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# Specialty Control Devices

## Solenoids

## Section 11

### CR9500

#### Industrial Strongbox Solenoids

#### Description

A solenoid is an electromagnet which applies a straight-line force, in a push or pull motion, when energized.

A solenoid consists of a frame, plunger, and coil. When the coil is energized, a magnetic field is set up in the frame. This magnetic field causes the plunger to move into the frame. The result is a straight-line force.

#### Application

In industrial applications, solenoids are used for a variety of purposes including:

- Hydraulic and pneumatic systems where the solenoid opens and/or closes a valve.
- Tool lifting for return strokes; to initiate a machining operation.
- Cutting and shearing operations in which the solenoid operates knife blades.
- Spring set magnetic brakes where, through a lever system the solenoid releases the brake on application of power.
- Safety devices where the energized solenoid holds a latch or locking pin in the open position (in case of power failure, the latch is released and moves into the locked position).
- Contactors, where the solenoid is used to actuate the contacts.
- Clamping devices for assembly and machine work.
- Lever mechanisms to engage or disengage a clutch.
- Latches for window and door openers.
- Magnetic brakes where the solenoid exerts force on the brake shoes.
- Variable reactors for control of small motors and amplifier circuits.
- Hopper gate actuators for automatic and remote control.
- Paper, plastic, and thin metal punches where the solenoid drives the punch.
- Magnetic drivers for small pins and nails.

#### Features

- Life: Unequaled mechanical life proved by many test hours.
- Strongbox coil: Moisture-, oil-, and shock-resistant.
- Flexible mounting: Solenoids can be mounted in any of five different ways—end, either side, throat, or elimination of brackets, and use of through bolts to a bedplate.
- Complete rating coverage: Nine different forms having 24 different ratings to 40 pounds at 1/2-inch stroke or 36 pounds at 1-inch stroke.
- Versatility of wiring: Provisions for either lead or terminal type connection.



Typical CR9500B102A2A solenoid

#### Product Number Selection Instructions

1. Order a solenoid or accessory by complete Product Number. Example: CR9500A101A2A at **\$81.00, GO-10G7**.
2. Order a solenoid to have optional mounting (per mounting option table, page 11-3): with right side mounting, CR9500A101A2A becomes CR9500A101B2A at **\$81.00, GO-10G7**.
3. If other special features are desired, order by description using a catalog listed form as reference.

#### Reference Publications

Instructions	GEH-2363
Renewal Parts	GEF-3997



# Specialty Control Devices

## Solenoids

### CR9500

Industrial Strongbox Solenoids

### AC Solenoid Forms, 600 Volts Maximum, 60 Hertz

Type of Operation (inches)	Maximum Stroke	Net Lbs. @ Max. Stroke								60Hz <sup>1</sup> Coil		Product Number	List Price GO-10G7
		With Gravity		Horizontal		Against Gravity		Quiet Seated Force in Lbs.		Coil	Coil		
		Force @ 100% V	Recommended Load	Force @ 100% V	Recommended Load	Force @ 100% V	Recommended Load	@ 100% Voltage	@ 85% Voltage	Voltamperes @ Max Stroke	Voltamperes Seated		
Pull	1	1.6	1.2	1.4	1.0	1.2	0.8	7	5	300	40	CR9500A100A*A	\$60.00
Pull	1	2.7	2.0	2.4	1.7	2.1	1.4	10	7	400	50	CR9500A101A*A	\$81.00
Pull	1	3.5	2.6	3.2	2.3	2.9	2.0	12	9	590	50	CR9500A102A*A	\$102.00
Pull	1	5.5	4.3	5.1	3.9	4.7	3.5	11	8	800	60	CR9500B100A*A	\$114.00
Pull	1	8.3	6.0	7.8	5.5	7.3	5.0	16	11	1050	70	CR9500B101A*A	\$137.00
Pull	1	13.2	10.0	12.5	9.3	11.8	8.6	23	16	1570	100	CR9500B102A*A	\$164.00
Pull	1	16.2	11.8	15.4	11.0	14.6	10.2	30	20	1880	100	CR9500C100A*A	\$192.00
Pull	1	26.1	18.6	25.0	17.5	23.9	16.4	40	27	2700	130	CR9500C101A*A	\$240.00
Pull	1	37.5	28.5	36.0	27.0	34.5	25.5	55	39	3900	160	CR9500C102A*A	\$282.00
Push	1/2	2.8	2.1	2.5	1.8	2.2	1.5	4	3	180	40	CR9500A103A*A	\$66.00
Push	1/2	5.0	3.7	4.7	3.4	4.4	3.1	7	6	280	50	CR9500A104A*A	\$87.00
Push	1/2	7.0	4.5	6.6	4.1	6.2	3.7	10	8	340	50	CR9500A105A*A	\$108.00
Push	1/2	17.0	12.8	16.0	11.8	15.0	10.8	25	16	970	100	CR9500C103A*A	\$210.00
Push	1/2	28.1	20.7	26.6	19.2	25.1	17.7	35	23	1450	150	CR9500C104A*A	\$258.00
Push	1/2	35.0	26.0	33.0	24.0	31.0	22.0	45	33	2050	190	CR9500C105A*A	\$300.00
Push	1	12.7	9.5	11.7	8.5	10.7	7.5	25	16	1450	100	CR9500C106A*A	\$210.00
Push	1	21.5	16.7	19.5	15.2	18.0	13.7	35	23	2300	150	CR9500C107A*A	\$258.00
Push	1	30.0	21.0	28.0	19.0	26.0	17.0	45	33	3450	190	CR9500C108A*A	\$300.00

\*Insert number from AC Coil Suffix Table below to complete product number.

<sup>1</sup>5/6 x 60 Hz Voltamperes = 50 Hz Voltamperes.

### Factory Installed Mounting Options—AC Forms Only

Methods of Mounting (Looking at terminal side with plunger down)	List Price Additions or Deductions GO-10G7 CR9500			Change Last 3 Digits of Product Number As Shown
	A	B	C	
End Mounting (Standard listed form)	\$ 0.00	\$ 0.00	\$ 0.00	A*A
Side Mounting Right side	\$ 0.00	\$ 0.00	\$ 0.00	B*A
Side Mounting Left side	\$ 0.00	\$ 0.00	\$ 0.00	E*A
Throat Mounting	\$ 0.00	\$ 0.00	\$ 0.00	C*A
Through-Bolt Mounting (No feet)	Deduct \$ 3.00	Deduct \$ 6.00	Deduct \$ 9.00	D*A
Both Sides Mounting	Add \$ 6.00	Add \$ 9.00	Add \$ 12.00	F*A

\*Insert number from AC Coil Suffix table below.

### AC Coil Suffix Table

Volts	Suffix Number 60 Hz	Suffix Number 50 Hz
115	2	6
230	3	7
460	4	
575	5	

### Mounting Options and Accessories

#### Accessories

Accessory Type	For Use With	Product Number	List Price GO-10G7
Linkage Pins	CR9500A100	CR9500A901A	\$3.90
Linkage Pins	CR9500A101	CR9500A901B	\$3.90
Linkage Pins	CR9500A102	CR9500A901C	\$3.90
Linkage Pins	CR9500B100	CR9500B901A	\$4.50
Linkage Pins	CR9500B101	CR9500B901B	\$4.50
Linkage Pins	CR9500B102	CR9500B901C	\$4.50
Linkage Pins	CR9500C100	CR9500C901A	\$5.10
Linkage Pins	CR9500C101	CR9500C901B	\$5.10
Linkage Pins	CR9500C102	CR9500C901C	\$5.10



Publications and Reference: See Section 17 for a complete list of additional product-related publications

# Specialty Control Devices Solenoids

# Section 11

## CR9500

Industrial Strongbox Solenoids  
Technical Data

### CR9500 Solenoids—1 Inch Pull Type AC Devices

Product Number	Quiet Seated Force in Lbs.		Plunger Weight (lbs.)	Shipping Weight (lbs.)	Voltamperes 100% Voltage Seated	Force in Lbs. Horizontal <sup>1</sup> 85% Voltage	Voltamperes @ 100% Voltage	Duty Cycle 50% Time On (ops./min.)
	@ 85% Voltage	@ 100% Voltage						
CR9500A100	5	7	0.2	1.3	40	1.0	300	60
CR9500A101	7	10	0.3	1.5	50	1.7	400	48
CR9500A102	9	12	0.3	1.7	50	2.3	590	47
CR9500B100	8	11	0.4	2.3	60	3.9	800	56
CR9500B101	11	16	0.5	2.6	70	5.5	1050	30
CR9500B102	16	23	0.7	3.1	100	9.3	1570	27
CR9500C100	20	30	0.8	3.9	100	11.0	1880	31
CR9500C101	27	40	1.1	4.9	130	17.5	2700	30
CR9500C102	39	55	1.5	5.8	160	27.0	3900	22

### CR9500 Solenoids—1/2 Inch Push Type AC Devices

Product Number	Force in Lbs. Horizontal <sup>1</sup> 85% Voltage	Plunger Weight (lbs.)	Shipping Weight (lbs.)	Quiet Seated Force in Lbs.		Duty Cycle 50% Time On (ops./min.)	Voltamperes 100% Voltage Seated	Voltamperes 100% Voltage 1/2 Inch
				@ 85% Voltage	@ 100% Voltage			
CR9500A103	1.8	0.3	1.4	3	4	190	40	180
CR9500A104	3.4	0.3	1.6	6	7	160	50	280
CR9500A105	4.1	0.4	1.8	8	10	140	50	340
CR9500C103	11.8	1.0	4.5	16	25	110	100	970
CR9500C104	19.2	1.5	5.5	23	35	105	150	1450
CR9500C105	24.0	2.0	6.4	33	45	90	190	2050

### CR9500 Solenoids—1 Inch Push Type AC Devices

Product Number	Force in Lbs. Horizontal <sup>1</sup> 85% Voltage	Plunger Weight (lbs.)	Shipping Weight (lbs.)	Quiet Seated Force in Lbs.		Duty Cycle 50% Time On (ops./min.)	Voltamperes 100% Voltage Seated	Voltamperes 100% Voltage 1/2 Inch
				@ 85% Voltage	@ 100% Voltage			
CR9500C106	8.5	1.0	4.5	16	25	28	100	1450
CR9500C107	15.2	1.5	5.5	23	35	26	150	2300
CR9500C108	19.0	2.0	6.4	33	45	22	190	3450

<sup>1</sup>For operation with gravity add plunger weight. For operation against gravity subtract plunger weight.

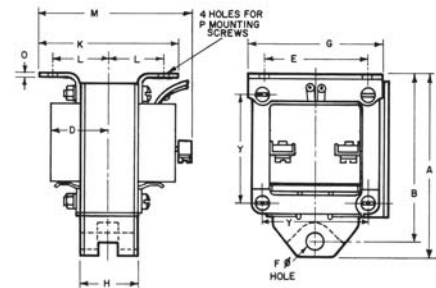
### Outlines and Dimensions in.(mm) For Estimating Only

#### Dimensions—1 Inch Maximum Stroke, Pull Type, 60 Hertz (Base Mounted)

Product Number	Dimension A	Dimension B	Dimension D	Dimension E	Dimension F	Dimension G	Dimension H
CR9500A100	2.73 (69.3)	2.52 (64.0)	0.72 (18.3)	1.50 (38.1)	0.25 (6.4)	1.94 (49.3)	0.62 (15.7)
CR9500A101	2.73 (69.3)	2.52 (64.0)	0.83 (21.1)	1.50 (38.1)	0.25 (6.4)	1.94 (49.3)	0.81 (20.6)
CR9500A102	2.73 (69.3)	2.52 (64.0)	0.91 (23.1)	1.50 (38.1)	0.25 (6.4)	1.94 (49.3)	1.00 (25.4)
CR9500B100	3.44 (87.4)	3.12 (79.2)	0.96 (24.4)	1.81 (46.0)	0.38 (9.6)	2.38 (60.4)	0.88 (22.4)
CR9500B101	3.44 (87.4)	3.12 (79.2)	1.09 (27.7)	1.81 (46.0)	0.38 (9.6)	2.38 (60.4)	1.12 (28.4)
CR9500B102	3.44 (87.4)	3.12 (79.2)	1.28 (32.5)	1.81 (46.0)	0.38 (9.6)	2.38 (60.4)	1.50 (38.1)
CR9500C100	4.33 (110.0)	3.98 (101.1)	1.25 (31.8)	2.25 (57.2)	0.44 (11.2)	3.06 (77.7)	1.05 (26.9)
CR9500C101	4.33 (110.0)	3.98 (101.1)	1.44 (36.6)	2.25 (57.2)	0.44 (11.2)	3.06 (77.7)	1.44 (36.6)
CR9500C102	4.33 (110.0)	3.98 (101.1)	1.66 (42.2)	2.25 (57.2)	0.44 (11.2)	3.06 (77.7)	1.88 (47.8)

Product Number	Dimension K	Dimension L	Dimension M	Dimension O	Dimension P	Dimension Y	Shipping Weight (lbs)
CR9500A100	2.00 (50.8)	0.80 (20.3)	2.48 (63.0)	0.09 (2.3)	#8	1.56 (39.6)	1.3
CR9500A101	2.19 (55.6)	0.89 (22.6)	2.67 (67.8)	0.09 (2.3)	#8	1.56 (39.6)	1.5
CR9500A102	2.38 (60.4)	0.98 (24.9)	2.86 (72.6)	0.09 (2.3)	#8	1.56 (39.6)	1.6
CR9500B100	2.56 (65.0)	1.06 (26.9)	2.91 (73.9)	0.12 (3.0)	#10	1.88 (47.8)	0.3
CR9500B101	2.81 (71.4)	1.19 (30.2)	3.16 (80.3)	0.12 (3.0)	#10	1.88 (47.8)	2.5
CR9500B102	3.19 (81.0)	1.38 (35.0)	3.55 (90.2)	0.12 (3.0)	#10	1.88 (47.8)	3.2
CR9500C100	3.19 (81.0)	1.27 (32.2)	3.50 (88.9)	0.16 (4.1)	1/4	2.38 (60.4)	4.0
CR9500C101	3.56 (90.4)	1.45 (36.8)	3.86 (98.0)	0.16 (4.1)	1/4	2.38 (60.4)	5.0
CR9500C102	4.00 (101.6)	1.67 (42.4)	4.30 (109.2)	0.16 (4.1)	1/4	2.38 (60.4)	5.8



Product Number Selection Instructions: See Page 11-2

# Specialty Control Devices Solenoids

### CR9503

#### Heavy Duty AC and DC Solenoids

##### Description

A solenoid is an electromagnet which applies a straight-line force, in a push or pull motion, when energized.

A solenoid consists of a frame, plunger, and coil. When the coil is energized, a magnetic field is set up in the frame. This magnetic field causes the plunger to move into the frame. The result is a straight-line force.

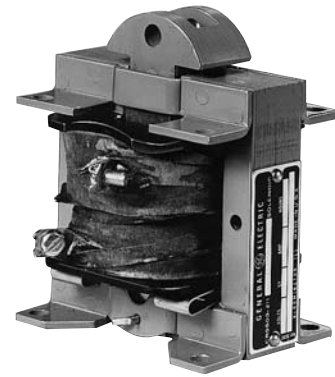
##### Application

In industrial applications, solenoids are used for a variety of purposes including:

- Hydraulic and pneumatic systems where the solenoid opens and/or closes a valve.
- Tool lifting for return strokes; to initiate a machining operation.
- Cutting and shearing operations in which the solenoid operates knife blades.
- Spring set magnetic brakes where, through a lever system the solenoid releases the brake on application of power.
- Safety devices where the energized solenoid holds a latch or locking pin in the open position (in case of power failure, the latch is released and moves into the locked position).
- Contactors, where the solenoid is used to actuate the contacts.
- Clamping devices for assembly and machine work.
- Lever mechanisms to engage or disengage a clutch.
- Latches for window and door openers.
- Magnetic brakes where the solenoid exerts force on the brake shoes.
- Variable reactors for control of small motors and amplifier circuits.
- Hopper gate actuators for automatic and remote control.
- Paper, plastic, and thin metal punches where the solenoid drives the punch.
- Magnetic drivers for small pins and nails.

Used to apply a mechanical force in a straight line, in a push or pull motion.

In applying solenoids, it is important that the load be kept as close to the recommended value as possible. If larger loads are used, action will be sluggish, and there will not be enough margin of pull to compensate for line-voltage variations, so that burned-out coils may result. If too light a load is used, the excess energy results in excessive hammer blows on the solenoid and reduces its life.



Typical CR9503211E Industrial Solenoid

##### Product Number Selection Instructions

Order a solenoid by complete Product Number.

Example: CR9503211EAB272 at **\$266.00, GO-10G7.**

##### Reference Publications

Renewal Parts

GEF-4245



**Publications and Reference:** See Section 17 for a complete list of additional product-related publications

# Specialty Control Devices

## Solenoids

### CR9503

Heavy Duty AC Solenoids

# Section 11

### CR9503 Solenoids—Pull Type AC Devices (Maximum Ambient Temperature 40°C)

Maximum Stroke (inches)	Recommended Load (lbs.)			Gross Load at Rated Voltage (lbs.)			Plunger Weight (lbs.)	Shipping Weight (lbs.)	Product Number	List Price GO-10G7
	Exclusive of Plunger Weight	For Operation with Gravity (Weight of Plunger Added)	For Operation Against Gravity (Less Plunger Weight)	Exclusive of Plunger Weight	For Operation with Gravity (Weight of Plunger Added)	For Operation Against Gravity (Less Plunger Weight)				
3/4	0.65	0.77	0.53	0.90	1.02	0.78	0.12	2.0	CR9503207EAB*	\$60.00
1	0.90	1.08	0.72	1.30	1.48	1.12	0.18	2.0	CR9503208DAB*	\$86.00
1	3.20	3.51	2.89	4.50	4.81	4.19	0.31	2.5	CR9503209CAB*	\$189.00
1 1/4	4.00	4.56	3.44	6.00	6.56	5.44	0.56	4.5	CR9503210CAB*	\$240.00
1	5.50	6.18	4.82	8.00	8.68	7.32	0.68	4.5	CR9503209MAB*	\$240.00
1 1/4	10.2	11.1	9.26	14.0	14.9	13.1	0.94	7.5	CR9503211EAB*	\$266.00
1 3/4	22.7	25.1	20.3	30.0	32.4	27.6	2.44	10	CR9503206BAB*	\$387.00
2	21.7	25.0	18.5	30.2	33.5	27.0	3.25	24	CR9503212BAB*	\$516.00
2	42.0	47.4	36.6	64.0	69.4	58.6	5.44	31	CR9503213CAB*	\$618.00
3	51.0	61.0	41.0	73.0	83.0	63.0	10.0	67	CR9503214BAB*	\$975.00
3	70.0	83.0	57.0	97.0	110	84.0	13.0	90	CR9503215CAB*	\$1149.00

### CR9503 Solenoids—Push Type AC Devices (Maximum Ambient Temperature 40°C)

Maximum Stroke (inches)	Recommended Load (lbs.)			Gross Load at Rated Voltage (lbs.)			Plunger Weight (lbs.)	Shipping Weight (lbs.)	Product Number	List Price GO-10G7
	Exclusive of Plunger Weight	For Operation with Gravity (Weight of Plunger Added)	For Operation Against Gravity (Less Plunger Weight)	Exclusive of Plunger Weight	For Operation with Gravity (Weight of Plunger Added)	For Operation Against Gravity (Less Plunger Weight)				
1	3.20	3.7	2.70	4.50	5.0	4.0	0.5	2.5	CR9503209CAC*	\$204.00
1 1/4	4.00	4.8	3.20	6.00	6.8	5.2	0.80	2.5	CR9503210CAC*	\$258.00
1	5.50	6.38	4.62	8.00	8.88	7.12	0.88	4.5	CR9503209MAF*	\$258.00
1 1/4	10.2	11.4	9.01	14.0	15.2	12.81	1.19	7.5	CR9503211EAC*	\$281.00
1 3/4	22.7	26.1	19.3	30.0	33.4	26.6	3.38	10	CR9503206BAC*	\$423.00
2	21.7	26.5	17.0	30.2	35.0	25.5	4.75	24	CR9503212BAF*	\$546.00
2	42.0	49.1	34.9	64.0	71.1	56.9	7.12	31	CR9503213CAF*	\$660.00
3	51.0	67.0	35.0	73.0	89.0	57.0	16.0	69	CR9503214BAF*	\$1002.00
3	70.0	89.0	51.0	97.0	116	78.0	19.0	90	CR9503215CAF*	\$1206.00

\*Insert three-digit coil suffix from table below to complete the product number.

### Coil Suffix Table—AC Solenoids

Voltage 60 Hertz	Size of Solenoid CR9503										
	206B	207E	208D	209C	209M	210C	211E	212B	213C	214B	215C
110	202	202	202	202	204	201	271	207	204	213	212
120	349	-	377	289	232	260	499	293	254	247	307
200	334	-	251	293	233	-	513	298	236	-	310
220	201	203	203	201	234	202	272	201	201	209	245
240	263	-	384	529	-	240	509	265	247	252	265
380	442	-	-	557	-	-	593	299	312	249	292
400	409	-	-	531	-	287	559	297	-	242	-
440	203	204	204	204	235	203	273	205	203	210	246
480	348	-	494	502	236	237	523	285	309	243	274
500	453	-	412	523	237	-	514	-	234	241	224
550	204	205	205	226	238	204	274	206	205	211	247

### Coil Rating in Voltamperes

Solenoid Size	60 Hertz	60 Hertz
	Coil Voltamperes @ Maximum Stroke	Coil Voltamperes @ Minimum Stroke
CR9503206B	5450	390
CR9503207E	110	25
CR9503208D	210	35
CR9503209C	500	55
CR9503209M	750	85
CR9503211E	1970	165
CR9503212B	6900	510
CR9503213C	12600	715
CR9503214B	24200	1290
CR9503215C	31200	1760

Product Number Selection Instructions: See page 11-5



## CR9503

### Heavy Duty AC and DC Solenoids

#### Maximum Duty Cycle (Operations per Minute)

Typical maximum operating speeds for 60 Hertz AC solenoids listed.

The ratings are based on operation at rated voltage with the recommended load shown in the table.

Product Number	Type of Operation	Recommended Load (lbs.)	60 Hertz, Alternating Current								
			25 Percent Time On			50 Percent Time On			75 Percent Time On		
			Percent Stroke			Percent Stroke			Percent Stroke		
			50	75	100	50	75	100	50	75	100
CR9503206B	Pull	22.7	58	24	11.5	42	18	10	18	12	6.5
CR9503207E	Pull	0.65	220	100	39	160	67	28	115	41	19
CR9503208D	Pull	0.90	150	71	25	130	58	20	78	36	15
CR9503209C	Pull	3.20	85	42	19	68	37	17	62	33	15
CR9503209M	Pull	5.50	85	42	19	68	37	17	62	33	15
CR9503211E	Pull	10.2	70	31.5	13.5	60	27	12	50	22	11
CR9503212B	Pull	21.7	65	29	14	51	24	11.5	40	21.4	9
CR9503213C	Pull	42.0	54	22	12	45	19	9	36	14.5	6
CR9503214B	Pull	51.0	45	27	13	35	20	9	25	13	6
CR9503215C	Pull	70.0	40	25	13	26	15	9	18	10	6

### Heavy Duty DC Solenoids

#### CR9503 Solenoids Pull Type and Push Type DC Devices (Maximum Ambient Temperature 40°C)

Type of Operation	Maximum Stroke (inches)	Recommended Load (lbs.)			Gross Load at Rated Voltage (lbs.)			Plunger Weight (lbs.)	Product Number	List Price GO-10G7
		Exclusive of Plunger Weight	For Operation with Gravity (Weight of Plunger Added)	For Operation Against Gravity (Less Plunger Weight)	Exclusive of Plunger Weight	For Operation with Gravity (Weight of Plunger Added)	For Operation Against Gravity (Less Plunger Weight)			
Pull	1	3.10	3.41	2.79	5.20	5.51	4.89	0.31	CR9503209CAN <sup>1</sup>	\$258.00 <sup>2</sup>
Pull	1 1/4	12	12.9	11.1	17.0	17.9	16.1	0.94	CR9503211EBF <sup>1</sup>	\$348.00
Pull	1 3/4	36.0	38.4	33.6	50.0	52.4	47.6	2.44	CR9503206BAF <sup>1</sup>	\$480.00
Pull	2	43.0	46.3	39.8	57.0	60.3	53.8	3.25	CR9503212BAT <sup>1</sup>	\$597.00
Pull	2	42.0	47.4	36.6	58.0	63.4	52.6	5.44	CR9503213CAS <sup>1</sup>	\$705.00
Pull	3	35.0	45.0	25.0	50.0	60.0	40.0	10.0	CR9503214BAS <sup>1</sup>	\$1068.00
Pull	3	59.0	72.0	46.0	81.0	94.0	68.0	13.0	CR9503215CAS <sup>1</sup>	\$1254.00
Push	1	3.10	3.60	2.60	5.20	5.70	4.70	0.50	CR9503209CAO <sup>1</sup>	\$273.00 <sup>3</sup>
Push	1 1/4	12.0	13.2	10.8	17.0	18.2	15.8	1.19	CR9503211EBG <sup>1</sup>	\$357.00
Push	1 3/4	36.0	39.4	32.6	50.0	53.4	46.6	3.38	CR9503206BAG <sup>1</sup>	\$501.00
Push	2	43.0	47.8	38.3	57.0	61.8	52.3	4.75	CR9503212BAU <sup>1</sup>	\$624.00
Push	2	42.0	49.1	34.9	58.0	65.1	50.9	7.12	CR9503213CAT <sup>1</sup>	\$744.00
Push	3	35.0	51.0	19.0	50.0	66.0	34.0	16.0	CR9503214BAT <sup>1</sup>	\$1125.00
Push	3	59.0	78.0	40.0	81.0	100.0	62.0	19.0	CR9503215CAT <sup>1</sup>	\$1308.00

<sup>1</sup>Insert one-, two-, or three-digit number from DC Coil Suffix table below. Use with dc forms only.

<sup>2</sup>Price for 440 Volt and 550 Volt forms is \$291.00 each, GO-10G7.

<sup>3</sup>Price for 440 Volt and 550 Volt forms is \$306.00 each, GO-10G7.

#### Coil Suffix Table—DC Solenoids

Voltage DC	Size of Solenoids CR9503						
	206B	209C	211E	212B	213C	214B	215C
110	48	93	141	-	-	-	22
125	1	5	10	3	2	2	2
230	44	104	110	37	24	-	23
250	2	1	1	1	1	1	1
440	43	-	84	-	-	-	-
550	3	34 <sup>4</sup>	9	4	3	-	20
115/125	62	131	138	-	-	-	-
230/250	63	132	139	-	-	-	-

<sup>4</sup>Requires a 4000-ohm, 100-watt resistor mounted in series.



# Specialty Control Devices Solenoids

# Section 11

## CR9503

### Heavy Duty AC Solenoids

#### Outlines and Dimensions in.(mm) For Estimating Only

#### Approximate Dimensions—Pull Type

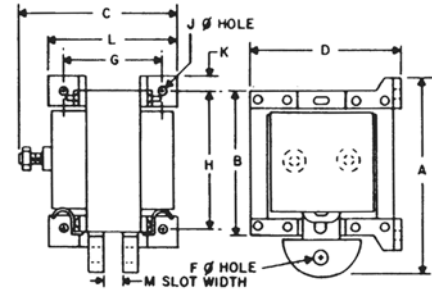
Product Number	Dimension A	Dimension B	Dimension C	Dimension D	Dimension F
CR9503207E	2.59 (65.8)	2.06 (52.3)	2.19 (55.6)	2.09 (53.8)	0.19 (4.8)
CR9503208D	2.78 (70.6)	2.06 (52.3)	2.44 (62.0)	2.09 (53.8)	0.19 (4.8)
CR9503209C	3.44 (87.4)	2.88 (73.1)	2.88 (73.1)	2.62 (66.5)	0.19 (4.8)
CR9503209M	3.44 (87.4)	2.88 (73.1)	2.88 (73.1)	2.62 (66.5)	0.19 (4.8)
CR9503211E	4.47 (113.5)	3.69 (93.7)	3.75 (95.2)	3.69 (93.7)	0.31 (7.9)
CR9503206B	5.81 (147.6)	4.75 (120.7)	4.31 (109.5)	4.75 (120.7)	0.38 (9.7)
CR9503212B	7.19 (182.6)	5.88 (149.3)	4.81 (122.2)	5.75 (146.1)	0.51 (13.0)
CR9503213C	7.19 (182.6)	5.88 (149.3)	5.69 (144.5)	5.75 (146.1)	0.51 (13.0)
CR9503214B	10.0 (254.0)	8.25 (209.6)	6.50 (165.1)	8.25 (209.6)	0.63 (16.0)
CR9503215C	10.0 (254.0)	8.25 (209.6)	7.12 (188.5)	8.25 (209.6)	0.63 (16.0)

Product Number	Dimension G	Dimension H	Dimension J	Dimension K	Dimension L	Dimension M	Shipping Weight (lbs.)
CR9503207E	1.12 (28.4)	1.62 (41.1)	0.25 (6.4)	0.22 (5.58)	1.56 (39.6)	0.25 (6.4)	2.0
CR9503208D	1.38 (35.1)	2.0 (50.8)	0.18 (4.6)	0.22 (5.58)	1.81 (46.0)	0.23 (5.8)	2.0
CR9503209C	1.44 (36.6)	2.25 (57.1)	0.18 (4.6)	0.18 (4.6)	2.25 (57.2)	0.23 (6.0)	2.5
CR9503209M	1.67 (42.4)	2.25 (57.1)	0.18 (4.6)	0.18 (4.6)	2.25 (57.2)	0.23 (6.0)	4.5
CR9503211E	2.25 (57.2)	3.12 (79.2)	0.28 (7.1)	0.28 (7.1)	3.12 (79.2)	0.44 (11.1)	7.5
CR9503206B	2.81 (71.4)	4.0 (101.6)	0.34 (8.6)	0.38 (9.7)	3.69 (93.7)	0.56 (14.3)	10
CR9503212B	2.94 (74.7)	4.75 (120.7)	0.40 (10.2)	0.50 (12.7)	4.19 (106.4)	0.56 (14.3)	24
CR9503213C	3.88 (98.6)	4.75 (120.7)	0.40 (10.2)	0.50 (12.7)	5.06 (128.5)	0.56 (14.3)	31
CR9503214B	4.44 (112.8)	7.0 (177.8)	0.53 (13.5)	0.62 (15.7)	5.88 (149.4)	0.69 (17.5)	67
CR9503215C	5.12 (130.0)	7.0 (177.8)	0.53 (13.5)	0.62 (15.7)	6.50 (165.1)	0.69 (17.5)	90

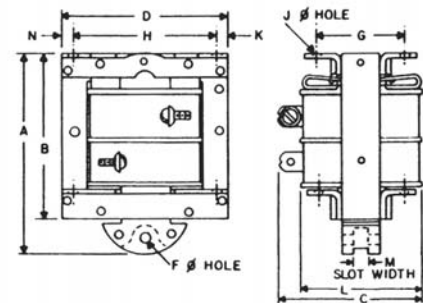
#### Approximate Dimensions—Push Type

Product Number	Dimension A	Dimension B	Dimension C	Dimension D	Dimension E	Dimension F
CR9503209C	5.56 (141.22)	2.88 (73.1)	2.88 (73.1)	2.62 (66.5)	2.12 (53.8)	0.19 (4.8)
CR9503209M	5.56 (141.22)	2.88 (73.1)	2.88 (73.1)	2.62 (66.5)	2.12 (53.8)	0.19 (4.8)
CR9503211E	7.09 (180.1)	3.69 (93.7)	3.75 (95.2)	3.69 (93.7)	2.62 (66.5)	0.31 (7.9)
CR9503206B	8.47 (215.1)	4.75 (120.7)	4.31 (109.5)	4.75 (120.7)	3.12 (79.2)	0.38 (9.7)
CR9503212B	11.12 (282.4)	5.88 (149.3)	4.75 (120.7)	5.75 (146.1)	4.0 (101.6)	0.51 (13.0)
CR9503213C	11.12 (282.4)	5.88 (149.3)	5.69 (144.5)	5.75 (146.1)	4.0 (101.6)	0.51 (13.0)
CR9503214B	15.5 (393.7)	8.25 (209.6)	6.50 (165.1)	8.25 (209.6)	5.50 (139.7)	0.63 (16.0)
CR9503215C	15.5 (393.7)	8.25 (209.6)	7.12 (188.5)	8.25 (209.6)	5.50 (139.7)	0.63 (16.0)

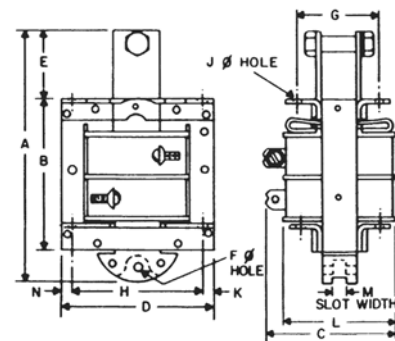
Product Number	Dimension G	Dimension H	Dimension J	Dimension K	Dimension L	Dimension M	Shipping Weight (lbs.)
CR9503209C	1.44 (36.6)	2.25 (57.1)	0.18 (4.6)	0.18 (4.6)	2.25 (57.2)	0.23 (6.0)	2.5
CR9503209M	1.67 (42.4)	2.25 (57.1)	0.18 (4.6)	0.18 (4.6)	2.25 (57.2)	0.23 (6.0)	4.5
CR9503211E	2.25 (57.2)	3.12 (79.2)	0.28 (7.1)	0.28 (7.1)	3.12 (79.2)	0.44 (11.1)	7.5
CR9503206B	2.81 (71.4)	4.0 (101.6)	0.34 (8.6)	0.38 (9.7)	3.69 (93.7)	0.56 (14.3)	10
CR9503212B	2.94 (74.7)	4.75 (120.7)	0.40 (10.2)	0.50 (12.7)	4.12 (104.6)	0.56 (14.3)	24
CR9503213C	3.88 (98.6)	4.75 (120.7)	0.40 (10.2)	0.50 (12.7)	5.06 (128.5)	0.56 (14.3)	31
CR9503214B	4.44 (112.8)	7.0 (177.8)	0.53 (13.5)	0.62 (15.7)	5.88 (149.4)	0.69 (17.5)	69
CR9503215C	5.12 (130.0)	7.0 (177.8)	0.53 (13.5)	0.62 (15.7)	6.50 (165.1)	0.69 (17.5)	90



CR9503-207 and 208 Only



All Other AC Pull Type



All Other AC Push Type



Product Number Selection Instructions: See page 11-5



# Specialty Control Devices

## Limit Switches

### CR127A, CR127B

Pressure Switches (Pilot Duty)

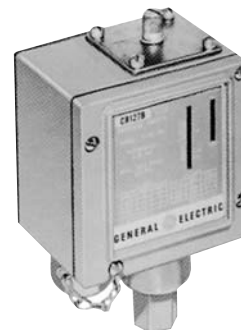
15 Amperes Continuous

600 Volts

#### Application

CR127 industrial pressure switches are designed for pilot-duty applications in control systems of hydraulic and pneumatic equipment. The bellows actuated forms, used with low-pressure applications of air, water and most hydraulics, are applied primarily on machine tools and welding equipment. Piston actuated forms are designed for use with high-pressure hydraulics such as lubricating systems.

Both bellows and piston forms must be used within their maximum safe pressure range which should be greater than line pressure including pressure surges. Although the switches are furnished with an orifice to protect against minor surges, a surge reducer should be used for protection against greater line surges. Also, a customer ground connection is provided within the enclosure.

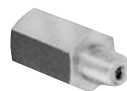


Typical CR127B Pressure Switch

#### Product Number Selection Instructions

1. Order by complete Product Number from pricing table.

Example: A pressure switch is required for line pressure of 200 lbs./sq. inch maximum 20 lbs./sq. inch differential. Order: one—CR127B8 at **\$228.00, GO-10G6**.



Surge Reducer



CR127X2  
Hand Adjusting Knob



CR127X3  
Sealing Cap

#### Reference Publications

Instructions	GEH-3626 (CR127A) GEH-2449 (CR127B)
Renewal Parts	GEF-4225



**Publications and Reference:** See Section 17 for a complete list of additional product-related publications

# Specialty Control Devices

## Limit Switches

### CR127A, CR127B

#### Pressure Switches

## Section 11

### CR127B Low Pressure Forms—Bellows Actuated

Note: NEMA Type 13 Enclosure (Reading in P.S.I.) For use with air, water and oil, noncorrosive to copper or tin-plated steel. Temperature should not exceed 250°F at the bellows.

Range Setting (PSI) <sup>1</sup>	Differential (Adjustable) <sup>2</sup>	Maximum Safe Pressure	Indicating Light	Contacts	Product Number <sup>3</sup>	List Price GO-10G6
1-10	0.5-5	30	No	SPDT	CR127B3	\$324.00
1-20	1-6	30	No	SPDT	CR127B4	\$324.00
1-75	3-15	100	No	SPDT	CR127B5	\$291.00
1-115	6-30	225	No	SPDT	CR127B1	\$228.00
20-180	10-30	255	No	SPDT	CR127B8	\$228.00
10-275	15-25	300	No	SPDT	CR127B9	\$312.00
10-300	25-125	600	No	SPDT	CR127B2	\$228.00
1-10	0.5-5	30	Yes	SPDT	CR127B13	\$366.00
1-20	1-6	30	Yes	SPDT	CR127B14	\$366.00
1-75	3-15	100	Yes	SPDT	CR127B15	\$333.00
1-115	6-30	225	Yes	SPDT	CR127B11	\$270.00
20-180	10-30	255	Yes	SPDT	CR127B18	\$270.00
10-275	15-25	300	Yes	SPDT	CR127B19	\$354.00
10-300	25-125	600	Yes	SPDT	CR127B12	\$270.00

<sup>1</sup>Switch can be adjusted to operate on FALLING pressure within range setting.

<sup>2</sup>Add to range setting to obtain operating point on RISING pressure.

<sup>3</sup>Add "BA" suffix on end of product number for prewired Brad Harrison type connector, and add **\$32.00, GO-10G6** to List Price for this option.

### CR127A High Pressure Forms—Piston Actuated

Note: For use with oil, noncorrosive to iron or steel.

Seal Ring	Range Setting (PSI) <sup>4</sup>	Differential (Adjustable) <sup>5</sup>	Differential (Adjustable) <sup>5</sup> Trip Setting			Maximum Safe Pressure	Indicating Light	Contacts	Product Number <sup>3</sup>	List Price GO-10G6
			Minimum	Medium	Maximum					
No	135-1000	35-135	-	-	-	10000	No	SPDT	CR127A3	\$318.00
No	400-3000	100-400	-	-	-	10000	No	SPDT	CR127A4	\$318.00
No	135-1000	35-135	-	-	-	10000	Yes	SPDT	CR127A13	\$360.00
No	400-3000	100-400	-	-	-	10000	Yes	SPDT	CR127A14	\$360.00
Yes	135-1000	-	70-100	95-135	125-150	10000	No	SPDT	CR127A5	\$324.00
Yes	400-3000	-	210-300	310-410	450-475	10000	No	SPDT	CR127A6	\$324.00
Yes	135-1000	-	70-100	95-135	125-150	10000	Yes	SPDT	CR127A15	\$366.00
Yes	400-3000	-	210-300	310-410	450-475	10000	Yes	SPDT	CR127A16	\$366.00

<sup>3</sup>Add "BA" suffix on end of product number for prewired Brad Harrison type connector, and add **\$32.00, GO-10G6** to List Price for this option.

Note: Enclosure cover shows approximate pressure settings and a trip indication. See page 11-11 for modifications and dimensions.

<sup>4</sup>Switch can be adjusted to operate on RISING pressure within range setting.

<sup>5</sup>Subtract from range setting to obtain operating point on FALLING pressure.

### Contact Ratings—CR127A, CR127B (SPDT Contacts)

#### Continuous carry current 15 Amperes

AC Volts	Make Amperes	Break Amperes
115	40	15
230	20	10
460	10	6
575	8	5

DC Volts	Make Amperes	Break Amperes
120	40	0.25
240	20	0.1



# Specialty Control Devices

## Limit Switches

# Section 11

## CR127A, CR127B

### Pressure Switches

#### Modifications

#### Outlines and Dimensions

#### Factory Installed Modifications

Description	CR127A List Price Addition, GO-10G6	CR127B List Price Addition, GO-10G6
DPDT contacts	\$24.00	\$24.00
Teflon <sup>1</sup> diaphragm	2	—
Range-locking nut (Standard on CR127A)	No charge	\$10.80

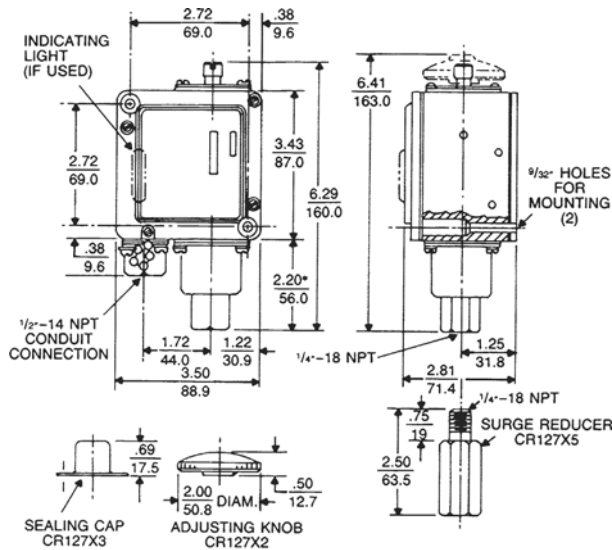
<sup>1</sup>Registered trademark of du Pont Co.

<sup>2</sup>Contact nearest GE Consumer & Industrial Representative.

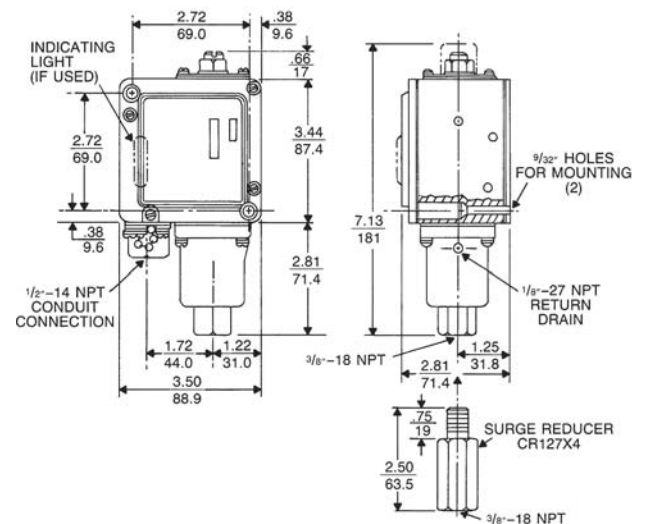
#### Modification Kits for Field Installation

Type	Application	Product Number	List Price GO-10G6
Hand-Adjusting Knob	Attaches to CR127B or factory modified CR127A (specify on order "For Use With CR127X2") to provide hand adjustment of TRIP range.	CR127X2	\$15.00
Surge Reducer (For NPT only) Piston Type CR127A Forms	-	CR127X4	\$45.00
Surge Reducer (For NPT only) Bellows Type CR127B Forms	-	CR127X5	\$45.00
Sealing Cap for Range- adjusting Screw	Prevents accidental adjustment of TRIP setting.	CR127X3	\$6.00

#### Outlines and Dimensions ( $\frac{\text{in}}{\text{mm}}$ ) For Estimating Only



CR127B Bellows form. Approx. shipping wt., 3 lbs.



CR127A Piston form. Approx. shipping wt., 4 lbs.



**Publications and Reference:** See Section 17 for a complete list of additional product-related publications

# Specialty Control Devices

## Limit Switches

### CR115A

#### Vane-Operated Limit Switches

#### Application

Used wherever conventional lever-operated switches are normally installed. The limit switch is actuated by the passage of a steel vane or rod through a recessed slot in the switch. The vane-operated limit switch is especially suited to tough applications where a severe duty cycle exists; operation in presence of dust, coolants, and other contaminants; where speed of actuator is high; and where accuracy, reliability, or high-speed operation is required. Switch may be used in general purpose control relay circuits and with static and PLC control. Typical applications include cranes, conveyors, machine tools, textile equipment, elevators, etc.

#### Description

**CR115A30 and CR115A35**—CR115A30 and CR115A35 general-purpose limit switches have similar characteristics and features as CR115A with the exception of 1/2-inch side slot and a larger mounting plate that has six mounting holes. The CR115A30 has one normally open contact and no indicating light. The CR115A35 has one normally closed contact.

#### Features

- Encapsulated unit: all enclosures meet Type 13 oiltight and dust-tight requirements. Several forms are also UL listed for types 3, 3R, 4, 4X, 12, and 13 environments; and for Division 2 hazardous locations—Type 7 (Class I, Groups A, B, C, and D) and Type 9 (Class II, Groups E, F, and G).
- Long life: practically unlimited mechanical life.
- Flexible: available for front or top operation, with or without pilot light.
- Versatile: can be mounted and operated in any position depending on model.
- Dependable: function and life unaffected by chips, dust, or grease.
- Small size: 20 percent smaller than previous design.
- Color coded leads: red for contact circuit, brown for indicating light (if supplied).
- Suitable for use in ambient temperatures to 75°C.

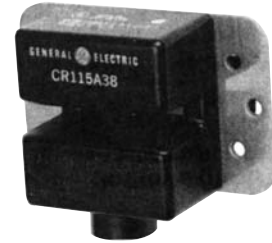
#### Operating Characteristics

##### CR115 (Type A & A30)

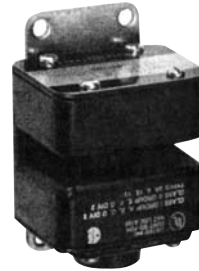
- Repetitive Accuracy:  $\pm 0.0025$ -inches or less (With constant vane path.)
- Response Time: 0.001 second
- Operating Differential: With a 3/16-inch thick vane in a fixed path in the center of the switch slot and 1/8-inch from the bottom of the slot, differential is:
  - NO contact—Approx. 1/8-inch
  - NC contact—Approx. 1/4 inch



CR115A (top orientation)



CR115A30, CR115A35, CR115A38 (general purpose)



CR115A (front orientation)

#### Product Number Selection Instructions

1. Order by complete Product Number shown in pricing information table.  
Example: CR115A11 at **\$244.00, GO-10G6**.  
**Note:** If accessory three-segment adjustable vane is specified, its full Product Number must be included.  
Example: CR115A11 switch at **\$244.00, GO-10G6** with CR115X18 adjustable vane at **\$26.00, GO-10G6**.

#### Reference Publications

Instructions	
Product Number CR115	Instruction
A11 thru A18	GEH-2440
A20	GEH-2490
A30	GEJ-2994
X18B (Vane)	GEH-3211



# Specialty Control Devices

## Limit Switches

# Section 11

## CR115A

### Vane-Operated Limit Switches

#### CR115A Standard Forms

Contact Configuration	Orientation	Lead Length	Product Number	List Price GO-10G6
1 NO	Front	3 ft.	CR115A11 <sup>1</sup>	\$244.00
1 NC	Front	3 ft.	CR115A12 <sup>1</sup>	\$244.00
1 NO	Top	3 ft.	CR115A15 <sup>1</sup>	\$244.00
1 NC	Top	3 ft.	CR115A16 <sup>1</sup>	\$244.00
1 NO	Front	12 ft.	CR115A11AC	\$260.00
1 NC	Front	12 ft.	CR115A12AC	\$260.00
1 NO	Top	12 ft.	CR115A15AC	\$260.00
1 NC	Top	12 ft.	CR115A16AC	\$260.00

<sup>1</sup>UL listed for Types 3, 3R, 4, 4X, 12, and 13 locations; and for Division 2 Types 7 and 9 hazardous locations

#### CR115A Standard Forms with Three-Foot Plug Connector and Watertight Bushing<sup>2</sup>

Contact Configuration	Orientation	Lead Length	Product Number	List Price GO-10G6
1 NO	Front	3 ft.	CR115A26	\$350.00
1 NO	Top	3 ft.	CR115A27	\$350.00

<sup>2</sup>Switch leads have a male connector for use with female receptacles such as: CAM-LOK E2004-504 (with 3/4-inch pipe thread), E2004-505 (with 1/2-inch pipe thread) or equivalent.

#### CR115A General Purpose Forms

Contact Configuration	Orientation	Lead Length	Product Number	List Price GO-10G6
1 NO	Front	3 ft.	CR115A30	\$178.00
1 NC	Front	3 ft.	CR115A35	\$178.00
1 NO	Front	12 ft.	CR115A30AC	\$194.00
1 NC	Front	12 ft.	CR115A35AC	\$194.00

#### CR115A Corrosion Resistant Forms

Contact Configuration	Orientation	Lead Length	Product Number	List Price GO-10G6
1 NO	Front	3 ft.	CR115A38 <sup>3</sup>	\$231.00
1 NO	Front	3 ft.	CR115A38AM <sup>4</sup>	\$231.00
1 NO	Front	12 ft.	CR115A38AC	\$246.00

<sup>3</sup>Has stainless steel hardware.

<sup>4</sup>Two-position mounting plate.



**Publications and Reference:** See Section 17 for a complete list of additional product-related publications

# Specialty Control Devices

## Limit Switches

# Section 11

### CR115A

#### Vane-Operated Limit Switches

#### Accessories

Accessory Type	For Use With	Product Number	List Price GO-10G6
Vane	CR115A vane-operated limit switch	CR115X18	\$26.00

The CR115X18 is constructed of 1/8-inch mild steel and can be adjusted a maximum of  $\pm 1/4$ -inch in any three planes. The segments are held securely with No. 10 screws and mounted to the equipment with 1/4-inch screws.



CR115X18 vane

#### CR115 Ratings

Product Number	AC Make @ 115 V	AC Make @ 230 V	AC Carry and Break 115 V	AC Carry and Break 230 V	AC Carry and Break Other V	DC With Arc Suppression
CR115A	0.75A	0.27A	0.20A	0.07A	15 VA max./1A max.	15 VA max./1A max.



Product Number Selection Instructions: See Page 11-12

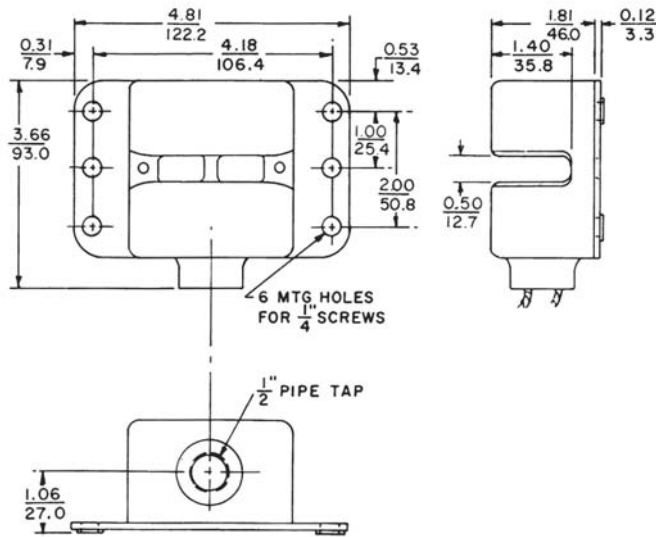
# Specialty Control Devices

## Limit Switches

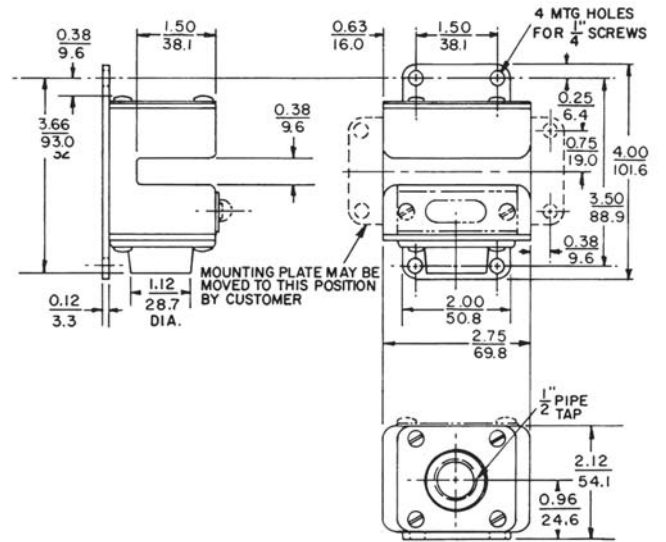
### CR115A

Vane-Operated Limit Switches

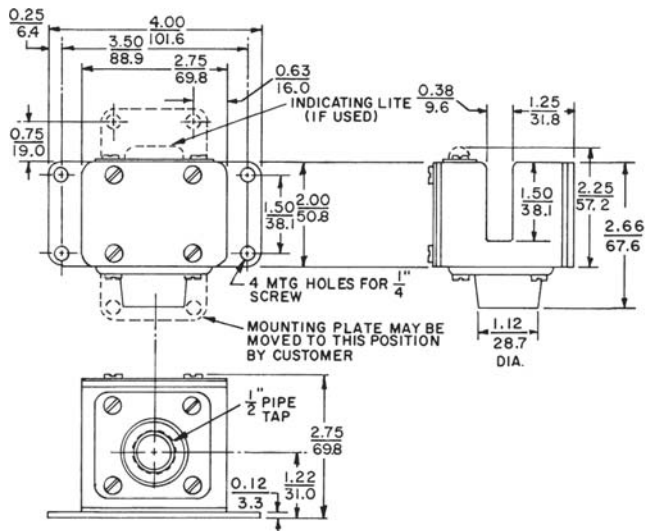
Outlines and Dimensions (in/mm) For Estimating Only



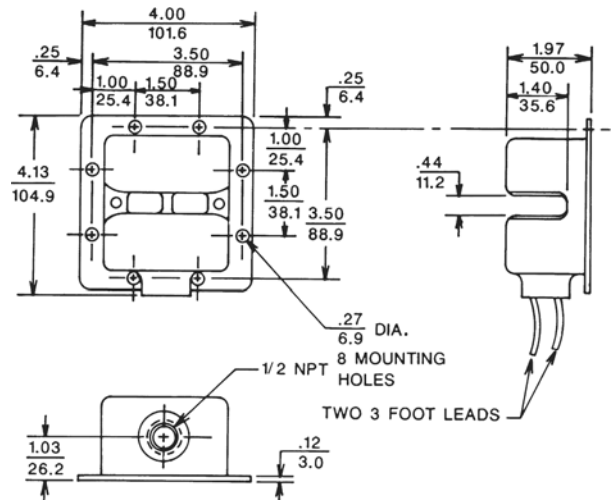
CR115A30—Approx. shipping wt., 2 lbs.



CR115A Front Orientation—Approx. shipping wt., 2 lbs.



CR115A Top Orientation—Approx. shipping wt., 2 lbs.



CR115A38AM—Corrosion Resistant



Publications and Reference: See Section 17 for a complete list of additional product-related publications

# Specialty Control Devices

## Limit Switches

### CR115A

#### Magnet-Operated Limit Switches

#### Application

CR115A provides accurate position detection of objects at distances up to 4 1/8 inches without physical contact. The switch is actuated by passage of a magnet near the face of the switch. This action causes the normally open contact to close and remain closed until the magnet is removed.

Magnet-operated limit switches are well-suited for controlling objects having an erratic motion such as skip hoists, elevators, and overhead conveyors.

#### Features

- Encapsulated unit: all enclosures meet NEMA Type 13 oiltight and dust-tight requirements. Several forms are also UL listed for Types 3, 3R, 4, 4X, 12 and 13 environments; and for Division 2 hazardous locations-Type 7 (Class I, Groups A, B, C and D) and Type 9 (Class II, Groups E, F and G).
- Flexible: magnetic operation permits wide mounting flexibility.
- Long life: detects high-speed object travel without wear or breakage and life unaffected by chips.
- Accurate: short response time assures high repetitive accuracy.
- Versatile: may be mounted with switch or magnet or both in a fixed position.
- Suitable for use in ambient temperatures to 75°C.

#### Operating Characteristics

##### CR115A22; CR115A23; CR115A59; CR115A61; CR115A62

- Response Time: 1.75 milliseconds.
- Repetitive Accuracy: (Path of operating magnet fixed at an angle to switch.) With CR115X20 (5/8-inch dia.) operating magnet  $\pm 0.003$ -inch. With CR115X2 (1 5/16-inch dia.) operating magnet  $\pm 0.007$ -inch.
- Operating Differential: (Path of operating magnet fixed at an angle to switch.) With CR115X20 (5/8-inch dia.) operating magnet 3/8-inch maximum. With CR115X2 (1 5/16-inch dia.) operating magnet 1-inch maximum.

##### CR115A19; CR115A24

- Response Time: 1 millisecond.
- Repetitive Accuracy: (Path of operating magnet fixed at an angle to switch.) With CR115X20 (5/8-inch dia.) operating magnet  $\pm 0.003$ -inch. With CR115X2 (1 5/16-inch dia.) operating magnet  $\pm 0.007$ -inch.
- Operating Differential: (Path of operating magnet fixed at an angle to switch.) With CR115X20 (5/8-inch dia.) operating magnet 3/8-inch maximum. With CR115X2 (1 5/16-inch dia.) operating magnet 5/8-inch maximum.



CR115A Magnet-Operated Limit switch (end hub form)



CR115X20 Magnet



CR115X2 Magnet



CR115A Magnet-Operated Limit Switch (back hub form)

#### Product Number Selection Instructions

1. For CR115A, order by complete Product Number both for switch and magnet.  
Example: CR115A19 at **\$165.00, GO-10G6** and CR115X20 at **\$73.00, GO-10G6**.

#### Reference Publications

Instructions	
Product Number CR115	Publication Number
A19	GEH-2445
A22, A23, A62, A72	GEH-5157





# Specialty Control Devices

## Limit Switches

### CR115A

#### Magnet-Operated Limit Switches

#### CR115A Magnet-Operated<sup>1</sup> Forms

Contact Configuration	Hub Location	Lead Length	Product Number	List Price GO-10G6
1 NO	Back	3 ft.	CR115A19 <sup>2</sup>	\$165.00
1 NO	End	3 ft.	CR115A24 <sup>2</sup>	\$165.00
SPDT	Back	3 ft.	CR115A23 <sup>2</sup>	\$178.00
SPDT	End	3 ft.	CR115A22 <sup>2</sup>	\$178.00
1 NO	Back	12 ft.	CR115A19AC	\$180.00
1 NO	End	12 ft.	CR115A24AC	\$180.00
SPDT	Back	12 ft.	CR115A23AC	\$198.00
SPDT	End	12 ft.	CR115A22AC	\$198.00

<sup>1</sup>Select magnet from Operating Magnet Table (Permanent Type).

<sup>2</sup>UL listed for Types 3, 3R, 4, 4X, 12, and 13 locations; and for Division 2 Types 7 and 9 hazardous locations.

#### CR115A Magnet-Operated<sup>1</sup> Four-Prong Plug-In

Contact Configuration	Hub Location	Lead Length	Product Number	List Price GO-10G6
1 NO	Back	3 ft. S.O. cable	CR115A59 <sup>3</sup>	\$270.00
1 NO	End	3 ft. S.O. cable	CR115A61 <sup>3</sup>	\$270.00
SPDT	Back	3 ft. S.O. cable	CR115A62 <sup>3</sup>	\$283.00

<sup>1</sup>Select magnet from Operating Magnet Table (Permanent Type).

<sup>3</sup>Switch leads have a male connector for use with female receptacles such as: CAM-LOK E2004-504 (with 3/4-inch pipe thread), E2004-505 (with 1/2-inch pipe thread) or equivalent.

#### CR115A Operating Magnets (Permanent Type)

Operating Distance <sup>7</sup> 1 NO Form	Operating Distance <sup>7</sup> 1 NO - 1 NC Form	Product Number	List Price GO-10G6
1 1/2" - 2"	1" - 1 1/2"	CR115X20	\$73.00
3" - 4 1/8"	2 3/4" - 3 1/4"	CR115X2	\$112.00
1" - 1 1/2"	1/2" - 1 1/2"	CR115X27 <sup>8</sup>	\$83.00

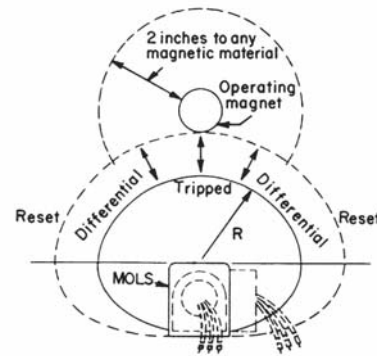
<sup>7</sup>From centerline of magnet to top of switch.

<sup>8</sup>Surface-to-surface.

#### CR115A Technical Information (Magnet-Operated Forms)

Product Number	AC Make @ 115 V	AC Make @ 230 V	AC Carry and Break 115V	AC Carry and Break 230V	AC Carry and Break Other V	DC With Arc Suppression
CR115A	0.75A	0.27A	0.20A	0.07A	15 VA max./1A max.	15 VA max./1A max.

Note: SPDT forms may exhibit false operation or damage if exposed to shock levels above 50g or vibration above 10g.



Operating Magnet	Trip Radius
CR115X20	R = 1.5
CR115X2	R = 3.5

RESPONSE TIME: 0.003 to 0.01 seconds.  
 REPETITIVE ACCURACY: (Magnet in radial path)  
 ± 0.004 with CR115X27 magnet  
 ± 0.006 with CR115X20 magnet  
 ± 0.011 with CR115X2 magnet

#### Notes: Operating Characteristics (See Drawing Above)

Magnet and switch must be parallel during operation. Center of magnet must pass over center of switch. Moving magnet directly across switch will give accurate sensing, but for best result, use angled approach with return in same path.

Most favorable operating characteristics are obtained with radial path of magnet movement.

Magnet actuates switch when it crosses inner diameter of differential band going towards switch. Switch remains in operating state until magnet passes outer diameter of its differential band going away from switch.



Publications and Reference: See Section 17 for a complete list of additional product-related publications

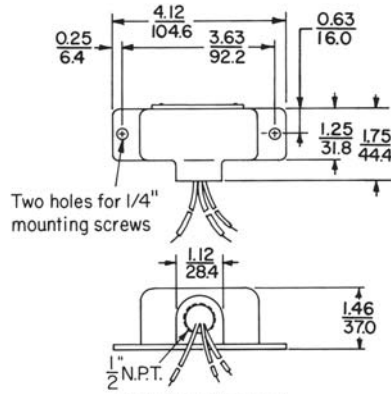
# Specialty Control Devices Limit Switches

# Section 11

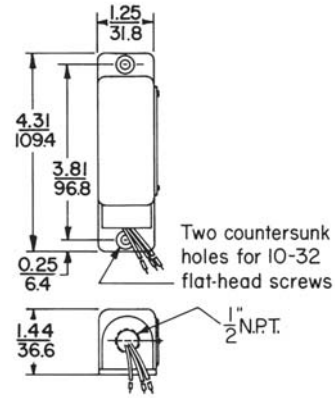
## CR115A

Magnetic-Operated Limit Switches

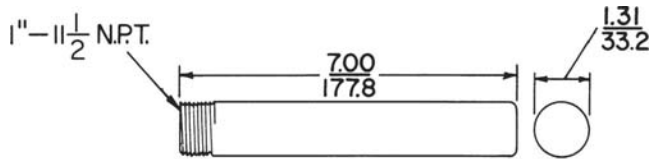
Outlines and Dimensions ( $\frac{in}{mm}$ ) For Estimating Only



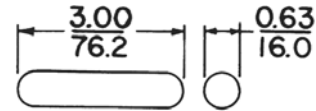
Switch with Hub on Back—Approx. shipping wt., 10 oz.



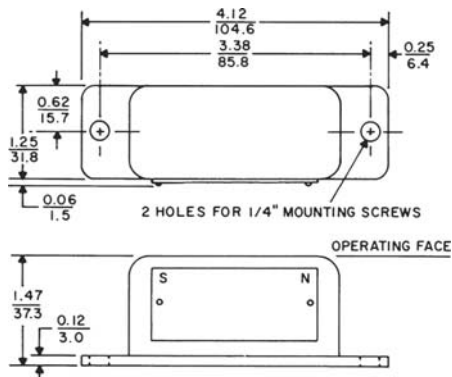
Switch with Hub on End—Approx. shipping wt., 10 oz.



CR115X2 Operating Magnet—Approx. shipping wt., 1 lb.



CR115X20 Operating Magnet—Approx. shipping wt., 4 oz.



CR115X27 Operating Magnet—Approx. shipping wt., 6 oz.



Product Number Selection Instructions: See Page 11-16

# Specialty Control Devices

## Limit Switches

### CR115E

Geared Rotary Limit Switches  
15 Amperes Continuous  
AC/DC

#### Application

GE's CR115E geared rotary limit switch provides limit control on rotating-drive equipment. This worm and gear-reduction limit switch may be used in conjunction with motors to open and close overhead doors, to operate cable on cranes and hoists, limit the number of turns on thread-tapping equipment, and on other machine tool applications that require rotating-drive shaft control.

Switches are provided in NEMA Type 1, 4, 7, and 9 enclosures for adapting to specific environmental conditions. Forms having long-dwell cams may be ordered by description. Forms with various contact arrangements of snap-acting switches are listed.

#### Features

- Long-life: switch equipped with rugged bearings and shaft extension on either or both sides.
- Flexible operation: gear ratios from 20:1 to 1280:1.
- Rapid reset: requires fewer turns to reset.
- Easy adjustment: trip points or operating cams can be quickly and easily adjusted independently with standard screwdriver.
- Versatility control: available with up to four precision snap-acting switches; each will control an independent function.
- Maximum input speed: 3600 RPM.

#### Product Number Selection Instructions

1. Order limit switch by complete Product Number from pricing information table.
2. Select shaft extension (by type of shaft end and desired side) and substitute suffix number in place of \*\* in switch Product Number.  
Example: A NEMA Type 1 enclosed switch with 4 NO-4 NC snap-acting contacts, a 320:1 cam ratio, and a standard plain-end shaft extension on the left side is desired.
3. Order: CR115E146111 at **\$636.00, GO-10G6**.

#### Reference Publications

Instructions

GEH-2458



CR115E geared rotary limit switch



# Specialty Control Devices

## Limit Switches

# Section 11

## CR15E

### Geared Rotary Limit Switches

#### Snap-Acting Forms (0.020 in. contact gap) (INO-INC per switch unit)

Nominal Input Shaft to Cam Ratio	Max. Number of Turns of Input Shaft to Trip Switch <sup>1</sup>	Min. Number of Turns of Input Shaft to Trip Switch	Overtravel Number of Turns of Input Shaft to Trip Switch <sup>1</sup>	Number of Turns of Input Shaft to Reset Switch	Contact Configuration	Pipe Tap Size (NPT)	Enclosure Type	Product Number	List Price <sup>2</sup> GO-10G6
20:1	19 (16 1/2)	1	1/2 (3)	1/3	2 NO-2 NC	3/4	NEMA Type 1	CR115E1211**	\$231.00
20:1	19 (16 1/2)	1	1/2 (3)	1/3	4 NO-4 NC	1	NEMA Type 1	CR115E1411**	\$435.00
40:1	38 (33)	2	1 (6)	2/3	2 NO-2 NC	3/4	NEMA Type 1	CR115E1221**	\$231.00
40:1	38 (33)	2	1 (6)	2/3	4 NO-4 NC	1	NEMA Type 1	CR115E1421**	\$435.00
80:1	75 (65)	3	2 (12)	1	2 NO-2 NC	3/4	NEMA Type 1	CR115E1231**	\$231.00
80:1	75 (65)	3	2 (12)	1	4 NO-4 NC	1	NEMA Type 1	CR115E1431**	\$435.00
111:1	104 (90)	1	3 1/4 (17 1/4)	1/3	2 NO-2 NC	3/4	NEMA Type 1	CR115E1241**	\$231.00
111:1	104 (90)	1	3 1/4 (17 1/4)	1/3	4 NO-4 NC	1	NEMA Type 1	CR115E1441**	\$435.00
222:1	208 (180)	2	6 1/2 (34 1/2)	2/3	2 NO-2 NC	3/4	NEMA Type 1	CR115E1251**	\$432.00
222:1	208 (180)	2	6 1/2 (34 1/2)	2/3	4 NO-4 NC	1	NEMA Type 1	CR115E1451**	\$636.00
320:1	300 (260)	1	10 (50)	1/3	2 NO-2 NC	3/4	NEMA Type 1	CR115E1261**	\$432.00
320:1	300 (260)	1	10 (50)	1/3	4 NO-4 NC	1	NEMA Type 1	CR115E1461**	\$636.00
445:1	415 (360)	3	13 (68)	1	2 NO-2 NC	3/4	NEMA Type 1	CR115E1271**	\$432.00
445:1	415 (360)	3	13 (68)	1	4 NO-4 NC	1	NEMA Type 1	CR115E1471**	\$636.00
640:1	600 (520)	2	20 (100)	2/3	2 NO-2 NC	3/4	NEMA Type 1	CR115E1281**	\$432.00
640:1	600 (520)	2	20 (100)	2/3	4 NO-4 NC	1	NEMA Type 1	CR115E1481**	\$636.00
1280:1	1200 (1040)	3	40 (200)	1	2 NO-2 NC	3/4	NEMA Type 1	CR115E1291**	\$450.00
1280:1	1200 (1040)	3	40 (200)	1	4 NO-4 NC	1	NEMA Type 1	CR115E1491**	\$654.00
20:1	19 (16 1/2)	1	1/2 (3)	1/3	2 NO-2 NC	3/4	NEMA Type 4	CR115E4211**	\$261.00
20:1	19 (16 1/2)	1	1/2 (3)	1/3	4 NO-4 NC	1	NEMA Type 4	CR115E4411**	\$465.00
40:1	38 (33)	2	1 (6)	2/3	2 NO-2 NC	3/4	NEMA Type 4	CR115E4221**	\$261.00
40:1	38 (33)	2	1 (6)	2/3	4 NO-4 NC	1	NEMA Type 4	CR115E4421**	\$465.00
80:1	75 (65)	3	2 (12)	1	2 NO-2 NC	3/4	NEMA Type 4	CR115E4231**	\$261.00
80:1	75 (65)	3	2 (12)	1	4 NO-4 NC	1	NEMA Type 4	CR115E4431**	\$465.00
111:1	104 (90)	1	3 1/4 (17 1/4)	1/3	2 NO-2 NC	3/4	NEMA Type 4	CR115E4241**	\$261.00
111:1	104 (90)	1	3 1/4 (17 1/4)	1/3	4 NO-4 NC	1	NEMA Type 4	CR115E4441**	\$465.00
222:1	208 (180)	2	6 1/2 (34 1/2)	2/3	2 NO-2 NC	3/4	NEMA Type 4	CR115E4251**	\$462.00
222:1	208 (180)	2	6 1/2 (34 1/2)	2/3	4 NO-4 NC	1	NEMA Type 4	CR115E4451**	\$666.00
320:1	300 (260)	1	10 (50)	1/3	2 NO-2 NC	3/4	NEMA Type 4	CR115E4261**	\$462.00
320:1	300 (260)	1	10 (50)	1/3	4 NO-4 NC	1	NEMA Type 4	CR115E4461**	\$666.00
445:1	415 (360)	3	13 (68)	1	2 NO-2 NC	3/4	NEMA Type 4	CR115E4271**	\$462.00
445:1	415 (360)	3	13 (68)	1	4 NO-4 NC	1	NEMA Type 4	CR115E4471**	\$666.00
640:1	600 (520)	2	20 (100)	2/3	2 NO-2 NC	3/4	NEMA Type 4	CR115E4281**	\$462.00
640:1	600 (520)	2	20 (100)	2/3	4 NO-4 NC	1	NEMA Type 4	CR115E4481**	\$666.00
1280:1	1200 (1040)	3	40 (200)	1	2 NO-2 NC	3/4	NEMA Type 4	CR115E4291**	\$480.00
1280:1	1200 (1040)	3	40 (200)	1	4 NO-4 NC	1	NEMA Type 4	CR115E4491**	\$684.00
20:1	19 (16 1/2)	1	1/2 (3)	1/3	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7211**	\$630.00
20:1	19 (16 1/2)	1	1/2 (3)	1/3	4 NO-4 NC	1	NEMA Type 7-9	CR115E7411**	\$834.00
40:1	38 (33)	2	1 (6)	2/3	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7221**	\$630.00
40:1	38 (33)	2	1 (6)	2/3	4 NO-4 NC	1	NEMA Type 7-9	CR115E7421**	\$834.00
80:1	75 (65)	3	2 (12)	1	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7231**	\$630.00
80:1	75 (65)	3	2 (12)	1	4 NO-4 NC	1	NEMA Type 7-9	CR115E7431**	\$834.00
111:1	104 (90)	1	3 1/4 (17 1/4)	1/3	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7241**	\$630.00
111:1	104 (90)	1	3 1/4 (17 1/4)	1/3	4 NO-4 NC	1	NEMA Type 7-9	CR115E7441**	\$834.00
222:1	208 (180)	2	6 1/2 (34 1/2)	2/3	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7251**	\$828.00
222:1	208 (180)	2	6 1/2 (34 1/2)	2/3	4 NO-4 NC	1	NEMA Type 7-9	CR115E7451**	\$1032.00
320:1	300 (260)	1	10 (50)	1/3	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7261**	\$828.00
320:1	300 (260)	1	10 (50)	1/3	4 NO-4 NC	1	NEMA Type 7-9	CR115E7461**	\$1032.00
445:1	415 (360)	3	13 (68)	1	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7271**	\$828.00
445:1	415 (360)	3	13 (68)	1	4 NO-4 NC	1	NEMA Type 7-9	CR115E7471**	\$1032.00
640:1	600 (520)	2	20 (100)	2/3	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7281**	\$828.00
640:1	600 (520)	2	20 (100)	2/3	4 NO-4 NC	1	NEMA Type 7-9	CR115E7481**	\$1032.00
1280:1	1200 (1040)	3	40 (200)	1	2 NO-2 NC	3/4	NEMA Type 7-9	CR115E7291**	\$846.00
1280:1	1200 (1040)	3	40 (200)	1	4 NO-4 NC	1	NEMA Type 7-9	CR115E7491**	\$1050.00

Note: Insert number from Shaft Extension Type Table where \*\* appears to complete product number.

<sup>1</sup>Figures shown in parentheses are for long-dwell (45°) cam forms. Order by description. No price addition for long-dwell cam. Contact nearest GE Consumer & Industrial Representative for prices and data for 180° cam forms.

<sup>2</sup>Prices shown are for shaft extension on one side only. Add \$6.00, GO-10G6 for forms with shaft extensions on both sides.

#### Shaft Extension Type

Description (Type or Shaft End)	Shaft Extension On		
	Right Side	Left Side	Both Sides <sup>3</sup>
Standard Plain-End Shaft	01	11	21 <sup>3</sup>
Woodruff Key-Type End Shaft (No. 3 Woodruff key is provided)	02	12	22 <sup>3</sup>

<sup>3</sup>Prices shown in pricing information table are for shaft extension on one side only. Add \$6.00, GO-10G6 for forms with shaft extensions on both sides.



Product Number Selection Instructions: See Page 11-19  
Enclosure Descriptions: See pages 13-2 to 13-3

# Specialty Control Devices

## Limit Switches

### CR115E

#### Geared Rotary Limit Switches

#### Contact Ratings<sup>1</sup>

Alternating Current  
Carry Continuous—15 Ampere

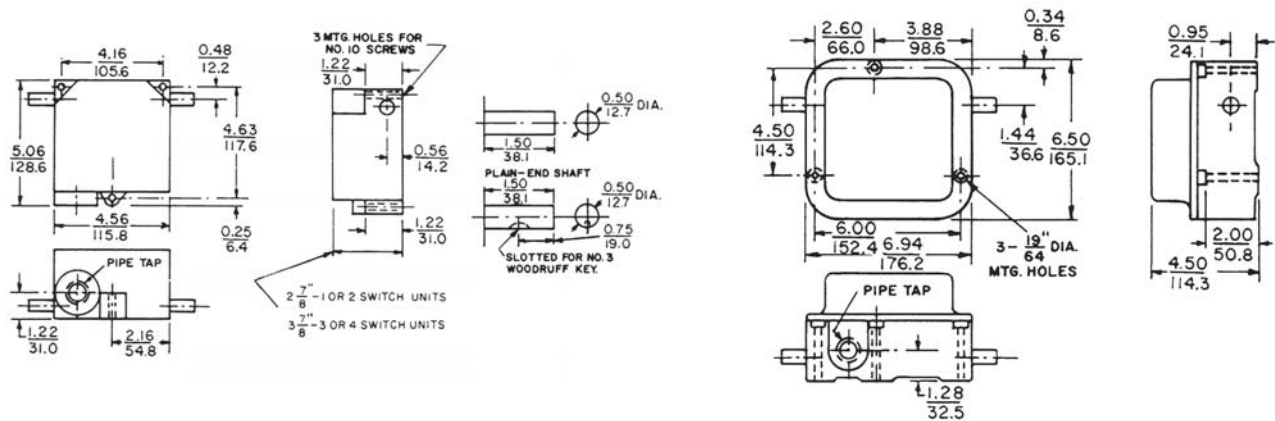
Volts	Make	Break
115	40 amp	15 amp
230	20 amp	10 amp
460	10 amp	6 amp
575	8 amp	5 amp

Direct Current  
(SPDT Snap-Acting Forms)

Volts	Break
120	0.25 amp
240	0.10 amp
600	—

<sup>1</sup>Double-throw circuits must be same polarity.

#### Outlines and Dimensions ( $\frac{\text{in.}}{\text{mm}}$ ) For Estimating Only



NEMA Type 1 and 4—Approx. shipping wt., 5 lbs.

NEMA Type 7—Approx. shipping wt., 19 lbs.



Publications and Reference: See Section 17 for a complete list of additional product-related publications

# Specialty Control Devices

## Limit Switches

### CR115B

Precision Snap-Acting Limit Switches  
15 Amperes Continuous  
AC/DC

#### Application

Designed for rugged industrial use in a small space and where highly repetitive operation is desired. These highly accurate switches require only a small amount of plunger travel to actuate.

One- and two-pole forms are available.

The basic switch is equipped with a button-type operator. Plunger-type forms are available for mounting behind the panel with only the button protruding. Roller lever forms are available for applications requiring a transfer of the axis of motion or for detection of objects passing the switch.

Typical applications include controlling solenoids, opening and closing valves, and controlling small horsepower motors.

#### Features

- Wear-resistant nylon button: retains perfect alignment with operating parts.
- Rugged molded enclosure: resists arc-over and shock.
- Operating head: available in button-, plunger-, and roller-lever types; plunger operator also available as accessory kit.

#### Contact Ratings-AC

##### Single-Pole Forms

Volts	Alternating Current	
	Make	Break
115	40 amp	15 amp
230	20 amp	10 amp
460	10 amp	6 amp
575	8 amp	5 amp

##### Double-Pole Forms

Volts	Alternating Current	
	Make	Break
0-115	30 amp	3 amp
116-600	3450 Va	345 Va

SPST forms are suitable for control of 1/2-hp motors at 115/230 Volt ac.

Double-pole forms are suitable for 10 amperes continuous maximum ac. Single-pole forms—15 amperes maximum ac.

#### Contact Ratings-DC

##### Forms with 0.02-inch gap

Volts	Direct Current—Break Ratings	
	SPDT Forms	SPST Forms
120	0.25 amp	0.50 amp
240	0.10 amp	0.25 amp
600	—	0.05 amp

##### Forms with 0.04-inch gap

Volts	Direct Current—Break Ratings	
	SPDT Forms	SPST Forms
120	0.50 amp	2.0 amp
240	0.20 amp	0.5 amp
600	0.02 amp	0.1 amp

##### Double-Pole Forms

Volts	Direct Current—Break Ratings	
	SPDT Forms	SPST Forms
120	0.2 amp	1.0 amp
240	0.1 amp	0.3 amp
600	—	0.1 amp



CR115B2 Basic Switch



CR115B201 Roller Lever Form



CR115B202 Plunger Type



# Specialty Control Devices

## Limit Switches

### CR115B

#### Precision Snap-Acting Limit Switches

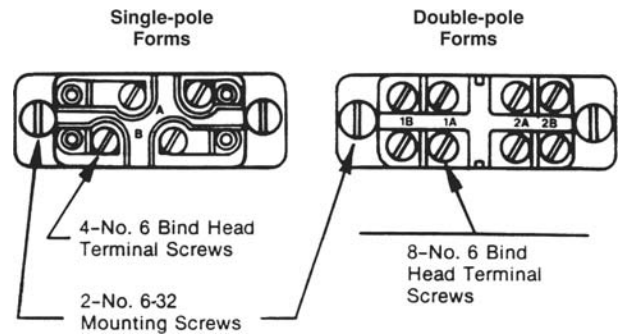
#### CR115B Snap-Acting Limit Switches

Product Form	Contact Configuration	Product Number	List Price GO-10G6
Basic	SPDT (1 NO-1 NC)	CR115B1 <sup>1</sup>	\$18.00
Basic	SPDT (1 NO-1 NC)	CR115B2 <sup>2</sup>	\$18.00
Roller Lever	SPDT (1 NO-1 NC)	CR115B201 <sup>2</sup>	\$30.00
Plunger	SPDT (1 NO-1 NC)	CR115B202 <sup>2</sup>	\$41.00
Basic	DPDT (2 NO-2 NC)	CR115B4 <sup>3</sup>	\$36.00
Roller Lever	DPDT (2 NO-2 NC)	CR115B401 <sup>3</sup>	\$48.00
Plunger	DPDT (2 NO-2 NC)	CR115B402 <sup>3</sup>	\$59.00

<sup>1</sup>Forms with 0.020-inch Contact Gap. Double throw circuits must be same polarity.  
<sup>2</sup>Forms with 0.040-inch Contact Gap. Double throw circuits must be same polarity.  
<sup>3</sup>Double-Pole Forms. Circuits 1A and 1B are electrically isolated from circuits 2A and 2B. Connections to 1A and 1B or to 2A and 2B must be same polarity.

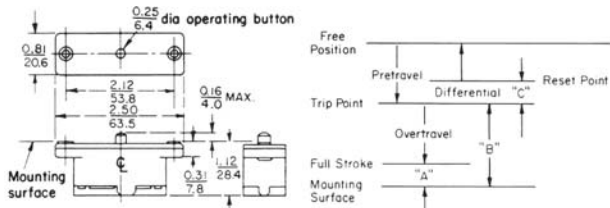
#### Plunger Accessory Kit

Application	Product Number	List Price GO-10G6
Use with basic switch of double-pole forms and 0.040-inch gap forms to make plunger-type switch.	CR115X3	\$22.50

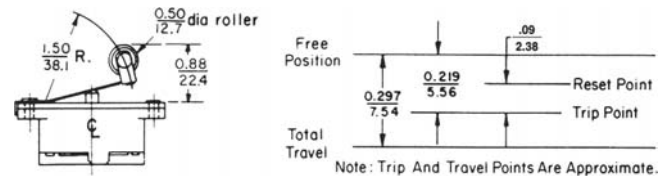


Terminal Connections

#### Outlines and Dimensions (in/mm) For Estimating Only



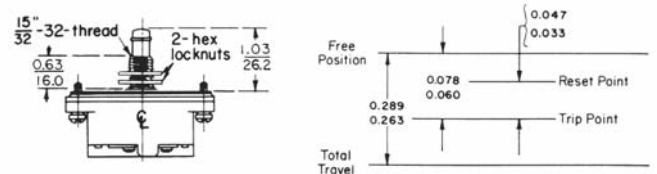
Basic Switch—Approx. shipping wt., 2 oz.



Roller Lever Type Switch—Approx. shipping wt., 2 oz.

#### Basic Switch Dimensions

Form	A	B	C	Trip Force (oz.)
.020-inch gap	.037	.079	.025	7-11
.040-inch gap	.037	.079	.047	10-14
Double-pole	.040	.088	.046	10-14
	.014	.058	.025	



Plunger Type Switch—Approx. shipping wt., 2 oz.



Publications and Reference: See Section 17 for a complete list of additional product-related publications

