in boldface and larger digits for a correct interpretation (side drawings).

View from bottom



IEC style starters

Full voltage - across the line - non reversing starters in insulated enclosure

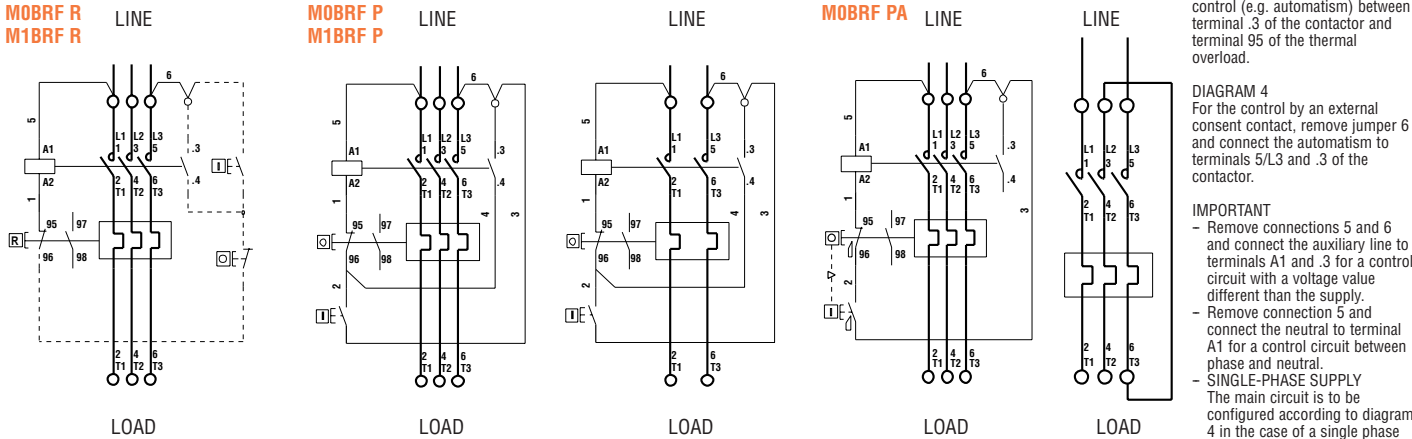


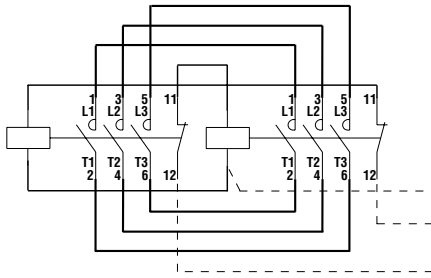
DIAGRAM 1
Connect the eventual two-wire control (e.g. automatism) between terminal .3 of the contactor and terminal 95 of the thermal overload.

DIAGRAM 4
For the control by an external consent contact, remove jumper 6 and connect the automatism to terminals 5/L3 and .3 of the contactor.

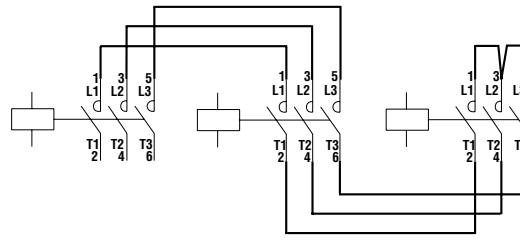
IMPORTANT
- Remove connections 5 and 6 and connect the auxiliary line to terminals A1 and .3 for a control circuit with a voltage value different than the supply.
- Remove connection 5 and connect the neutral to terminal A1 for a control circuit between phase and neutral.
- **SINGLE-PHASE SUPPLY**
The main circuit is to be configured according to diagram 4 in the case of a single phase line or motor.
- **FUSES**
A set of three fuses is to be connected upstream of the starter in the event no appropriate protection is included in the system.

Diagram 1 - External button control
Diagram 2 - Incorporated button control
Diagram 3 - Power connection for 1-phase motors (type c/w RFS overload relay)
Diagram 4 - Control with latched start button
Diagram 5 - Power connection for 1-phase motors

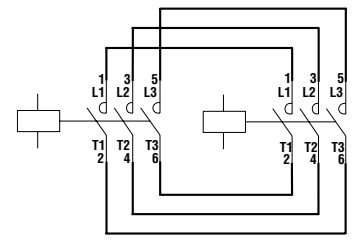
SMX90 22



SMX90 23

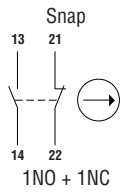


SMX90 24

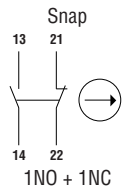


Limit and safety limit switches

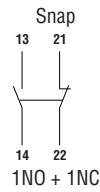
KB...S9
KM...S11



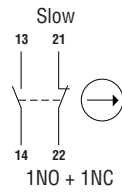
**RS1...
RS4...**



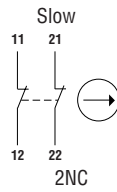
TS...



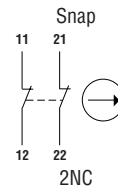
KB...L11 - KM...L11
RS2... - RS5...



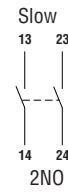
KB...L02 - KM...L02
RS3... - RS6...



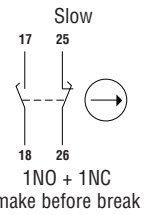
KB...S02
KM...S02



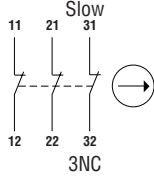
KB...L20
KM...L20



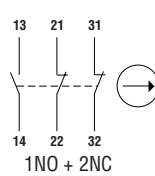
KB...A11
KM...A11



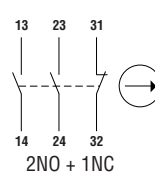
KB...L03
KM...L03



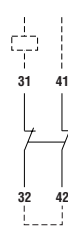
KB...L12
KM...L12



KB...L21
KM...L21



RS8... - RS13...
TL8... - TL13



90 - One-pole ON/OFF switch



Number of wafers: 1
Switching angle: 60°

91 - Two-pole ON/OFF switch



Number of wafers: 1
Switching angle: 60°

10 - Three-pole ON/OFF switch



Number of wafers: 2
Switching angle: 60°

92 - Four-pole ON/OFF switch



Number of wafers: 2
Switching angle: 60°

51 - 1-pole double-throw switch with 0



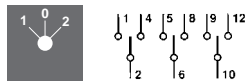
Number of wafers: 1
Switching angle: 60°

52 - 2-pole double-throw switch with 0



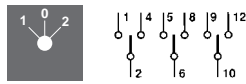
Number of wafers: 2
Switching angle: 60°

53 - 3-pole double-throw switch with 0



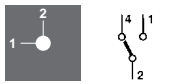
Number of wafers: 3
Switching angle: 60°

75 - 4-pole double-throw switch with 0



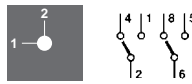
Number of wafers: 4
Switching angle: 60°

54 - 1-pole double-throw without 0



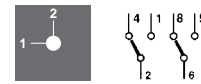
Number of wafers: 1
Switching angle: 90°

55 - 2-pole double-throw without 0



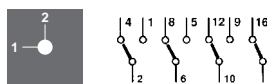
Number of wafers: 2
Switching angle: 90°

56 - 3-pole double-throw without 0



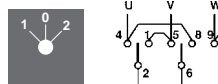
Number of wafers: 3
Switching angle: 90°

69 - 4-pole double-throw without 0



Number of wafers: 4
Switching angle: 90°

11 - 3-pole reversing switch



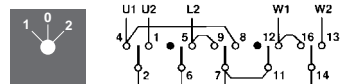
Number of wafers: 3
Switching angle: 60°

207 - Contactor control switch

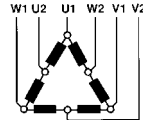


Number of wafers: 1
Switching angle: 30°

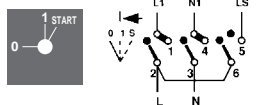
13 - Pole-changing switch with 0 (Dahlander)



Number of wafers: 4
Switching angle: 60°

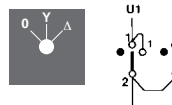


15 - 1-phase motor control switch



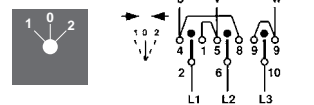
Number of wafers: 2
Switching angle: 90° + 30°

12 - Wye-delta switch



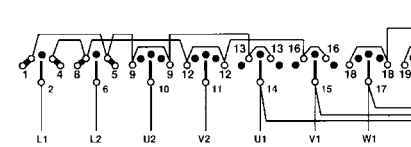
Number of wafers: 4
Switching angle: 60°

26 - Reversing switch, spring return to 0



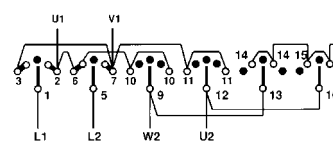
Number of wafers: 3
Switching angle: 30°

20 - Pole-changing switch with reversing (Dahlander)



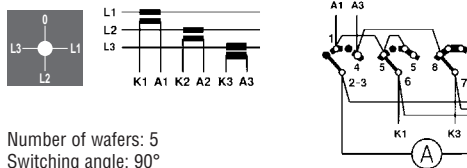
Number of wafers: 6
Switching angle: 30°

21 - Wye-delta double-throw with reversing



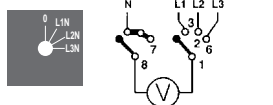
Number of wafers: 5
Switching angle: 30°

97 - Ammeter switch direct reading or via current transformer



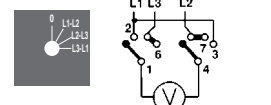
Number of wafers: 5
Switching angle: 90°

68 - Phase-neutral voltmeter switch



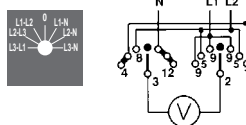
Number of wafers: 2
Switching angle: 30°

67 - Phase-phase voltmeter switch



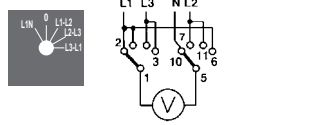
Number of wafers: 2
Switching angle: 30°

66 - Phase-phase phase-neutral voltmeter double-throw



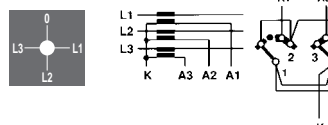
Number of wafers: 3
Switching angle: 30°

60 - Double-throw switch 1 phase phase-neutral, 3 phase-phase voltages

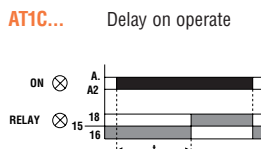
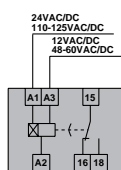
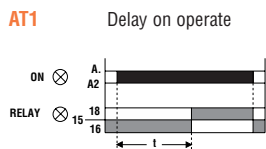
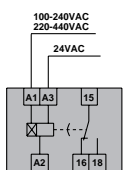


Number of wafers: 3
Switching angle: 30°

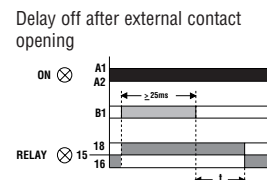
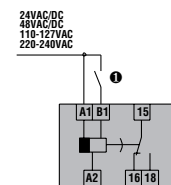
98 - L1-L2-L3 current double-throw switch



Number of wafers: 3
Switching angle: 90°



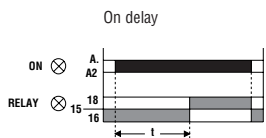
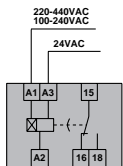
AT1DP



Terminal B1 is to be simultaneously energized with terminal A1 or subsequently.

N.B. With DC supply, connect the (-) polarity to terminal A2. For time range setting (t DELAY), refer to indication given for AT1P.

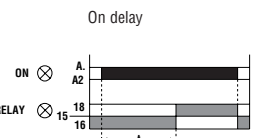
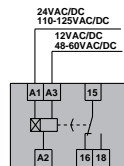
AT1P



Time range setting (t DELAY)



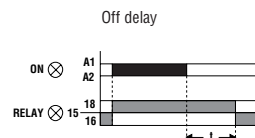
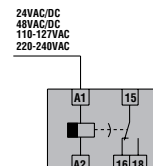
AT1CP



Time range setting (t DELAY)



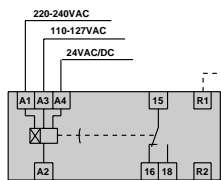
ATD



Time range setting (t DELAY)

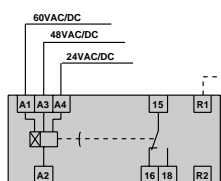
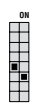
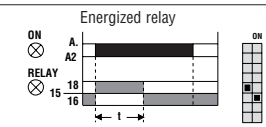
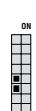
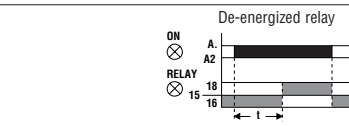


BTPM1

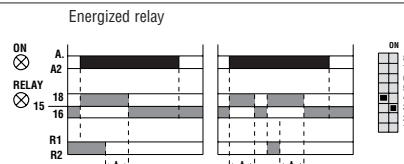
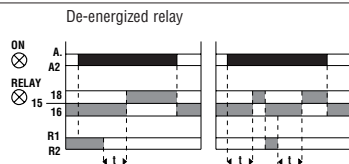


On delay

Delay on external remote contact opening (R1-R2)



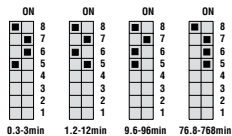
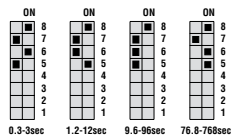
Pulsing



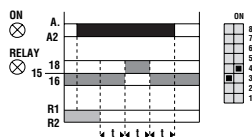
⊕ "C" contact is to be voltage free.

Pulsing on external/remote contact opening (R1-R2)

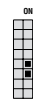
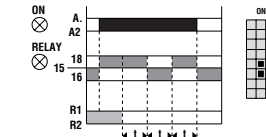
Time range setting (t DELAY)



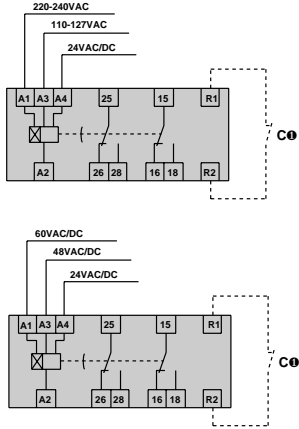
Beginning with pause



Beginning with pulse (work)



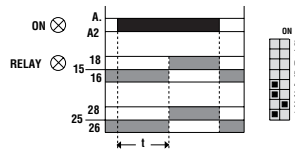
BTPM



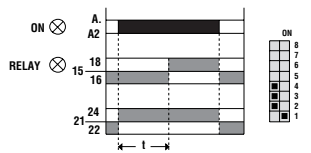
On delay

De-energized relay

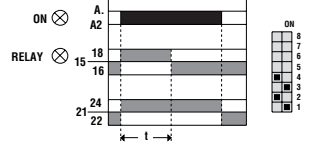
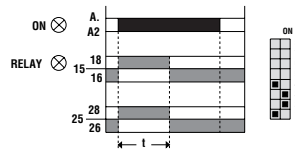
2 delayed contacts



1 instantaneous + 1 delayed contacts

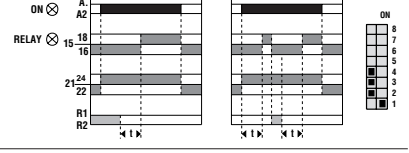
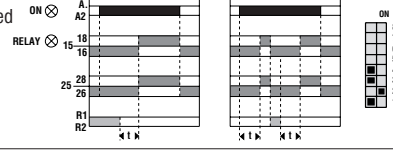


Energized relay

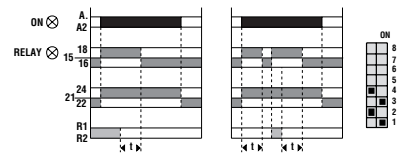
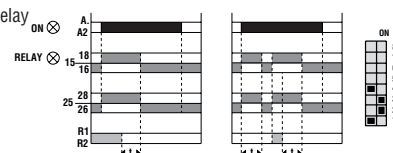


Delay on external/remote contact opening (R1-R2)

De-energized relay



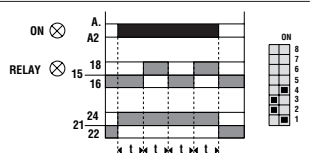
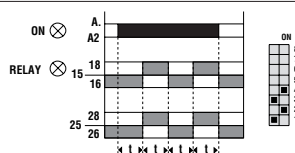
Energized relay



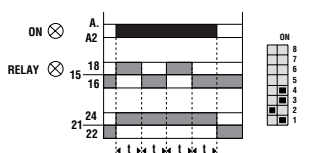
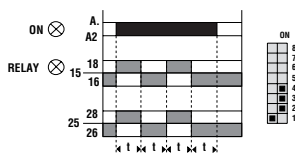
① "C" contact to be voltage free.

Pulsing

Beginning with pause

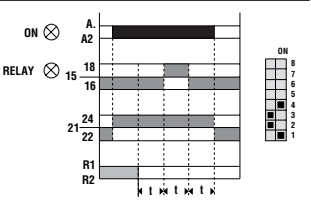
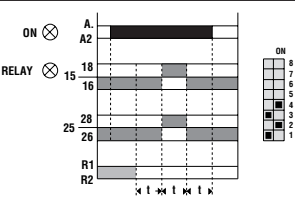


Beginning with pulse (work)

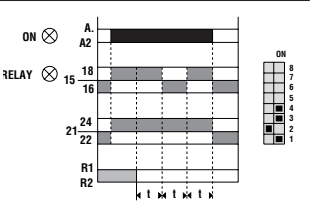
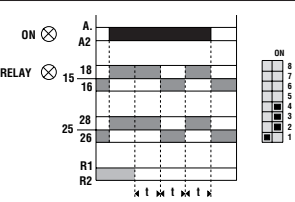


Pulsing on external/remote contact opening (R1-R2)

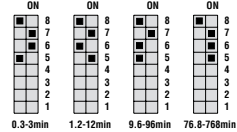
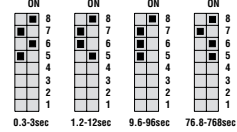
Beginning with pause



Beginning with pulse (work)

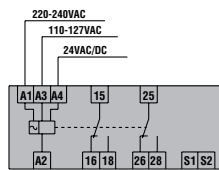
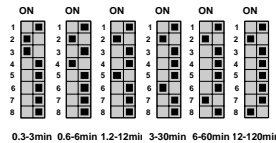
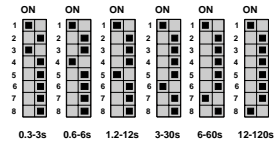


Time range setting (t DELAY)

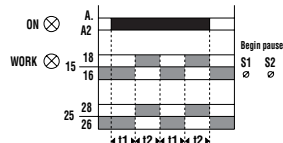


DRPL

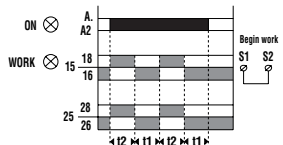
Time range setting (t DELAY)



Pulsing: beginning with pause

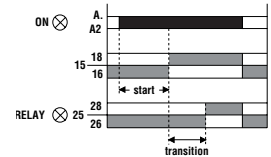
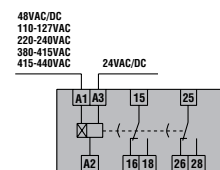


Pulsing: beginning with work

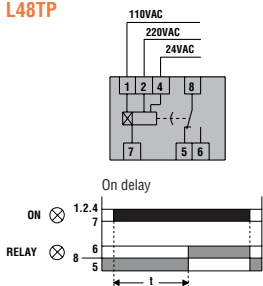


BT2N

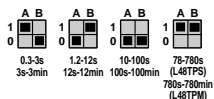
(for wye-delta starters)



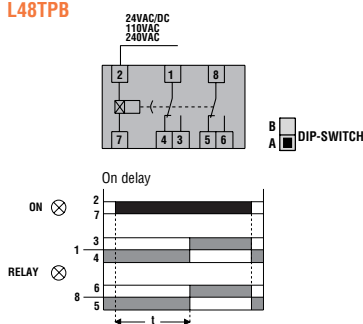
L48TP



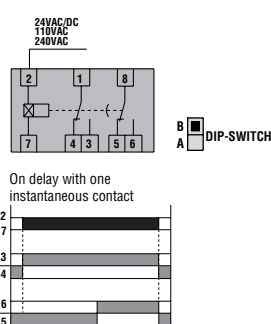
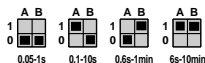
Time range setting



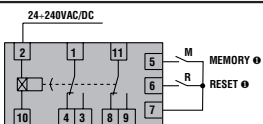
L48TPB



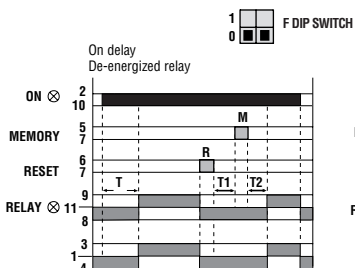
T dip switch time range setting



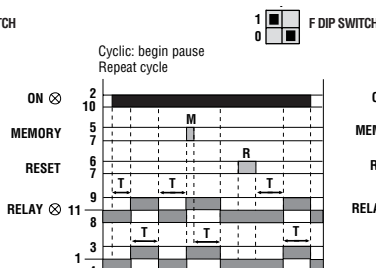
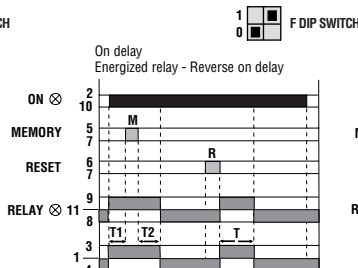
L48M



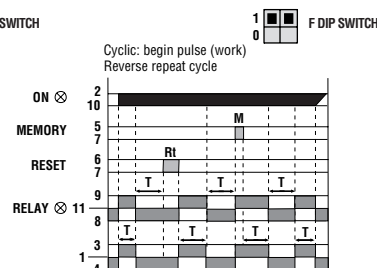
T (PRESET TIME) = $T1+T2$ R_t =reset time
 ● Contacts "M" and "R" are to be voltage free.



T dip switch time range setting for L48MM type

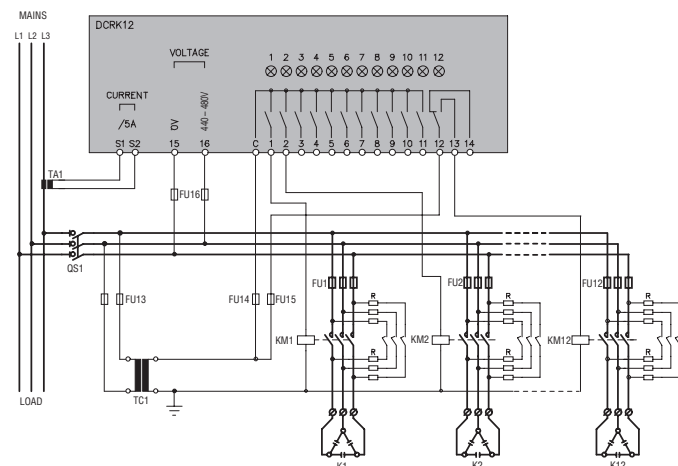


T dip switch time range setting for L48MH type



Power factor regulators

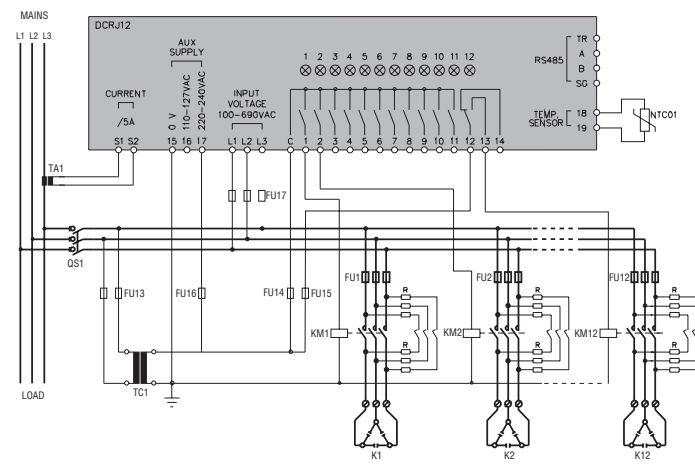
DCRK... installed with BF...K contactors



IMPORTANT

- For three-phase connection, the voltage input must be connected between two phases; the line current transformer must be connected on the remaining phase.
 - The polarity of the current input is irrelevant.
- CAUTION! Always remove the power supply when operating on the terminals.

DCRJ... installed with BF...K contactors



IMPORTANT

- For three phase connection, the voltage input must be connected between two phases; the line current transformer must be connected to the remaining phase.
 - The polarity of the current input is irrelevant.
 - When no auxiliary source is available, the line to be controlled (maximum 240VAC) can supply the regulator.
- CAUTION! Always remove the power supply when operating on the terminals.



Technical characteristics

Operational characteristics

TYPE		SM1B	SM2A	SM3A
OPERATING CONDITIONS				
Ambient temperature	Operating	°F -4 to +160 (-20 to +70°C)	-4 to +160 (-20 to +70°C)	-4 to +160 (-20 to +70°C)
	Storage	°F -60 to +175 (-50 to +80°C)	-60 to +175 (-50 to +80°C)	-60 to +175 (-50 to +80°C)
	Compensation	°F -4 to +120 (-20 to +50°C)	-4 to +120 (-20 to +50°C)	-4 to +120 (-20 to +50°C)
Maximum altitude	ft	9800 (3000m)		
Mounting position		any		
Mounting		35mm DIN rail (EN 50022)	Screw fixing or 35mm DIN rail (EN 50022)	Screw fixing or DIN rail 35mm (EN 50022) or 75mm (EN 50023)
Reference standards		IEC/EN 60947-2, IEC/EN 60947-4-1		
Certifications		cULus	UL - CSA	UL - CSA

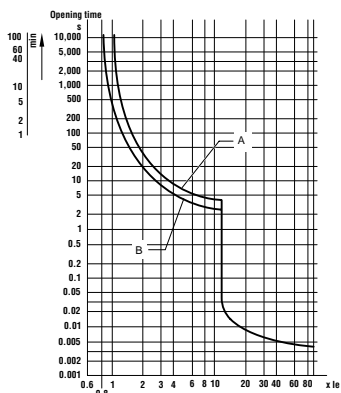
CONTACT AND RELEASE CHARACTERISTICS

Rated insulation voltage Ui	V	690			
Rated frequency	Hz	50/60			
Rated impulse voltage Uimp	kV	6			
Maximum rated current	A	32	50	100	
Number of adjustment ranges		15	4	4	
Power dissipation per phase	W	0.57-1.46	7.1-20	10-38	
Magnetic tripping		12 le	13 le	13 le	
Mechanical life	cycles	100,000	25,000	25,000	
Electrical life (le max AC3)	cycles	100,000	50,000	50,000	
Maximum tightening torque for terminals	Nm	2.3	4.5	6	
	in lb	20.4	39.6	52.8	
Minimum-maximum cable section connectable 1 or 2 conductors	AWG	n°	16-10	18-3	10-1/0
	Flexible without lug	mm²	1-6	0.75-25	10-50

IEC breaking capacity

Type	Thermal trip adjustment range [A]	Rated short-circuit breaking capacity [kA]								Protection fuses when I > Icu (gL or gG fuses) ①			
		230V		400V		500V		690V		230V	400V	500V	690V
		Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	[A]	[A]	[A]	[A]
SM1B 00	0.1-0.16	100	100	100	100	100	100	100	100	▲	▲	▲	▲
SM1B 04	0.16-0.25	100	100	100	100	100	100	100	100	▲	▲	▲	▲
SM1B 08	0.25-0.4	100	100	100	100	100	100	100	100	▲	▲	▲	▲
SM1B 12	0.4-0.63	100	100	100	100	100	100	100	100	▲	▲	▲	▲
SM1B 16	0.63-1	100	100	100	100	100	100	100	100	▲	▲	▲	▲
SM1B 20	1-1.6	100	100	100	100	100	100	100	100	▲	▲	▲	▲
SM1B 24	1.6-2.5	100	100	100	100	100	100	8	8	▲	▲	▲	35
SM1B 28	2.5-4	100	100	100	100	100	100	8	8	▲	▲	▲	35
SM1B 32	4-6.5	100	100	100	100	100	100	8	8	▲	▲	▲	40
SM1B 36	6.3-10	100	100	100	100	42	21	8	8	▲	▲	63	50
SM1B 40	9-14	100	100	25	12.5	10	5	2	2	▲	80	63	50
SM1B 44	13-18	100	100	25	12.5	4	2	2	2	▲	100	80	63
SM1B 48	17-23	100	100	25	12.5	4	2	2	2	▲	100	80	63
SM1B 52	20-25	100	100	25	12.5	4	2	2	2	▲	100	80	63
SM1B 56	24-32	100	100	25	12.5	4	2	2	2	▲	100	80	63
SM2A 64	22-32	100	100	50	25	10	5	4	2	▲	125	100	63
SM2A 68	28-40	100	100	50	25	10	5	4	2	▲	160	100	63
SM2A 72	36-45	100	100	50	25	10	5	4	2	▲	160	100	63
SM2A 76	40-50	100	100	50	25	10	5	4	2	▲	160	100	80
SM3A 84	45-63	100	100	50	25	12	6	6	3	▲	160	100	80
SM3A 88	57-75	100	100	50	25	8	4	5	3	▲	160	125	100
SM3A 92	70-90	100	100	50	25	8	4	5	3	▲	160	125	125
SM3A 96	80-100	100	100	50	25	8	4	5	3	▲	160	125	125

Thermal tripping curve



Tripping times at cold state are an indication only. The tripping time at hot state is obtained by multiplying the value obtained from the characteristic curve by 0.75.

A = Balanced 3-phase operation
B = 2-phase operation (phase failure)
le = Rated current

▲ Fuses not required.

① Fuses are used only in those cases when the value of short-circuit current at the starter installation point exceeds the breaking capacity of the starter.

Mounting position of contactors

ON VERTICAL PLANE

The performances given in this catalogue have been established with contactors mounted on a vertical plane with line terminals facing upwards and load terminals facing downwards.

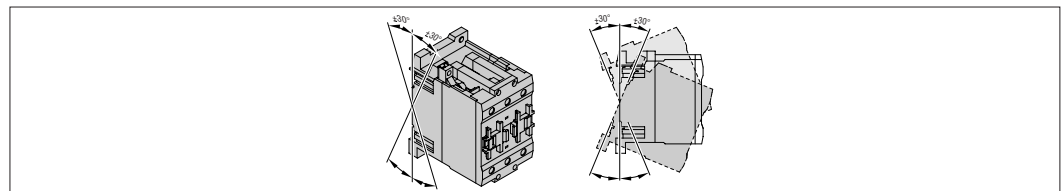
All contactors can be mounted with a $\pm 30^\circ$ inclination to the vertical axis of the contactor without any derating. For contactors up to BF110, this inclination can reach $\pm 90^\circ$, that is with the terminals are facing towards left and right. Position I (A1-A2 coil terminals facing downwards) is not recommendable for mini-contactors type BG.



ON VERTICAL PLANE WITH 30° INCLINATION

All contactors can be mounted on a plane which varies in respect to the vertical up to $\pm 30^\circ$ angle. On the average, a 5% increase of the minimum pick-up

voltage in -30° position can be noted. This inclination is greater than the one prescribed by main naval registers.



ON HORIZONTAL PLANE (ONLY FOR CONTACTORS UP TO BF110)

Considerable performance variations can be noted.

It is necessary to check the two possible mounting positions:

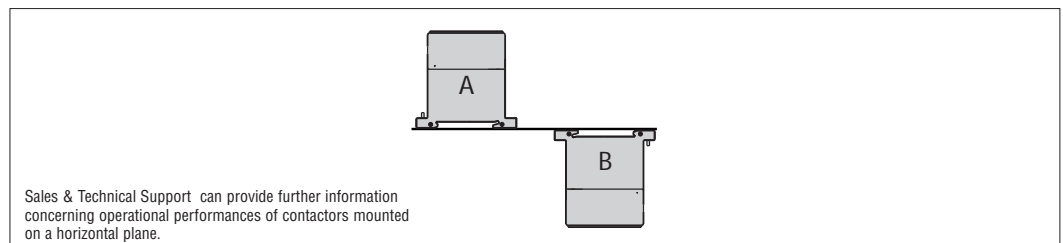
- when the contactor is energised, the movable equipment moves upwards.
- when the contactor is energised, the movable equipment moves downwards.

In the first case, it is difficult to close the contactor while in the second, to open it.

The variables which could influence the contactor performance, in addition to the two mounting positions, are:

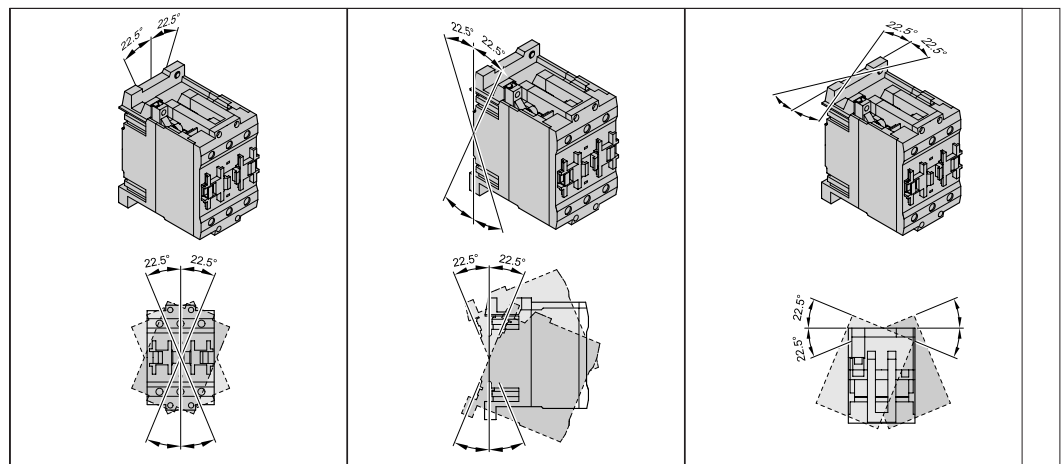
- type of contactor
- type of control
- contact configuration
- number and type of add-on blocks
- permissible tolerance of auxiliary voltage variation
- ambient temperature.

NOTE: Position B is not recommendable.



DYNAMIC TYPE TESTS

Our contactors sustained dynamic testing, with contactor mounting position rotated $\pm 22.5^\circ$ in respect to the three orthogonal axes.



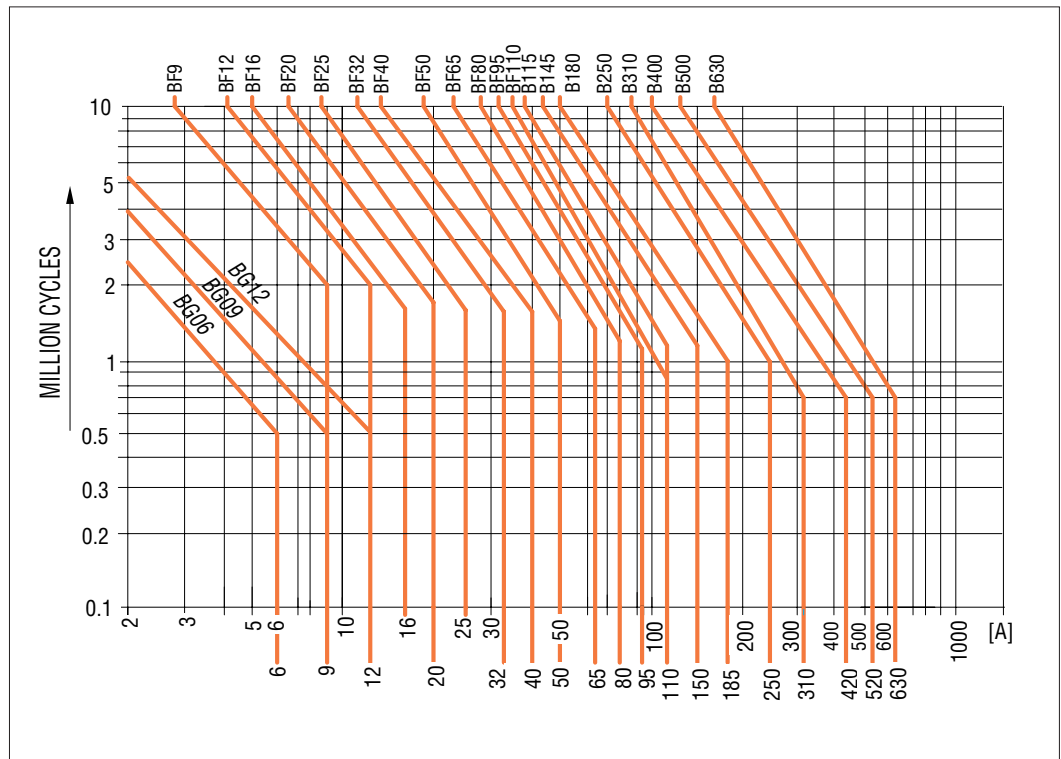
Utilisation
category AC3

POLE CHARACTERISTICS
Squirrel-cage induction motors; breaking at rated motor current

MAXIMUM OPERATIONAL POWER at ambient temperature $\leq +130^{\circ}\text{F}$ ($+55^{\circ}\text{C}$)

Contactor type	Operational current (U _e \leq 440V) [A]	Operational power						
		220/230V [kW]	380/400V [kW]	415V [kW]	440V [kW]	500V [kW]	660/690V [kW]	1000V [kW]
BG06	6	1.5	2.2	2.4	2.5	3	3	-
BG09	9	2.2	4.0	4.3	4.5	5	5	-
BG12	12	3.2	5.7	6.2	4.5	5	5	-
BF9	9	2.2	4.2	4.5	4.8	5.5	7.2	-
BF12	12	3.2	5.7	6.2	6.2	7.5	10	-
BF16	16	4.3	7.7	8.5	8.5	10	10	-
BF20	20	5.5	9.7	10.6	10.6	13	15	-
BF25	25	7.0	12.5	13.4	13.4	15	18	-
BF32	32	8.8	16	17	17	20	22	-
BF40	40	11	18.5	18.5	18.5	20	22	-
BF50	50	14.3	25	27.2	27.2	33.2	43.5	25
BF65	65	18.5	33	36	36	45.3	59.7	30
BF80	80	23	41	46	46	56	74	37
BF95	95	27.6	50	55	55	56	74	45
BF110	110	33	61	60	70	9	80	45
B115	110	33	61	66	70	80	100	63
B145	150	46	80	88	93	100	120	75
B180	185	57	100	108	115	123	144	103
B250	265	83	140	155	164	176	212	156
B310	320	100	170	188	200	213	256	180
B400	420	130	225	247	263	271	352	208
B500	520	156	290	306	328	367	416	312
B630	630	198	335	368	368	368	440	368

Electrical life
AC3 \leq 440V



Utilisation categories DC1, DC3 and DC5 Pole characteristics

CHOICE CRITERIA

The elements to be considered for the contactor choice are:

- Rated operational current I_e
- Rated operational voltage U_e
- Utilisation category and L/R time constant
- Eventual verification of electrical life.

OPERATING CONDITIONS

Indicated current is valid for:

- Ambient temperature $\leq 130^\circ\text{F}$ (55°C)
- Operating cycles: up to 120 cy/h with 60% on-load factor
up to 250 cy/h with 30% on-load factor

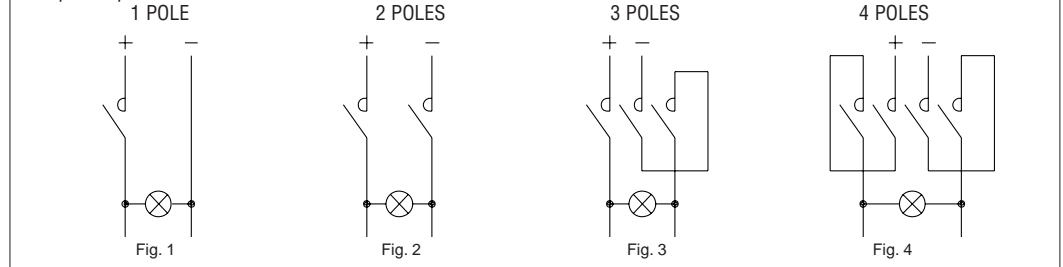
POLES IN SERIES

It is important to use contactors with the indicated number of poles in series depending on operating voltage.

The poles in series can be connected to one single polarity or divided between the two polarities of the circuit indifferently.

NOTE. For voltages lower than 30V, the diagrams given in figures 3 and 4 are not recommendable since voltage drops can take place. In these cases, it is better to use poles in parallel observing the notes given in the following section.

Examples of poles in series:



POLES IN PARALLEL

It is possible to increase the electrical life by placing poles in series when using voltages which require 1 or 2 poles in parallel.

Poles in parallel do not increase the maximum operational current given in the following pages; that is, if one pole has a maximum operational current in DC5 of 8A, two poles in parallel, it will always be 8A.

With poles in parallel, it is possible to increase the rated contact capacity (Ith) only if the contactor opens and closes in no-load conditions or when used as resistance shunts.

In this case, the contact capacity can be increased.

The value can be obtained by multiplying the rated current of one pole by the factor K given below; e.g.: if one pole carries 10A, three poles in parallel can carry $10 \times 2.2 = 22\text{A}$.

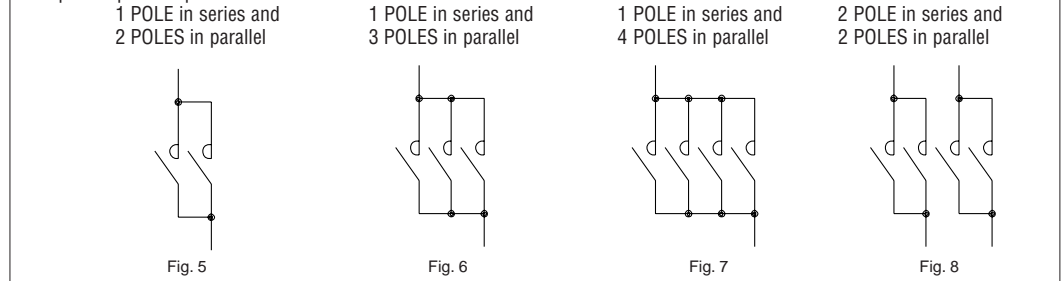
Therefore, the operating current is the one indicated in the tables, multiplied by the K coefficient given below which take into consideration the unequal current division on the various poles.

2 POLES in parallel $K = 1.6$

3 POLES in parallel $K = 2.2$

4 POLES in parallel $K = 2.8$

Examples of poles in parallel:



MAXIMUM OPERATIONAL CURRENT

See tables on pages TC-6, TC-7 and TC-8.

OTHER CONDITIONS

For different operating conditions or voltage not included among those indicated in the tables, on pages TC-6 to TC-8, contact Sales & Technical Support.

DC utilisation category

POLE CHARACTERISTICS

MAXIMUM OPERATIONAL CURRENT

Voltage U_e	Contactor Type	Maximum current I_e [A] in categories:							
		DC1 with $L/R \leq 1\text{ms}$ and poles in series				DC3 - DC5 with $L/R \leq 15\text{ms}$ and poles in series			
		1	2	3	4	1	2	3	4
$\leq 24\text{V}$	BG06	9	12	14	-	6	7	9	-
	BG09	12	15	16	16	7	8	10	10
	BF9	15	18	20	20	10	13	15	15
	BF12	17	20	22	-	12	15	18	-
	BF16	17	20	22	22	12	15	18	18
	BF20	20	23	23	23	15	18	22	25
	BF25	25	28	28	28	18	20	25	30
	BF32	30	32	32	-	20	25	30	-
	BF40	35	36	36	36	24	28	32	32
	BF50	45	60	60	60	30	35	50	55
	BF65	50	70	70	70	35	45	55	60
	BF80	70	100	100	100	40	60	80	90
48V	BF95	70	100	100	-	40	60	80	-
	BF110	70	100	100	-	40	60	80	-
	BG06	8	11	14	-	5	7	9	-
	BG09	10	14	16	16	6	8	10	10
	BF9	13	18	20	20	9	11	15	15
	BF12	15	20	22	-	11	13	18	-
	BF16	15	20	22	22	11	13	18	18
	BF20	18	23	23	23	13	18	22	25
	BF25	21	28	28	28	15	20	25	30
	BF32	26	32	32	-	17	22	28	-
	BF40	30	34	34	34	20	25	28	28
	BF50	40	60	60	60	25	35	50	55
75V	BF65	50	70	70	70	25	40	50	60
	BF80	60	100	100	100	30	50	70	90
	BF95	60	100	100	-	30	55	75	-
	BF110	60	100	100	-	30	55	75	-
	BG06	4	7	8	-	2	4	5	-
	BG09	4	9	10	10	2	5	6	6
	BF9	12	17	20	20	8	10	13	15
	BF12	13	18	20	-	10	12	15	-
	BF16	15	20	20	20	11	13	16	16
	BF20	18	23	23	23	13	16	18	20
	BF25	18	25	25	25	13	18	20	25
	BF32	22	28	32	-	15	20	28	-
110V	BF40	23	29	33	33	17	22	28	28
	BF50	40	60	60	60	22	30	45	55
	BF65	50	70	70	70	25	40	50	60
	BF80	60	100	100	100	30	50	70	90
	BF95	60	100	100	-	30	50	70	-
	BF110	60	100	100	-	30	50	70	-
	BG06	3	6	8	-	1	3	4	-
	BG09	3	8	10	10	1	4	5	5
	BF9	6	12	15	16	2	7	11	12
	BF12	6	13	16	-	2	8	12	-
	BF16	6	13	16	18	2	8	12	13
	BF20	6	16	18	20	2	10	15	16
160V	BF25	6	22	24	24	2	13	18	20
	BF32	8	25	27	-	2.5	15	20	-
	BF40	8	32	34	34	2.5	18	23	23
	BF50	8	50	55	60	3	25	30	45
	BF65	8	60	60	70	3	30	35	50
	BF80	8	80	85	100	3	40	60	75
	BF95	8	80	85	-	3	40	60	-
	BF110	8	80	85	-	3	40	60	-
	BG06	-	4	6	-	-	3	3	-
	BG09	-	4	8	8	-	2	4	4

DC utilisation category

POLE CHARACTERISTICS
MAXIMUM OPERATIONAL CURRENT

Voltage U _e	Contactor Type	Maximum current I _e [A] in categories:				DC3 - DC5 with L/R ≤ 15ms and poles in series			
		DC1 with L/R ≤ 1ms and poles in series				DC3 - DC5 with L/R ≤ 15ms and poles in series			
		1	2	3	4	1	2	3	4
220V	BF9	4	8	10	12	0.75	1.5	5	7
	BF12	4	8	11	-	0.75	1.5	6	-
	BF16	4	8	11	13	0.75	1.5	6	8
	BF20	4	8	12	14	0.75	1.5	8	10
	BF25	5	12	14	14	0.75	1.5	10	15
	BF32	5	14	16	-	1	3	12	-
	BF40	5	20	26	26	1	4	15	15
	BF50	6	36	45	50	1	5	20	25
	BF65	6	36	50	60	1	5	25	30
	BF80	6	40	55	70	1	7	35	40
	BF95	6	40	55	-	1	7	35	-
300V	BF110	6	40	55	-	1	7	35	-
	BF9	-	-	-	10	-	-	-	5
	BF16	-	-	-	11	-	-	-	-
	BF20	-	-	-	12	-	-	-	8
	BF25	-	-	-	16	-	-	-	10
	BF40	-	-	-	25	-	-	-	12
	BF50	-	-	-	45	-	-	-	20
	BF65	-	-	-	60	-	-	-	25
BF80	-	-	-	70	-	-	-	35	

DC utilisation category

POLE CHARACTERISTICS

MAXIMUM OPERATIONAL CURRENT

Voltage Ue	Contactor Type	Maximum current I _e [A] in categories: DC1 with L/R ≤ 1ms and poles in series				DC3 - DC5 with L/R ≤ 15ms and poles in series			
		1	2	3	4	1	2	3	4
75V	B115	160	160	160	160	140	140	140	140
	B145	220	220	220	220	160	160	160	160
	B180	260	260	260	260	180	180	180	180
	B250	350	350	350	350	280	280	280	280
	B310	375	375	375	375	310	310	310	310
	B400	400	400	400	400	350	350	350	350
	B500	650	650	650	650	550	550	550	550
	B630	800	800	800	800	800	800	800	800
110V	B115	100	130	130	130	70	100	120	120
	B145	110	150	150	150	80	120	140	140
	B180	120	170	170	170	90	140	160	160
	B250	160	300	300	300	150	250	280	280
	B310	195	350	350	350	170	290	310	310
	B400	250	400	400	400	200	350	350	350
	B500	320	550	600	600	320	550	550	550
	B630	460	800	800	800	460	800	800	800
220V	B115	-	100	130	130	-	80	100	120
	B145	-	130	150	150	-	90	120	140
	B180	-	150	170	170	-	100	140	160
	B250	-	250	300	300	-	200	250	280
	B310	-	300	350	350	-	230	290	310
	B400	-	350	400	400	-	280	350	350
	B500	-	450	600	600	-	450	550	550
	B630	-	700	800	800	-	700	800	800
330V	B115	-	-	100	130	-	-	80	120
	B145	-	-	130	150	-	-	90	140
	B180	-	-	150	170	-	-	100	160
	B250	-	-	250	300	-	-	200	280
	B310	-	-	300	350	-	-	230	310
	B400	-	-	350	400	-	-	280	350
	B500	-	-	450	600	-	-	450	550
	B630	-	-	700	750	-	-	650	700
460V	B115	-	-	-	100	-	-	-	80
	B145	-	-	-	130	-	-	-	90
	B180	-	-	-	150	-	-	-	100
	B250	-	-	-	250	-	-	-	200
	B310	-	-	-	300	-	-	-	230
	B400	-	-	-	350	-	-	-	280
	B500	-	-	-	450	-	-	-	450
	B630	-	-	-	700	-	-	-	700

Selection guide for lighting circuit switching

GENERAL INFORMATION

The elements which are to be considered for the contactor choice are:

- Type of lamp
- Power factor (cosφ)
- With or without power factor correction
- Value of current when switching on and in running conditions

Depending on the number and type of lamps, it is also important to bear in mind the main discriminating characteristics given below for the contactor choice:

- Incandescent lamps → contactor making capacity
- Lamps not corrected → rated contactor current in AC1
- Lamps corrected → rated contactor current in AC3

The table below summarises the major characteristics depending on the more commonly used type of lamps:

Type of lamps	Switching on		Switching off	
	Multiple of In ^①	cosφ	Multiple of In ^①	cosφ
Incandescent	15	1	1	1
Mixed light	1.3	1	1	1
Fluorescent	1.15 - 1.3	0.2	1	0.3 - 0.5 (not corrected) 1 (corrected)
High-pressure mercury vapour	1.5 - 1.75	0.2	1	0.45 - 0.7 (not corrected)
High-pressure sodium vapour	1.3 - 1.5	0.2	1	0.3 - 0.5 (not corrected)
Low-pressure sodium vapour	1	0.2 - 0.5	1	0.2 - 0.5 (not corrected)
Metal halide	1.7 - 2.1	0.2	1	0.4 - 0.5 (not corrected)

Lamp features	Lamp power [W]	Rated current [A]	Capacitor capacity [μF]	Maximum number [n] of lamps for each contactor pole ^②																																
				BF9 BF12 BF20 BF16 BF25 BF32			BF40 BF50 BF65					BF80 BF95 BF110 B115 B145 B180																								
INCANDESCENT																																				
220/240V 50/60Hz	60	0.27	-	48	92	118	129	203	240	296	370	425	462																							
	100	0.45	-	28	55	71	77	122	144	177	222	255	277																							
	200	0.91	-	14	27	35	38	60	71	87	109	126	137																							
	300	1.4	-	9	17	22	25	39	46	57	71	82	89																							
	500	2.3	-	5	10	13	15	23	28	34	43	50	54																							
1000	4.6	-	2	5	6	7	11	14	17	21	25	27																								
MIXED LIGHT																																				
220/240V 50/60Hz	100	0.45	-	33	57	77	88	122	144	177	244	311	377																							
	160	0.72	-	20	36	48	55	76	90	111	152	194	236																							
	250	1.13	-	13	23	30	35	48	57	70	97	123	150																							
	500	2.3	-	6	11	15	17	23	28	34	47	60	73																							
	1000	4.6	-	3	5	7	8	11	14	17	23	30	36																							
ELECTRONIC BALLAST FLUORESCENT																																				
220/240V 50/60Hz																																				
Single mounting	16 / 18	0.1	(6.8) ^③	80	160	220	220	400	450	500	750	1050	1200																							
	32 / 36	0.18	(6.8) ^③	44	88	122	122	222	250	277	416	583	666																							
	50 / 58	0.27	(10) ^③	29	59	82	82	148	166	185	277	388	444																							
Dual mounting	2 - 16 / 18	0.18	(10) ^③	44	88	122	122	222	250	277	416	583	666																							
	2 - 32 / 36	0.35	(10) ^③	22	45	62	62	114	128	142	214	300	342																							
	2 - 50 / 58	0.52	(22) ^③	15	30	42	42	76	86	96	144	201	230																							
STANDARD FLUORESCENT																																				
220/240V 50/60Hz																																				
Not corrected Single mounting	15	0.35	-	42	74	100	114	157	185	228	314	400	485																							
	20	0.37	-	40	70	94	108	148	175	216	297	378	459																							
	40	0.44	-	34	59	79	90	125	147	181	250	318	386																							
	65	0.7	-	21	37	50	57	78	92	114	157	200	242																							
	115	1.5	-	10	17	23	26	36	43	53	73	93	113																							
	140	1.5	-	10	17	23	26	36	43	53	73	93	113																							
Corrected Single mounting	15	0.11	4.5	40	62	94	94	200	200	200	533	533	533																							
	20	0.16	4.5	40	62	94	94	200	200	200	533	533	533																							
	40	0.24	4.5	40	62	94	94	200	200	200	458	500	520																							
	65	0.4	7	25	40	50	57	125	128	128	275	300	312																							
	115	0.7	18	10	15	23	23	50	50	50	133	133	133																							
	140	0.7	18	10	15	23	23	50	50	50	133	133	133																							
DUO circuit	2 - 20	0.26 ^④	-	57	100	153	153	211	250	307	423	538	653																							
	2 - 40	0.46 ^④	-	32	56	86	86	119	141	173	239	304	369																							
	2 - 65	0.7 ^④	-	21	37	57	57	78	92	114	157	200	242																							
	2 - 115	1.3 ^④	-	11	20	30	30	42	50	61	84	107	130																							
	2 - 140	1.5 ^④	-	10	17	26	26	36	43	53	73	93	113																							

① In = Rated lamp current.

② For 220/240V circuits, either single-phase (between phase and neutral) or 2-wire (between phase and phase), the maximum number of lamps is as per the table.

For three-phase circuits with neutral 380/415V or 220/240V, the maximum number of lamps controlled by the same contactor is n • 3.

For three-phase 380/415V circuits without neutral, the maximum number of lamps controlled by the same contactor is n • √3. Electrical life is 100,000 cycles up to +55°C (+131°F).

Contact Sales & Technical Support for use at higher voltage values.


③ Incorporated capacitor.

④ Total.

Lamp features	Lamp power [W]	Rated current [A]	Capacitor capacity [μF]	Maximum number [n] of lamps for each contactor pole ❶										
				BF9				BF80				BF95		
				BF12	BF20	BF32	BF40	BF50	BF65	BF110	B115	B145	B180	
HIGH-PRESSURE MERCURY VAPOR														
220/240V 50/60Hz														
Not corrected	50	0.61	-	16	26	36	44	65	73	82	122	172	196	
	80	0.8	-	12	20	27	33	50	56	62	93	131	150	
	125	1.2	-	8	13	18	22	33	37	41	62	87	100	
	250	2.2	-	4	7	10	12	18	20	22	34	47	54	
	400	3.4	-	3	5	6	7	11	13	14	22	30	35	
	700	5.5	-	1	3	4	4	7	8	9	13	19	21	
	1000	8	-	1	2	2	3	5	5	6	9	13	15	
Corrected	50	0.29	7	25	40	60	60	128	128	128	258	342	342	
	80	0.42	8	22	35	52	53	95	107	112	178	250	285	
	125	0.7	10	14	22	31	35	57	64	71	107	150	171	
	250	1.3	18	7	12	16	19	30	34	38	57	80	92	
	400	2.1	25	4	7	10	11	19	21	23	35	50	57	
	700	3.6	40	2	4	6	6	11	12	13	20	29	33	
	1000	5.3	60	1	3	4	4	7	8	9	14	19	22	
380/415V 50/60Hz														
Not corrected	2000	8	-	-	1	2	2	3	3	4	5	8	9	
	Corrected	2000	5.5	35	-	1	2	2	4	5	5	8	11	13
HIGH-PRESSURE SODIUM VAPOR														
220/240V 50/60Hz														
Not corrected	150	1.8	-	5	8	12	15	22	25	27	41	58	66	
	250	3	-	3	5	7	9	13	15	16	25	35	40	
	400	4.7	-	2	3	4	5	8	9	10	15	22	25	
	600	7.1	-	1	2	3	3	5	6	6	10	15	16	
	1000	10.4	-	-	1	2	2	3	4	4	7	10	11	
Corrected	150	0.83	20	9	14	19	21	45	45	45	90	120	120	
	250	1.5	36	5	7	10	11	25	25	25	50	66	66	
	400	2.4	48	3	5	6	7	16	18	18	31	43	50	
	600	3.5	68	2	3	4	4	10	12	12	20	28	34	
	1000	6.3	120	1	1	2	2	6	7	7	11	16	19	
LOW-PRESSURE SODIUM VAPOR														
220/240V 50/60Hz														
Not corrected	35	1.5	-	6	10	14	18	26	30	33	50	70	80	
	55	1.5	-	6	10	14	18	26	30	33	50	70	80	
	90	2.4	-	4	6	9	11	16	18	20	31	43	50	
	135	3.1	-	3	5	7	8	12	14	16	24	33	38	
	150	3.2	-	3	5	6	8	12	14	15	23	32	37	
	180	3.3	-	3	4	6	8	12	13	15	22	31	36	
	Corrected	35	0.31	20	6	10	14	18	45	45	45	120	120	120
55		0.42	20	6	10	14	18	45	45	45	120	120	120	
90		0.63	30	4	6	9	11	30	30	30	80	80	80	
135		0.94	40	3	5	7	8	22	22	22	60	60	60	
150		1	40	3	5	6	8	22	22	22	60	60	60	
180		1.2	40	3	4	6	8	22	22	22	60	60	60	
METAL HALIDE														
220/240V 50/60Hz														
Not corrected	250	3	-	3	5	7	9	13	15	16	25	35	40	
	400	3.5	-	2	4	6	7	11	12	14	21	30	34	
	1000	10	-	1	1	2	2	4	4	5	7	10	12	
	2000	17	-	-	-	1	1	2	2	2	4	6	7	
Corrected	250	1.5	32	5	7	8	10	26	28	28	46	50	53	
	400	2	35	4	5	6	7	20	22	25	35	37	40	
	1000	5.8	95	1	1	2	2	6	7	8	12	12	13	
	2000	11.5	148	-	-	1	1	3	3	4	6	6	6	
380/415V 50/60Hz														
Not corrected	2000	10.3	-	-	-	1	1	2	2	3	4	6	7	
	3500	18	-	-	-	-	-	1	1	1	2	3	4	
Corrected	2000	6.6	60	-	1	1	1	3	3	4	6	7	7	
	3500	11.6	100	-	-	-	-	2	2	2	3	3	4	

❶ For 220/240V circuits, either single-phase (between phase and neutral) or 2-wire (between phase and phase), the maximum number of lamps is as per the table. For three-phase circuits with neutral 380/415V or 220/240V, the maximum number of lamps controlled by the same contactor is $n \cdot 3$. For three-phase 380/415V circuits without neutral, the maximum number of lamps controlled by the same contactor is $n \cdot \sqrt{3}$. Electrical life is 100,000 cycles up to +55°C (+131°F). Contact Sales & Technical Support for use at higher voltage values.

Operational characteristics BG00 and CF4

TYPE			BG00	CF4	
OPERATING CONDITIONS					
Ambient temperature	operation	°F	-40 to +140 (-40 to +60°C)	-60 to +160 (-50 to +70°C)	
	storage	°F	-65 to +160 (-55 to +70°C)	-75 to +175 (-60 to +80°C)	
Maximum altitude		ft	9800 (3000m)	9800 (3000m)	
Operation position	normal		on vertical plane	on vertical plane	
	allowable		±30°	±30°	
Fixing	screw or 35mm DIN rail (EN 50022)				
Compliance to standards	IEC/EN 60947-5-1				
Approvals	see page 3-5 and 6				
POLE CHARACTERISTICS					
Poles	n°		4		
Rated thermal current I _{th} (≤40°C/105°F)	A		10		
Rated insulation voltage U _i	V		690		
Frequency limit	Hz		25 - 400 ❶		
Designation of auxiliary contacts according to IEC/EN 60947-5-1 UL/CSA	AC		A600		
	DC		Q600		
Terminals		A	7.5	8.3	
		B	4	3.5	
		screw	M3	M3.5	
		Faston	1-6.35 or 2-2.8	—	
Maximum tightening torque for contact terminals	Nm		0.8-1	1.4-1.8	
	in lb		7.1-8.9	12.4-16	
Maximum tightening torque for coil terminals	Nm		0.8-1		
	in lb		7.08-8.88		
Maximum wire section connectable with 1 or 2 conductors	AWG	n°	10	10	
	Flexible w/o lug (min-max)	mm²	0.75-2.5	6	
	Flexible c/w lug	mm²	2-1 or 1-2.5	6	
Terminal protection according to EN 60529	IP20❷				
AC CONTROL					
Rated control voltage at 50, 60, 50-60Hz	V		12 - 550	12 - 660	
Operating voltage limits❸	pick-up	% U _s	75 - 115	70 - 110	
		drop-out	% U _s	30 - 55	40 - 55
Average coil consumption	50Hz	in rush/holding	VA	30/4	
	60Hz	in rush/holding	VA	25/3	
Dissipation at 60 Hz	W		0.95	2.5	
DC CONTROL					
Rated control voltage	V		6 - 250	—	
Operating voltage limits	pick-up	% U _s	70 - 115	—	
		drop-out	% U _s	10 - 20	
Average consumption	W		3.2❹	—	
OPERATING TIMES					
With control	AC	closing NO	ms	12 - 21	8 - 24
		opening NO	ms	9 - 18	10 - 20
		closing NC	ms	17 - 26	17 - 30
		opening NC	ms	7 - 17	7 - 18
	DC	closing NO	ms	18 - 25	—
		opening NO	ms	2 - 3	—
		closing NC	ms	3 - 5	—
		opening NC	ms	11 - 17	—
LIFE					
Mechanical in AC and DC (millions)	cycles		20	20	
Maximum operating cycle	cycles/h		3600	3600	


❶ Derating for use at 61-400 Hz. Contact Sales & Technical Support.

❷ IP20 protection warranted by wired equipment; minimum 0.75mm² / 18AWG section for BG00 or 1mm²/18 AWG for CF4.

❸ For CF4 control relay, the limits are valid for 50Hz or 60Hz operation only.

❹ 2.2W for low-consumption BG00...L version.

Operational characteristics BG06, BG09 and BG12

TYPE		BG06	BG09	BG12	
OPERATING CONDITIONS					
Ambient temperature	operation	°F			
	storage	°F			
Maximum altitude		ft			
Operating position	normal	on vertical plane			
	allowable	± 30°			
Fixing		screws or 35mm DIN rail (EN 50022)			
Compliance to standards		IEC/EN 60947-4-1			
Approvals		see page 3-5 and 6			
POLE CHARACTERISTICS					
Power poles	n°	3	3-4	3	
Rated insulation voltage Ui	V	690			
Operational frequency	Hz	25 - 400 ①			
Operational current	I _{th} (≤40°C/105°F)	A	16	20	20
	AC3 (380/400V)	A	6	9	12
	AC4 (380/400V) ②	A	3.3	4.0	4.8
Short-time allowable current for 10s (IEC 60947-1)	A	80			
Max fuse size	gG	A	16	20	20
Type 1 or 2	aM	A	6	10	16
Making capacity (RMS value)		A	92	92	120
Breaking capacity at voltage	≤ 440V	A	72	72	96
	500V	A	72	72	72
	690V	A	72	72	72
Consumption per pole and resistance (average values)		mΩ	10	10	10
	I _{th}	W	2.6	4	4
	AC3	W	0.36	0.81	1.44
Terminals		A	7.5	7.5	7.5
		B	4	4	4
		screw	M3	M3	M3
	Quick connect	Faston	—	1-6.35 or 2-2.8	—
	Solder		—	PCB solder pin ③	—
Maximum tightening torque for contact and coil terminals		Nm	0.8-1	0.8-1	0.8-1
		in lb	7.1-8.9	7.1-8.9	7.1-8.9
Maximum cable section connectable with 1 or 2 conductors	AWG	n°	10		
	Flexible w/o lug (min-max)	mm ²	0.75-2.5		
	Flexible c/w lug	mm ²	2-1 or 1-2.5		
Terminal protection according to EN60529			IP20 ④		

① Derating for use at 61-400Hz. Contact Sales & Technical Support.

② Current values guarantee an electrical life of about 50,000 cycles.


③ Dimensions and drilling distances are given on page D-3.

④ IP20 protection warranted by wired equipment; minimum 0.75mm²/18 AWG section.

TYPE			BG06	BG09	BG12	
AC CONTROL						
Rated control voltage at 50, 50/60 or 60Hz	from	V	12	12	12	
	to	V	550	550	550	
Operating voltage limits	pick-up	from	% Us	75	75	75
		to	% Us	115	115	115
	drop-out	from	% Us	30	30	30
		to	% Us	55	55	55
Coil consumption	50Hz	in-rush	VA	30	30	30
		holding	VA	4	4	4
	60Hz	in-rush	VA	25	25	25
		holding	VA	3.0	3.0	3.0
Dissipation at 60 Hz		W	0.95	0.95	0.95	
DC CONTROL						
Rated control voltage	from	V	6	6	6	
	to	V	250	250	250	
Operating voltage limits	pick-up	from	% Us	75	75	75
		to	% Us	115	115	115
	drop-out	from	% Us	10	10	10
		to	% Us	20	20	20
Average consumption		W	32	3.2 ^❶	3.2	
OPERATING TIMES						
With control	AC	closing NO	ms	12 - 21	12 - 21	12 - 21
		opening NO	ms	9 - 18	9 - 18	9 - 18
		closing NC	ms	17 - 26	17 - 26	17 - 26
		opening NC	ms	7 - 17	7 - 17	7 - 12
	DC	closing NO	ms	18 - 25	18 - 25	18 - 25
		opening NO	ms	2 - 3	2 - 3	2 - 3
		closing NC	ms	3 - 5	3 - 5	3 - 5
		opening NC	ms	11 - 17	11 - 17	11 - 17
LIFE (millions)						
Mechanical	AC control	cycles	20	20	20	
	DC control	cycles	20	20	20	
Electrical (Ie at 400V AC3)		cycles	0.5	0.5	0.5	
MAXIMUM OPERATING CYCLE						
Mechanical		cy/h	3600	3600	3600	
Electromagnet		cy/h	3600	3600	3600	
Poles		cy/h	3600	3600	3600	

❶ 2.3W for low-consumption type BG...L

Operational characteristics BF9...-BF40...

TYPE		BF9	BF12	BF16	BF20	BF25	BF32	BF40 ^①	BF40 40 ^②	
OPERATING CONDITIONS										
Ambient temperature	operation	°F -60 to +160 (-50 to +70)								
	storage	°F -75 to +175 (-60 to +80)								
Maximum altitude		ft 9800 (3000m)								
Operating position	normal	on vertical plane								
	allowable	± 30°								
Fixing		screw or 35mm DIN rail (EN 50022)								
Correspondance to standards		IEC/EN 60947-4-1								
Approvals		see page 3-5 and 6								
POLE CHARACTERISTICS										
Power poles	n°	3-4	3	3-4	3-4	3-4	3	3	4	
Rated insulation voltage Ui	V	690	690	690	690	690	690	690	690	
Operational frequency	Hz	25-400 ^③								
Operational current	lth (≤40°C/105°F)	A	25	25	25	40	40	55	60	60
	AC3 (380/400V)	A	9	12	16	20	25	32	40	40
	AC4 (380/400V) ^④	A	5.3	7.2	7.5	10	11.7	16	20	20
Short-time allowable current for (IEC 60947-1)	10s	A	110	110	110	160	160	230	240	240
Max fuse size	gG	A	32	40	40	50	50	63	80	80
	Type 1 or 2	aM	A	10	12	16	20	25	32	40
Making capacity (RMS value)		A	210	210	210	350	350	480	480	480
Breaking capacity at voltage	≤440V	A	210	210	210	350	350	480	480	480
	500V	A	160	160	160	290	290	320	320	320
	690V	A	120	120	120	220	220	270	270	270
Consumption and resistance per pole (average values)		mΩ	5	5	5	2.5	2.5	2.0	1.8	1.8
	lth	W	3.1	3.1	3.1	4.0	4.0	6.0	6.5	6.5
	AC3	W	0.40	0.72	1.3	1.0	1.6	2.0	2.6	2.6
Terminals		Type	Screw + washer							
		A	8.3	8.3	8.3	10.1	10.1	13.2	13.2	13.2
		B	3.5	3.5	3.5	5.9	5.9	5.5	5.5	5.5
		Screw	M3.5	M3.5	M3.5	M4	M4	M5	M5	M5
Maximum tightening torque for contact terminal		Nm	1.8	1.8	1.8	2.3	2.3	3.9	3.9	3.9
		in lb	12.36 - 16			16 - 20.4		26.9 - 34.5		
Maximum tightening torque for coil terminals		Nm	1	1	1	1	1	1	1	1
		in lb	7.08 - 8.88							
Maximum cable section connectable with 1 or 2 conductors	AWG	n°	10	10	10	8	8	4	4	4
	Flexible w/o lug (min-max)	mm ²	1-6	1-6	1-6	1.5-10	1.5-10	2.5-16	2.5-16	2.5-16
	Flexible c/w lug	mm ²	6	6	6	6	6	6	6	6
Power terminal protection according to EN 60529			IP20 ^⑤	IP20 ^⑤	IP20 ^⑤	IP20 ^⑥	IP20 ^⑥	IP20 ^⑦	IP20 ^⑦	—

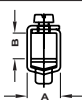
- ① Three-pole version.
- ② Four-pole version, 4NO or 2NO+2NC type (power poles).
- ③ Derating for use at 61-400Hz. Contact Sales & Technical Support.
- ④ Current values guarantee an electrical life of about 200,000 cycles.
- ⑤ IP20 protection warranted by wired equipment; minimum 1mm²/18 AWG section.
- ⑥ 2.5mm²/14 AWG section for 3-pole type or 6mm²/10 AWG for 4-pole type.
- ⑦ IP20 protection warranted by wired equipment; minimum 16mm²/6 AWG section.

TYPE			BF9	BF12	BF16	BF20	BF25	BF32	BF40 ^①	BF40 40 ^②	
AC CONTROL											
Rated control voltage at 50, 50/60, 60Hz	from	V	12	12	12	12	12	12	12	12	
	to	V	660	660	660	660	660	660	660	660	
Operating voltage limits with 50Hz or 60Hz coil only	pick-up	from	% Us	70	70	70	70	70	70	70	
		to	% Us	110	110	110	110	110	110	110	
	drop-out	from	% Us	40	40	40	40	40	40	40	
		to	% Us	55	55	55	55	55	55	55	
Average coil consumption	50Hz	in-rush	VA	65	65	65	65	65	95	95	210
		holding	VA	9	9	9	9	9	12.3	12.3	18
	60Hz	in-rush	VA	78	78	78	78	78	92	92	252
		holding	VA	10.8	10.8	10.8	10.8	10.8	12	12	21.6
Dissipation at 60Hz		W	2.5	2.5	2.5	2.5	2.5	4.5	4.5	6	
DC CONTROL											
Rated control voltage	from	V	12	12	12	12	12	12	12	12	
	to	V	660	660	660	660	660	660	660	660	
Operating voltage limits	pick-up	from	% Us	70	70	70	70	70	70	70	
		to	% Us	120	120	120	120	120	120	120	110
	drop-out	from	% Us	15	15	15	15	15	15	15	
		to	% Us	25	25	25	25	25	25	25	
Average coil consumption		W	9	9	9	9	9	9	9	15	
OPERATING TIMES											
With control	AC	closing NO	ms	8-24	8-24	8-24	8-24	8-24	14-27	14-27	10-22
		opening NO	ms	10-20	10-20	10-20	15-20	15-20	8-18	8-18	8-18
		closing NC	ms	17-30	17-30	17-30	16-22	16-22	-	-	-
		opening NC	ms	7-18	7-18	7-18	7-18	7-18	-	-	-
	DC	closing NO	ms	42-58	42-58	42-58	42-58	42-58	42-58	42-58	58-80
		opening NO	ms	7-13	7-13	7-13	7-13	7-13	5-10	5-10	11-16
		closing NC	ms	11-17	11-17	11-17	11-17	11-17	-	-	-
		opening NC	ms	32-42	32-42	32-42	28-38	28-38	-	-	-
LIFE (millions)											
Mechanical	AC control	cycles	20	20	20	20	20	20	20	20	
	DC control	cycles	20	20	20	20	20	20	20	20	
Electrical (Ie at 400V AC3)		cycles	2.0	2.0	1.7	1.7	1.7	1.6	1.6	1.6	
MAXIMUM OPERATING CYCLE											
Mechanical operations		cy/h							3600		
Electromagnet		cy/h							3600		
Pole		cy/h							3600		

① Three-pole version.

② Four-pole version, 4NO or 2NO+2NC type (power poles).

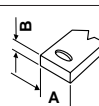
Operational characteristics BF50-BF95

TYPE		BF50	BF65	BF80	BF95	BF110	
OPERATING CONDITIONS							
Ambient temperature	operation	°F -60 to +160 (-50 to +70°C)					
	storage	°F -75 to +175 (-60 to +80°C)					
Maximum altitude		ft 9800 (3000m)					
Operating position:	normal	on vertical plane					
	allowable	± 30°					
Fixing		screw or 35mm (EN 50022) ❶ and 75mm (EN 50023) DIN rail					
Correspondance to standards		IEC/EN 60947-4-1					
Approvals		see page 3-5 and 6					
POLE CHARACTERISTICS							
Power poles	n°	3-4	3-4	3-4	3	3	
Rated insulation voltage Ui	V	690					
Operational frequency	Hz	25 - 400❷					
Operational current	Ith (≤40°C/105°F)	A 90	A 110	A 125	A 125	A 125	
	AC3 (380/400V)	A 50	A 65	A 80	A 95	A 110	
	AC4 (380/400V)❸	A 28	A 31	A 38	A 43	A 50	
Short-time allowable current for (IEC 60947-1)	10s	A 390	A 390	A 480	A 760	A 880	
Max fuse size	gG	A 100	A 125	A 160	A 160	A 160	
	Type 1 or 2	aM	A 50	A 80	A 80	A 100	A 125
Making capacity (RMS value)		A 800	A 1090	A 1200	A 1200	A 1200	
Breaking capacity at voltage	≤440V	A 800	A 1090	A 1200	A 1200	A 1200	
	500V	A 660	A 830	A 1050	A 1050	A 1050	
	690V	A 500	A 630	A 800	A 800	A 800	
Consumption and resistance per pole (average values)		mΩ 0.8	mΩ 0.8	mΩ 0.6	mΩ 0.6	mΩ 0.6	
	Ith	W 6.5	W 9.7	W 9.4	W 9.4	W 9.4	
	AC3	W 2.0	W 3.4	W 3.8	W 5.4	W 7.3	
Terminals		Type	Lug clamp ❹				
		A	10.4	10.4	12.3	12.3	12.3
		B	10.5	10.5	12	12	12
		Screw	M6	M6	M6	M6	M6
Maximum tightening torque for contact terminals	Nm	4 - 5					
	in lb	32.3 - 44.3					
Maximum tightening torque for coil terminals	Nm	0.8 - 1					
	in lb	7.1 - 8.9					
Maximum wire section connectable with 1 conductor	AWG	n° 2					
	Flexible w/o lug (min-max)	mm² 4-50	mm² 4-50	mm² 6-50	mm² 6-50	mm² 6-50	
Power terminal protection according to EN 60529		IP20❺					

- ❶ Only three-pole versions can be mounted on 35mm DIN rail.
- ❷ Derating for use at 61-400 Hz. Contact Sales & Technical Support.
- ❸ Current values guarantee an electrical life of about 200,000 cycles.
- ❹ In addition the main terminal, the following dimensions refer to the second entry of flexible bars: 12.3x3.8mm (0.48x0.15in).
- ❺ IP20 protection warranted to three-pole contactors only by mounting the G265 protection.

TYPE			BF50	BF65	BF80	BF95	BF110
AC CONTROL							
Rated control voltage at 50, 50/60, 60Hz	from	V	12	12	12	12	12
	to	V	660	660	660	660	660
Operating voltage limits with 50Hz or 60Hz coil	pick-up	from	% Us	70	70	70	70
		to	% Us	110	110	110	110
	drop-out	from	% Us	40	40	40	40
		to	% Us	55	55	55	55
Average coil consumption	50Hz	in-rush	VA	210	210	210	210
		holding	VA	18	18	18	18
	60Hz	in-rush	VA	252	252	252	252
		holding	VA	21.6	21.6	21.6	21.6
Dissipation at 60Hz		W	6	6	6	6	6
DC CONTROL							
Rated control voltage	from	V	12	12	12	12	12
	to	V	660	660	660	660	660
Operating voltage limits	pick-up	from	% Us	70	70	70	70
		to	% Us	110	110	110	110
	drop-up	from	% Us	15	15	15	15
		to	% Us	25	25	25	25
Average coil consumption		W	15	15	15	15	15
OPERATING TIMES							
With control	AC	closing NO	ms	13-25	13-25	13-25	13-25
		opening NO	ms	8-12	8-12	8-12	8-12
		closing NC	ms	-	-	-	-
		opening NC	ms	-	-	-	-
	DC	closing NO	ms	60-90	60-90	60-90	60-90
		opening NO	ms	7-12	7-12	7-12	7-12
		closing NC	ms	-	-	-	-
		opening NC	ms	-	-	-	-
LIFE (millions)							
Mechanical	AC control	cycles	15	15	15	15	15
	DC control	cycles	15	15	15	15	15
Elettrica (Ie at 400V in AC3)		cycles	1.5	1.4	1.3	1.2	0.8
MAXIMUM OPERATING CYCLE							
Mechanical operations		cy/h	3600				
Electromagnet		cy/h	3600				
Pole		cy/h	3600				

Operational characteristics B115-B1600

TYPE		B115	B145	B180	B250	B310	B400	B500	B630	B630 1000	B1250	B1600	
OPERATING CONDITIONS													
Ambient temperature	operation	°F -60 to +160 (-50 to +70°C)											
	storage	°F -75 to +175 (-60 to +80°C)											
Maximum altitude	ft	9800 (3000m)											
Operating position	normal	on vertical plane											
	allowable	± 30°											
Fixing		screw											
Correspondence to standard		IEC/EN 60947-4-1											
Approvals		see page 3-5 and 6											
POLE CHARACTERISTICS													
Power poles	n°	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	3-4	
Rated insulation voltage Ui	V	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
Operational frequency	Hz	25-400 ^①											
Operational current	I _{th} (≤40°C/105°F)	A	160	250	275	350	450	550	700	800	1000	1250	1600
	AC3 (380/400V)	A	110	150	185	265	320	420	520	630	-	-	-
	AC4 (380/400V) ^②	A	47	57	65	92	110	133	175	210	-	-	-
Short-time allowable current (IEC 60947-1)	10s	A	1100	1300	1500	2200	2900	3600	4050	4500	5600	6500	8300
Max fuse size Type 1 or 2	gG	A	200	250	315	400	500	630	800	1000	Ⓢ	Ⓢ	Ⓢ
	aM	A	125	160	200	250	400	400	500	630	Ⓢ	Ⓢ	Ⓢ
Making capacity (rms value)	A	1100	1500	1850	2750	3150	4200	5000	6300	Ⓢ	Ⓢ	Ⓢ	
Breaking capacity at voltage	≤440V	A	1300	1500	1850	2500	3000	4000	5000	6300	Ⓢ	Ⓢ	Ⓢ
	500V	A	1100	1400	1600	2250	2700	3400	4500	5600	Ⓢ	Ⓢ	Ⓢ
	690V	A	880	1200	1480	2200	2520	3360	4000	5000	Ⓢ	Ⓢ	Ⓢ
	1000V	A	600	800	1000	1500	1700	2300	2700	3400	Ⓢ	Ⓢ	Ⓢ
Consumption and resistance per pole (average values)		mΩ	0.30	0.30	0.30	0.20	0.20	0.20	0.14	0.14	0.14	0.07	0.07
	I _{th}	W	7.7	14.5	20.3	24.5	40.5	52.0	68.6	90	140	110	180
	AC3	W	4.0	6.8	9.7	12.5	20	32	35	56	-	-	-
Terminals		A	15	20	20	25	25	25	35	40	60	60	60
		B	4	4	4	5	5	5	6	6	6	10	10
		Screw	M6	M8	M8	M10	M10	M10	M10	M12	2-M12	2-M12	2-M12
Maximum cross section connectable	1 or 2 bars	mm	20x3	25x3	25x3	30x4	30x5	30x5	50x5	60x5	60x5	100x5	100x5
	N° 1 wire with lug	mm ²	70	120	150	240	-	-	-	-	-	-	-
	N° 2 wire with lug	mm ²	-	-	-	-	150	150	240	240	-	-	-

^① Derating for use at 61-400 Hz. Contact Sales & Technical Support.

^② Current values guarantee an electrical life of about 200,000 cycles.

^③ Consult Sales & Technical Support.

Operational characteristics of types B115-B1600

TYPE		B115	B145	B180	B250	B310	B400	B500	B630	B630 1000	B1250	B1600	
AC CONTROL													
Supply voltage		The electromagnet can operate either in AC or DC										AC only	
Rated control voltage		V	24-480	24-480	24-480	24-480	24-480	24-480	48-480	48-480	48-480	110-480	110-480
Operating voltage limits	pick-up	% Us	80-110	80-110	80-110	80-110	80-110	80-110	80-110	80-110	80-110	80-110	80-110
	drop-out	% Us	30-60	30-60	30-60	30-60	30-60	30-60	30-60	30-60	30-60	30-60	30-60
Consumption	in-rush	VA/W	300	300	300	300	300	300	400	400	400	800	800
	holding	VA/W	10	10	10	10	10	10	18	18	18	40	40
Dissipation		W	10	10	10	10	10	10	18	18	18	40	40
OPERATING TIMES													
Making		ms	60-100	60-100	60-100	80-120	80-120	80-120	110-180	110-180	110-180	120-210	120-210
Breaking		ms	25-60	25-60	25-60	30-75	30-75	30-75	60-100	60-100	60-110	70-130	70-130
LIFE (millions)													
Mechanical		cycles	10	10	10	10	10	10	5	5	5	5	5
Electrical (Ie at 400V in AC3)		cycles	1.1	1.1	1.0	1	0.7	0.7	0.7	0.7	—	—	—
MAXIMUM OPERATING CYCLE													
Mechanical operations		cy/h	2400	2400	2400	2400	2400	2400	1200	1200	1200	1200	1200
Electromagnet		cy/h	2400	2400	2400	2400	2400	2400	1200	1200	1200	1200	1200
Pole		cy/h	2400	2400	2400	2400	2400	2400	1200	1200	1200	1200	1200
PARTICULAR CHARACTERISTICS													
Indicator			Contactor open or closed										
Safety feature			Closing operations are prevented without arc chutes										

CONTROL CIRCUIT UTILISATION

The input electronic circuit of the contactor coil B115-B1600 is designed and tested according to IEEEC 62.41 and can withstand a 10 kV impulse voltage (1.2/50µs) with 50 Joule energy.

For higher values, the use of an auxiliary reduced voltage transformer is recommended.

Operational characteristics of incorporated auxiliary contacts of types BG00, BG06, BG09, BG12, CF4, BF9-BF25

TYPE		BG00 - BG06 - BG09 - BG12	CF4 - BF9 - BF12 - BF16	BF20 - BF25
CHARACTERISTICS				
Thermal current Ith		A	10	10
Rated insulation voltage Ui		V	690	690
Terminals	Screw		M3	M3.5
	Width	mm	7.5	8.3
	Faston		1-6.35 2-2.8	—
Maximum wire section connectable with 1 or 2 conductors				
Flexible w/o lug (min-max)		mm ²	0.75-2.5	1-6
Flexible c/w lug (min-max)		mm ²	2-1 or 1-2.5	6
AWG		n°	10	10
UL/CSA designation	AC	A600	A600	A600
	DC	Q600	Q600	P600

- ① The NO and NC auxiliary contacts of BG mini-contactors are highly conductive.
- ② The NC auxiliary contacts of CF4, BF9, BF12 and BF16 contactors are highly conductive.
- ③ BF20 00 and BF25 00 excluded.
- ④ For BG00 and BG09 types only.

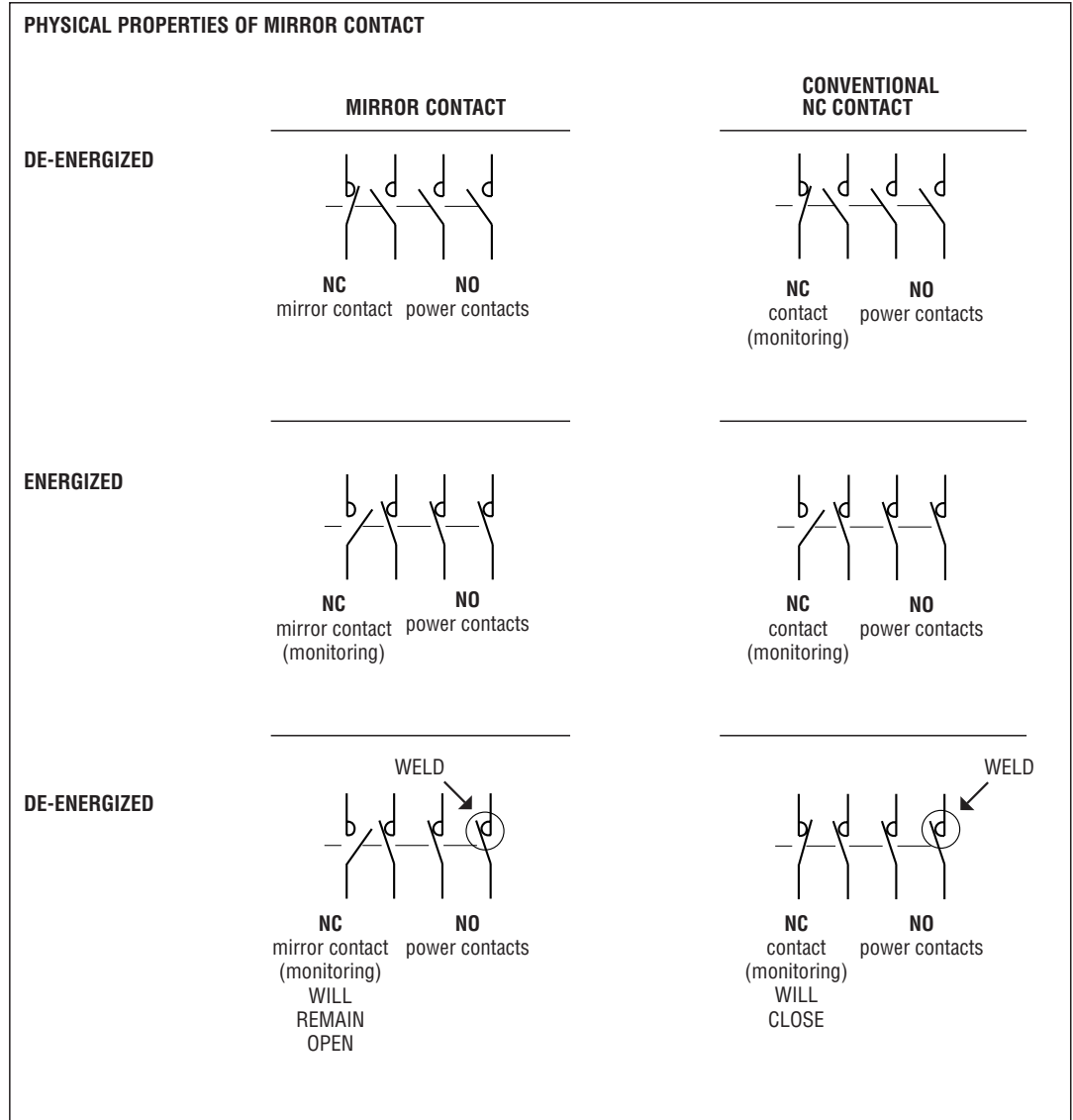
Positively guided contacts for types with incorporated auxiliary contacts

Positively guided contacts are a requirement in safety circuits to correctly monitor the status of normally open contacts. Guided contacts imply that Normally Open (NO) and Normally Closed (NC) will operate together reciprocally but can never be simultaneously closed, even in case of NO contacts weld. This requirement is obtained by particular constructional details, such as reduced gap tolerance through which the mobile contact travels and the points of actuation are closer to the actual contact position. Positively Guided Contacts are also called positively safety contacts, forced contacts, linked contacts, force or positive guided or positively driven contacts. The positively guided contacts assume different meanings and

terminologies in compliance with the product standards which are given below.

IEC 60947-4-1/A1 ed. 2 - Annex F

In this case, positively guided contacts are called auxiliary contacts linked with power contacts (**mirror contact**). The requirement is that when power poles weld, the auxiliary NC contacts remain open. This requirement is standard supplied on all our contactors having an integrated NC auxiliary contacts: **BG..01, BF9..01, BF12..01, BF16..01, BF20..01 or BF25..01 types.**



IEC 60947-5-1/A2 ed. 2 - Annex L

In this case, positively guided contacts are called **mechanically linked contacts**. The requirement is that NO and NC contacts can never be simultaneously closed, even if the NO contact or NC contact welds in closed position. This requirement applies to auxiliary safety contacts included

in control circuit devices where the actuating positively is provided internally; therefore, this does not apply to push buttons or limit switches. Lovato control relays, such as **BG00** and **CF4**, which have at least one NO and one NC contact, fall into this category. (See Physical properties of mechanically linked contacts on page TC-21).

Note: Control circuit devices, operated externally (e.g. push-button or limit-switches) can not have mechanically linked contact elements. Such devices, in safety applications, generally have contacts with Direct Opening Actuation.

Positively guided contacts for add-on auxiliary contact blocks

IEC 60947-5-1/A2 ed. 2 - Annex L

In this case, positively guided contacts are called **mechanically linked contacts**.

The requirement is that NO and NC contacts can never be simultaneously closed, even if the NO contact or NC contact welds in closed position.

This requirement applies to auxiliary safety contacts included in control circuit devices where the actuating positively is

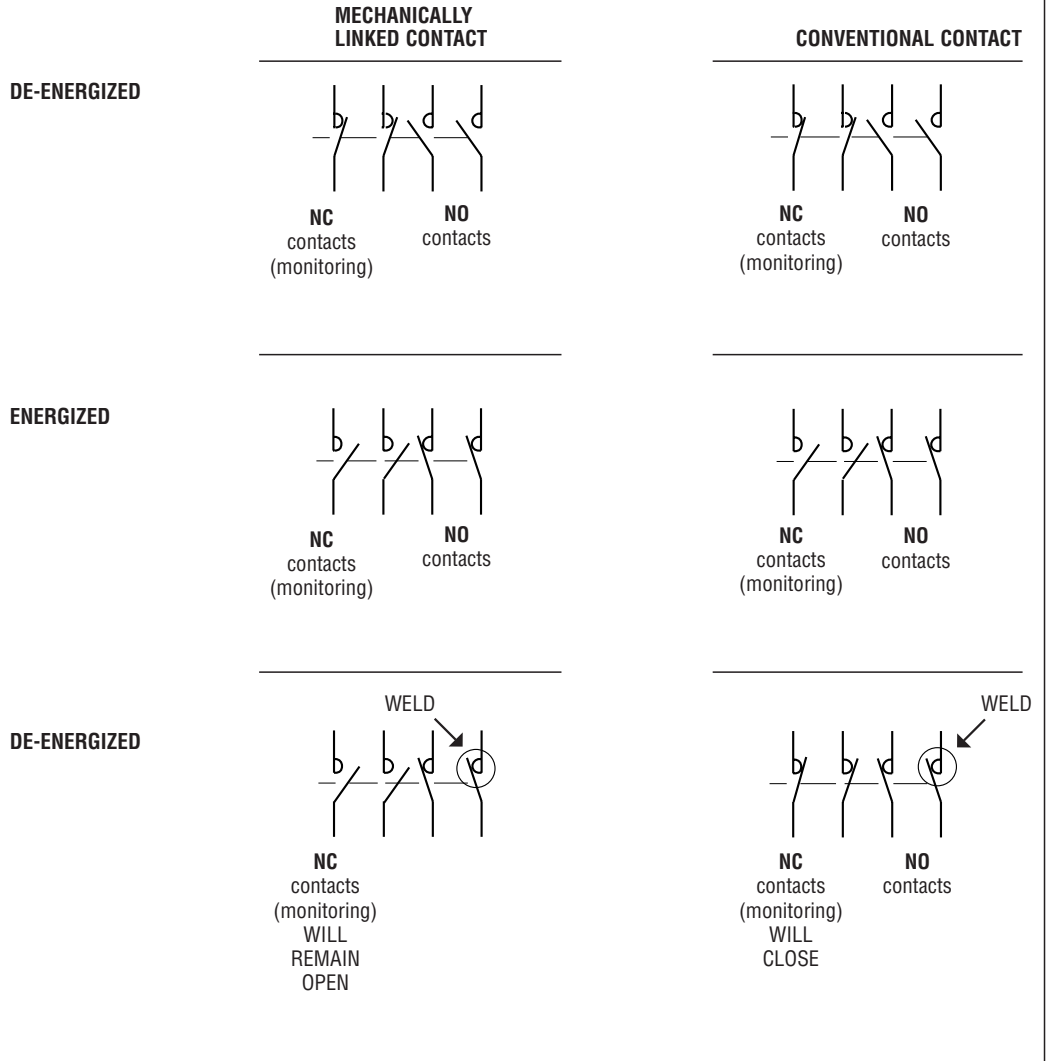
provided internally; therefore, this does not apply to push buttons or limit switches.

Several auxiliary contact blocks, which have at least one NO and one NC contact, fall into this category. These blocks include:

BGX10 11, BGX10 31, BGX10 22, BGX10 13, BGX11 11, BGX11 12, BGXF10 11, BGXF10 13, BGXF10 22, BGXF10 31, G350, G354, G480 11, G481 11, G484 11, G484 12 and G484 21.

TC

PHYSICAL PROPERTIES OF MECHANICALLY LINKED CONTACTS



**Maximum combination
CF4 and BF9-BF95**

POSITION AND MAXIMUM QUANTITY OF ADD-ON BLOCKS AND ACCESSORIES

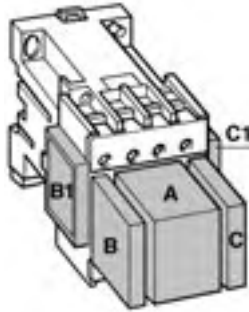
For application at maximum composition, at temperatures >+40°C/+105°F and DC control, contact Sales Technical Support.

CONTACTORS
CF4-BF9-BF12-BF16-BF20-BF25-BF32-BF40
Area A Area B/Area C

N° 2 G480	N° 1 G218
or	or
N° 1 G484	N° 1 G318
or	or
N° 1 G485	N° 1 G319
or	or
N° 1 G486	N° 1 G322
or	or
N° 1 G487	N° 1 G418
	or
	N° 1 G481
	or
	N° 1 G482
	or
	N° 1 G223
	or
	N° 1 G269 1

CONTACTORS
BF50-BF65-BF80-BF110
Area A Area B/Area C

N° 2 G480	N° 1 G218
or	or
N° 1 G484	N° 1 G318
or	or
N° 1 G485	N° 1 G319
or	or
N° 1 G486	N° 1 G322
or	or
N° 1 G487	N° 1 G418
	or
	N° 1 G481
	or
	N° 1 G482
	or
	N° 1 G269 2



NOTE :
G218, G481 and G482 add-on blocks can be mounted both on B and C and on B1 and C1 with the relative G483 (G481-G482) adapter and G280 (G218) adapter if contactor width is sufficient.
No side-mount blocks can be mounted on BF40 22 contactors.

CONTACTS WITH MECHANICAL LATCH
FIGURE 1
BF9-BF12-BF16
THREE/FOUR POLE

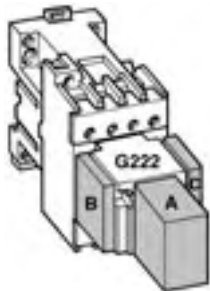
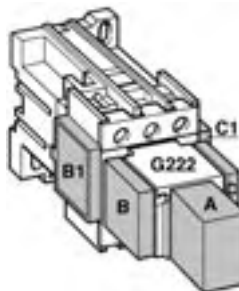


FIGURE 2
BF20-BF25 THREE/FOUR POLE
BF32-BF40 THREE-POLE



CONTACTORS FIG. 1 and 2

Area A	Area B/C
N° 2 G480	N° 1 G223
or	or
N° 1 G484	N° 1 G418
or	
N° 1 G485	
or	
N° 1 G486	
or	
N° 1 G487	

● BF20 00 or BF25 00 excluded.

FIGURE 3
BF40 40
FOUR-POLE

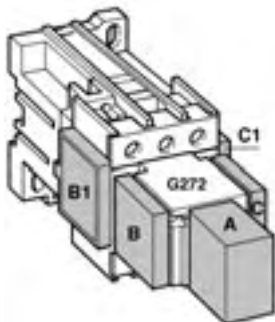
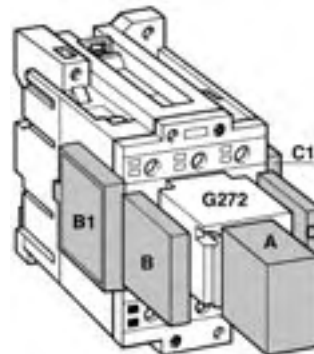


FIGURE 4
BF50-BF65-BF80-BF110
THREE/FOUR POLE



CONTACTORS FIG. 3 and 4

Area A	Area B/C
N° 2 G480	N° 1 G218
or	or
N° 1 G484	N° 1 G318
or	or
N° 1 G485	N° 1 G319
or	or
N° 1 G486	N° 1 G322
or	or
N° 1 G487	N° 1 G418
	or
	N° 1 G481
	or
	N° 1 G482
	or
	N° 1 G269 2

NOTE:
G218, G481 and G482 add-on blocks can mounted both on B and C and on B1 and C1 with the relative G483 (G481 or G482) and G280 (G218) adapters.
No side-mount blocks can be mounted on BF40 22 contactors.

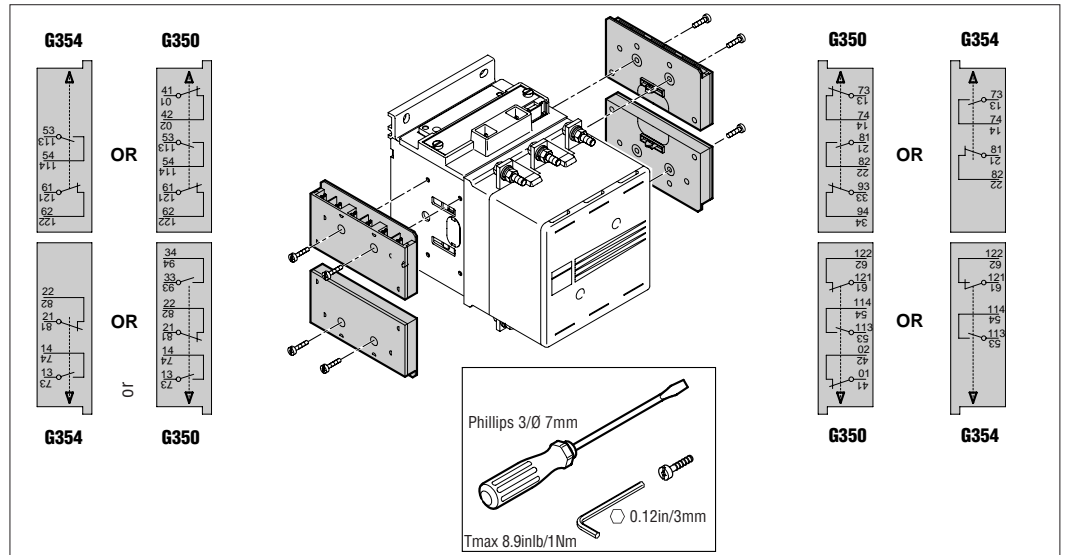
IEC style contactors: add-on blocks and accessories

Maximum combination B115-B630 1000

AUXILIARY CONTACTS

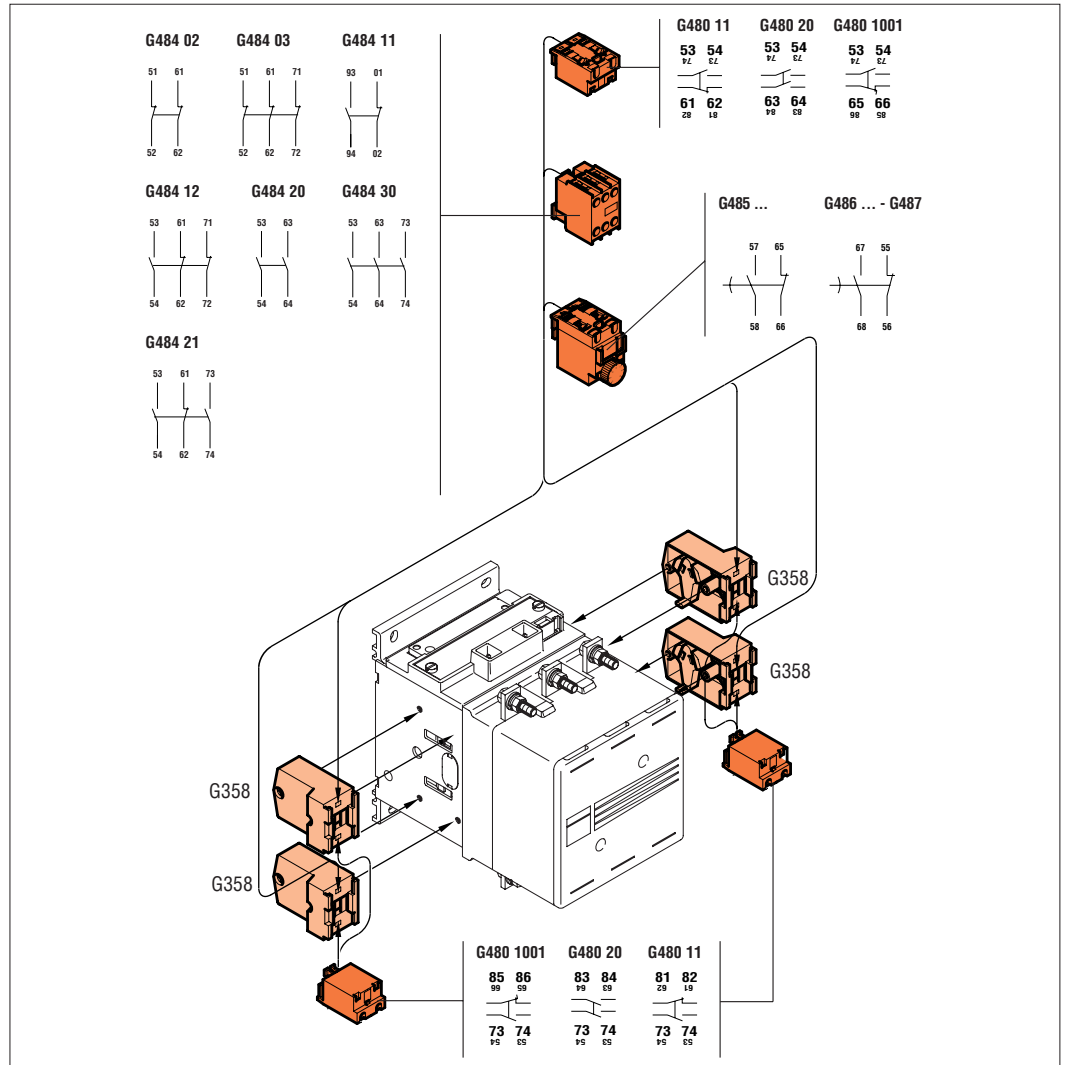
The add-on auxiliary contact blocks G350 and G354 can be applied to contactors B115-B630 1000 only up to a maximum of four pieces, for a total of 12 contacts. The contact block G350

provides a 2NO+1NC or 1NO+2NC combination depending on its mounting position; see the drawing below. The G354 block consists of 1NO+1NC.



Contact blocks, G480, G484, G485, G486 and G487 types, can be mounted using the G358 adapter, refer to page 3-20 for exact types and order codes of the blocks. A maximum of four

adapters can be possibly used per contactor and each adapter can hold two G480 blocks or one G484, G485, G486 and G487.



CONTACT BLOCKS APPLIABLE TO CONTACTORS WITH MECHANICAL INTERLOCK

Auxiliary contact blocks G350 or G354 can be mounted according to the combinations below when the mechanical interlock is used (see parts in orange in figure 1) or the G358 adapter with the auxiliary blocks as per the combinations given in figure 2.

Figure 1

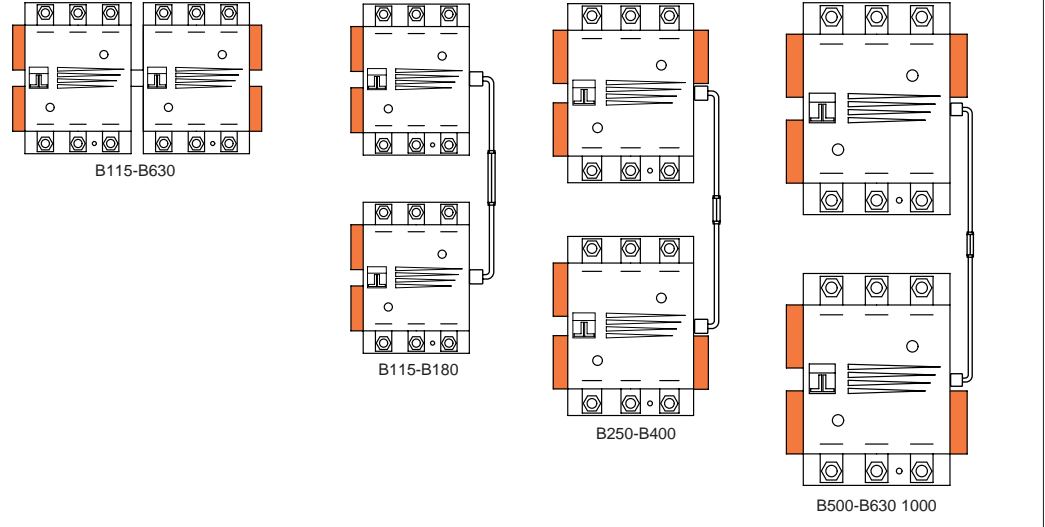
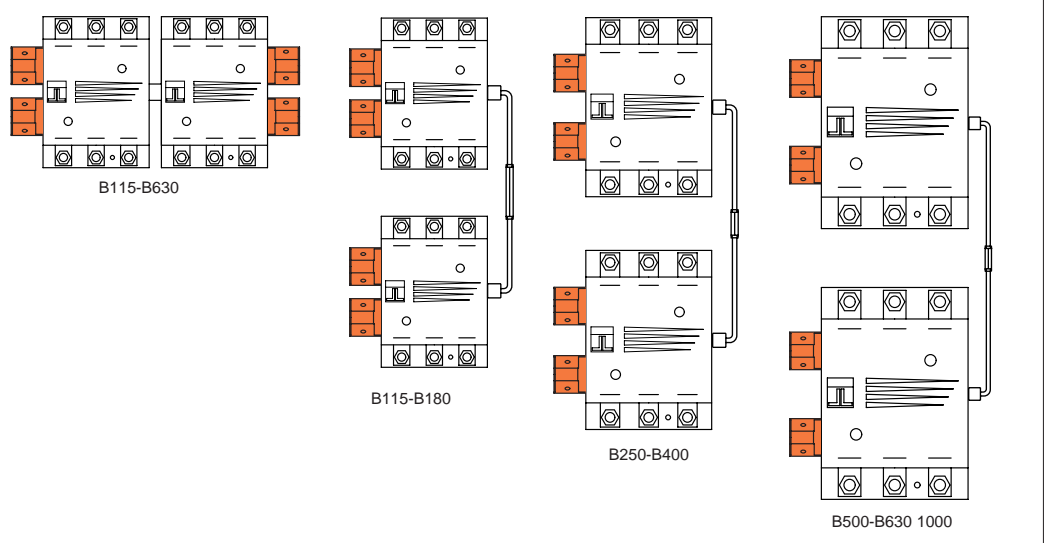
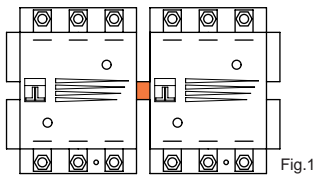


Figure 2



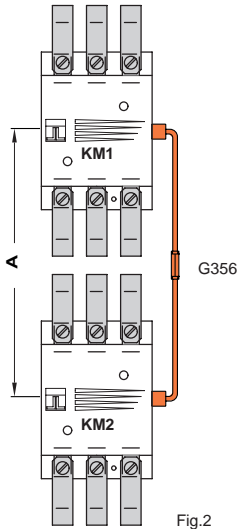
IEC style contactors: add-on blocks and accessories



MECHANICAL INTERLOCK BETWEEN CONTACTORS SIDE BY SIDE B115-B630 1000

The G356 type can interlock contactors of the same size or of a different one (e.g.: B115 interlocked to B630).

This interlock can not be used with B1250 or B1600 contactor. Consult Sales & Technical Support to interlock B630 1000 three-pole contactors.



MECHANICAL INTERLOCK BETWEEN CONTACTORS ONE ON TOP OF THE OTHER B115-B1600

It is G356... which is provided in six types to allow different fixing interaxis of contactors. Contactors of the same size can be interlocked as well as different sizes.

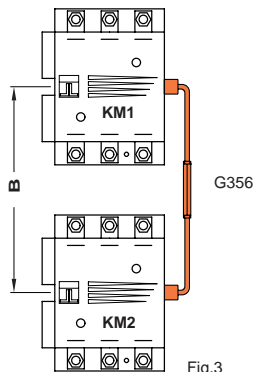
The tables below indicate the interaxis which can be obtained with the various interlock types; with terminal protections (INTERAXIS A) and without terminal protection (INTERAXIS B).

INTERAXIS A [mm] (in) - For contactors with terminal protection

KM1	B115-B145-B180			B250-B310-B400			B500-B630		
	B115 B145 B180	B250 B310 B400	B500 B630	B115 B145 B180	B250 B310 B400	B500 B630	B115 B145 B180	B250 B310 B400	B500 B630
G356 1	-	-	-	-	-	-	-	-	-
G356 2	286-305 (11.26-12)	-	-	-	-	-	-	-	-
G356 3	305-345 (12-13.6)	330-345 (13-13.6)	-	330-345 (13-13.6)	-	-	-	-	-
G356 4	345-385 (13.6-15.15)	345-385 (13.6-15.15)	375-385 (14.8-15.15)	345-385 (13.6-15.15)	375-385 (14.8-15.15)	-	375-385 (14.8-15.15)	-	-
G356 5	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	420-425 (16.5-16.75)	390-425 (15.35-16.75)	420-425 (15.35-16.75)	-
G356 6	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)

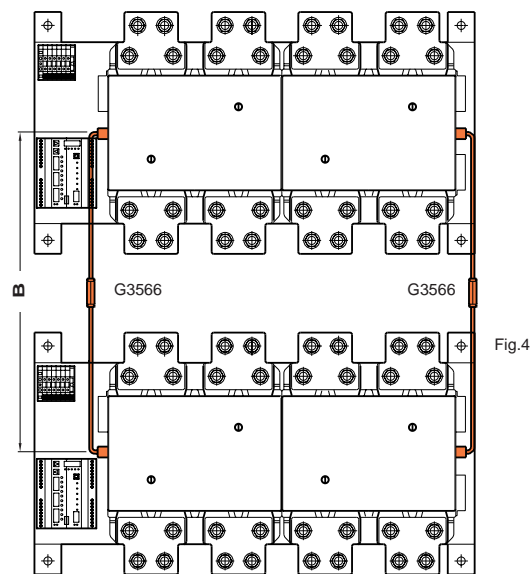
INTERAXIS B [mm] (in) - For contactors without terminal protection

KM1	B115-B145-B180			B250-B310-B400			B500-B630		
	B115 B145 B180	B250 B310 B400	B500 B630	B115 B145 B180	B250 B310 B400	B500 B630	B115 B145 B180	B250 B310 B400	B500 B630
G356 1	225-265 (8.85-10.4)	-	-	-	-	-	-	-	-
G356 2	265-305 (10.4-12)	265-305 (10.4-12)	-	265-305 (10.4-12)	265-305 (10.4-12)	-	-	-	-
G356 3	305-345 (12-13.6)	305-345 (12-13.6)	305-345 (12-13.6)	305-345 (12-13.6)	305-345 (12-13.6)	305-345 (12-13.6)	305-345 (12-13.6)	305-345 (12-13.6)	-
G356 4	345-385 (13.6-15.15)	345-385 (13.6-15.15)	345-385 (13.6-15.15)	345-385 (13.6-15.15)	345-385 (13.6-15.15)	345-385 (13.6-15.15)	345-385 (13.6-15.15)	345-385 (13.6-15.15)	345-385 (13.6-15.15)
G356 5	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)	390-425 (15.35-16.75)
G356 6	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)	470-500 (18.5-19.7)



To interlock two contactors B630 1000, use type G356 6 only; interaxis B is 470-500mm (18.5-19.7in).

To interlock two contactors B1250 or B1600, it is imperative to use two pieces of type G356 6, one fixed on the left side and the other on the right; interaxis B is 470-500mm (18.5-19.7in).



Power factor correction capacitors

CHOICE CRITERIA

The contactor during the closing transition is influenced by electrical currents having high frequencies and high amplitudes.

The frequencies of these currents range between 1 and 10kHz; the amplitudes must have values lower than the maximum permissible current peak of the contactor to be used.

OPERATING CONDITIONS

Ambient temperature: $\leq +120^{\circ}\text{F}$ ($+50^{\circ}\text{C}$)

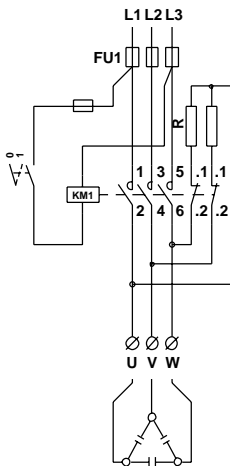
For temperatures higher than $+120^{\circ}\text{F}$ ($+50^{\circ}\text{C}$) up to $+160^{\circ}\text{F}$ ($+70^{\circ}\text{C}$), stated maximum operational power ratings are to be reduced by a percentage equal to the difference between the ambient temperature and $+120^{\circ}\text{F}$ ($+50^{\circ}\text{C}$).

Operating cycle: ≤ 120 cy/h

Electrical life: $\geq 100,000$ cycles

SELECTION GUIDE

Contactor	Rated current for capacitors	Maximum permissible peak current	Maximum operational voltage	Fuse	Maximum operational power at voltages:			
					220V	230V	380V	415V
Type	[A]	[A]	[V]	[A]	[kvar]	[kvar]	[kvar]	[kvar]
BF9	12	500	690	16	4.5	8	9	10
BF12	16	550	690	25	6	11	12	14
BF16	16	550	690	25	6	11	12	14
BF20	22	1000	690	32	9	15	16	18
BF25	30	1400	690	40	11	20	22	22
BF32	38	1700	690	50	14	25	27	30
BF40	42	1900	690	63	16	28	30	34
BF50	60	2500	690	80	23	40	44	50
BF65	70	2700	690	100	26	45	50	56
BF80	90	3000	690	125	34	60	65	70
BF95	90	3000	690	125	34	60	65	70
BF110	90	3000	690	125	34	60	65	70
B115	130	3200	1000	200	50	87	93	115
B145	150	3400	1000	200	57	100	108	130
B180	170	3600	1000	250	65	112	122	150
B250	240	5100	1000	315	91	158	172	210
B310	265	5900	1000	315	105	184	200	245
B400	320	7500	1000	400	122	211	230	280
B500	500	9000	1000	630	190	330	360	430
B630	610	11000	1000	800	230	400	432	520



The use of contactors with the above operational powers is allowable only when the peak current, in the installation point of the power factor correction board, is lower than the values stated in the table.

If this condition is not verified, it is necessary to use limiting inductances or specific contactors stated on pages 3-10. Contact Sales & Technical Support to obtain detailed information on the correct use of contactors without limiting inductances.

LIMITING INDUCTANCES

The use of limiting inductances is imperative when the system inductances (line transformer and wires), upstream of the power factor correction panel, are not able to maintain the maximum connecting current within the limit value of the contactor used.

FAST DISCHARGE RESISTANCES OF CAPACITORS

The use of the contactor, according to the wiring diagram given, allows the fast discharge of the capacitors as well as the instantaneous disconnection of the capacitors from the mains when the coil is de-energised.

The resistances, indicated in the following table, guarantee the discharge within a maximum time of 2 seconds.

Capacitor power [kvar]	Voltage 220-230V		Voltage 380-500V	
	[Ω]	[W]	[Ω]	[W]
2.5-5	3900	12	8200	12
10-15	1800	25	4300	25
20-50	1000	50	2200	50

Special contactors for power factor correction capacitors

GENERAL CHARACTERISTICS

These contactors are equipped with early-make contacts. This special type of contact has the purpose of connecting for a very brief interval, 2-3ms, during the contactor closing, resistors which limit the connecting current of the capacitors. These resistors are then excluded when the closing operation is complete and the current capacity is conveyed to the main contacts. With this type of circuit, it is possible to obtain minor wear of all the components of the system especially fuses and capacitors ensuring a longer life and better reliability.

The contactors are particularly suitable for use in automatic power factor correction panels since there is no need of limiting inductances and a source of heat has been eliminated. In this way, these modular electric switchboards can be more compact.

The BF..K version, figure 1, is designed for three-phase switching. The peculiarity of this type is in the contacts, suitable to connect limiting resistors, which close only for the time needed to limit any in-rush current peak and then reopen to avoid eventual flow of residual currents through the resistors.

OPERATING CONDITIONS

Ambient temperature: $\leq +120^{\circ}\text{F}$ ($+50^{\circ}\text{C}$)

For ambient temperature higher than $+120^{\circ}\text{F}$ ($+50^{\circ}\text{C}$) up to $+160^{\circ}\text{F}$ ($+70^{\circ}\text{C}$), maximum operational power ratings, indicated in the table, are to be reduced by a percentage equal to the difference between the ambient temperature and $+120^{\circ}\text{F}$ ($+50^{\circ}\text{C}$).

Operating cycles: ≤ 120 cy/h

Electrical life: $\geq 200,000$ cycles

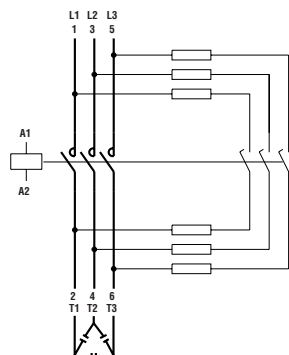


Figure 1

CHOICE OF CONTACTORS TYPE BF...K ACCORDING TO IEC DATA

Contactor	Rated current	Fuse	Maximum operational power at voltages ^①			
			220V	380V	415V	500V
Type	[A]	[A]	[kvar]	[kvar]	[kvar]	[kvar]
BF9K	12	16	4.5	8	9	10
BF12K	18	25	7	12.5	14	16
BF20K	23	40	9	15	17	20
BF25K	30	40	11	20	22	22
BF40K	43	63	17	30	33	36
BF50K	58	80	22	38	41	46
BF65K	70	100	26	45	50	56
BF80K	90	125	34	60	65	70

NOTE: See page 3-10 for catalog numbers.

^① Consult Sales & Technical Support for the use of contactors to switch within delta connection.

CHOICE OF CONTACTORS TYPE BF...K ACCORDING TO UL LISTING

Contactor	Rated current	Fuse	Maximum operational power at voltages ^①		
			240V	480V	600V
Type	[A]	[A]	[kvar]	[kvar]	[kvar]
BF9K	12	16	4.5	9	10
BF12K	16	25	7	14	16
BF20K	22	40	9	17	20
BF25K	26.5	40	11	22	27.6
BF40K	40	63	17	33	36
BF50K	58	80	22	41	46
BF65K	68	100	26	50	56
BF80K	78	125	34	65	70

NOTE: See page 3-10 for catalog numbers.

^① Consult Sales & Technical Support for the use of contactors to switch within delta connection.

Operational characteristics thermal overload relays RF

Three-pole types Single-phase sensitive manual reset Single-phase sensitive automatic reset	RF9 RFA9	RF25 RFA25	RF95 RFA95	RF180 RFA180	RF400 RFA400
Two-pole types Not single-phase sensitive manual reset Not single-phase sensitive automatic reset	RFS9 RFA9	RFS25 RFA25	RFS95 RFA95		

OPERATING CONDITIONS

Ambient temperature compensation and normal operating limits	°F	-4 to +130 (-20 to +55°C) (compensation from -15°C/5°F)
Storage temperature	°F	-65 to +160 (-55 to +70°C)
Maximum altitude	m	9800 (3000m)
Operation position	normal	on vertical plane
	allowable	±30°
Mounting		on contactor or separately
Compliance to standards		IEC/EN 60947-1, IEC/EN 60947-4-1
Approvals		See pages 4-2 to 6
Tripping class		10A
Particular characteristics		Test button - Trip indicator

POWER CIRCUIT CHARACTERISTICS

Rated insulation voltage U_i	V	690	690	690	1000	1000	
Frequency limit	Hz	0 - 400	0 - 400	0 - 400	50 - 60	50 - 60	
Operational range	from to	A A	0.9 15	0.9 26	14 95	60 200	150 420 ^①
Connection		direct			with current transformers ^②		
Terminals	Type	Screw & washer		Yoke clamp	Screw & flat washer		
	Screw	M 4	M 4	M 5	M 8	M 10	
	Terminal width	mm	9.8	9.8	9	20	25
Maximum cross section connectable	AWG	n°	10	10	2	-	-
	flexible w/o lug	mm ²	6	6	35	-	-
	flexible c/w lug	mm ²	10	10	-	150	2 - 150
	Bar	mm	-	-	-	25 x 3	30 x 5
Maximum tightening torque for terminals	Nm	2.3	2.3	3.9	18	35	
	in lb	20.4	20.4	24.6	159.6	310.8	
Dissipation per phase	W	0.7 - 2.4	0.7 - 2.4	2.0 - 4.2	0.7 - 2.4	0.7 - 2.4	

AUXILIARY CIRCUIT CHARACTERISTICS

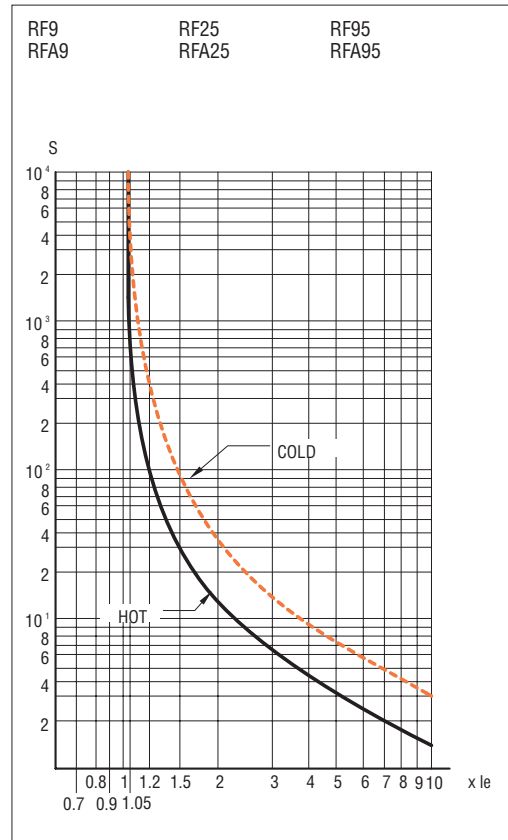
Available contacts	NO	n°	1			
	NC	n°	1			
Rated insulation voltage	V	690				
Rated thermal current	A	10				
Terminals with screw and washer	Screw	M 3.5				
	Terminal width	mm	8			
Maximum wire section connectable	Flexible w/o lug	mm ²	2.5			
	Flexible c/w lug	mm ²	2.5			
Maximum tightening torque for terminals	Nm	1	1	1	1	1
	in lb	8.9	8.9	8.9	8.9	8.9
UL designation		B600 - P600 (with automatic reset, C600 - R300)				
Operational current	AC (220-230V)	A	2.5			
	DC (110V)	A	1.1			

^① For currents higher than 420A, contact Sales & Technical Support.

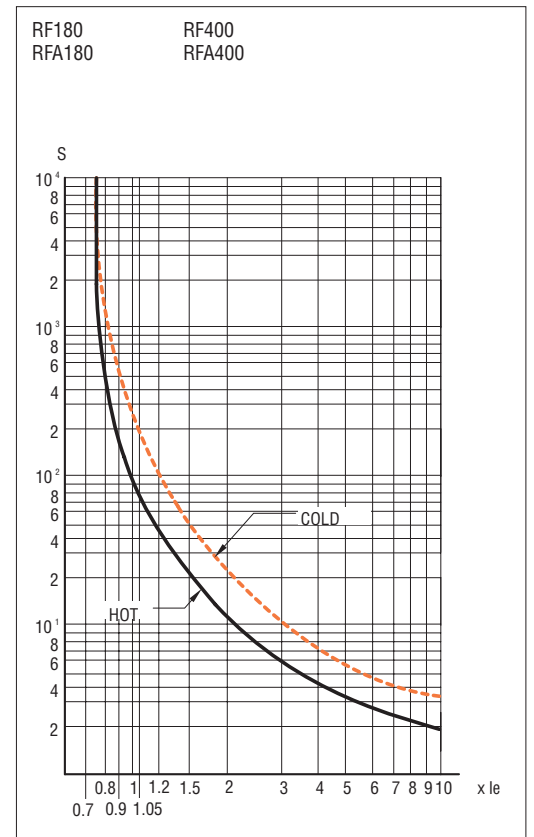
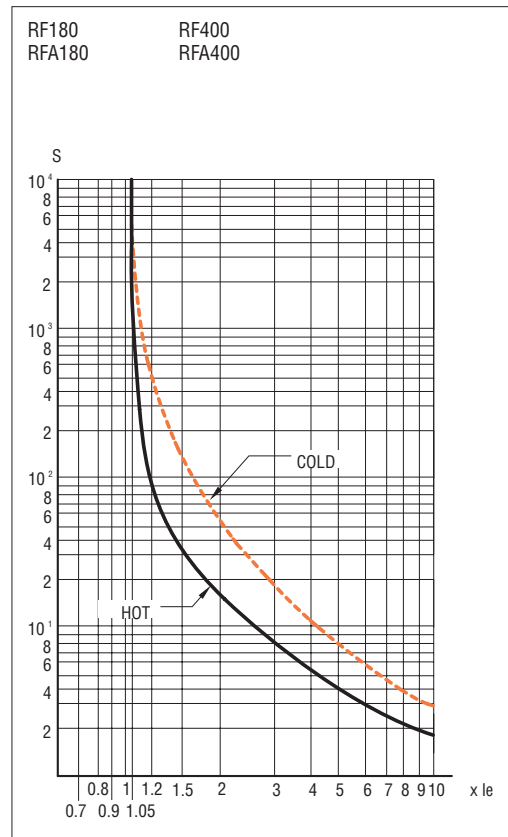
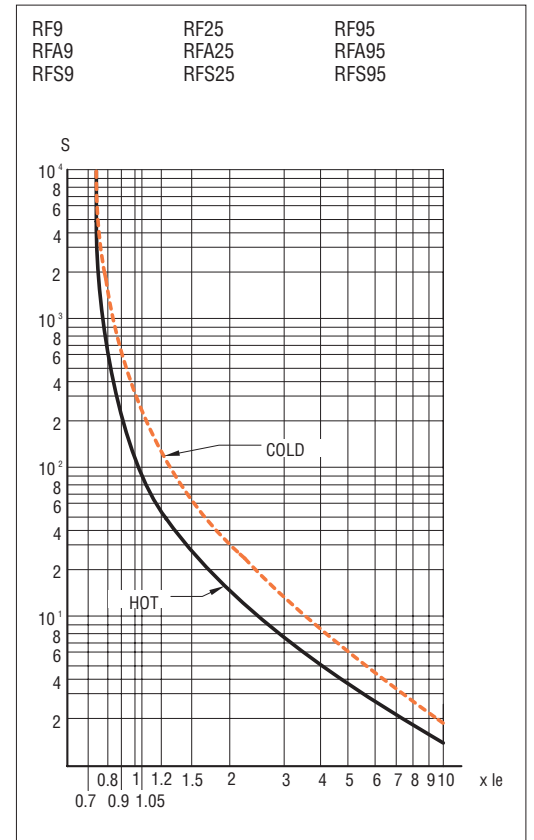
^② Supply included.

Trip characteristic curves thermal overload relays RF (average times)

Three-phase balanced operation



Two-phase operation (single-phase)



Selection guide

The choice of a rotary cam switch and the relative type are based on the functional diagram and the type of application as well.

IEC standards provide a comprehensible and quick classification of the most frequent utilization categories:

- AC1: Connection and disconnection of non-inductive or slightly inductive loads ($\cos\varphi \geq 0.95$)
- AC21: Resistance furnaces
- AC3: Starting and switching off motors during running
- AC23: Switching of motor loads or other highly inductive loads

AC15: Control of electromagnetic loads

For DC applications, the rotary cam switches are used for the switching of minor loads or in control circuits, such as:

- DC13: Control of electromagnets
- DC21A: Switching of resistive loads
- DC23: Switching of highly inductive loads

Other prescriptions and recommendations concerning the use of cam switches as auxiliary equipment of electrical machines are given in IEC/EN 60204-1 standards and specifically as given under utilization.

Utilization

MAIN SUPPLY DISCONNECTING SWITCH WITH EMERGENCY-STOP OPERATION:

- Red operating handle with yellow background
- Lockable in open position (OFF).

EMERGENCY-STOP SWITCH

- Red operating handle with yellow background
- Independent operation and the breaking of the load circuit of switching devices before the opening of its main contacts
- Rated capacity is to sufficient in order to break the sum of the rated operating currents of all the connected equipment
- Breaking capacity equal to the current of the largest motor when stalled (locked rotor) together with the total of the normal running currents of the other motors or loads.

MAIN SUPPLY DISCONNECTING SWITCH

- Used to disconnect all live electrical equipment from the power supply circuit
- Contact clearance distance is to comply with IEC/EN 60947-3 standards
- Provided with a means in order to be locked in the OFF position
- Selection of current breaking according to AC1 and AC21 utilization categories.

Operational characteristics

TYPE		GX16...	GX20...	GX32...	GX40...			
Rated insulation voltage U_i ❶	IEC/EN	690	690	690	690			
	UL/CSA	600	600	600	600			
Rated impulse withstand voltage U_{imp} ❶	IEC/EN 60947-3	kV	6	6	6			
Rated thermal current I_{th} IEC/EN	UL/CSA general purpose	A	16	20	32			
		A	12	15	32			
Maximum fuse size for short-circuit protection I_e		A	13	15	32			
		A			35			
(gG)	10kA	A	20	20	40			
	25kA	A	16	16	35			
	50kA	A	-	-	32			
	63kA	A	-	-	35			
		A	-	-	35			
Short-time withstand current I_{cw}	1sec	A	200	250	800			
Rated operational current I_e	AC1/AC21A (IEC/EN)	A	16	20	32			
		A			40			
	AC15 (IEC/EN)	110V	A	10	10	25		
		220/230V	A	8	8	20		
		380/400V	A	4	6	10		
	660/690V	A	1.5	1.5	2			
Motor power for switches in AC utilisation categories	AC3 (IEC/EN)	220-240V	kW	3	3.7	5.5	7.5	
		380-440V	kW	4	5.5	11	15	
		500-690V	kW	5.5	5.5	11	15	
	1 phase (2 poles)	110V	kW	0.55	0.75	1.8	2.2	
		220/240V	kW	1.5	1.8	3.5	4.4	
		380/440V	kW	2.2	3	5.5	7	
	AC23A (IEC/EN)	3 phase	220/240V	kW	3	4	9	9
			380/440V	kW	6.5	7.5	15	18.5
			500/690V	kW	5.5	7.5	15	15
		1 phase (2 poles)	110V	kW	0.75	0.75	2.2	3
220/240V			kW	1.8	2.2	3.5	5.2	
380/440V			kW	3	3.5	6	7.5	
UL/CSA HP ratings	3 phase	120V	HP	1.5	1.5	3	5	
		240V	HP	3	3	7.5	10	
		480V	HP	5	5	15	15	
		600V	HP	5	5	15	15	
	1 phase (2 pole)	230V	HP	1	1.5	3	5	
Mechanical life		cycles	5×10^6	5×10^6	5×10^6	5×10^6		
Conductor cross section	max. r/f	2-mm ²	2.5/2.5	2.5/2.5	10/6	10/6		
		2-AWG	14/14	14/14	8/10	8/10		
r: rigid	min. r/f	2-mm ²	0.5/0.5	0.5/0.5	1.5/1.5	1.5/1.5		
		2-AWG	20/20	20/20	16/16	16/16		

❶ Valid for systems with grounded neutral, overvoltage category III, pollution degree 3.

Operational characteristics

TYPE		GN12	GN20	GN25	GN32	GN40	GN63	GN125	
Rated insulation voltage U_i ①	IEC/EN	V	690	690	690	690	690	690	
	UL/CSA	V	300	300	600	600	600	600	
Rated impulse withstand voltage U_{imp} ①	IEC/EN 60947-3	kV	6	6	6	6	6	8	
Rated thermal current I_{th}	IEC/EN	A	12	20	25	32	40	63	
General purpose	UL/CSA	A	10	15	20	32	35	55	
Rated operational voltage (disconnecting switch) ①		V	480	480	480	480	480	690	
Operational impulse voltage	IEC/EN 60947-1	kV	4	4	4	4	4	6	
Maximum fuse size for short-circuit protection I_n (gG)	10kA	A	16	20	25	32	40	63	
	25kA	A	10	16	25	32	40	63	
	50kA	A	–	–	–	32	40	63	
	63kA	A	–	–	–	–	40	63	
Short-time withstand current I_{cw} 1sec		A	200	250	400	800	1000	1200	
Rated operational current I_e AC1/AC21A (IEC/EN)		A	12	20	25	32	40	63	
	AC15 (IEC)	110V	A	10	10	16	25	25	40
		220/230V	A	8	8	12	20	22	28
		380/400V	A	4	6	8	10	12	15
		660/690V	A	1.5	1.5	2	2	2	4
AC switching capacity AC3 (IEC/EN) 3 phases	220/230V	kW	2.5	3	5.5	7.5	8	11	
	380/440V	kW	4	5.5	7.5	11	15	18.5	
	500/690V	kW	5.5	5.5	7.5	11	15	18.5	
	1 phase (2 poles)	110V	kW	0.8	0.8	1.5	2.2	3	3.7
		220/230V	kW	1.5	2.2	3	4	6.5	6.5
		380/440V	kW	2.2	3	5.5	6.5	8	11.5
AC23A (IEC/EN) 3 phases	220/230V	kW	3	5	6.5	8	8	12.5	
	380/440V	kW	6	7.5	11	15	18.5	30	
	500/690V	kW	7.5	7.5	11	18.5	22	30	
	1 phase (2 poles)	110V	kW	0.8	0.8	1.5	2.2	3	3.7
		220/230V	kW	1.7	2.5	3.7	5	6	7.5
		380/440V	kW	3	3.7	5.5	8	11	12.5
UL/CSA HP ratings 3 phases	120V	HP	1.5	1.5	3	5	5	7.5	
	240V	HP	3	3	5	10	10	15	
	480V	HP	–	–	10	10	20	25	
	600V	HP	–	–	10	15	20	25	
	1 phase (2 poles)	230V	HP	1	2	3	5	5	10
DC switching capacity DC21A $T_{\leq 1}$ ms	48V	A	12	20	25	32	40	63	
	60V	A	12	20	25	32	40	50	
	110V	A	4	4	4	6	6	8	
	220V	A	0.6	0.6	0.7	0.8	–	–	
	440V	A	0.25	0.25	–	–	–	–	
	DC23 $T_{\leq 1}$ ms (motor duty) (number of contacts connected in series)	24V	A	10(1)	20(1)	25(1)	32(1)	40(1)	50(1)
		48V	A	10(2)	20(2)	25(2)	32(2)	40(2)	50(2)
		60V	A	10(3)	20(3)	25(3)	32(3)	40(3)	50(3)
		110V	A	5(3)	10(3)	12(3)	15(3)	20(3)	25(3)
		220V	A	5(4)	8(4)	10(4)	12(4)	12(4)	15(4)
DC13 $T_{\leq 50}$ ms for 1 contact	48V	A	10	16	20	25	32	40	
	60V	A	8	12	16	16	16	28	
	110V	A	1	1	1.5	3	3	3.3	
	220V	A	0.4	0.4	0.4	0.5	–	–	
	400V	A	0.15	0.15	–	–	–	–	
Mechanical life	cycles		3×10^6	5×10^6	5×10^6	5×10^6	5×10^6	1×10^6	
Terminal screw	M		3	3	3.5	4	4	5	
Maximum tightening torque	Nm		0.5	0.5	0.8	1.2	1.2	2	
	inlb		4.45	4.45	7.14	10.7	10.7	17.8	
Conductor cross section	max. r/f	2 - mm ²	1.5/1.5	2.5/2.5	6/4	6/4	10/6	16/10	
		2 - AWG	16/16	14/14	10/12	10/12	8/10	6/8	
r: rigid f: flexible	min. r/f	2 - mm ²	0.5/0.5	0.5/0.5	0.5/0.5	1.5/1.5	1.5/1.5	2.5/2.5	
		2 - AWG	20/20	20/20	20/20	16/16	16/16	14/14	

① Valid for systems with grounded neutral, overvoltage category III, pollution degree 3.

Operational characteristics

TYPE	L48TP...	L48TPB...	L48M...
DESCRIPTION			
	On delay	On delay	Programmable multifunction
	multiscale	multiscale	multiscale
	multivoltage	multivoltage	multivoltage
CONTROL CIRCUIT			
Rated supply voltage (Us)	24VAC/DC ^①	24VAC/DC ^①	24-240VAC/DC ^①
	110VAC ^①	110VAC ^①	
	220-240VAC ^①	220-240VAC ^①	
Rated frequency		50/60Hz	
Operational limit	0.85-1.1 Us		
Maximum power consumption	6VA		
TIMING CIRCUIT			
Time setting ranges	multiscale	multiscale	multiscale
	0.3-3s	0.05-1s	0.05-1s
	1.2-12s	0.1-10s	0.1-10s
	10-100s	0.6s-1min	0.6s-1min
	78-780s	6s-10min	6s-10min
	18s-3min		0.05-1min
	72s-12min		0.1-10min
	10s-100min		0.6min-1h
	78s-780min		1min-10h
Setting accuracy	±5%		
Repeat accuracy	±0.5%		
Influence of voltage variation	±0.5%		
Average variation of set delays related to 20°C/68°F condition	at -10°C/-15°F		
	at +60°C/+140°F		
Minimum ON time	—		
Reset time	during operation	≥ 0.1s	≥ 0.1ms
	elapsed time	≥ 65ms	≥ 65ms
Power loss ride through	≤ 40ms	≤ 40ms	≤ 40ms
OUTPUT CONTACTS			
Contact arrangement	1 delayed d/t	2 delayed or 1 inst.+1 delayed	2 delayed d/t
Maximum switching voltage	250V		
Rated thermal current (Ith)	5A		
Operational current	AC15 2A - 250VAC DC14 4A - 24VDC		
Electrical life (with rated load)	10 ⁵ cycles		
Mechanical life	30x10 ⁶ cycles		
INSULATION (input-output)			
Reference standards	IEC/EN 61812-1, UL 508		
Rated insulation voltage	250V		
Rated impulse withstand voltage	—		
Impulse test voltage	—		
Dielectric test voltage	2kV (50Hz - 60s)		
Operating temperature	-15 to +140°F (-10 to +60°C)		
Storage temperature	-20 to +175°F (-30 to +80°C)		
Housing material	self-extinguishing polyamide		
Degree of protection	IP40 housing, IP20 terminals		

① Other voltages on request

* Operation values warranted by laboratory testing

AT1...	AT1P...	AT1C...	AT1CP...	ATD...	AT1DP...	BTPM1...	BTPM...	DRPL...	BT2N...			
On delay	On delay	On delay	On delay	On delay	Off delay, auxiliary supply	Programmable multifunction	Programmable multifunction	Asymmetrical recycle	For starters			
single scale	multiscale	single scale	multiscale	multiscale	multiscale			single scale				
multivoltage	multivoltage	multivoltage	multivoltage	single voltage	single voltage	multivoltage			dual voltage			
24VAC / 100-240VAC❶		12-24VAC/DC❶		24VAC/DC❶	24VAC/DC❶	24VAC/DC❶			24/48VAC/DC❶			
24VAC / 220-440VAC❶		48-60 / 110-125VAC/DC❶		48VAC/DC❶	48VAC/DC❶	110-127VAC❶			24VAC/DC			
				110-127VAC❶	110-127VAC❶	220-240VAC❶			110-127VAC❶			
				220-240VAC❶	220-240VAC❶				24VAC/DC			
									220-240VAC❶			
									24VAC/DC			
									380-415VAC❶			
									24VAC/DC			
									415-440VAC❶			
50-60Hz												
0.85-1.1 Us		0.85-1.1 Us in AC - 0.6-1.3 Us in DC			0.8-1.1 Us							
24V=1VA; 110-240V=10VA 110V=1.4VA 220-440V=15.6VA (220V=3.2VA)		1.5W (12/24V) - 2.5W (48-60/110-125V)			2.7VA AC - 0.3W DC	8.7VA AC - 1.6W DC	9.2VA AC - 2.9W DC		12.8VA AC - 1W DC	8.7VA AC - 1.5W DC		
single scale	multiscale	single scale	multiscale	multiscale	multiscale	multiscale		multiscale	single scale			
0.3-3s	0.3-3s	0.3-3s	0.3-3s	0.3-3s	0.3-3s	0.3-3s		0.3-3s/min	start time:			
0.6-6s	1.2-12s	0.6-6s	1.2-12s	1.2-12s	1.2-12s	1.2-12s		0.6-6s/min	0.6-6s			
1.2-12s	9.6-96s	1.2-12s	9.6-96s	9.6-96s	9.6-96s	9.6-96s		1.2-12s/min	1.2-12s			
3-30s	76.8-768s	3-30s	76.8-768s	76.8-768s	76.8-768s	76.8-768s		3-30s/min	3-30s			
6-60s		6-60s				0.3-3min		6-60s/min	6-60s			
0.3-3min		0.3-3min				1.2-12min		12-120s/min	transition time 20÷300ms			
0.6-6min		0.6-6min				9.6-96min						
1.2-12min		1.2-12min				76.8-768min						
3-30min		3-30min										
6-60min		6-60min										
±9%												
≤ ±0.5%												
±0.3%		-0.3% +0.74%			±0.3%							
+2%												
-3%												
—					25ms	—						
≥ 100ms	≥ 80ms	≥ 90ms	≥ 60ms	200ms	≥ 55ms	≥ 75ms	≥ 75ms	≥ 85ms	≥ 75ms			
≥ 65ms	≥ 55ms	≥ 60ms	≥ 50ms	—	≥ 80ms	≥ 45ms	≥ 45ms	≥ 75ms	≥ 70ms			
≤ 40ms	≤ 30ms	≤ 40ms	≤ 30ms	≤ 7ms	≤ 7ms	≤ 7ms	≤ 7ms	≤ 7ms	≤ 7ms			
1 delayed double-throw (d/t)				1 delayed d/t	1 delayed d/t	2 del. /1 inst. + 1 del.	2 delayed d/t	1 del. + 1 del. d/t				
440VAC (rated 250V)				250VAC	250VAC			380VAC				
8A												
AC15 2.5A - 250VAC								V AC	220	380	415*	440*
DC14 5A - 24VDC								A(AC15)	2.5	1.5	1.3*	1*
10 ⁵ cycles												
30x10 ⁶ cycles												
IEC/EN 61812-1, UL 508												
250V								500V				
4kV												
5kV (1.2/50µs)												
2.5kV (50Hz - 60s)												
+5 to +140°F (-10 to +60°C)												
-20 to +175°F (-30 to +80°C)												
self-extinguishing polyamide												
IP40 housing, IP20 terminals												

Operational characteristics

TYPE	DMK20	DMK50
AUXILIARY SUPPLY		
Rated voltage U_s	120VAC ^①	
Operating range	78-145VAC	
Frequency	45-65Hz	
Consumption	5.5VA ($U_s=240V$)	
Dissipation	2.5W ($U_s=240V$)	
Immunity time for microbreakings	20ms	
VOLTAGE INPUTS		
Maximum rated voltage	690VAC L-L (400VAC L-N)	
UL rating	600VAC L-L (347VAC L-N)	
Measuring range	60-830VAC L-L (30-480VAC L-N)	
Frequency range	45-65Hz	
Measuring method	True RMS	
Measuring input impedance	>1.1M Ω L-L and >570k Ω L-N	
Method of connection	Single phase, two-phase, three-phase or balanced three-phase system	
Measuring accuracy	$\pm 0.25\%$ ± 1 digit (class 0.5 accuracy)	
CURRENT INPUTS		
Rated current I_e	standard 5A (1A on request)	
Measuring range	0.05-6A	
Measuring method	True RMS	
Overload capacity	+20% I_e via external CT with 5A secondary	
Overload peak	50A for 1 second	
Dynamic limit	125A for 10ms	
Power consumption	<0.6W per phase	
Measuring accuracy	$\pm 0.25\%$ ± 1 digit (class 0.5 accuracy)	
INSULATION		
Reference standards	IEC/EN 61010-1, IEC/EN 61000-6-1, IEC/EN 61000-6-2, CISPR11/EN 55011	
Rated insulation voltage U_i	690V	
OPERATING AMBIENT CONDITIONS		
Operating temperature	-4 to +140°F (-20 to +60°C)	
Storage temperature	-20 to +175°F (-30 to +80°C)	
Relative humidity	<90%	
Maximum pollution degree	2	
CONNECTIONS		
Type of terminals	Removable / Plug-in	Fixed
Wire section (minimum/maximum)	0.2/2.5mm ² (24-12 AWG)	0.2/1.5mm ² (24-16 AWG)
Tightening torque	0.5Nm (4.5 inlb)	0.45Nm (4 inlb)
HOUSING		
Material	Self-extinguishing black plastic	Self-extinguishing grey plastic
Version	Flush mount according to EN 50022	Modular 6U suitable for mounting on 35mm DIN rail (EN 50022)
Degree of protection	IP20 housing and terminals IP54 on front with cover	IP20 housing and terminals IP41 on front

^① 208-240VAC on request.

Operational characteristics

TYPE	DMK3...	DMK6...
AUXILIARY SUPPLY		
Rated voltage Us	100-240VAC/110-250VDC	
Operating range	85-265VAC/93.5-300VDC	
Frequency	45-450Hz	
Consumption	10VA/4W	
Dissipation	3W (DMK30-DMK60); 4W (DMK31-DMK32-DMK61-DMK62)	
Power loss ride through	20ms	
VOLTAGE INPUTS		
Maximum rated voltage	690VAC L-L (400VAC L-N max)	
Measuring range	20-830VAC L-L (10-480VAC L-N max)	
Frequency range	45-65Hz	
Measuring method	True RMS	
Measuring input impedance	>1.1M Ω L-L and >570k Ω L-N	
Method of connection	Single-phase, two-phase or three-phase system with or without neutral	
Measuring accuracy	±1 digit	
CURRENT INPUTS		
Rated current Ie	standard 5A (1A on request)	
Measuring range	0.02-6A	
Measuring method	True RMS	
Overload capacity	+20% Ie via external CT with 5A secondary	
Overload peak	50A for 1 second	
Dynamic limit	125A for 10ms	
Power consumption	<0.3VA	
Measuring error	±1digit	
OUTPUTS		
Relay outputs	5A - 250V in AC1 for DMK31, DMK32, DMK61, DMK62	
Static output	55mA - 60VAC/DC in AC1 for DMK31, DMK32, DMK61, DMK62	
UL rating	B630/30VDC 1A for DMK31, DMK32, DMK61, DMK62	
INSULATION		
Reference standards	IEC/EN 61010-1, IEC/EN 61000-6-1, IEC/EN 61000-6-2, CISPR11/EN 55011	
Rated insulation voltage Ui	690V	
OPERATING AMBIENT CONDITIONS		
Operating temperature	-4 to +140°F (-20 to +60°C)	
Storage temperature	-20 to +175°F (-30 to +80°C)	
Relative humidity	<90%	
Maximum pollution degree	2	
CONNECTIONS		
Type of terminals	Removable / plug-in	Fixed
Wire section (minimum/maximum)	0.2/2.5mm ² (24-12 AWG)	0.2/1.5mm ² (24-16 AWG)
Tightening torque	0.5Nm (4.5 inlb)	0.45Nm (4 inlb)
HOUSING		
Material	Self-extinguishing black plastic	Self-extinguishing grey plastic
Version	Flush mount according to EN 50022	Modular 6U suitable for mounting on 35mm DIN rail (EN 50022)
Degree of protection	IP20 housing and terminals IP54 on front with cover	IP20 housing and terminals IP41 on front

Operational characteristics

TYPE	DCRK5 - DCRK7	DCRK8 - DCRK12	DCRJ8 - DCRJ12
AUXILIARY SUPPLY CIRCUIT			
Supply voltage	①	①	110-127 / 220-240VAC ⊕(dual voltage)
Operational limit	—	—	-15 to +10%
Operating frequency	—	—	50Hz or 60Hz ±1%
Maximum power consumption	—	—	5VA
Maximum dissipation (output contacts excluded)	—	—	4W
VOLTAGE CIRCUIT			
Control voltage	440-480VAC ⊕	440-480VAC ⊕	100-690VAC
Operational limit	-15 to +10%	-15 to +10%	85 to 760VAC
Operating frequency	50 or 60Hz ±1% (self configurable)	50 or 60Hz ±1% (self configurable)	50 or 60Hz ±1% (self configurable)
Power consumption	5.8VA	4.2VA	0.03VA
Maximum dissipation (output contacts excluded)	2.8W	3W	—
Maximum dissipation of each output contact (5A 250VAC load)	0.5W	0.5W	0.5W
Immunity time for microbreakings	≤ 30ms	≤ 30ms	≤ 30ms
No-voltage release	≥10ms	≥10ms	≥10ms
CURRENT CIRCUIT			
Rated current I _e	5A (1A on request)	5A (1A on request)	5A (1A on request)
Operating limit	0.125-6A	0.125-6A	0.125-6A
Constant overload	1.2 I _e	1.2 I _e	1.2 I _e
Short time withstand current	10 I _e for 1s	10 I _e for 1s	10 I _e for 1s
Power consumption	0.64VA	0.27VA	0.27VA
DETECTION DATA			
Type of voltage and current detection	RMS	RMS	RMS
Power factor adjustment	0.8 ind. - 0.8 cap.	0.8 ind. - 0.8 cap.	0.8 ind. - 0.8 cap.
Type of temperature sensor	Semiconductor (internal)	Semiconductor (internal)	NTC 01(external)
Temperature measurement range	-20 to +185°F (-30 to +85°C)		
OUTPUT RELAYS			
Number of outputs	5 or 7	8 or 12	8 or 12
Contact arrangement	1 each w/1 NO contact	7 or 11 contacts each w/1NO + 1 double throw	
Rated capacity I _{th}	5A - 250V (AC1)	5A - 250V (AC1)	5A - 250V (AC1)
Maximum capacity of contact common	12A	12A	12A
Maximum switching voltage	440VAC	440VAC	440VAC
UL designation to IEC/EN 60947-5-1 AC, DC	C/250, B/400	C/250, B/400	C/250, B/400
Electrical life (at rated load)	10 ⁵ cycles	10 ⁵ cycles	10 ⁵ cycles
Mechanical life	30x10 ⁶ cycles	30x10 ⁶ cycles	30x10 ⁶ cycles
OPERATING AMBIENT CONDITIONS			
Operating temperature	-4 to +140°F (-20 to +60°C)		
Storage temperature	-20 to +175°F (-30 to +80°C)		
CONNECTIONS			
Type of termination	removable/plug-in	removable/plug-in	removable/plug-in
Conductor cross section	2.5mm ² / AWG12	2.5mm ² / AWG12	2.5mm ² / AWG12
ENCLOSURE			
Version	flush mount 96x96mm	flush mount 144x144mm	flush mount 144x144mm
Degree of protection (on front)	IP54	IP41 without protection cover IP54 with protection cover	
Reference standards	IEC/EN 61010-1, IEC/EN 61000-6-2, CISPR11/EN 55011, UL 508		

① Refer to data given under voltage circuit.

⊕ Other voltages available on request.

⊕ Powered by monitored voltage. Other voltages on request.

Index in alphanumeric order

A014	8-17	BA1589	3-25	BF65 40	3-6	FN32	11-4	G375	4-7
A180	8-17	BA1594	3-18	BF65C 00	3-4	FN33	11-4	G376	4-7
A181	8-17	BA1595	3-18	BF65C 40	3-6	G218	3-14	G380	3-25
A0191	8-17	BA1671	3-24	BF65K 00	3-10	G222	3-15	G380 4	3-25
A0192	8-17	BA1678	3-24	BF80 00	3-4	G223	3-15	G381	3-25
A119U	8-17	BA1700 1	3-24	BF80 40	3-6	G227	5-4	G381 4	3-25
A1190	8-17	BA1713	3-25	BF80C 00	3-4	G228	4-7	G382	3-25
A1691	8-17	BA1714	3-25	BF80C 40	3-6	G230	4-7	G382 4	3-25
A1692	8-17	BA1720	3-18	BF80K 00	3-10	G231	3-15	G383	3-25
A1693	8-17	BA1721	3-18	BF9	3-4	G232	3-15	G383 4	3-25
A20746	7-18	BA1796	3-24	BF9 40	3-6	G233	4-7	G384	3-25
	7-22	BA1799	3-24	BF95	3-4	G234	2-25	G384 4	3-25
A20747	7-18	BA1803	3-24	BF95 C 00	3-4	G234 4	2-25	G385	3-25
	7-22	BA1838	3-25	BF9C	3-4	G235	2-25	G385 4	3-25
A20748	7-18	BA1839	3-25	BF9C 40	3-6	G236	2-25	G418	3-14
	7-22	BA1845	3-18	BF9K 10	3-10	G236 4	2-25	G430	4-7
A441	8-17	BA1846	3-18	BFT	3-8	G237	2-25	G460	3-10
A442	8-17	BA235	3-15		3-9	G237 4	2-25	G464	3-10
A443	8-17	BA435	3-15	BFU	3-8	G244	4-7	G470	3-25
APRBP	8-17	BA456	3-22		3-9	G258	4-7	G470 4	3-25
AR114	8-17	BA705	3-22	BG00... A	3-11	G260	4-7	G475	3-25
AR124	8-17	BA904	3-23	BG00... D	3-11	G261	4-7	G476	3-15
AR214	8-17	BA911	3-23	BG00... L	3-11	G262	4-7	G477	3-15
AR224	8-17	BF12	3-4	BG06... A	3-4	G265	3-15	G479	3-15
AT1	9-2	BF12K 10	3-10	BG09... A	3-4	G269	3-15	G480	3-14
AT1C	9-2	BF16	3-4	BG09... D	3-4	G270	4-7	G481	3-14
ATDP	9-2	BF16 04	3-7	BG09 T2 A	3-7	G271	3-15	G482	3-14
AT1DP	9-2	BF16 22	3-7	BG09 T2 D	3-7	G272	3-15	G483	3-14
AT1CP	9-3	BF16 40	3-6	BG09 T4 A	3-6	G273	3-25	G484	3-14
AT1P	9-3	BF16C	3-4	BG09 T4 D	3-6	G274	3-25	G485	3-14
ATD	9-4	BF16C 04	3-7	BG12... A	3-4	G274 4	3-25	G486	3-14
B115 00	3-4	BF16C 22	3-7	BGF00	3-11	G275	3-25	G487	3-14
B115 4 00	3-6	BF16C 40	3-7	BGR	3-8	G275 4	3-25	G525	3-25
B1250	3-4	BF20 00	3-4		3-9	G276	3-25	G525 4	3-25
B1250 4	3-6	BF20 40	3-6	BGS	3-4	G276 4	3-25	G526	3-25
B145 00	3-4	BF20C	3-4		3-6	G279	3-25	G526 4	3-25
B145 4 00	3-6	BF20K 00	3-10	BGT	3-8	G279 4	3-25	G527	3-18
B1600	3-4	BF25 00	3-4		3-9	G280	3-14	G528	3-18
B1600 4	3-6	BF25 04	3-7	BGU	3-8	G281	3-15	G529	3-18
B180 00	3-4	BF25 22	3-7		3-9	G285	3-15	G530	3-18
B180 4 00	3-6	BF25 40	3-6	BGX	3-12	G291	4-7	G611	7-20
B250 00	3-4	BF25C	3-4	BT2N	9-6	G318	3-15		8-16
B250 4 00	3-6	BF25C 04	3-7	BTPM1220	9-4	G319 225	3-15		8-17
B310 00	3-4	BF25C 22	3-7	BTPM220	9-5	G322	3-15	G612	7-20
B310 4 00	3-6	BF25C 40	3-6	BTU001	11-5	G350	3-18		8-16
B400 00	3-4	BF25K 00	3-10	C11	12-2	G354	3-18		8-17
B400 4 00	3-6	BF32 00	3-4	C2	12-3	G355	3-18	G613	7-23
B500 00	3-4	BF32C 00	3-4	C4	10-3	G356	3-18		8-17
B500 4 00	3-6	BF40 00	3-4		10-5	G358	3-18	G614	7-23
B630 00	3-4	BF40 22	3-7	CE106	9-6	G360	3-18		8-17
B630 4 00	3-6	BF40 40	3-6	CE107	6-6	G361	3-18	G616	1-5
B630 1000	3-4	BF40C 00	3-4	CF4	3-11		4-7		8-16
B630 1000 4	3-6	BF40C 22	3-7	DCRJ	12-3	G362	3-18		8-17
BA126 2	3-15	BF40C 40	3-6	DCRK	12-2		4-7	G617	1-5
	3-18	BF40K 00	3-10	DMK20	10-2	G363	3-18		8-16
BA135	3-15	BF50 00	3-4	DMK3	10-3		4-7		8-17
BA1533	3-24	BF50 40	3-6	DMK50	10-4	G370	3-18	G621	8-16
BA1546	3-24	BF50C 00	3-4	DMK6	10-5	G371	3-18		8-17
BA1575 1	3-24	BF50K 00	3-10	DMKSW	10-3	G372	4-7	G622	8-16
BA1588	3-25	BF65 00	3-4		10-5	G373	4-7		8-17

Index in alphanumeric order

electric

G623	7-13	KM A	7-2	LM2TALP	6-20	LP2TBL614	6-14	RS... 04	7-14
G624	7-13	KM B	7-3	LM2TAT	6-21	LP2TBL71	6-15	RS... 05	7-15
GN...068	8-13	KM C	7-4	LM2TAU10	6-20	LP2TBL7133	6-15	RS... 06...A	7-16
GN...078	8-13	KM D	7-5	LM2TAU101	6-9	LP2TBL72	6-15	RS... 06...AS	7-16
GN...079	8-13	KM E	7-6	LM2TAU106	6-20	LP2TBL7233	6-15	RS... 07	7-17
GN...088	8-13	KM F	7-7	LM2TAU107	6-21	LP2TIL2	6-15	RS... 08	7-17
GN...098	8-13	KM H	7-8	LM2TAU108	6-20	LP2TR100	6-11	RS... 09	7-17
GN...099	8-13	KM L	7-8	LM2TAU11	6-19	LP2TR1196	6-11	RS... 10	7-18
GN...P	8-14	KM M	7-9	LM2TAU120	6-17	LP2TR2004	6-11	RS... 11...P	7-19
	8-15	KM P	7-10	LM2TAU13	6-20	LP2TS1	6-13	RS... 12	7-20
GN...P25	8-15	KM Q	7-10	LM2TAU14	6-22	LP2TS2	6-13	RS... 13	7-20
GN...U	8-8	KXA	7-13	LM2TAU157	6-21	LP2TS3	6-13		7-24
	8-9	KXB	7-12	LM2TAU167	6-20	LP2TS3G	6-13	S11	9-7
	8-10	KXC	7-12	LM2TAU170	6-20	LP2TSL12	6-14	S8	9-7
	8-11	L2PP1A5	6-16	LM2TAU20	6-19	LP2TSL13	6-14	SM1B	1-2
GN...U11	8-12	L2PP1A8	6-16	LM2TB1	6-2	M...BRF P	5-2	SM2A	1-3
GN...U12	8-12	L2PP2A8	6-16	LM2TB2	6-2	M...BRF R	5-2	SM3A	1-3
GN...U25	8-12	L2PP3A8	6-16	LM2TB3	6-3	M0	5-4	SMX1	1-4
GN...U65	8-12	L2PP4A8	6-16	LM2TB6	6-3	M0P	5-4		1-5
GUS	2-2	L2PP5A8	6-16	LM2TBL10	6-6	M0R	5-4	SMX2	1-8
GUSH	2-3	L2PP100	6-16	LM2TBL20	6-6	M1	5-4	SMX9001	1-4
GUSS	2-3	L2PP110	6-16	LM2TBL614	6-6	M1P	5-4		3-12
GX... U	8-2	L2PP115	6-16	LM2TBL624	6-6	M1R	5-4		3-16
	8-3	L2PP120	6-16	LM2TC	6-17	M2	5-4		5-6
	8-4	L2PP130	6-16	LM2TDL400	6-18	M2P	5-4	SMX9002	1-4
GX...U11	8-5	L2PP150	6-16	LM2TE	6-17	M2R	5-4		3-16
GX...U12	8-5	L2PP160	6-16	LM2TEL400	6-18	M3	5-4		5-6
GX...U25	8-5	L2PP165	6-16	LM2TFL	6-18	M3P	5-4	SMX9003	1-4
GX...068	8-6	L2PP170	6-16	LM2TGL	6-18	M3R	5-4		3-12
GX...078	8-6	L2PP180	6-16	LM2TJ	6-9	MISTOS B	11-5		3-16
GX...088	8-6	L48AP	9-7	LM2TIL1	6-7	NEONV	1-5		5-6
GX...098	8-6	L48M	9-7	LM2TL	6-18	NEONR	1-5	SMX9004	1-4
GX...P	8-7	L48 P11	9-7	LM2TM	6-18	NTC01	12-3		3-16
GX...P25	8-7	L48 P8	9-7	LM2TP100	6-8	P330	7-25		5-6
GXA01	8-16	L48TP	9-7	LM2TP110	6-8	PA96X96	10-2	SMX9010	1-5
	8-17	L48TPB	9-7	LM2TR100	6-4		10-3		3-12
GXA01H	8-16	LM2TA12	6-21	LM2TR1196	6-4		12-2		3-16
	8-17	LM2TA130	6-21	LM2TR2004	6-4	PACR	12-3		5-6
GXA11	8-16	LM2TA140	6-21	LM2TS1	6-4	PLN13	7-24	SMX9012	1-5
	8-17	LM2TA150	6-20	LM2TS2	6-4	PT25	11-5		3-12
GXM1	8-16	LM2TA160	6-20	LM2TS3	6-4	PT53	11-5		3-16
	8-17	LM2TA170	6-20	LM2TS3...G	6-4	PX1	10-3		5-6
GXM2	8-16	LM2TA170G	6-20	LM2TSL12	6-7		10-5	SMX9014	1-5
	8-17	LM2TA180	6-21	LM2TSL13	6-7	RB6	4-7		3-16
GXM5	8-16	LM2TA185	6-20	LM2TT100	6-18	RE244	2-13		5-6
	8-17	LM2TA190	6-20	LM2TVL230	6-18	RF180	4-3	SMX9018	1-5
GXM6	8-16	LM2TA200	6-21	LM2TXL	6-18	RF25	4-2		3-16
IND	11-5	LM2TAGB21	6-19	LM2TYL	6-18	RF400	4-3		5-6
KB A	7-2	LM2TAGB2	6-19	LM2TZL230	6-18	RF9	4-2	SMX9019	1-5
KB B	7-3	LM2TAGB23.	6-19	LP2TAU120	6-21	RF95	4-2		3-16
KB C	7-4	LM2TAGB24	6-19	LP2TB1	6-10	RFA	4-4		5-6
KB D	7-5	LM2TAI23	6-19	LP2TB2	6-10	RFS	4-5	SMX9020	3-16
KB E	7-6	LM2TALA0	6-20	L2PTB3	6-10	RFSA	4-6		5-6
KB F	7-7	LM2TALB0	6-20	L2PTB6	6-11	RKP001Z0	11-5	SMX9021	3-12
KB H	7-8	LM2TALB048	6-20	LP2TB71	6-12	ROF	11-5		5-6
KB L	7-8	LM2TALB130	6-20	LP2TB72	6-12	ROPPE	11-5	SMX9022	3-12
KB M	7-9	LM2TALL006	6-20	LP2TB7233	6-12	RS2001Z0	11-5		5-6
KB N	7-11	LM2TALL024	6-20	LP2TB73	6-12	RS... 01	7-14	SMX9023	3-16
KB P	7-10	LM2TALL048	6-20	LP2TBL10	6-14	RS... 02	7-14		5-6
KB Q	7-10	LM2TALN	6-20	LP2TBL20	6-14	RS... 03	7-14	SMX9024	3-16

Index in alphanumeric order

	5-6		5-6	SMX9035	1-4	TL...10	7-22	TS...13	7-23
SMX9025	3-16	SMX9029	3-16	SMX9042	1-4	TL...11	7-22	VFNC1	11-2
	5-6		5-6	SMX9043	1-4	TL...12	7-23	VFS9	11-3
SMX9026	3-16	SMX9030	1-4	SMX9044	1-4	TL...13	7-23	VFP7	11-4
	5-6	SMX9031	1-4	SMX9045	1-4		7-24		
SMX9027	3-16	SMX9032	1-4	TL...01	7-21	TS...01	7-21		
	5-6	SMX9033	1-4	TL...05	7-21	TS...05	7-21		
SMX9028	3-16	SMX9034	1-4	TL...09	7-22	TS...09	7-22		

LOVATO ELECTRIC, INC.

Terms and Conditions of Sale

The following terms and conditions of sale are subject to change.

- 1. GENERAL:** These terms and conditions of sale apply to all sales of Lovato Electric, Inc (Seller), unless modified in writing by Seller. Seller expressly rejects any other terms and conditions as may be proposed by the Purchaser. A contract upon the conditions and terms herein (including terms of identification of products, quantity, shipping and billing) shall be deemed to have been entered into when, on receipt of an order, Seller acknowledges acceptance in writing. All sales are governed by and subject to the laws of the Commonwealth of Virginia without regard to its conflicts of laws provisions.
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- 5. DELIVERY:** Delivery terms are FCA, Free Carrier (INCOTERMS 2000) Seller's facility, Chesapeake, Virginia with respect to shipping costs, risk of loss and title transfer. Seller will not be liable for any loss, damage or delay arising out of its failure to perform hereunder due to causes beyond its reasonable control, including without limitation, acts of God or the Purchaser, acts of civil or military authority, fires, strikes, floods, epidemics, quarantine restrictions, war, riots, raw materials shortages, delays in transportation, or transportation embargoes. In the event of any such delay, Seller's performance date(s) will be extended for that length of time as may be reasonably necessary to compensate for the delay.
- 6. SHIPPING TIMES:** Acknowledged dates of delivery in accordance with Paragraph 5 are approximate and are based on receipt of all necessary information, required materials to complete the order, are dependent on prevailing conditions at the time of quotation, and are not guaranteed.
- 7. LIMITED WARRANTY:** Seller warrants for a period of one (1) year from delivery in accordance with Paragraph 5, that product manufactured by it will be free from defects solely due to material, workmanship and design. This warranty does not cover defects caused by wear and tear, accident, misuse, improper installation, or neglect, as determined solely by Seller. Warranty shall be limited to Seller's option of repair or replacement at Seller's facility. With respect to equipment sold but not manufactured by Seller, the warranty obligations of Seller shall in all respects conform and be limited to the warranty actually extended to Seller by the manufacturer. The foregoing warranties do not cover reimbursement for labor, transportation, removal, installation or other expenses which may be incurred in connection with repair or replacement. THESE WARRANTIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESSED, IMPLIED OR STATUTORY, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR PERFORMANCE OR APPLICATION WARRANTIES.
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- 10. CANCELLATIONS:** Any order or partial order cancelled or suspended by Purchaser is subject to express written consent of Seller. Seller may impose and Purchaser hereby agrees to pay reasonable cancellation charges which reflect costs up to the time of cancellation or suspension.
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GENERAL INFORMATION

Typical Full Load Currents For Single and Three Phase Electric Motors

The information in the chart below was obtained from the National Electric Code Table 430-148 and 430-150 and from U.L. Industrial Control Standard 508. The voltages shown are standard rated motor voltages. The currents listed are permitted for system voltage ranges of 110-120, 220-240, 440-480, and 550-600 volts.

The full load current values listed are for motors running at standard speeds with normal torque characteristics. Motors which are non-standard, such as low speed, high torque or other special applications may have higher full load currents.

Caution: For accurate and reliable motor protection, motor nameplate current should be used to obtain actual motor full load amps for all motors.

Horsepower	Inductive Motor - 60Hz 3 Phase [A]					
	Single Phase		Three Phase			
	115V	230V	200V	230V	460V	575V
1/10	3.0	1.5				
1/8	3.8	1.9				
1/6	4.4	2.2				
1/4	5.8	2.9				
1/3	7.2	3.6				
1/2	9.8	4.9	2.5	2.2	1.1	0.9
3/4	13.8	6.9	3.2	2.8	1.4	1.1
1	16	8	4.8	4.2	2.1	1.7
1 1/2	20	10	6.9	6	3	2.4
2	24	12	7.8	6.8	3.4	2.7
3	34	17	11	9.6	4.8	3.9
5	56	28	17.5	15.2	7.6	6.1
7 1/2	80	40	25.3	22	11	9
10	100	50	32.2	28	14	11
15	135	68	48.3	42	21	17
20			62.1	54	27	22
25			78.2	68	34	27
30			92	80	40	32
40			120	104	52	41
50			150	130	65	52
60			177	154	77	62
75			221	192	96	77
100			285	248	124	99
125			359	312	156	125
150			414	360	180	144
200			552	480	240	192
250				604	302	242
300				722	361	289
350				828	414	336
400				954	477	382



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