Hand-Held Pendant Stations/ Handwheels

More than safety.

EUCHNER

More than safety.

Emil Euchner, the company's founder and inventor of the multiple limit switch, circa 1928.

Around the world – the Swabian specialists in motion sequence control for mechanical and systems engineering.

EUCHNER's history began in 1940 with the establishment of an engineering office by Emil Euchner. Since that time, EUCHNER has been involved in the design and development of switchgear for controlling a wide variety of motion sequences in mechanical and systems engineering. In 1953, Emil Euchner founded EUCHNER + Co., a milestone in the company's history. In 1952, he developed the first multiple limit switch – to this day a symbol of the enterprising spirit of this family-owned company.

Automation – Safety – ManMachine

Today, our products range from electromechanical and electronic components to complex system solutions. With this wide range of products we can provide the necessary technologies to offer the right solution for special requirements – regardless of whether these relate to reliable and precise positioning or to components and systems for safety engineering in the automation sector.
EUCHNER products are sold through a world-wide sales network of competent partners. With our closeness to the customer and the guarantee of reliable solutions throughout the globe, we enjoy the confidence of customers all over the world.

Quality, reliability, precision

Quality, reliability and precision are the hallmarks of our corporate philosophy. They represent concepts and values to which we feel totally committed.
At EUCHNER, quality means that all our employees take personal responsibility for the company as a whole and, in particular, for their own field of work. This individual commitment to perfection results in products which are ideally tailored to the customers' needs and the requirements of the market. After all: our customers and their needs are the focus of all our efforts. Through efficient and effective use of resources, the promotion of personal initiative and courage in finding unusual solutions to the benefit of our customers, we ensure a high level of customer satisfaction. We familiarize ourselves with their needs, requirements and products and we learn from the experiences of our customers' own customers.

EUCHNER – More than safety.

Quality – made by EUCHNER

Contents

Hand-Held Pendant Stations/Handwheels

About this catalog

The *Hand-held Pendant Stations/ Handwheels* catalog provides you with an overview of our HBA and HBL series hand-held pendant stations as well as of our series HK and HW handwheels.

Due to their precision, their ergonomic design and their robustness, these switches are the right choice for numerous applications. You will find the technical data after the product overview.

You will find the following series and accessories in this catalog:

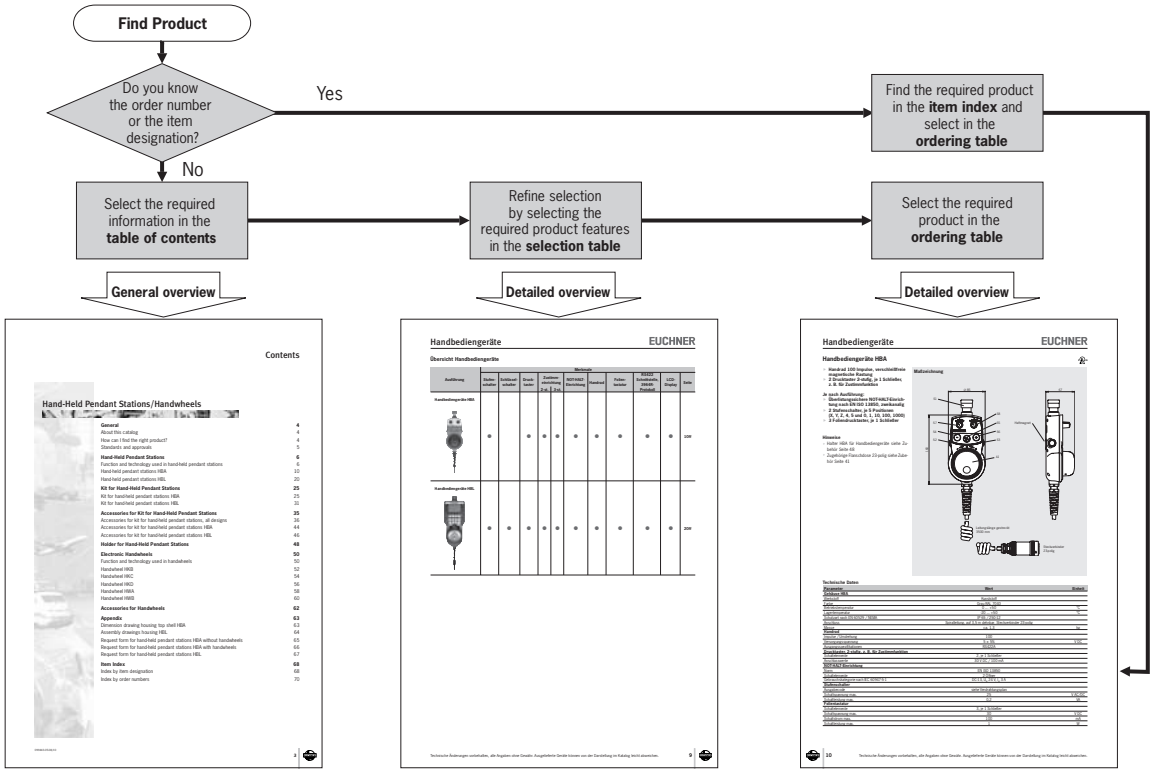
Hand-Held Pendant Stations / Handwheels

Hand-Held Pendant Stations					Handwheels					
Complete Devices		Kit	Acces-sories	Holder	Handwheels with Magnetic Detent Mechanism			Handwheels with Mechanical Detent Mechanism		Acces-sories
HBA	HBL				HKB	HKC	HKD	HWA	HWB	
										
see page 10	see page 20	see page 25	see page 35	see page 48	see page 52	see page 54	see page 56	see page 58	see page 60	see page 62

How can I find the right product?

There are two ways you can find the right product:

1. If you know the order number or the item designation, look for the product directly in the item index (see page 68 or page 70).
2. If you have specific requirements, refine the selection step-by-step with the aid of the table of contents and the selection tables.



Standards and approvals

Standards

Hand-held pendant stations must comply with the requirements of the EMC directive 2004/108/EEC. The EMC directive has been implemented in national law in the EU member states and, as a result, is binding for all manufacturers. Detailed requirements on EMC are defined in EN 61000 (Electromagnetic compatibility (EMC)) part 6-2 and 6-4. If the requirements of this standard are met, conformity with the applicable laws and therefore with the EMC directive is assumed. EUCHNER hand-held pendant stations comply with the relevant standards and therefore help you to comply with the requirements during the design of your machinery.

Approvals

Many of the hand-held pendant stations given in this catalog are listed by Underwriters Laboratories (UL). The approval symbols on the individual pages of the catalog indicate which devices are approved.
This is the UL approval symbol:

c UL us LISTED	Products with this symbol are approved by Underwriters Laboratories (UL, Canada and USA)

Function and technology used in hand-held pendant stations

The most important machine functions can be monitored, e.g. axis selection and axis movement can be controlled decentrally using hand-held pendant stations. The freedom of movement of the machine operator is increased and the operator can monitor and control processes without being tied to a fixed control panel.
In addition to the control function, hand-held pendant stations can also have a safety function. For this purpose the hand-held pendant stations are equipped with emergency stop buttons and enabling switches.

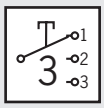
Hand-held pendant stations with enabling function

Hand-held pendant stations with enabling function are essentially similar to classic enabling switches.
Enabling switches are manually operated control devices that, together with other control switches, enable commands related to potentially hazardous conditions to be run, as long as the enabling switches are actuated continuously. These switches are used wherever personnel must work directly in the danger area on machines and systems. This is necessary, e. g. during setting up, programming, testing or servicing work. As per annex 1 of the Machinery directive, the protective action of movable safety guards can be disabled in these operating modes. The Machinery directive places the condition that these operating modes must be secured using a lockable device (e. g. key-operated switch) and machine operation is only allowed to be triggered by a second, separate action. To enable the operator in the danger area of a machine to trigger a machine movement, an enabling device should also be actuated.
The operator must also be able to stop the machine movement using the enabling device. This task is performed by the enabling switch. Every person who is in the hazardous area must carry an enabling device so that suitable action can be taken in case of danger.

Two-stage pushbutton or three-stage enabling switch?

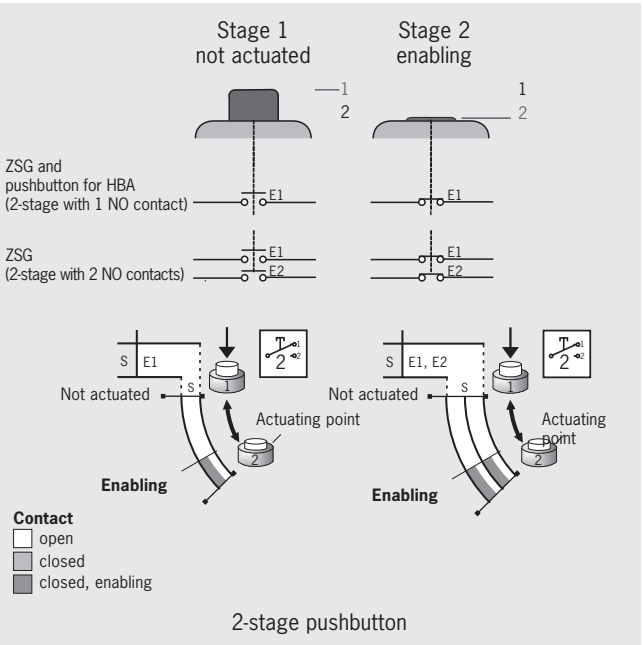
The operator can only start a machine movement if he/she actuates the enabling device and keeps it in the actuated position. The movement is stopped again when the switch is released. This two-stage function (OFF-ON) is provided by all pushbuttons and all three-stage enabling switches. However, experience shows that the operator often clenches the enabling device in an emergency.
In this case a three-stage enabling switch is better and is specifically requested in many C standards. This switch has three switch positions (OFF-ON-OFF) and, if the operator clenches the switch, it is actuated beyond the enabling position (middle position) and the machine is shut down as a result.
If a 2-stage pushbutton is used, it must also be ensured that, in an emergency, the operator is in a position to activate an emergency stop device in close proximity (VDI 2853). To identify the type of enabling device in the catalog, the following symbols are used:

Symbol for
a 2-stage push button



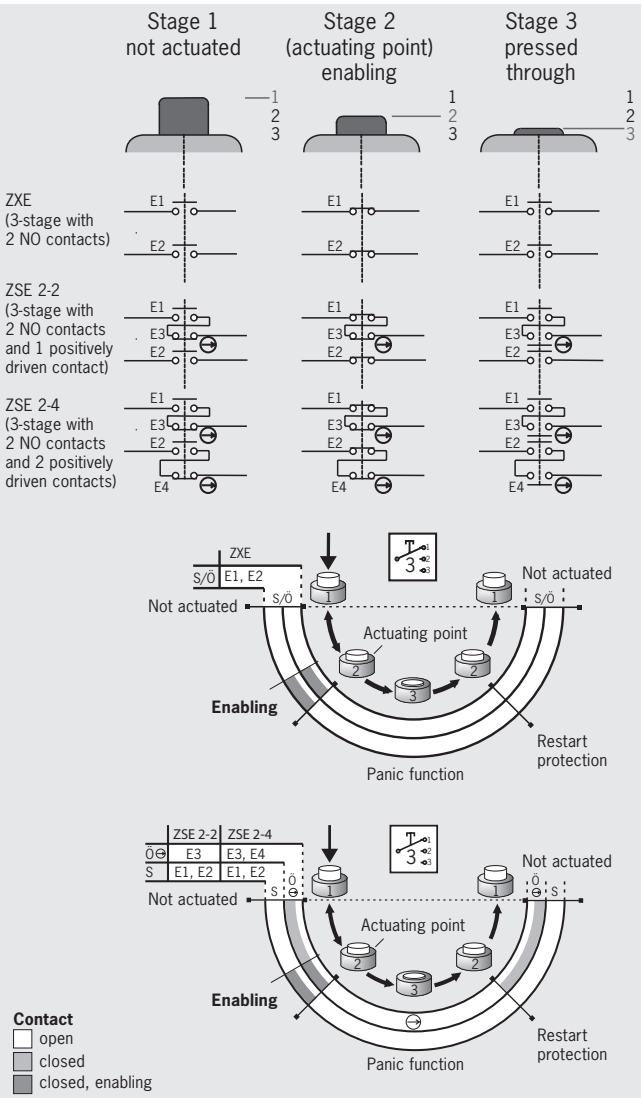
Symbol for
a 3-stage enabling switch

Function sequence for two-stage pushbutton



2-stage pushbutton

Function sequence for three-stage enabling switch



3-stage enabling switch

As can be clearly seen in the figure, the enabling function can only be achieved at stage 2. This function is provided by the closing of the normally open contacts (NO = E1 and E2).
If the button is released, that is back from stage 2 to stage 1, the normally open contacts are opened again. The 2-stage pushbuttons and the 3-stage enabling switches are identical in this function.
If, in this example, the button on a 3-stage enabling switch is pressed past the actuating point (stage 2) in panic (to stage 3), then not only the normally open contacts (NO) are reset, but at the series ZSE also the safe positively driven contacts (NC ⊖) are opened additionally.
The patented switch system ensures that the enabling function does not become active at stage 2 on the resetting of the pushbutton from stage 3 to stage 1. In this example the enable can only be given if normally open and normally closed contacts are closed at the same time. This situation is only possible on actuation from stage 1 to stage 2. In the other direction, from stage 3 to stage 1, stage 2 is skipped and unintentional restarting prevented.
Once the pushbutton has reached stage 1, the function sequence can be started again.
Due to its design, the switch unit also provides a wear-free, constant actuating point (stage 2).

Ergonomic housing

To make the operation of machines even easier and safer for the user, EUCHNER is the first manufacturer of hand-held pendant stations to have designed the housing taking into account ergonomic aspects. This means the HBL and HBA housings have been developed such that they fit optimally in the hand. Well-known manufacturers of machine tools and controllers all over the world are already using EUCHNER hand-held pendant stations. The wide product range extends from standard housings to custom-built hand-held pendant stations, e.g. with LCD displays, membrane keypads and serial communication ports.

Design prize for hand-held pendant station HBA

Custom hand-held pendant stations

Customized hand-held pendant stations based on the standard devices can also be produced in small quantities. In order to use these ergonomically designed housings for the various requirements, EUCHNER offers the option of customized solutions. In the Appendix you will find forms which can be used to describe your requirements. We will be pleased to draw up a quotation based on your requirements.

Kits for hand-held pendant stations

To enable you to use ergonomically designed housings even for small quantities, e. g. prototypes or special versions, EUCHNER provides kits for hand-held pendant stations. As a result, you can assemble a hand-held pendant station in a user-friendly housing to suit your requirements.

Explanation of symbols and notation

Symbols and specific notation related to the switches or the contact element are used time and again in the catalog.

The following example is intended to explain these aspects:

- *Notation 1 NC ⊖ + 1 NO*

Explanation:
Normally closed contacts are termed *NC*, normally open contacts *NO*. The number indicates how many contacts are available. The symbol ⊖ after the *NC* defines that the NC contact is a positively driven contact. This switch therefore has one NC contact and one NO contact; the NC contact is a positively driven contact.

Overview of hand-held pendant stations

Version	Features										
	Selector switch	Key-operated switch	Push-button	Enabling device 2-st.	Enabling device 3-st.	EMERGENCY STOP device	Hand-wheel	Membrane keypad	RS422 interface, 3964R protocol	LCD display	Page
Hand-held pendant stations HBA 	●		●	●	●	●	●	●	●	●	10ff
Hand-held pendant stations HBL 	●	●	●	●	●	●	●	●	●	●	20ff

Hand-held pendant stations HBA

- **Handwheel 100 pulses, wear-free magnetic detent**
- **2 pushbuttons, 2-stage, 1 NO contact each, e.g. for enabling function**

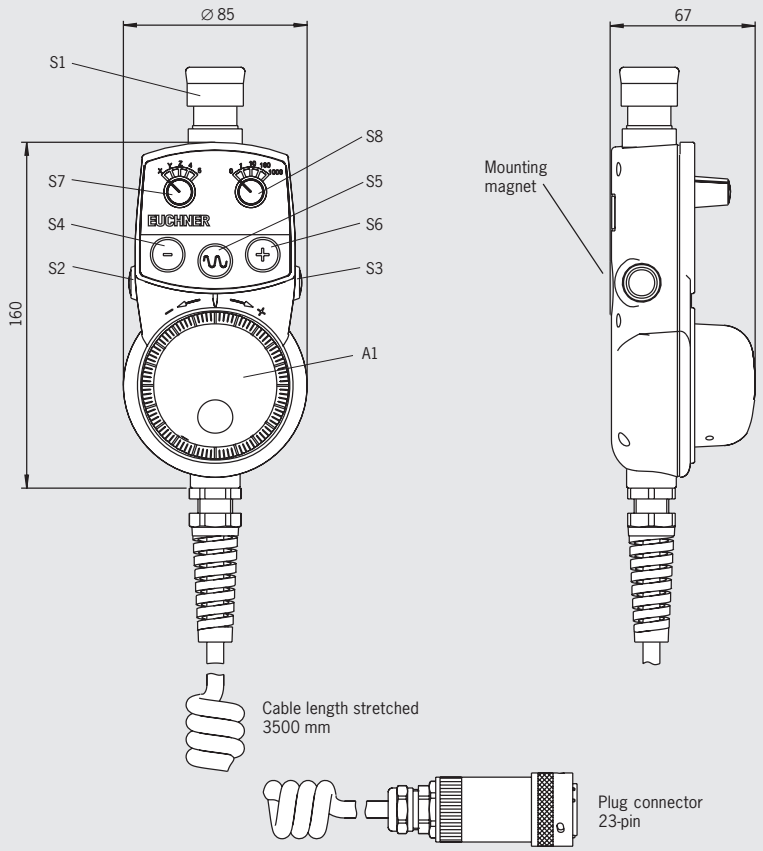
Depending on version:

- **Tamper-proof EMERGENCY STOP device according to EN ISO 13850, dual-channel**
- **2 selector switches, 5 positions each (X, Y, Z, 4, 5 and 0, 1, 10, 100, 1000)**
- **3 membrane pushbuttons, 1 NO contact each**

Notes

- For holder HBA for hand-held pendant stations, see Accessories page 48
- For related 23-pin flange socket, see Accessories page 41

Dimension drawing



Technical data

Parameter	Value	Unit
Housing HBA		
Material	Plastic	
Color	Gray RAL 7040	
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Degree of protection according to EN 60529 / NEMA	IP 65 / 250-12	
Connection	Coiled cable, expandable to 3.5 m, 23-pin plug connector	
Weight	Approx. 1.3	kg
Handwheel		
Pulses / revolution	100	
Power supply	5 ± 5%	V DC
Output specifications	RS422A	
Pushbutton, 2-stage, e.g. for enabling function		
Switching elements	2, 1 NO contact each	
Connection ratings	30 V DC / 100 mA	
EMERGENCY STOP device		
Standard	EN ISO 13850	
Switching elements	2 NC contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 3 A	
Selector switch		
Output code	See wiring diagram	
Switching voltage max.	25	V AC/DC
Switching capacity max.	0.2	VA
Membrane keypad		
Switching elements	3, 1 NO contact each	
Switching voltage max.	30	V DC
Switching current max.	100	mA
Breaking capacity max.	1	W

Ordering table

Version/item	Features					Order No.
	2 selector switches 5 positions each S7, S8	3 membrane pushbuttons 1 NO contact each S4, S5, S6	2 pushbuttons 2-stage S2, S3	EMERGENCY STOP device S1	Handwheel 100 pulses A1	
HBA - 079 828 			●		●	**079 828**
HBA - 079 826 	●		●	●	●	**079 826**
HBA - 072 936 		●	●	●	●	**072 936**
HBA - 079 827 	●	●	●	●	●	**079 827**

Wiring diagram

S8:
Increment selection
Selector switch right
5 positions

S8	DCBA	
1	0000	0
2	0001	1
3	0011	10
4	0010	100
5	0110	1000

S7:
Axle selection
Selector switch left
5 positions

S7	DCBA	
1	0000	X
2	0001	Y
3	0011	Z
4	0010	4
5	0110	5

S4:
Push button left

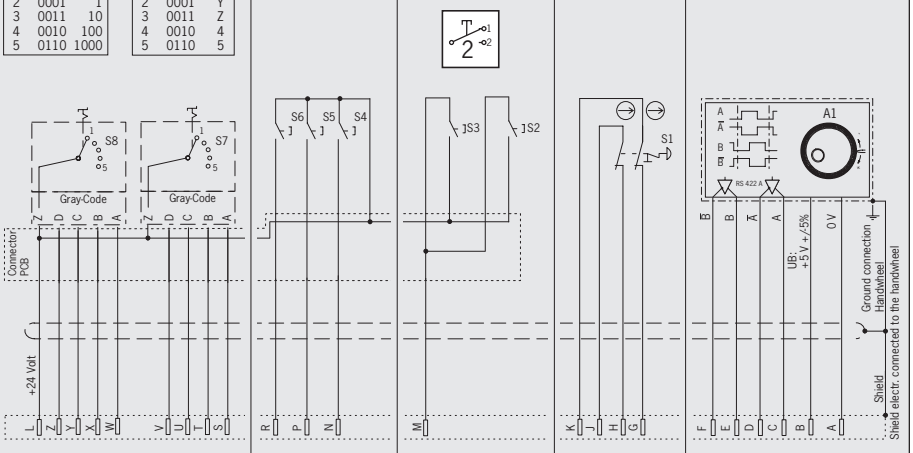
S5:
Push button middle

S6:
Push button right

S2 (left) + S3 (right):
Pushbutton 2-stage
e.g. for
enabling function *

S1:
Emergency Stop

A1:
Handwheel



* Travel diagram
see page 6

Hand-held pendant stations HBA

- **Handwheel 100 pulses, wear-free magnetic detent**
- **1 enabling switches, 3-stage, 2 NO contacts each**

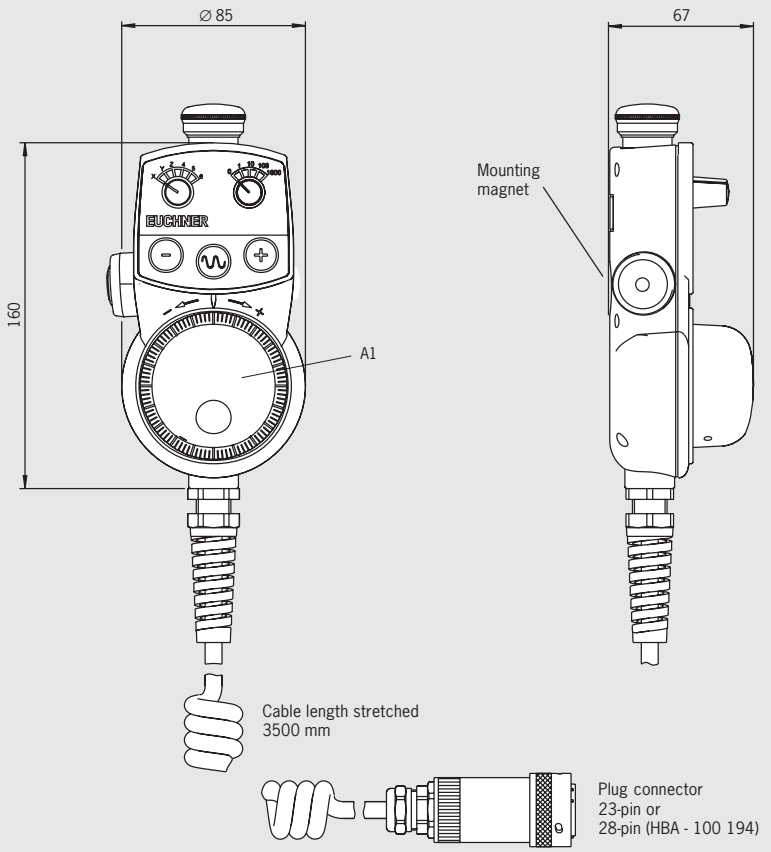
Depending on version:

- **Tamper-proof EMERGENCY STOP device according to EN ISO 13850, dual-channel**
- **1 selector switch with 6 positions (X, Y, Z, 4, 5 6)**
- **1 selector switch with 5 positions (0, 1, 10, 100, 1000)**
- **3 membrane pushbuttons, 1 NO contact each**

Notes

- For holder HBA for hand-held pendant stations, see Accessories page 48
- For related 23-pin flange socket, see Accessories page 41
- For related 28-pin flange socket, see Accessories page 41

Dimension drawing



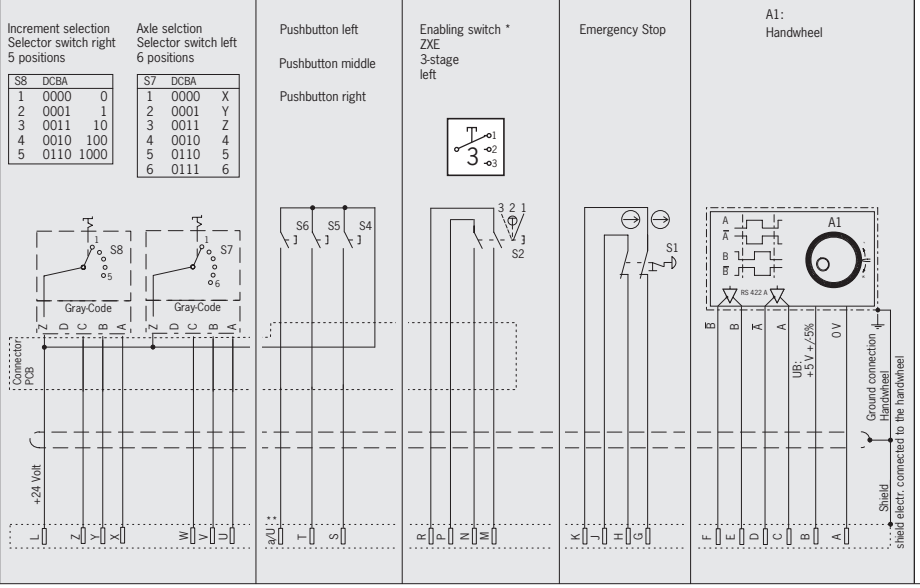
Technical data

Parameter	Value	Unit
Housing HBA		
Material	Plastic	
Color	Gray RAL 7040	
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Degree of protection according to EN 60529 / NEMA	IP 65 / 250-12	
Connection	Coiled cable, expandable to 3.5 m, 23-pin or 28-pin (HBA - 100 194) plug connector	
Weight	Approx. 1.3	kg
Handwheel		
Pulses / revolution	100	
Power supply	5 ± 5%	V DC
Output specifications	RS422A	
Enabling switch ZXE, 3-stage		
Switching elements	2 NO contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 0.1 A	
EMERGENCY STOP device		
Standard	EN ISO 13850	
Switching elements	2 NC contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 3 A	
Selector switch		
Output code	See wiring diagram	
Switching voltage max.	25	V AC/DC
Switching capacity max.	0.2	VA
Membrane keypad		
Switching elements	3, 1 NO contact each	
Switching voltage max.	30	V DC
Switching current max.	100	mA
Breaking capacity max.	1	W

Ordering table

Version/item	Features					Order No.
	2 selector switches 5 and 6 positions	3 membrane pushbuttons 1 NO contact each	1 enabling switch ZXE 3-stage	EMERCENY stop device	Handwheel 100 pulses	
HBA - 100 186 			●		●	**100 186**
HBA - 100 212 	●		●	●	●	**100 212**
HBA - 100 213 		●	●	●	●	**100 213**
HBA - 100 194 	●	●	●	●	●	**100 194**

Wiring diagram



* Travel diagram
see page 6

** Plug contact U at HBA - 100 213
(plug connector 23-pin)
Plug contact a at HBA - 100 194
(plug connector 28-pin)

Hand-held pendant stations HBA

- **Handwheel 100 pulses, wear-free magnetic detent**
- **Tamper-proof EMERGENCY STOP device according to EN ISO 13850, dual-channel**
- **1 selector switch, 6 positions (0, Z, X, Y, 4, 5)**
- **6 membrane pushbuttons, 1 NO contact each**

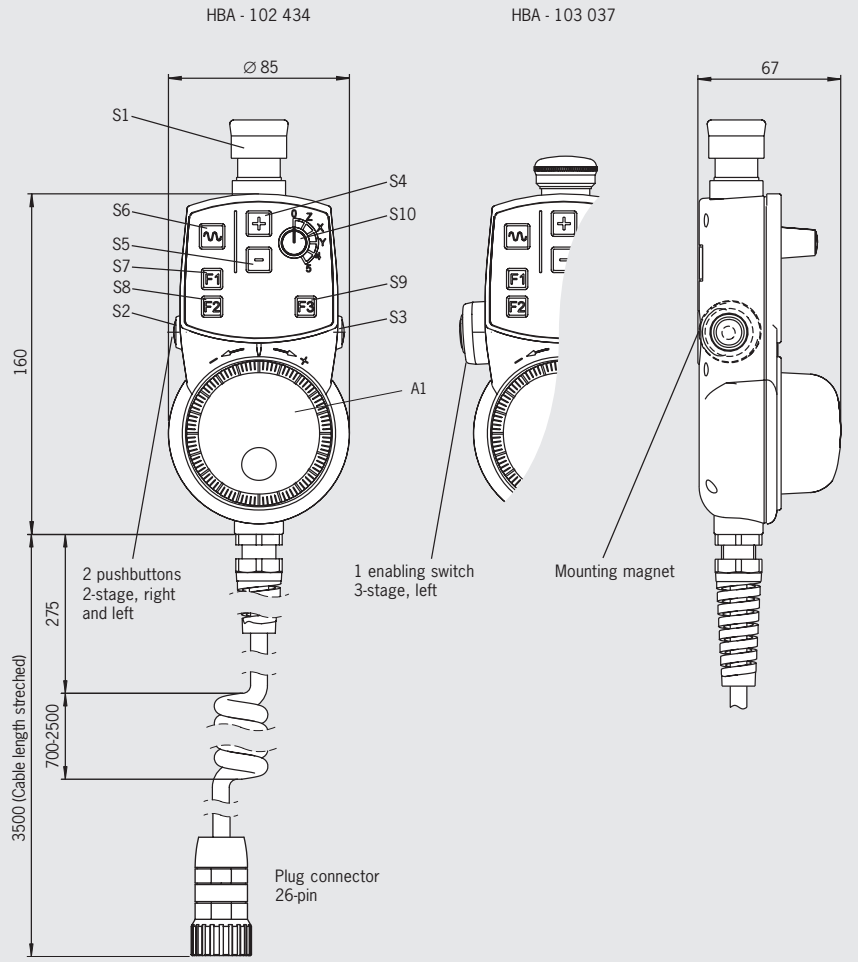
Depending on version:

- **2 pushbuttons, 2-stage, 1 NO contact each, e.g. for enabling function**
- **1 enabling switch, 3-stage, 2 NO contacts**

Notes

- For holder HBA for hand-held pendant stations, see Accessories page 48
- For related connection kit comprising 26-pin flange socket and short-circuit plug, see Accessories page 44
- Function compatible with Siemens MINI BHG

Dimension drawing



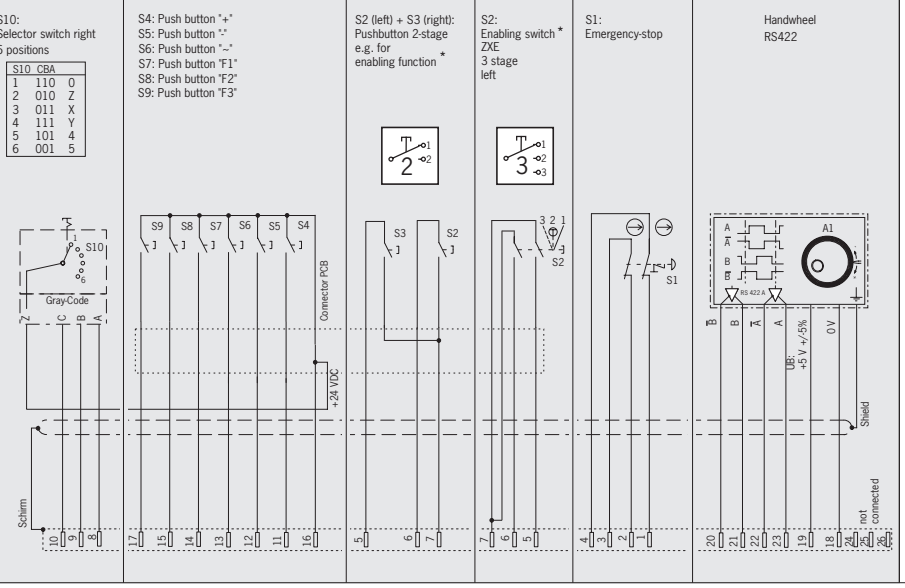
Technical data

Parameter	Value	Unit
Housing HBA		
Material	Plastic	
Color	Gray RAL 7040	
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Degree of protection according to EN 60529 / NEMA	IP 65 / 250-12	
Connection	Coiled cable, expandable to 3.5 m, 26-pin plug connector	
Weight	Approx. 1.3	kg
Handwheel		
Pulses / revolution	100	
Power supply	5 ± 5%	V DC
Output specifications	RS422A	
EMERGENCY STOP device		
Standard	EN ISO 13850	
Switching elements	2 NC contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 3 A	
Selector switch		
Output code	See wiring diagram	
Switching voltage max.	25	V AC/DC
Switching capacity max.	0.2	VA
Membrane keypad		
Switching elements	6, 1 NO contact each	
Switching voltage max.	30	V DC
Switching current max.	100	mA
Breaking capacity max.	1	W
Pushbutton, 2-stage, e.g. for enabling function		
Switching elements	2, 1 NO contact each	
Connection ratings	30 V DC / 100 mA	
Enabling switch ZXE, 3-stage		
Switching elements	1, 2 NO contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 0.1 A	

Ordering table

Version/item	Features						Order No.
	1 selector switch 6 positions S10	6 membrane pushbuttons 1 NO contact each S4, S5, S6, S7, S8, S9	2 pushbuttons 2-stage S2, S3	1 enabling switch ZXE 3-stage S2	EMERGENCY STOP device S1	Handwheel 100 pulses A1	
HBA - 102 434 	●	●	●		●	●	**102 434**
HBA - 103 037 	●	●		●	●	●	**103 037**

Wiring diagram



* Travel diagram
see page 6

Hand-held pendant stations HBA

- **Membrane keypad can be labled as required using slide-in strips**
- **Tamper-proof EMERGENCY STOP device according to EN ISO 13850, dual-channel**
- **LEDs white, color customer-specific using colored keypad membrane**

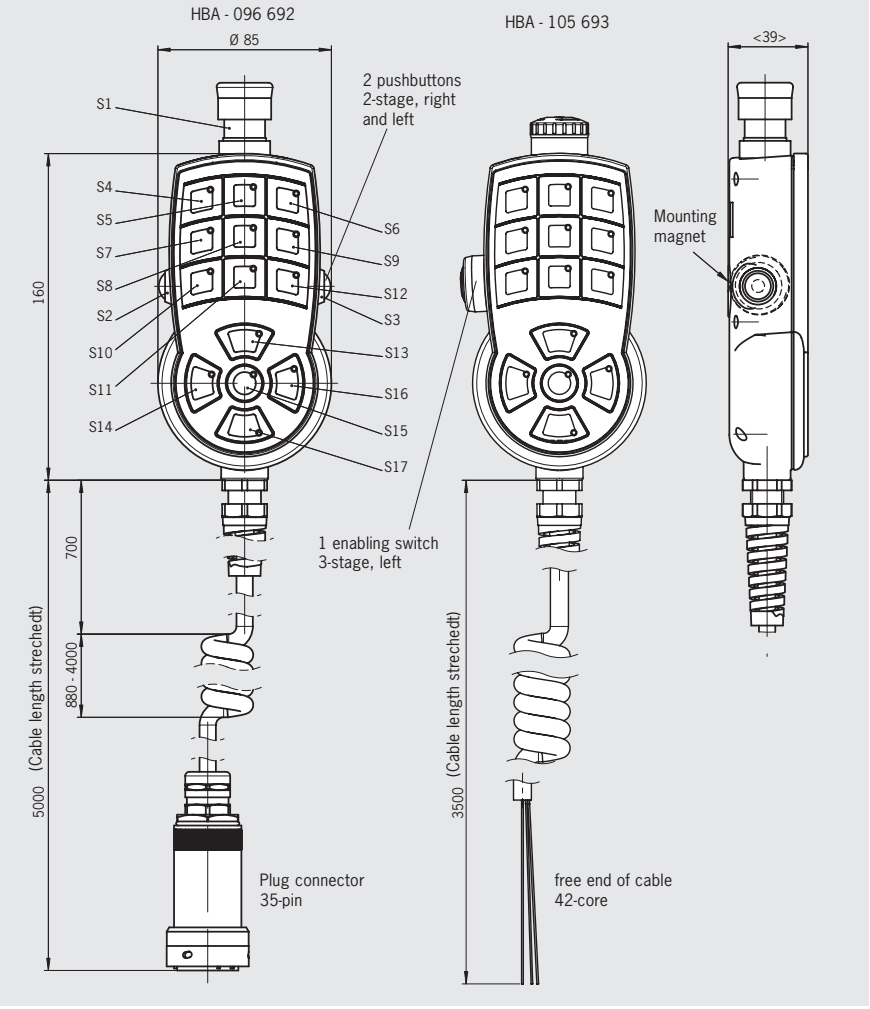
Depending on version:

- **2 pushbuttons, 2-stage, 1 NO contact each, e.g. for enabling function**
- **1 enabling switch, 3-stage, 2 NO contacts**
- **Coiled cable expandable to 5 m, 35-pin plug connector**
- **Coiled cable expandable to 3.5 m, 42-core free cable end**

Hinweise

- For holder HBA for hand-held pendant stations, see Accessories page 48
- For related 35-pin flange socket, see Accessories page 41
- For template for slide-in strips see www.euchner.de (Operating Instructions)

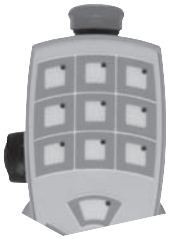
Dimension drawing



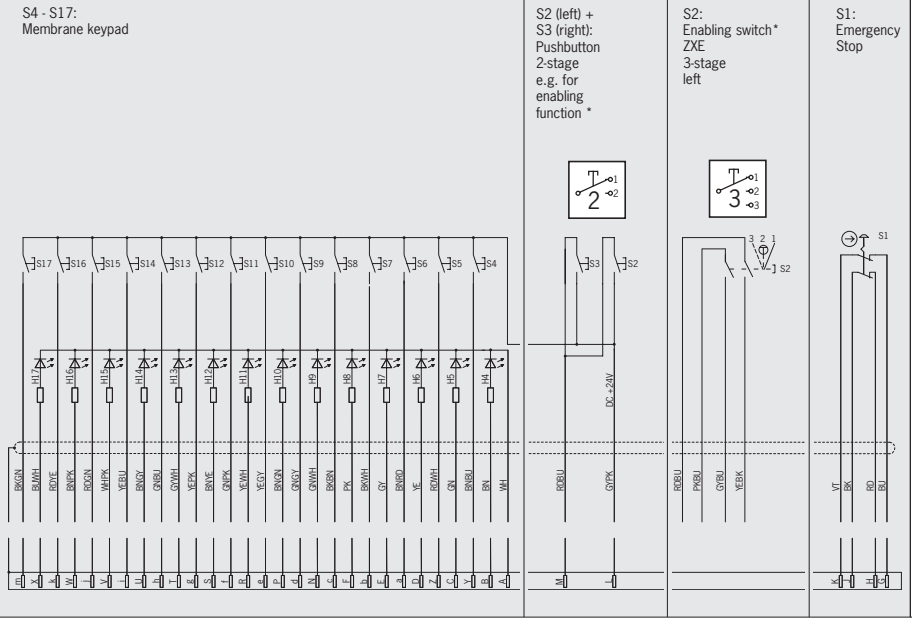
Technical data

Parameter	Value	Unit
Housing HBA		
Material	Plastic	
Color	Gray RAL 7040	
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Degree of protection according to EN 60529 / NEMA	IP 65 / 250-12	
Connection	Coiled cable, expandable to 5 m, 35-pin plug connector Coiled cable, expandable to 3.5 m, 42-core free cable end	
Weight	Approx. 1.3	kg
EMERGENCY STOP device		
Standard	EN ISO 13850	
Switching elements	2 NC contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 3 A	
Membrane keypad		
Switching elements	14, 1 NO contact each	
Switching voltage max.	30	V DC
Switching current max.	100	mA
Breaking capacity max.	1	W
Pushbutton, 2-stage, e.g. for enabling function		
Switching elements	2, 1 NO contact each	
Switching voltage max.	30	V DC
Switching current max.	100	mA
Enabling switch ZXE, 3-stage		
Switching elements	1, 2 NO contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 0.1 A	

Ordering table

Version/item	Merkmale: Membrane keypad S4 - S17	Pushbutton 2-stage S2, S3	Enabling switch ZXE, 3-stage S2	EMER-GENCY STOP device S1	Order No.
HBA - 096 692 	●	●		●	**096 692**
HBA - 105 693 	●		●	●	**105 693**

Wiring diagram



* Travel diagram
see page 6

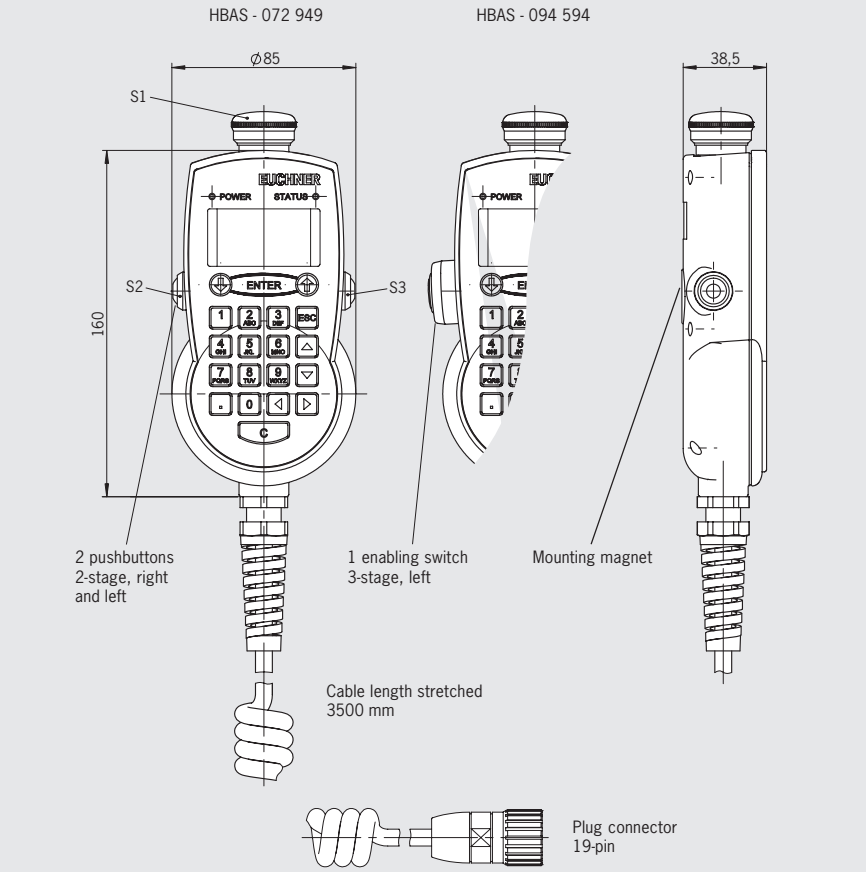
Hand-held pendant stations HBAS

- **Programmable pulse generator**
- **Tamper-proof EMERGENCY STOP device according to EN ISO 13850, dual-channel**
- **Membrane keypad with 20 keys and 2 LEDs**
- **LCD display with LED background lighting, switchable 4-line/8-column or 8-line/16-column**
- **RS422 interface, 3964R protocol**

Depending on version:
- **2 pushbuttons, 2-stage, 1 NO contact each, e.g. for enabling function**
- **1 enabling switch, 3-stage, 2 NO contacts**

Notes
- For holder HBA for hand-held pendant stations, see Accessories page 48
- For related 19-pin flange plug, see Accessories page 44
- ActiveX module available for integrating the user's application (for MS Windows®-based user programs with ActiveX support)

Dimension drawing



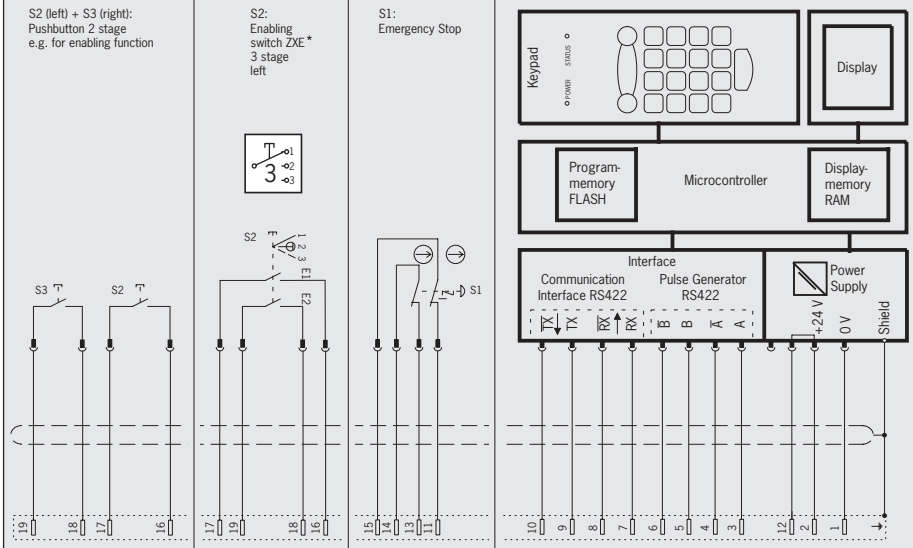
Technical data

Parameters	Value	Unit
Housing HBA		
Material	Plastic	
Color	Gray RAL 7040	
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Degree of protection according to EN 60529 / NEMA	IP 65 / 250-12	
Connection	Coiled cable, expandable to 3.5 m, 19-pin plug connector	
Weight	Approx. 0.85	kg
Pulse generator		
Pulses	Programmable	
Output specifications	RS422A	
EMERGENCY STOP device		
Standard	EN ISO 13850	
Switching elements	2 NC contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 3 A	A
Communications interface		
Type	Serial, RS422A (4-wire)	
Data format	8 data bits + 1 parity bit (even), 1 stop bit	
Transfer speed	9600 or 19200 baud, automatic detection	
Transfer protocol	3964R	
Electrical connection		
Power supply	24 ± 20%	V DC
Operating current, max.	100	mA
Pushbutton, 2-stage, e.g. for enabling function		
Switching elements	2, 1 NO contact each	
Switching voltage max.	30	V DC
Switching current max.	100	mA
Enabling switch ZXE, 3-stage		
Switching elements	1, 2 NO contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 0.1 A	

Ordering table

Version/item	Features				Order No.
	2 pushbuttons 2-stage S2, S3	1 enabling switch ZXE, 3-stage S2	EMERGENCY STOP device S1	Programmable pulse generator, membrane keypad, display, RS422 interface, 3964R protocol	
HBAS - 072 949 	●		●	●	**072 949**
HBAS - 094 594 		●	●	●	**094 594**

Wiring diagram



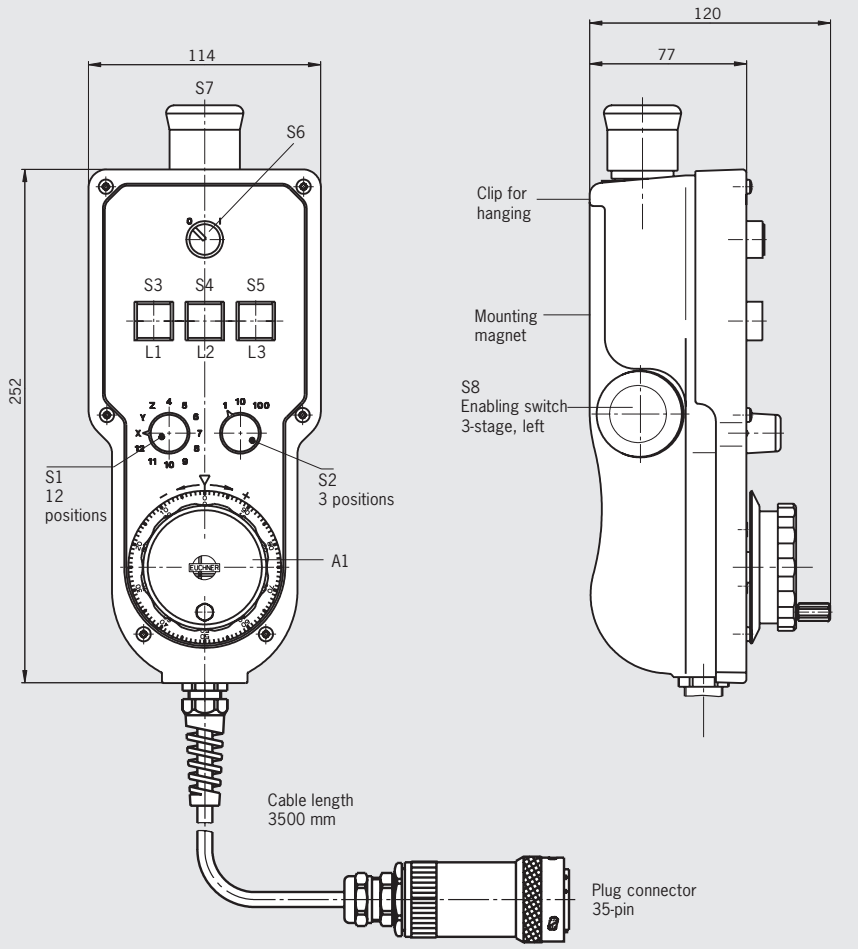
* Travel diagram see page 6

ActiveX module Software for integration into user software that supports ActiveX	**093 011**
Manual ActiveX module Detailed documentation on use of the software	**093 013**

Hand-held pendant station HBL - 097 339

- **Handwheel 100 pulses**
- **Tamper-proof EMERGENCY STOP device according to EN ISO 13850, dual-channel**
- **Enabling switch 3-stage**
- **3 illuminated pushbuttons, can be individually labeled**
- **2 selector switches**
- **Key-operated switch**

Dimension drawing



Notes

- For holder HBL for hand-held pendant stations, see Accessories page 48
- For related 35-pin flange socket, see connection components page 48

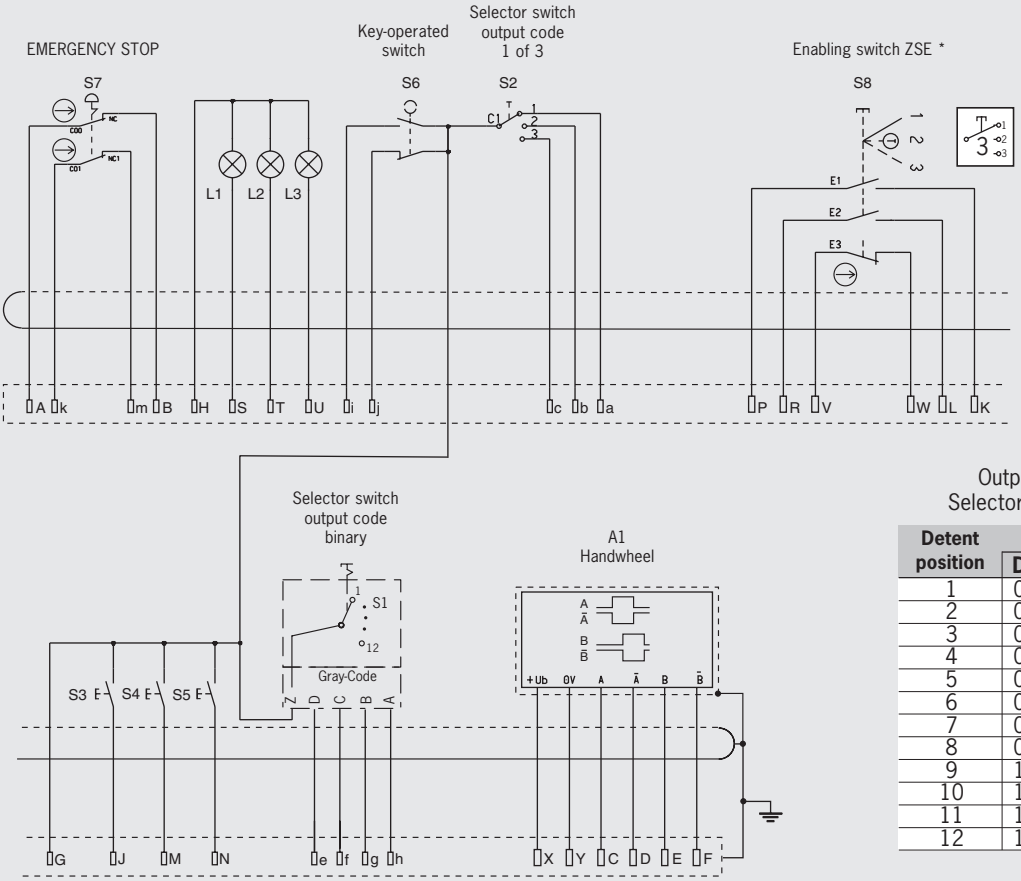
Technical data

Parameters	Value	Unit
Housing HBL		
Material	Plastic	
Color	Blue-gray RAL 7031	
Ambient temperature	0 ... +55	°C
Degree of protection according to EN 60529	IP 65	
Connection	Cable 3.5 m, 35-pin plug	
Weight	Approx. 2.1	kg
EMERGENCY STOP device		
Standard	EN ISO 13850	
Switching elements	2 NC contacts	
Utilization category to IEC 60947-5-1	DC-13 U_e 24 V I_e 2.75 A	
Handwheel HKD		
Pulses per revolution	100	
Power supply	5 ± 5%	V DC
Output circuit	RS 422 A	
Output signals	See page 67	
Enabling switch ZSE, 3-stage		
Switching elements	2 NO contacts, 1 positively driven contact	
Utilization category to IEC 60947-5-1	AC-15 U_e 24 V I_e 4 A DC-13 U_e 24 V I_e 3 A	
Buttons		
Switching elements	3, 1 NO contact each	
Switching voltage max.	30	V DC
Switching current max.	100	mA
LED	I = 21 mA / U = 24 V DC	
Selector switch		
Switching voltage max.	30	V DC
Switching current max.	100	mA
Breaking capacity max.	2	W
Key-operated switch		
Switching voltage max.	30	V AC/DC
Switching current max.	250	mA

Ordering table

Item	Order No.
Hand-held pendant station HBL - 097 339 with: ▶ Handwheel 100 pulses ▶ Tamper-proof emergency stop device according to EN ISO 13850, dual-channel ▶ Enabling switch ZSE 3-stage, 2 NO contacts, 1 positively driven contact ▶ 3 illuminated pushbuttons, 1 NO contact each ▶ 2 selector switches, 12 positions and 3 positions ▶ Key-operated rotary switch, 1 NO contacts, 1 NC contact	**097 339**

Wiring diagram



Output table
Selector switch S1

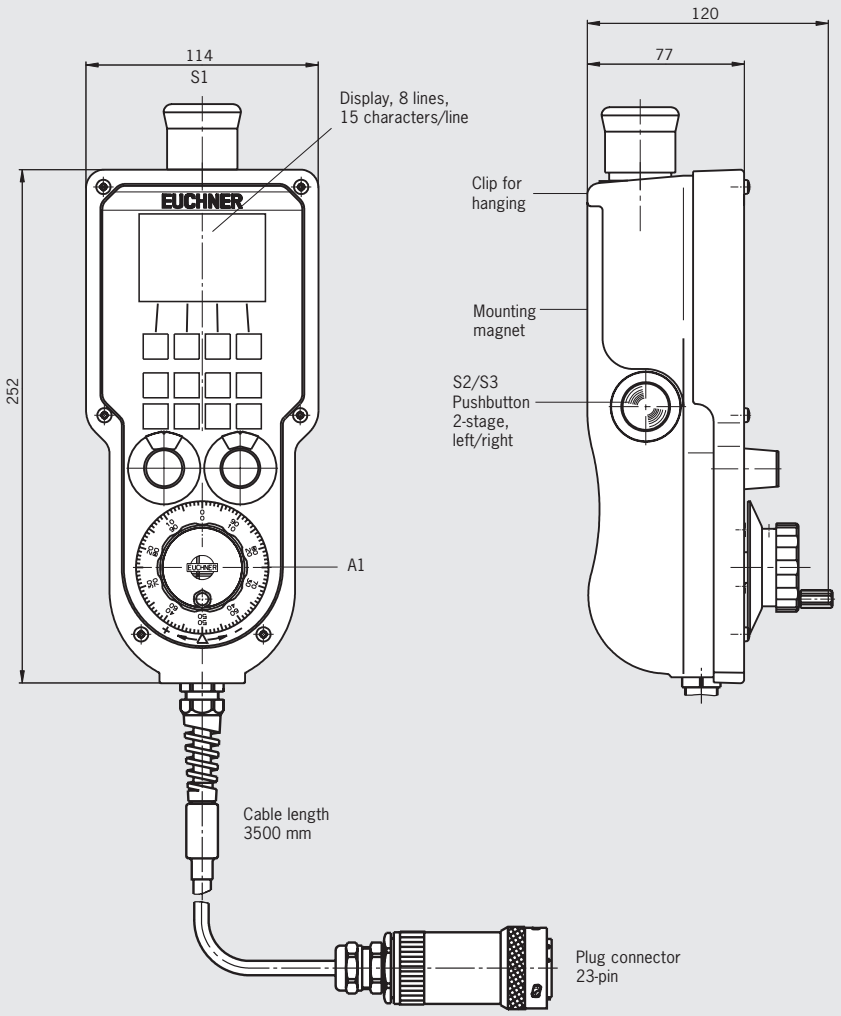
Detent position	Output D	C	B	A
1	0	0	0	0
2	0	0	0	1
3	0	0	1	0
4	0	0	1	1
5	0	1	0	0
6	0	1	0	1
7	0	1	1	0
8	0	1	1	1
9	1	0	0	0
10	1	0	0	1
11	1	0	1	0
12	1	0	1	1

* Travel diagram
see page 6

Hand-held pendant station HBLS - 072 725

- **Handwheel 100 pulses**
- **Tamper-proof EMERGENCY STOP device according to EN ISO 13850, dual-channel**
- **2 pushbuttons 2-stage, e.g. for enabling function**
- **12 illuminated buttons**
- **Buttons can be designed as required using slide-in film**
- **2 selector switches**
- **LCD display (text mode)**
- **RS422 interface, 3964R protocol**

Dimension drawing



Notes

- For holder HBL for hand-held pendant stations, see Accessories page 48
- For related 23-pin flange socket, see connection components page 41
- ActiveX module available for integrating the user's application (for MS Windows®-based user programs with ActiveX support)

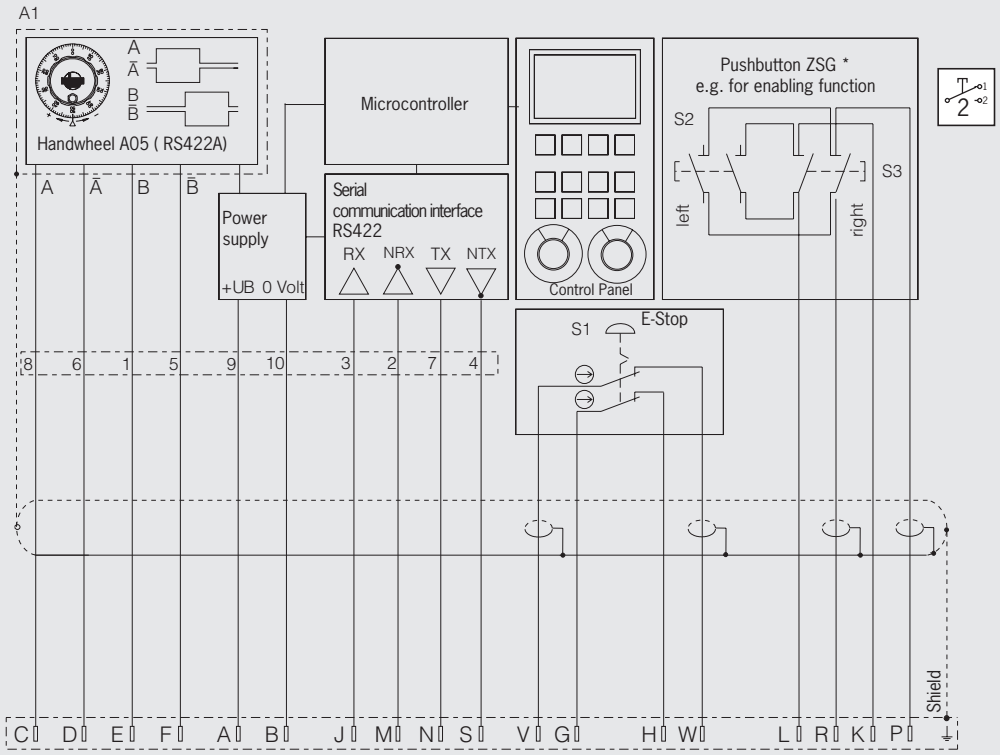
Technical data

Parameters	Value	Unit
Housing HBL		
Material	Plastic	
Color	Blue-gray RAL 7031	
Operating temperature	0 ... +50	°C
Degree of protection according to EN 60529	IP 65	
Connection	Cable 3.5 m, 23-pin plug	
Weight	2.2	kg
EMERGENCY STOP device		
Standard	EN ISO 13850	
Switching elements	2 NC contacts	
Utilization category to IEC 60947-5-1	DC-13 U_e 24 V I_e 2.75 A	
Handwheel HKD		
Pulses per revolution	100	
Output circuit	RS 422 A	
Output signals	See page 67	
Pushbutton ZSG, 2-stage, e.g. for enabling function		
Switching elements	2, 2 NO contacts each	
Utilization category to IEC 60947-5-1	AC-15 U_e 24 V I_e 4 A DC-13 U_e 24 V I_e 3 A	
Interface		
Type	RS 422	
Data format	8 data bits , even parity, 1 or 2 stop bits	
Transfer speed	9600 or 19200 (setting using DIL switches)	baud
Transfer protocol	3964 R	
Electrical connection		
Power supply	24 ±20%	V DC
Operating current, max.	200	mA

Ordering table

Item	Order No.
Hand-held pendant station HBLS - 072 725 with: ▶ Handwheel 100 pulses ▶ Tamper-proof emergency stop device according to EN ISO 13850, dual-channel ▶ 2 pushbuttons ZSG 2-stage, 2 NO contacts each, e.g. for enabling function ▶ 12 illuminated buttons ▶ 2 selector switches, 12 positions each	**072 725**

Wiring diagram



Shield electr. connected to the plug connector housing

* Travel diagram
see page 6

ActiveX module Software for integration into user software that supports ActiveX	**067 176**
Manual ActiveX module Detailed documentation on use of the software	**067 178**

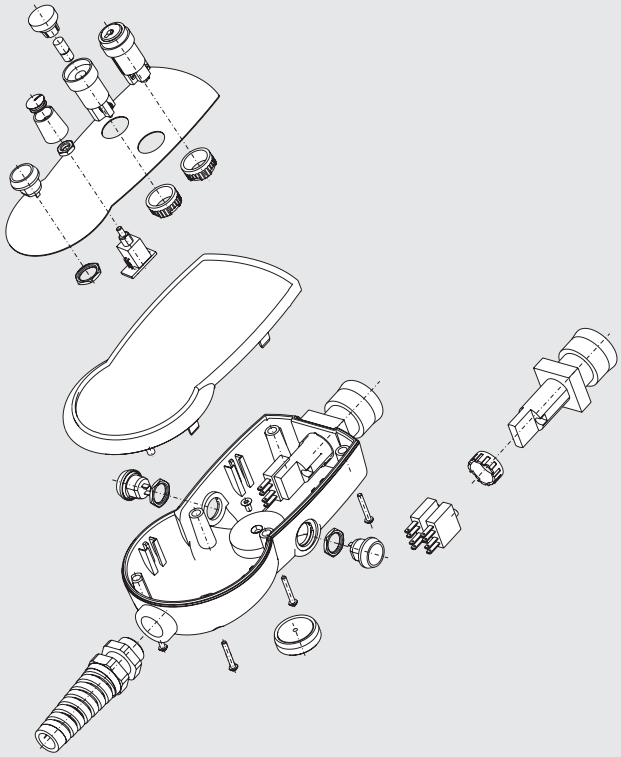
Kit for hand-held pendant stations HBA

The kit is designed to match individual customer specifications. Thanks to its modular configuration, you can construct prototypes and special versions in line with your requirements.
Aluminum front plates are available in silver or black anodized to match the housings.

Customer-specific functionality can be achieved by using the components supplied in the kit (pushbuttons, selector switches, key-operated rotary switches, etc).
For connection to the control system, cables with different numbers of cores, plug connectors and the relevant flange sockets are available.

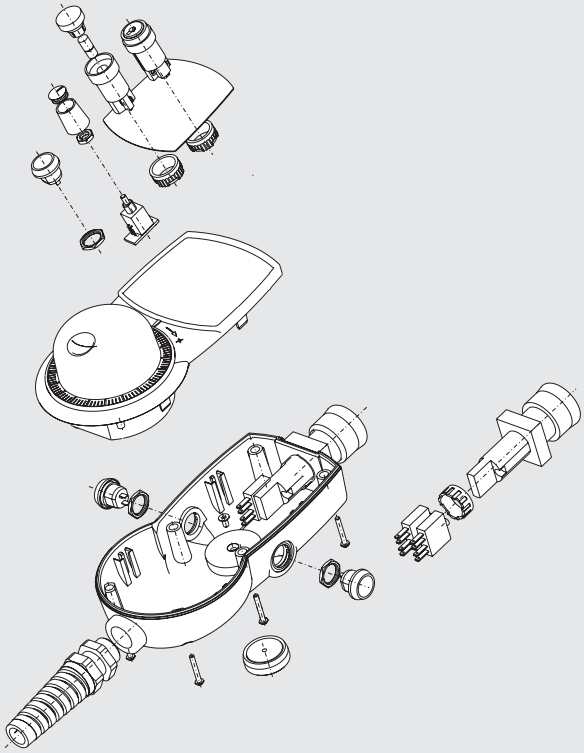
Kit HBA without handwheel

The designs without handwheel have a cable gland and mounting magnet. In addition to the basic housing HBA, other identical designs with the option of fitting an EMERGENCY STOP and 2-stage pushbuttons or 3-stage enabling switches are available.



Kit HBA with handwheel

The designs with handwheels, some with 2-stage pushbuttons or 3-stage enabling switches, differ in the output stages on the handwheels and are adapted to various control systems.



Housing HBA without handwheel

- **Cable gland for cable diameter 5-10 mm**
- **Rubber-coated mounting magnet on the rear of housing**
- **6 fixing points for printed circuit board in top shell**

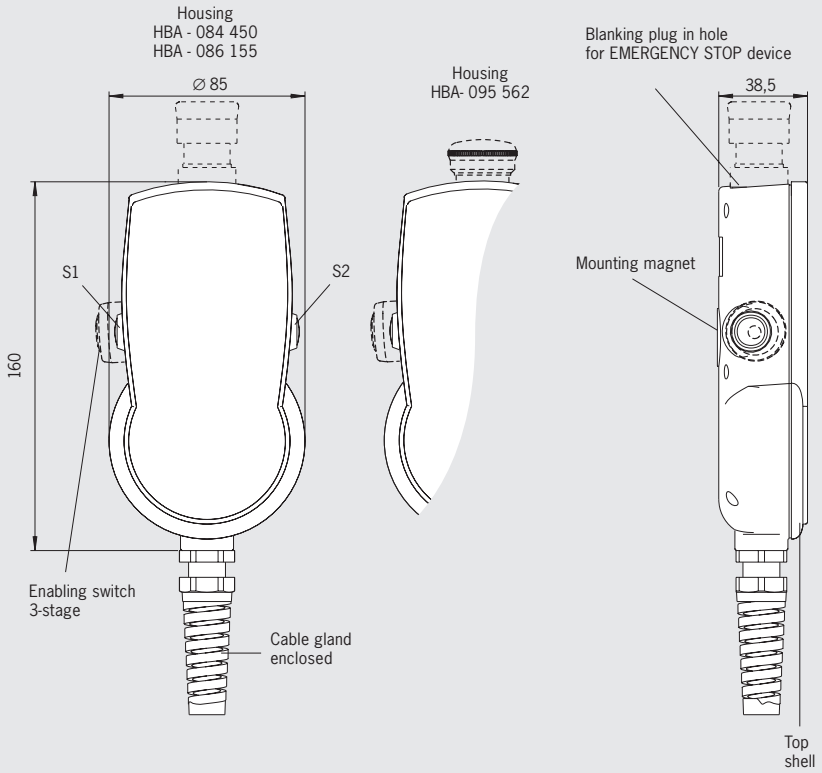
Depending on version:

- **Hole for EMERGENCY STOP device** (sealed with blanking plug)
- **2 pushbuttons, 2-stage, 1 NO contact each, e.g. for enabling function**
- **1 enabling switch, 3-stage, 2 NO contacts**

Notes

- Matching front plate, see page 30
- Matching EMERGENCY STOP device (rotary or pull release) see page 36/37
- **Attention:** housing HBA - 095 562 only suitable for EMERGENCY STOP device with rotary release.
- Depending on version with two 2-stage pushbuttons or one 3-stage enabling switch.

Dimension drawing



For dimensions of EMERGENCY STOP devices see page 36/37

Technical data

Parameter	Value	Unit
Housing HBA		
Material	Plastic	
Color	Gray RAL 7040	
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Degree of protection according to EN 60529 / NEMA	IP 65 / 250-12	
Weight	0.3	kg
Pushbutton, 2-stage, e.g. for enabling function		
Switching elements	2, 1 NO contact each	
Connection ratings	DC 30 V / 100 mA	
Enabling switch ZXE, 3-stage		
Switching elements	2 NO contacts	
Utilization category to IEC 60947-5-1	DC-13, U_e 24 V, I_e 0.1 A	

Ordering table

Version/item	Features			Order No.
	Hole for EMERGENCY STOP device	2 pushbuttons*, 2-stage, 1 NO contact each e.g. for enabling function S1, S2	1 enabling switch ZXE**, 3-stage, 2 NO contacts S1	
Housing HBA - 084 445 (without hole, without enabling switch)				**084 445**
Housing HBA - 084 450	● for EMERGENCY STOP with pull release			**084 450**
Housing HBA - 086 155	● for EMERGENCY STOP with pull release	●		**086 155**
Housing HBA - 095 562	● for EMERGENCY STOP with rotary release		●	**095 562**
				

* Travel diagram
see page 6

* Travel diagram
see page 45

Housing HBA with handwheel

- **Handwheel 100 pulses, wear-free magnetic detent**
- **Hole for EMERGENCY STOP device** (sealed with blank plug)
- **Cable gland for cable diameter 5-10 mm**
- **Rubber-coated mounting magnet on the rear of housing**
- **6 fixing points for printed circuit board in top shell**

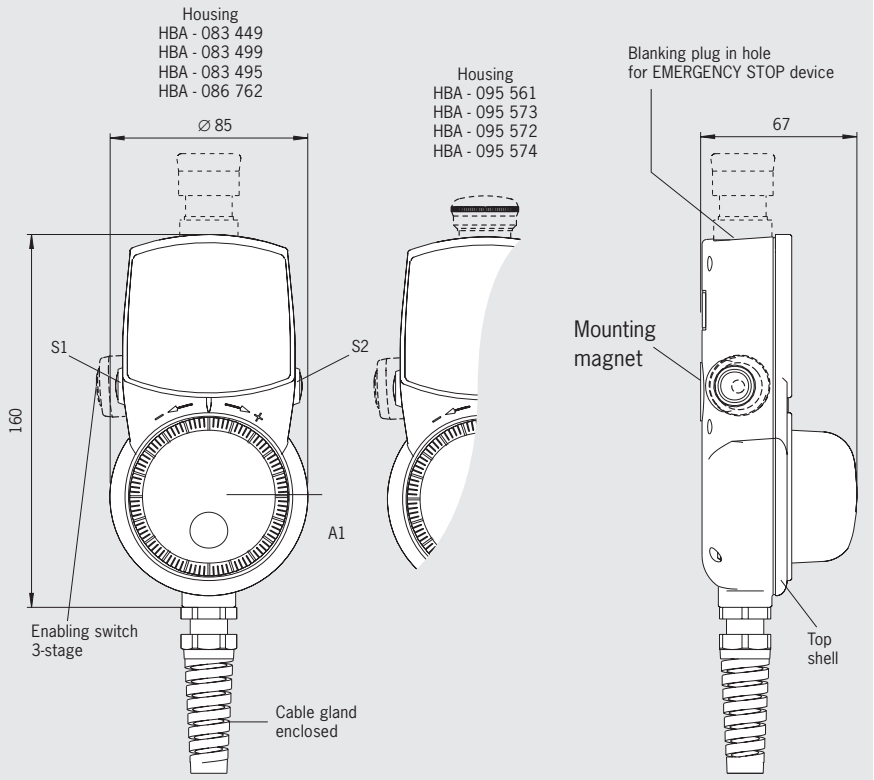
Depending on version:

- **2 pushbuttons, 2-stage, 1 NO contact each, e.g. for enabling function**
- **1 enabling switch, 3-stage, 2 NO contacts**
- **Various handwheel output stages**

Notes

- Matching front plate, see page 36
- Matching EMERGENCY STOP device (rotary or pull release) see page 36/37
- **Warning:**
  Housing HBA - 095 561, HBA - 095 573, HBA - 095 572 and HBA - 095 574 only suitable for EMERGENCY STOP device with rotary release.
- Depending on version with two 2-stage pushbuttons or one 3-stage enabling switch.

Dimension drawing



For dimensions of EMERGENCY STOP devices see page 36/37

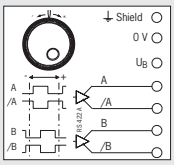
Technical data

Parameter		Value	Unit
Housing HBA			
Material		Plastic	
Color		Gray RAL 7040	
Operating temperature		0 ... +50	°C
Storage temperature		-20 ... +50	°C
Degree of protection according to EN 60529 /NEMA		IP 65 / 250-12	
Weight		0.3	kg
Pushbutton, 2-stage, e.g. for enabling function			
Switching elements		2, 1 NO contact each	
Utilization category to IEC 60947-5-1		30 V AC / 0.4 A; 30 V DC / 0.1 A	
Enabling switch ZXE, 3-stage			
Switching elements		1, 2 NO contacts	
Utilization category to IEC 60947-5-1		DC-13, U_e 24 V, I_e 0.1 A	
Handwheel RS422A (U_B = 5 V DC)			
Pulses / revolution		100	
Power supply		5 ± 5%	V DC
Output specifications		RS422A	
Handwheel push-pull 5 V (U_B = 5 V DC)			
Pulses / revolution		100	
Power supply		5 ± 5%	V DC
Output circuit		5 V push-pull	
Output voltage / output current	HIGH, min.	4.0 V at 0 mA / 3.4 V at 5 mA / 3.0 V at 20 mA	
	LOW, max.	1.3 V at 15 mA	
Handwheel push-pull 5 V (U_B = 10...30 V DC)			
Pulses / revolution		25	
Power supply		10 ... 30	V DC
Output circuit		5 V push-pull	
Output voltage / output current	HIGH, min.	4.9 V at 0 mA / 3.9 V at 5 mA / 3.6 V at 20 mA	
	LOW, max.	1.3 V at 15 mA	
Handwheel push-pull 24 V (U_B = 10...30 V DC)			
Pulses / revolution		100	
Power supply		10 ... 30	V DC
Output circuit		Push-pull 24 V	
Output voltage / output current	HIGH, min.	U_B - 3 V at 20 mA	
	LOW, max.	3 V at 20 mA	

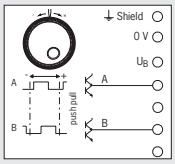
Ordering table / wiring diagram

Version/ item	Features							Order No.
	Handwheel				Hole for EMERGENCY STOP	2 push-buttons* 2-stage, 1 NO contact each S1, S2	1 enabling switch ZXE**, 3-stage 2 NO contacts S1	
	Output circuit		Power supply U_B	Pulses per revolution				
	RS422	Push-pull U_A						
Housing HBA - 083 449	●		5 V DC	100	● for EMERGENCY STOP with pull release	●		**083 449**
Housing HBA - 095 561	●		5 V DC	100	● for EMERGENCY STOP with rotary release		●	**095 561**
Housing HBA - 083 499		● 5 V	10 ... 30 V DC	25	● for EMERGENCY STOP with pull release	●		**083 499**
Housing HBA - 095 573		● 5 V	10 ... 30 V DC	25	● for EMERGENCY STOP with rotary release		●	**095 573**
Housing HBA - 083 495		● U_B - 3 V	10 ... 30 V DC	100	● for EMERGENCY STOP with pull release	●		**083 495**
Housing HBA - 095 572		● U_B - 3 V	10 ... 30 V DC	100	● for EMERGENCY STOP with rotary release		●	**095 572**
Housing HBA - 086 762		● 5 V	5 V DC	100	● for EMERGENCY STOP with pull release	●		**086 762**
Housing HBA - 095 574		● 5 V	5 V DC	100	● for EMERGENCY STOP with rotary release		●	**095 574**

A1
Handwheel
RS422A



A1
Handwheel
push pull



* Travel diagram see page 6
* Travel diagram see page 45

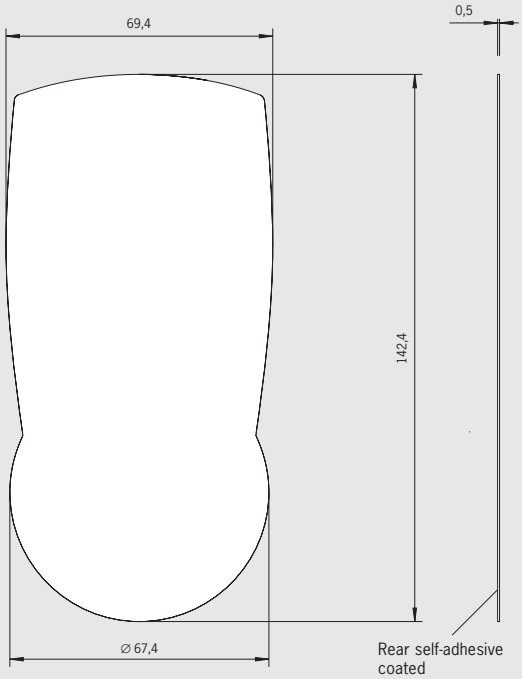
Front plates for housing HBA with and without handwheel

Notes

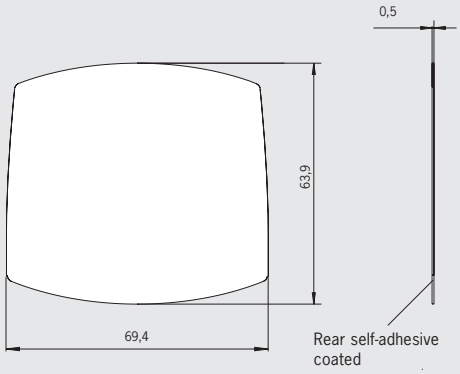
- Matches housing HBA (see page 26 and page 28)

Dimension drawing

For housing HBA without handwheel



For housing HBA with handwheel



Technical data

	Material
Front plate	Electrically anodized aluminum, black or silver Self-adhesive coating on rear

Ordering table

Item	Order No.
Front plate for housing HBA without handwheel, silver anodized	**084 395**
Front plate for housing HBA without handwheel, black anodized	**084 396**
Front plate for housing HBA with handwheel, silver anodized	**083 635**
Front plate for housing HBA with handwheel, black anodized	**083 636**

The kit is designed to match individual customer specifications.

The housings differ in the integrated safety element:

- Housing without holes and without safety-related components
- Housing with dual-channel enabling device on both sides and hole for EMERGENCY STOP
- Housing with 3-stage enabling switch (1 positively driven contact, 2 NO contacts) without EMERGENCY STOP
- Housing with 3-stage enabling switch (2 positively driven contacts, 2 NO contacts) with hole for EMERGENCY STOP

Various versions of front plate are available:

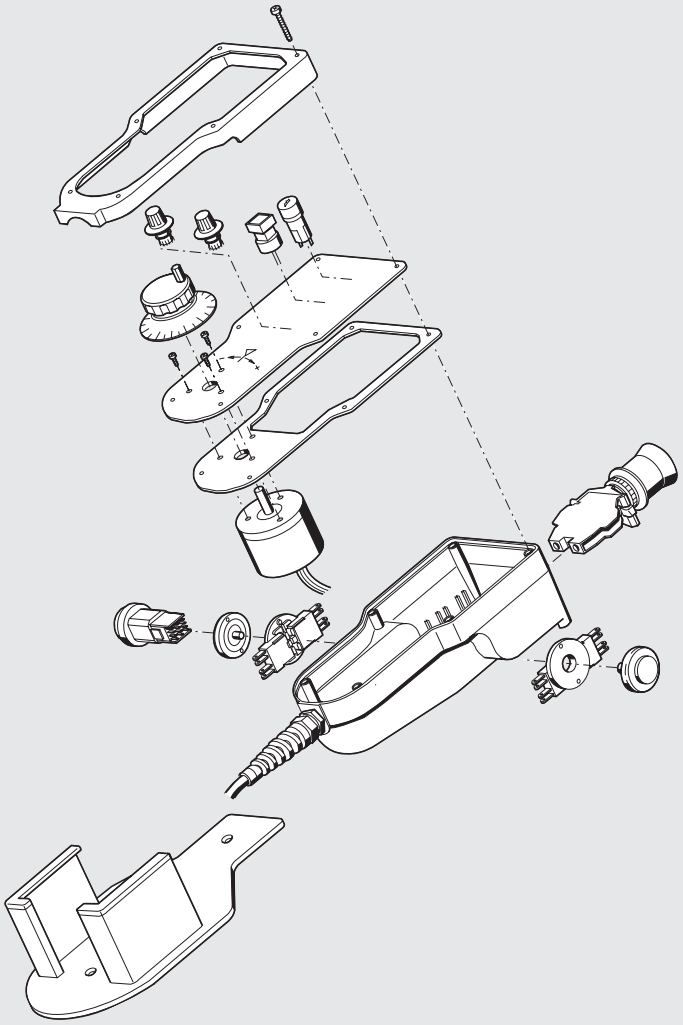
- Front plate for applications with handwheel
- Front plate for applications without handwheel

With the related seal, degree of protection IP 65 is achieved.

Customer-specific functionality can be created by using the components supplied as accessories (pushbuttons, selector switches, key-operated rotary switches) and/or other components.

For connection to the control system, cables with or without plug connectors and with different numbers of cores and the relevant flange sockets are also available as accessories.

Kit for hand-held pendant stations HBL



Housing HBL

- **Rubber-coated mounting magnet on the rear of housing**
- **Hanging clip**
- **6 screws for front plate fastening**
- **Cover frame for front plate**
- **Fixing points for fitting printed circuit board**

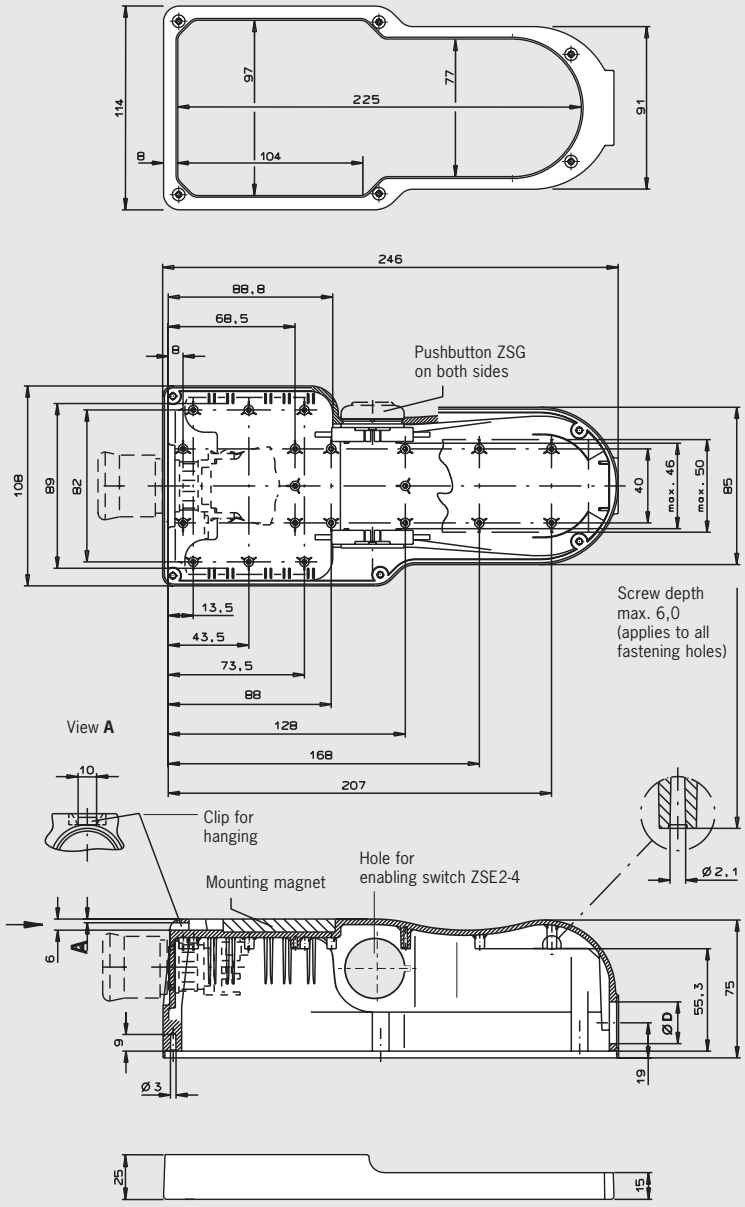
Depending on version:

- **Fastening nuts for cable gland Pg 11 or Pg 13.5**
- **Hole for EMERGENCY STOP device**
- **2 pushbuttons ZSG 2-stage, 2 NO contacts each, e.g. for enabling function**
- **Hole on left for enabling switch ZSE**

Notes

- For EMERGENCY STOP devices see page 36/ 37 and 46
- For enabling switches ZSE see page 47
- For cable glands see page 43
- For assembly drawing see page 64
- Pg 11 for cable diameter 5 ... 10 mm
- Pg 13.5 for cable diameter 6 ... 12 mm

Dimension drawing



Technical data

Parameter	Value	Unit
Housing HBL		
Material	Plastic	
Color	Blue-gray RAL 7031	
Ambient temperature	0 ... +55	°C
Degree of protection according to EN 60529 / NEMA	IP 65 / 250-12	
Pushbutton ZSG, 2-stage, e.g. for enabling function		
Switching elements	2, 2 NO contacts each	
Utilization category to IEC 947-5-1	AC-15 U_e 24 V I_e 4 A DC-13 U_e 24 V I_e 3 A	

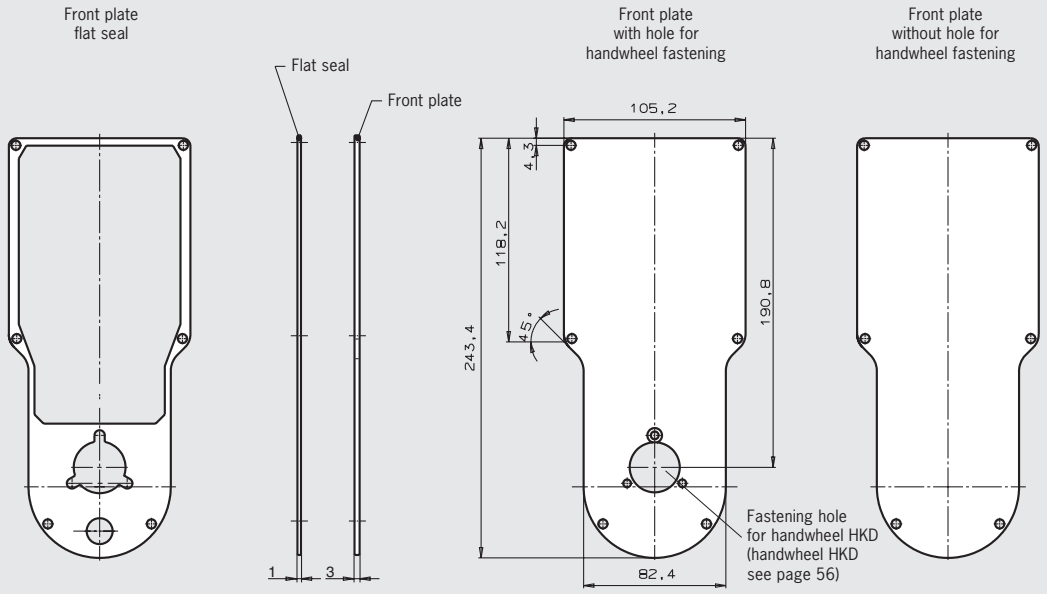
Ordering table / wiring diagram

Version	Features						Order No.
	Fastening nut for cable gland		Hole for EMERGENCY STOP *	Hole for enabling switch ZSE2-2 C1692 3-stage 2 NO + 1 NC → (enabling switch page 47)	Hole for enabling switch ZSE2-4 C1943 3-stage 2 NO + 2 NC → (enabling switch page 47)	2 enabling switches ZSG 2-stage 2 NO contacts each e.g. for enabling function	
	Pg 11	Pg 13.5					
Housing HBL - 073 098	●						**073 098**
Housing HBL - 072 630		●					**072 630**
Housing HBL - 073 113	●		●			●	**073 113**
Housing HBL - 072 631		●	●			●	**072 631**
Housing HBL - 073 109	●			●			**073 109**
Housing HBL - 072 632		●		●			**072 632**
Housing HBL - 072 983	●		●		●		**072 983**
Housing HBL - 083 484		●	●		●		**083 484**

* Blanking plug ∅ 22 supplied for hole for EMERGENCY STOP device

Front plate for housing HBL

Dimension drawing



Technical data

	Material
Front plate	Electrically anodized aluminum, black
Seal	NBR, self-adhesive on one side

Ordering table

Item	Order No.
HBL front plate, with seal	**073 138**
HBL front plate, with hole for handwheel HKD and seal	**073 139**
Front seal for HBL front plate	**072 641**

Overview of accessories for kits for hand-held pendant stations

Accessories for kit	Accessories							Page
	EMERGENCY STOP device	Pushbutton	Key-operated switch	Selector switch	Enabling switch 3-stage	Plug connector	Connection cables	
Suitable for all designs		●						37
			●					38
				●				39
						●		41
							●	42
Hand-held pendant stations HBA	●							36
						●		44
					●			45
Hand-held pendant stations HBL	●							46
					●			47

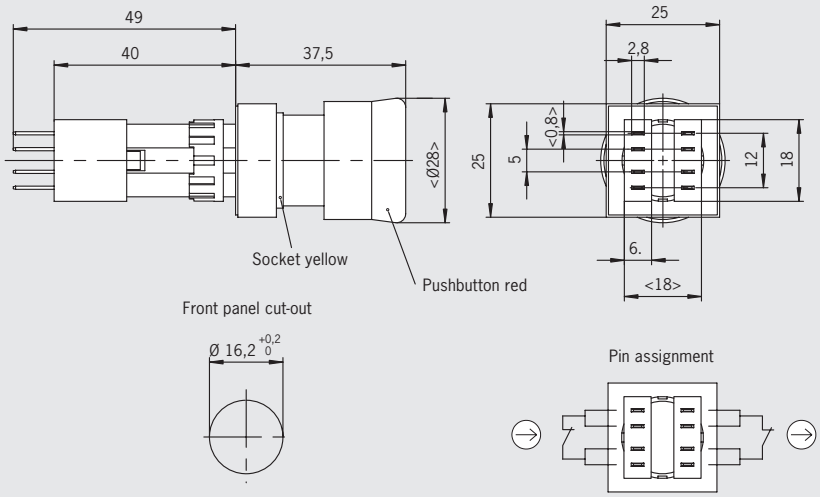
EMERGENCY STOP devices according to EN ISO 13850

- **With pull release**
- **EMERGENCY STOP device for housing HBA without enabling switch ZXE 3-stage**

Notes

- The EMERGENCY STOP device engages when actuated by pressing, unlocks when pulled, and is overload-proof
- Do not use for housing HBA with 3-stage enabling switch ZXE

Dimension drawing



Technical data

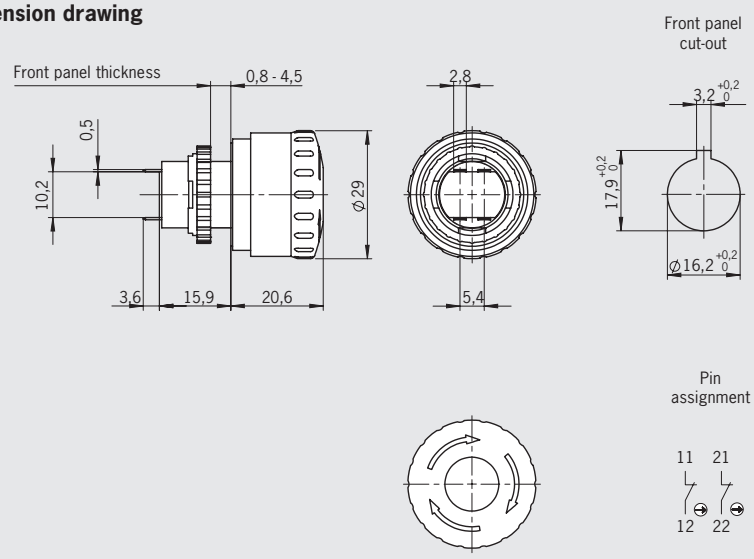
Parameter	Value	Unit
Actuating element		
Color of actuating button	Red	
Color of bottom shell	Yellow	
Switching elements	2, one positively driven contact each	
Degree of protection	IP 65	
Utilization category to IEC 947-5-1	DC-13 U_e 24 V I_e 3 A	

- **With rotary release**
- **EMERGENCY STOP device for housing HBA**
- **Bottom shell yellow**

Notes

- The EMERGENCY STOP device engages when actuated by pressing, unlocks when rotated, and is overload-proof

Dimension drawing



Technical data

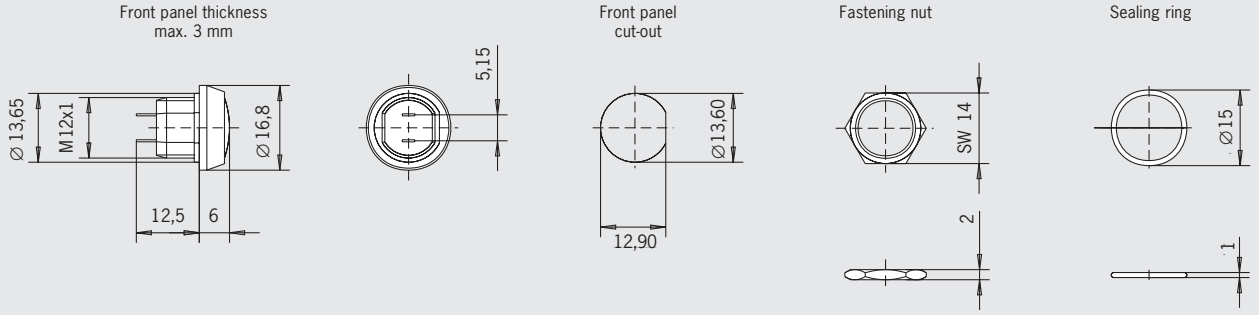
Parameter	Value	Unit
Actuating element		
Color of actuating button	Red	
Color of bottom shell	Black	
Switching elements	1, 2 positively driven contacts	
Degree of protection	IP 65	
Connection ratings	30 V DC / 3 A	

Ordering table

Item	Order No.
EMERGENCY STOP device (pull release) with 2 switching elements, 1 positively driven contact each	**096 298**
EMERGENCY STOP device (rotary release), bottom shell yellow, 2 positively driven contacts	**106 435**
Blanking plug for fastening hole for EMERGENCY STOP device	**083 653**

Pushbutton

Dimension drawing



Technical data

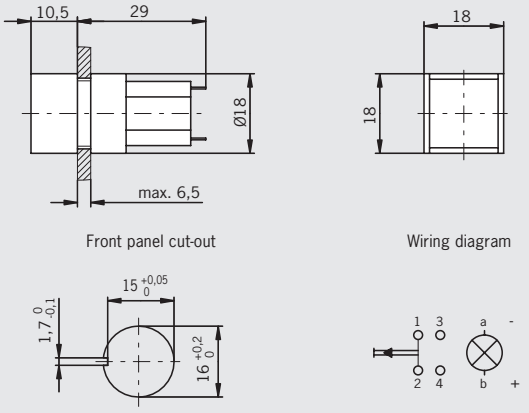
Parameter	Value	Unit
Ambient temperature	-25 ... +70	°C
Front degree of protection (integrated in front plate)	IP 67	
Switching principle	Button, snap-action switching element	
Switching elements	1 NO contact	
Switching voltage	30	V DC
Switching current max.	0.1	A
Connection type	Soldered connection	

Ordering table

Item	Order No.
Pushbutton, black button	**083 640**
Pushbutton, red button	**086 753**
Pushbutton, green button	**086 754**
Pushbutton, blue button	**086 757**
Pushbutton, white button	**086 755**
Pushbutton, yellow button	**086 756**

Illuminated pushbutton (can be individually labeled)

Dimension drawing



Technical data

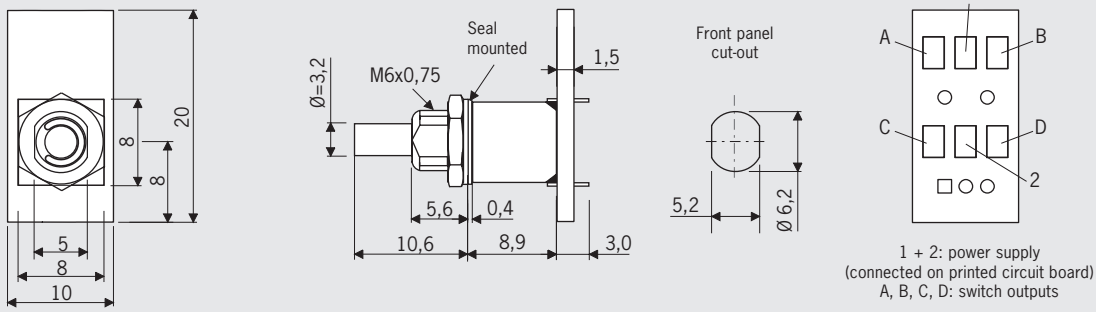
Parameter	Value	Unit
Ambient temperature	-25 ... +55	°C
Front degree of protection (integrated in front plate)	IP 65	
Switching principle	Button, snap-action switching element	
Switching elements	1 NC contact, 1 NO contact	
Switching current max.	100	mA
Switching voltage max.	30	V AC/DC
LED	24 V / 14 mA	
Connection type	Soldered connection	

Ordering table

Item	Order No.
Illuminated pushbutton, can be individually labeled	**074 991**

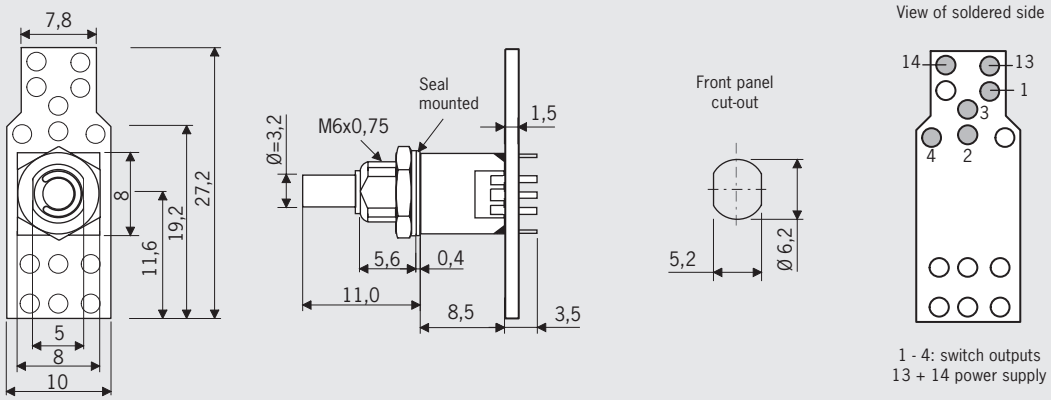
Gray code selector switch

Dimension drawing



Selector switch 1 of X

Dimension drawing



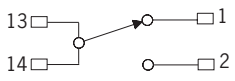
Code table, switch with Gray code

Detent position	Output D	C	B	A
1	0	0	0	0
2	0	0	0	1
3	0	0	1	1
4	0	0	1	0
5	0	1	1	0
6	0	1	1	1
7	0	1	0	1
8	0	1	0	0
9	1	1	0	0
10	1	1	0	1
11	1	1	1	1
12	1	1	1	0
13	1	0	1	0
14	1	0	1	1
15	1	0	0	1
16	1	0	0	0

Connections A - D: switch outputs
Connections 1 - 3: power supply

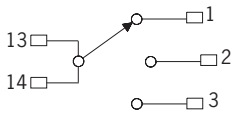
Circuit diagrams switch 1 of X

1 of 2



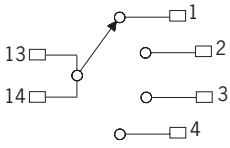
Detent position	Output 1	2
1	1	0
2	0	1

1 of 3



Detent position	Output 1	2	3
1	1	0	0
2	0	1	0
3	0	0	1

1 of 4



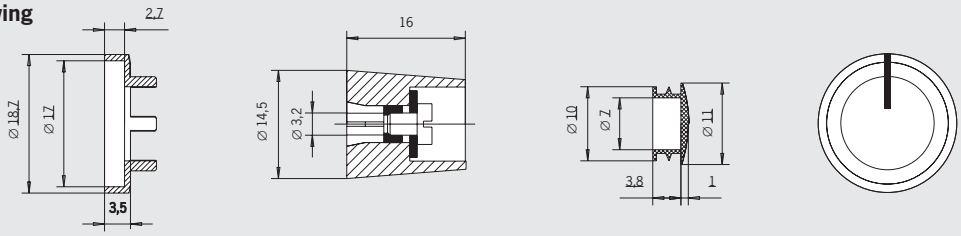
Detent position	Output 1	2	3	4
1	1	0	0	0
2	0	1	0	0
3	0	0	1	0
4	0	0	0	1

Technical data

Parameter	Value	Unit
Front degree of protection (integrated in front plate)	IP 67	
Single-hole bushing mounting	M6 x 0.75	
Detent positions	2, 3, 4, 5, 6, 7, 8, 12 or 16 depending on item	
Detent angle	Gray code 22.5° / 1 of X: 30°	
Output code	1 of 2, 1 of 3, 1 of 4 or Gray code depending on item	
Breaking capacity max.	0.2	VA
Switching voltage max.	25	V AC/DC
Connection type	Soldered connection on printed circuit board	
Maximum soldering time.	≤ 5 (at t ≤ 260 °C)	s

Rotary knob

Dimension drawing



Nut cover

Ordering table

Item	Detent angle	Order No.
Selector switch, 2 detent positions, 1 of 2, break-before-make [1]	30°	**097 026**
Selector switch, 3 detent positions, 1 of 3, break-before-make [1]	30°	**097 027**
Selector switch, 4 detent positions, 1 of 4, break-before-make [1]	30°	**097 028**
Selector switch, 5 detent positions, Gray code, make-before-break [2]	22.5°	**097 029**
Selector switch, 6 detent positions, Gray code, make-before-break [2]	22.5°	**097 030**
Selector switch, 7 detent positions, Gray code, make-before-break [2]	22.5°	**097 031**
Selector switch, 8 detent positions, Gray code, make-before-break [2]	22.5°	**097 032**
Selector switch, 12 detent positions, Gray code, make-before-break [2]	22.5°	**097 033**
Selector switch, 16 detent positions, Gray code, make-before-break [2]	22.5°	**097 034**
Rotary knob, matt black with a marking, collet fastening for shaft 3.2 mm	-	**097 141**

1) Break-before-make: all outputs are open between the switch positions.

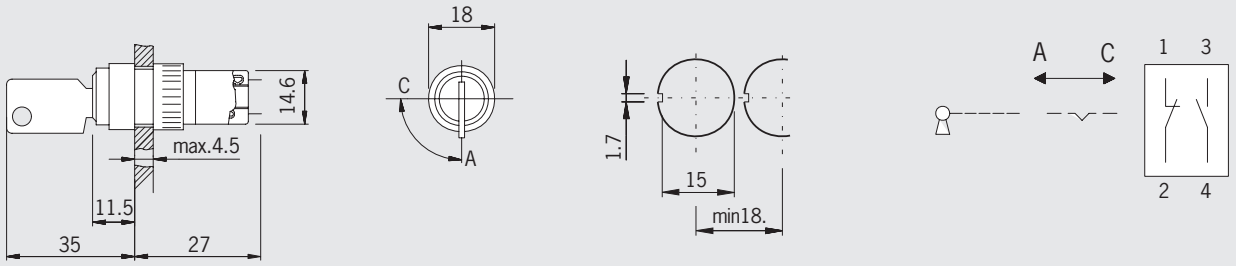
2) Make-before-break: the related outputs are connected between the switch positions.

Key-operated switch

Dimension drawing

Front panel cut-out

Connection circuit diagram



Technical data

Parameter	Value	Unit
Ambient temperature	-25 ... +55	°C
Front degree of protection (integrated in front plate) / NEMA	IP 65 / 250-12	
Switching principle	Snap-action switching element	
Switching element	1 NC contact, 1 NO contact	
Switching voltage max.	30	V AC/DC
Switching current max.	250	mA
Connection type	Soldered connection	

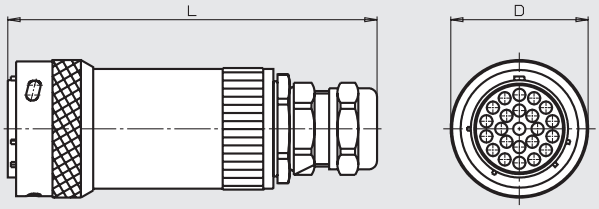
Ordering table

Item		Order No.
Key-operated switch	Key can be withdrawn in both positions	**083 639**

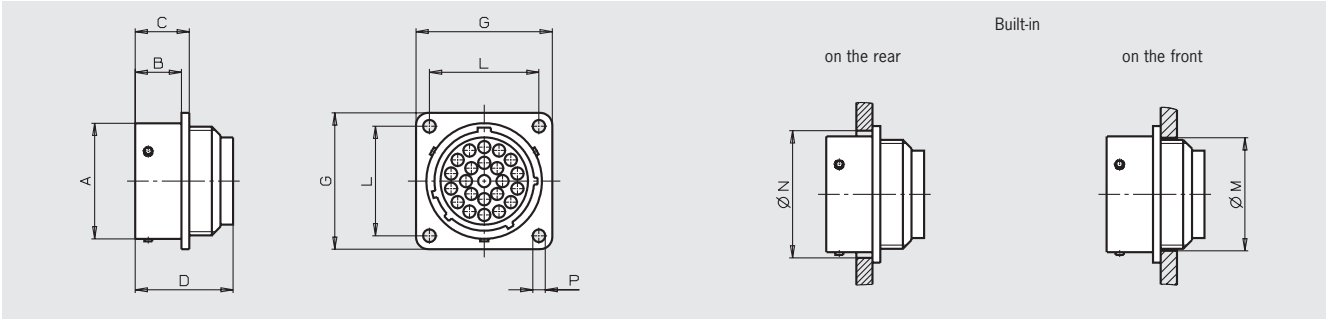
Plug connectors

Number of pins	D	L	Cable-Ø
35	40.2	103	8.0 - 12.0
28	37.2	97	8.0 - 12.0
23	33.9	91	6.0 - 10.0
12	27.5	81	5.5 - 9.5

Dimension drawing



Flange sockets

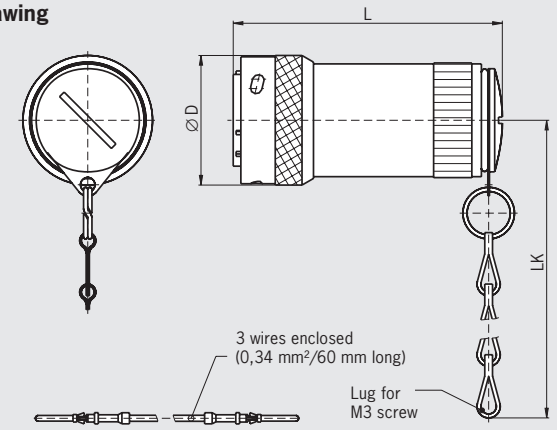


Number of pins	A	B_{max}	C_{max}	D_{max}	G_{max}	L	M	N	P
35	34.9	14.6	17.3	25.7	39.9	31.8	34.1	37.7	3.1
28	31.7	14.6	17.3	25.7	36.8	29.4	30.9	34.5	3.1
23	28.5	11.4	13.3	24.1	33.6	27	27.8	31.3	3.1
12	22.2	11.4	13.3	24.1	28.8	22.9	21.4	25	3.1

Short-circuit plugs

Number of pins	D	L	LK
35	40.2	84	255
28	37.2	78	255
23	33.9	72	252
12	27.5	59.4	251

Dimension drawing



Technical data

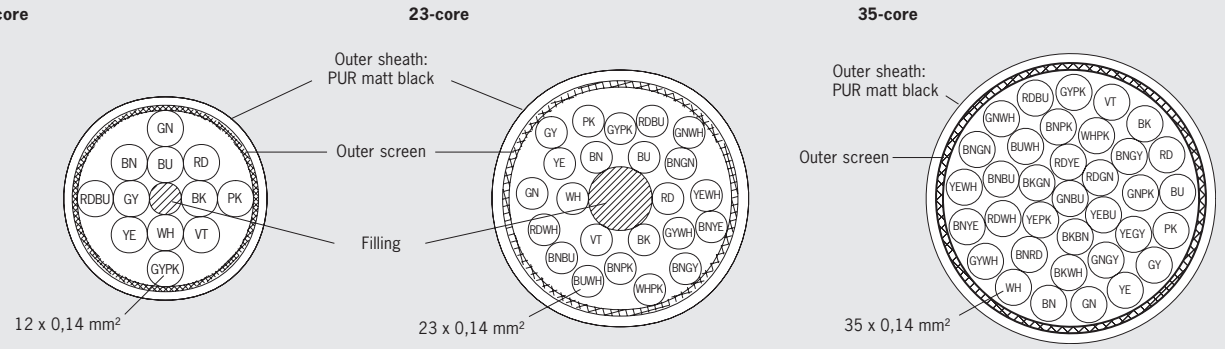
Parameter	Value	Unit
Connecting plug/Flange socket		
Housing material	Metal	
Number of pins	12 / 23 / 28 / 35	
Degree of protection according to EN 60529 (inserted) / NEMA	IP 65 / 250-12	
Contact material	Gold-plated	

Ordering table

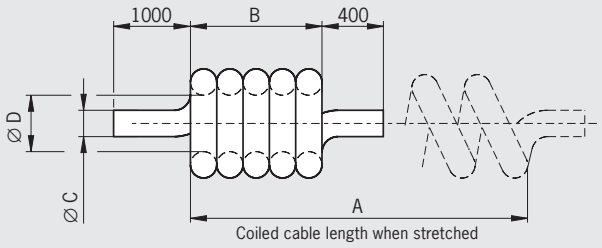
Item	Order No.
Plug connector, 35-pin with pin contacts	**074 395**
Plug connector, 28-pin with pin contacts	**074 394**
Plug connector, 23-pin with pin contacts	**074 393**
Plug connector, 12-pin with pin contacts	**086 748**
Flange socket, 35-pin with socket contacts	**074 386**
Flange socket, 28-pin with socket contacts	**074 385**
Flange socket, 23-pin with socket contacts	**074 384**
Flange socket, 12-pin with socket contacts	**086 749**
Short-circuit plug with chain, 35-pin	**083 459**
Short-circuit plug with chain, 28-pin	**083 458**
Short-circuit plug with chain, 23-pin	**083 457**
Short-circuit plug with chain, 12-pin	**087 802**

Cable, coiled and straight

View of cable cross-section



Dimensions of coiled design



Technical data

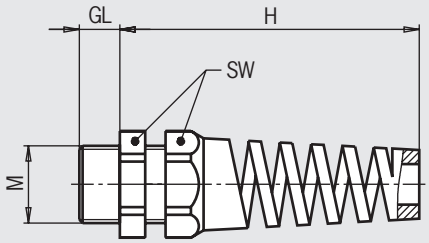
Parameter		Value	Unit
Cable resistance		≤ 145	Ω/km
Test voltage core / core		1.0	kV_{eff}
Test voltage core / screen		1.0	kV_{eff}
Insulation resistance	12-core and 23-core	≥ 200	MΩ
	35-core	≥ 20	
Operating temperature		-10 ... +70	°C
Bending radius	once	≥ 10 x cable diameter	
	several times	≥ 15 x cable diameter	

Ordering table

Item	Cable length [mm]	A [mm]	B [mm]	Ø C [mm]	Ø D [mm]	Order No.
Cable, 12-core, coiled	3900	Approx. 2500	550 ± 20	6 ± 0.3	8 ± 2	**086 721**
Cable, 12-core, coiled	5400	Approx. 4000	880 ± 20	6 ± 0.3	8 ± 2	**086 722**
Cable, 12-core, straight	3500	-	-	-	-	**087 379**
Cable, 12-core, straight	5000	-	-	-	-	**087 380**
Cable, 12-core, straight	10000	-	-	-	-	**087 381**
Cable, 23-core, coiled	3900	Approx. 2500	550 ± 20	7.5 ± 0.3	10 ± 2	**087 408**
Cable, 23-core, coiled	5400	Approx. 4000	880 ± 20	7.5 ± 0.3	10 ± 2	**087 409**
Cable, 23-core, straight	3500	-	-	-	-	**087 382**
Cable, 23-core, straight	5000	-	-	-	-	**087 383**
Cable, 23-core, straight	10000	-	-	-	-	**087 384**
Cable, 35-core, coiled	3900	Approx. 2500	550 ± 20	8 ± 0.5	10 ± 2	**097 190**
Cable, 35-core, coiled	5400	Approx. 4000	880 ± 20	8 ± 0.5	10 ± 2	**097 191**
Cable, 35-core, straight	3500	-	-	-	-	**097 189**
Cable, 35-core, straight	5000	-	-	-	-	**097 188**
Cable, 35-core, straight	10000	-	-	-	-	**097 187**

Cable gland with anti-kink spiral

Dimension drawing



Thread M	Use	Cable diameter	SW	GL	H
M16x1.5	Kit HBA	5 - 10	22	8	71
Pg 11	Kit HBL	5 - 10	22	11	71
Pg 13.5	Kit HBL	6 - 12	24	12.5	81

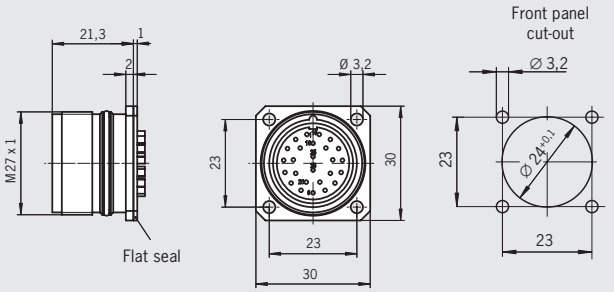
Ordering table

Item	Order No.
Cable gland M16x1.5 with anti-kink spiral, color black	**083 641**
Cable gland Pg 11, with anti-kink spiral and fastening nut, color black	**073 982**
Cable gland Pg 13.5, with anti-kink spiral and fastening nut, color black	**073 983**

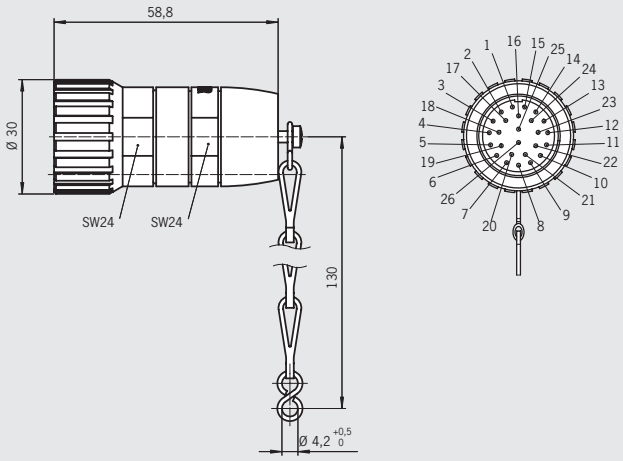
Connection kit

for design HBA - 102 434 and HBA - 103 037, comprising flange socket 26-pin and short-circuit plug

Flange socket 26-pin



Short-circuit plug 26-pin for flange socket 26-pin
(Pin 1 bridged with pin 4 and pin 2 with pin 3)



Technical data

Parameter	Value
Flange socket	
Housing material	Metal
Number of pins	26
Degree of protection according to EN 60529 (inserted)	IP 67
Contact material	Copper alloy
Short-circuit plug	
Housing material	Metal
Number of pins	26
Degree of protection according to EN 60529 (inserted)	IP 67
Contact material	Copper alloy

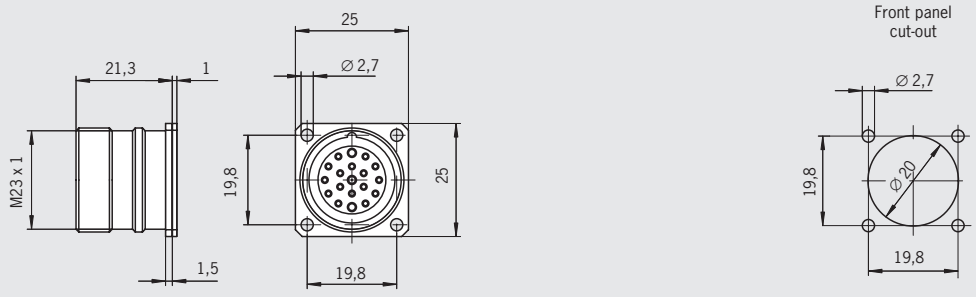
Ordering table

Item	Order No.
Flange socket and short-circuit plug	**103 042**

Flange plug

for design HBAS - 072 949 and HBAS - 094 594

Flange plug, 19-pin with socket contacts



Technical data

Parameter	Value
Housing material	Metal
Number of pins	19
Degree of protection according to EN 60529 (inserted)	IP 65
Contact material	Copper alloy
Connection type	Soldered connection

Ordering table

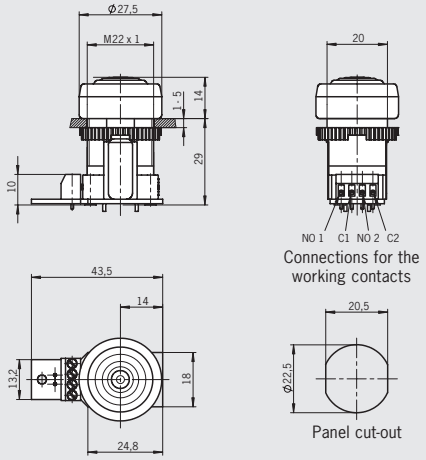
Item	Order No.
Flange plug, 19-pin with socket contacts	**092 374**

Enabling switch ZXE-091336, 3-stage, 2 NO contacts

Notes
- Enabling switch ZXE-091336 for use in housing HBA - 095 562 (see page 26)

Switching elements
- **2202** 2 NO contacts

Dimension drawing

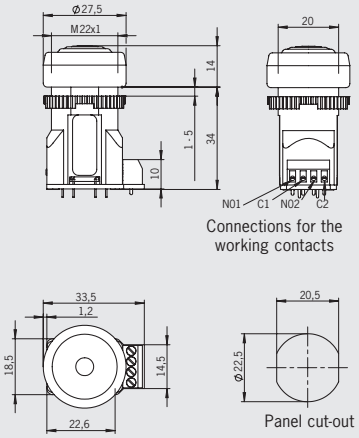


Enabling switch ZXE-104833 with a click, 3-stage, 2 NO contacts

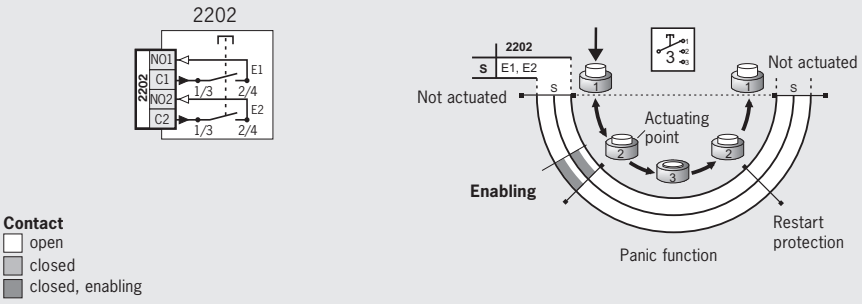
Notes
- Enabling switch ZXE-104833 for use in housing HBA - 095 562 (see page 34)
- A clicking sounds when changing from stage 1 to stage 2 and when the buttom is released back from stage 2 to stage 1.

Switching elements
- **2202** 2 NO contacts

Dimension drawing



Wiring diagramm/function sequence ZXE



Technical data

Parameter	Value	Unit
Housing material	Polyamide, black	
Material protective cap	CR (neoprene), black	
Degree of protection to IEC 529	IP 65 on front	
Ambient temperature	- 5 ... + 60	°C
Switching principle	Slow-action contact element	
Utilization category to IEC 947-5-1	DC-13 U_e 24 V I_e 0.1 A	
Weight	ca. 0.03	kg

Ordering table

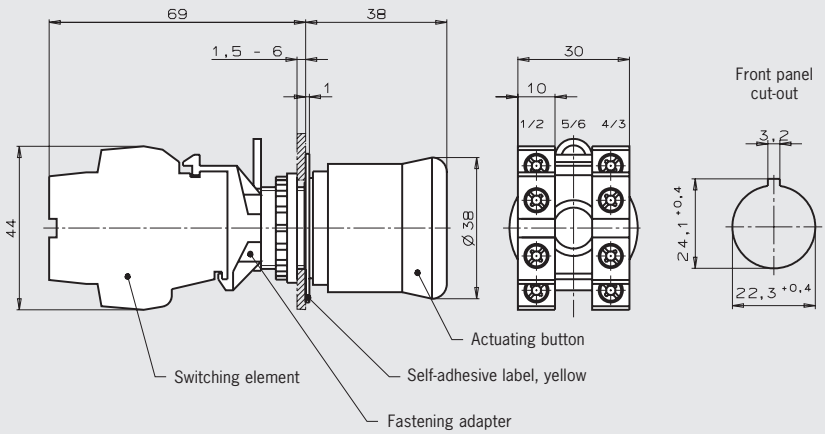
Item	Feature	Contact elements	Switch type	Order No.
ZXE-091336	-	2 NO contacts	Dual-channel	**091 336**
ZXE-104833	Clicking noise with actuation	2 NO contacts	Dual-channel	**104 833**

EMERGENCY STOP device, 22 mm with pull release according to EN ISO 13850

Notes

- The EMERGENCY STOP device engages when actuated by pressing, unlocks when pulled, and is overload-proof
- Use only for following housings:
  HBL - 072 631
  HBL - 072 983
  HBL - 073 113
  HBL - 083 484

Dimension drawing



Technical data

Parameter	Value	Unit
Color of actuating button	Red	
Color self-adhesive label	Yellow	
Switching element	2 NC contacts	
Utilization category to IEC 947-5-1	DC-13 U_e 24 V I_e 2.75 A	

Ordering table

Item	Order No.
EMERGENCY STOP device, complete with switching elements (2 x NC contacts), 1 pull release	**073 985**
Blanking plug for fastening hole for EMERGENCY STOP device	**059 622**

Enabling switch ZSE2-2, 3-stage, 1 positively driven contact

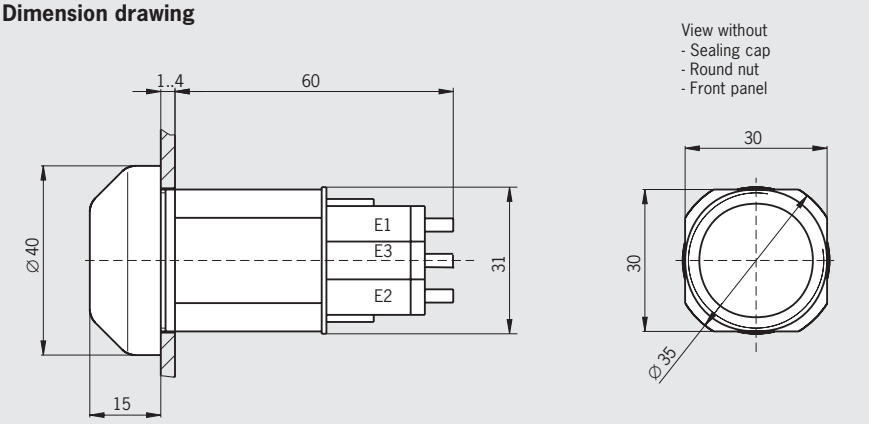
Notes

- Enabling switch ZSE2-2 C1692 for use in housing HBL - 073 109 and HBL - 072 632 (see page 32)

Switching elements

- **210** 2 NO contacts + 1 NC contact ⊖

Dimension drawing



Wiring diagram see below

Enabling switch ZSE2-4, 3-stage, 2 positively driven contacts

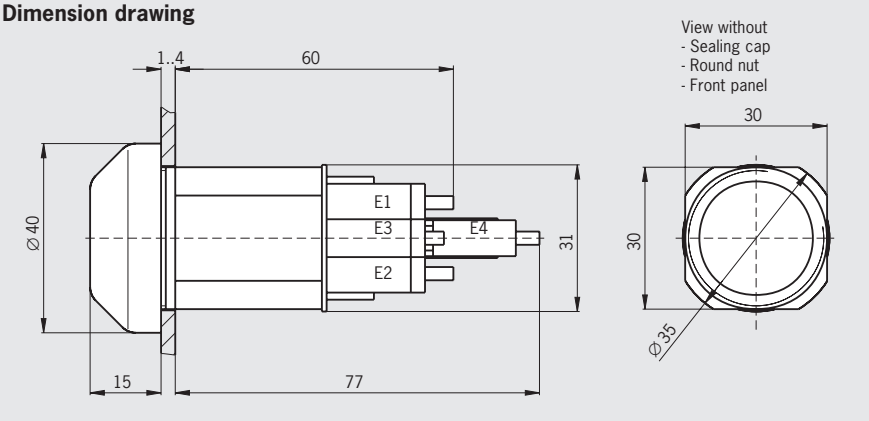
Notes

- Enabling switch ZSE2-4 C1943 for use in housing HBL - 072 983 and HBL - 083 484 (see page 32)

Switching elements

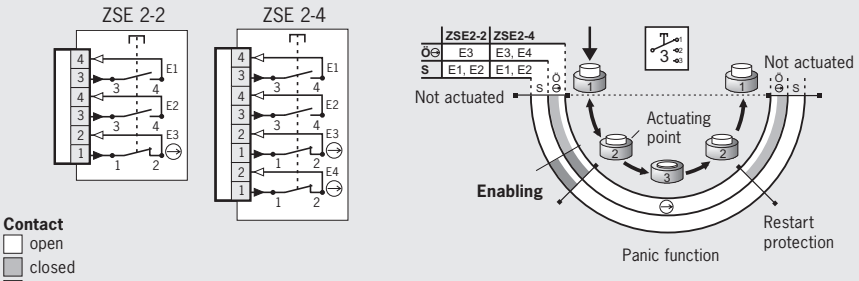
- **220** 2 NO contacts + 2 NC contacts ⊖

Dimension drawing



Wiring diagram see below

Wiring diagrams/function sequence ZSE 2-2 and ZSE 2-4



Technical data

Parameter	Value	Unit
Housing material	Plastic	
Fastening hole	∅ 30.5 $^{+0.5}$	mm
Degree of protection according to IEC 529	IP65 on front	
Ambient temperature	- 5 ... + 60	°C
Switching principle	Slow-action contact element	
Utilization category to IEC 947-5-1	AC-15 U_e 24 V I_e 4 A DC-13 U_e 24 V I_e 3 A	
Weight	Approx. 0.1	kg

Ordering table

Item	Contact elements	Switch type	Order No.
ZSE2-2 C 1692	2 NO contacts + 1 positively driven contact	Single-channel	**070 752**
ZSE2-4 C 1943	2 NO contacts + 2 positively driven contacts	Dual-channel	**083 477**

Holder HBA

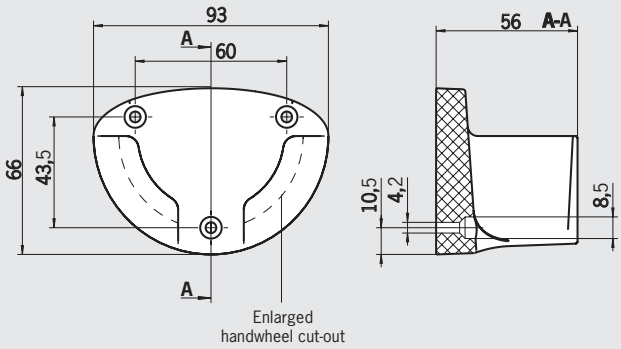
Technical data

Parameter	Value	Unit
Housing material	Plastic	
Fixing system	Screws	
Ambient temperature	-5 to +60	°C
Weight	Approx. 0.1	kg

Ordering table

Item	Order No.
Holder HBA	**072 828**
Holder HBA gray	**072 828**
Holder HBA black	**100 221**
Holder HBA gray, enlarged handwheel cut-out	**072 935**
Holder HBA black, enlarged handwheel cut-out	**109 979**

Dimension drawing



Holder HBL

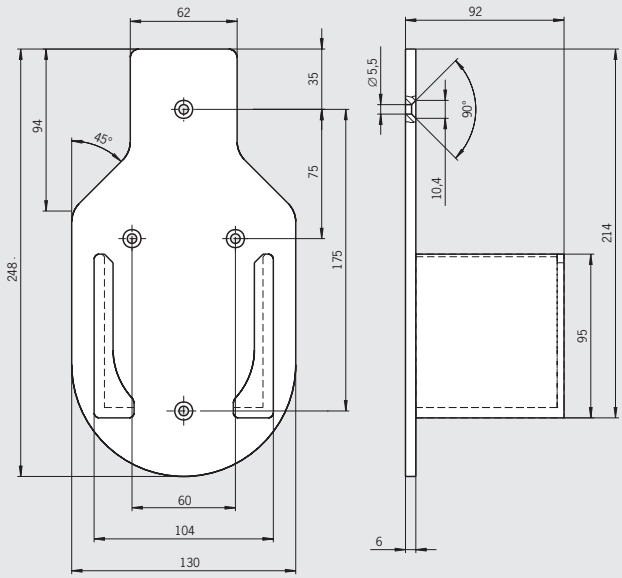
Technical data

Parameter	Value	Unit
Housing material	Plastic	
Fixing system	Screws	
Ambient temperature	-5 to +60	°C
Weight	Approx. 0.1	kg

Ordering table

Designation	Order No.
Holder HBL	**084 397**

Dimension drawing



Function and technology used in handwheels

The change from a handwheel directly coupled to the spindle or axes to CNC-controlled axes has meant dramatic new developments for the handwheels. Along with the rotary movement and the visual indication of the position, the rotation of the handwheel generates square-wave pulses that are evaluated by the CNC axis controller and initiate the movement of the axis. With over 20 years of handwheel experience, EUCHNER provides a wide selection of handwheels that meet the high requirements on quality, reliability and safe signal generation in the machine tool sector.

The daily use of handwheels places high demands on the mechanical design. With twin bearings and a wear-free detent, the handwheels are the optimum choice for trouble-free operation. The detent moment prevents undesired movement even in the event of machine vibration. The detent moment and the 100 or 25 pulses per revolution allow a desired value to be set quickly, reliably and accurately. In addition to the manual positioning of axes on CNC-controlled machines, handwheels are also used for medical and telecommunication applications. EUCHNER also offers handwheels for these applications.

Magnetic detent mechanism

Handwheels with magnetic detent are characterized by their absolutely wear-free and noiseless detent mechanism.

With 100 detent positions (100 or 25 pulses)

The detent position is generated by a magnetic field. A combination of 100 magnetic north/south poles is generated by the opposing magnetic fields creating 100 detent positions per revolution of the handwheel. Thanks to an air gap, the detent mechanism has no wear and is absolutely maintenance-free. With two ball bearings, the handwheel's bearing assembly can withstand high axial and radial forces. Different circuit outputs are available for all common controllers.

Three different designs are available:

- Design HKB
  - Ideally for flat machine panels and small, light hand-held pendant stations.

Handwheel HKB

- Design HKC
  - Suitable for installation in control panels
  - The design is particularly suitable for flat operating panels

Handwheel HKC

- Design HKD
  - Suitable for installation in control panels and EUCHNER HBE and HBL series hand-held pendant stations
  - Suitable for integration in universal turning and milling machines for axis movement

Handwheel HKD

Mechanical detent mechanism

Handwheels with mechanical detent are characterized by their light weight and shallow mounting depth.

With 100 detent positions (100 or 25 pulses)

A toothed rotor working in conjunction with a roller creates the mechanical detent position. The roller is pushed between the teeth of the rotor by a spring and the dial fixed in position. The detent moment is produced by the movement of the roller over the teeth.

There are two different designs available:

- Design HWA
  - Suitable for installation in control panels.
  - Suitable for installation in EUCHNER hand-held pendant stations
  - With single-hole bushing mounting

Handwheel HWA

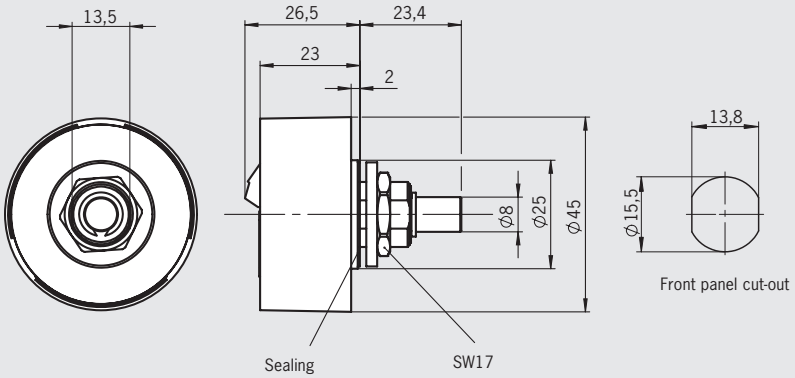
- Design HWB
  - Suitable for installation in control panels
  - With 3-point fastening

Handwheel HWB

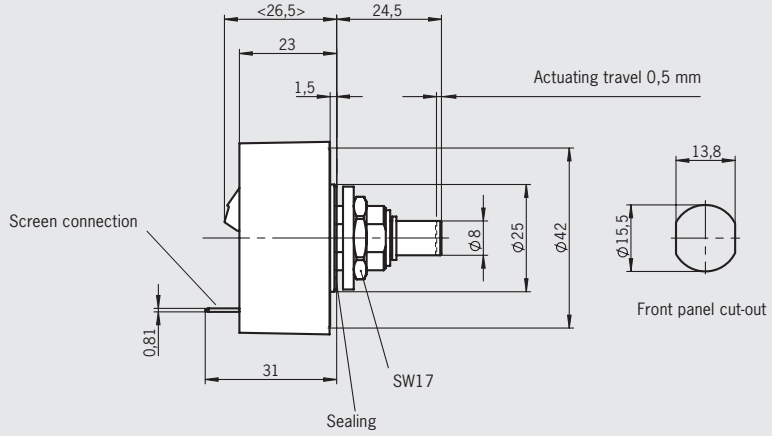
Handwheel HKB

- **100 detend positions per revolution**
- **Wear-free magnetic detend mechanism**
- **100 or 25 pulses per revolution**
- **Pushbutton function in axial direction optional**
- **Ideally for flat machine panels and small, light hand-held pendant stations**

Dimension drawing



Version with pushbutton function



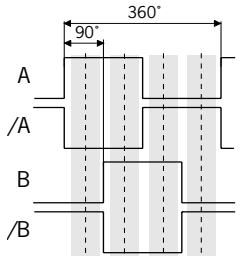
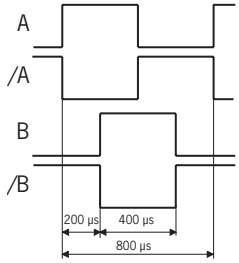
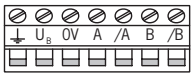
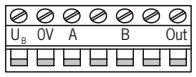
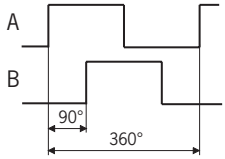
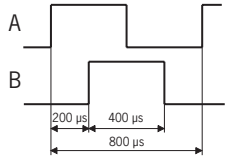
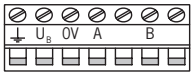
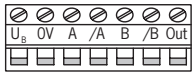
Notes

- A05 output suitable for Siemens controllers with RS422 input
- G05 output suitable for Fanuc control systems
- For dial, see Accessories page 62
- For front plate, see Accessories page 62

Ordering table

Design	Number of pulses per revolution	Connection type	Detent positions	Outputs	Order No. / Item
HKB	25	S Screw terminal	100	**G12** Push pull 5 V U_B= 10 ... 30 V DC	**105 137** HKB025S7G12
	100	S Screw terminal	100	**A05** RS422A U_B= 5 V DC	**105 134** HKB100S7A05
				A12 RS422A U_B= 10 ... 30 V DC	**105 135** HKB100S7A12
				G05 Push pull 5 V U_B= 5 V DC	**105 136** HKB100S7G05
				G24 Push pull 10...30 V U_B= 10 ... 30 V DC	**105 138** HKB100S7G24
HKB with pushbutton function		S		**A05** U_B= 5 V DC	**109 429** HKB100S7A05K

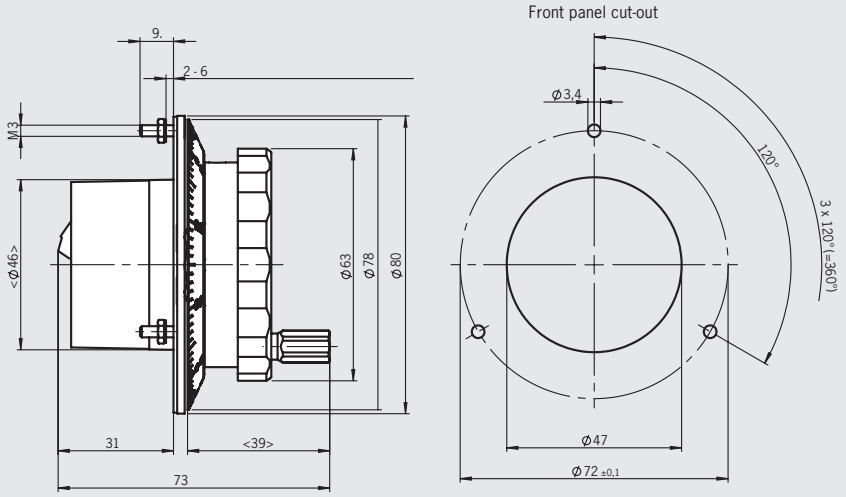
Technical data

Parameter		Value		Unit
Pulses per revolution		2 x 25 oder 2 x 100		
Detent positions		100		
Housing material		Aluminum		
Weight		0.095		kg
Detent		Magnetic		
Shaft load axial, max.		25		N
Shaft load axial radial, max.		40		N
Mechanical life, min.		5 x 10^6		rev.
Operating temperature		0 ... +50		°C
Storage temperature		-20 ... +50		°C
Atmospheric humidity, max.		80 % (condensation not allowed)		
Front degree of protection	EN 60529 / IEC 529	IP 65		
	NEMA	250-12		
Resistance to vibration Vibrations (3 axes) Shock (3 axes)		 DIN/IEC 68-2-6 DIN/IEC 68-2-27		
EMC protection requirements in accordance with CE		EN 61000-6-2, EN 61000-6-4		
Pushbutton function				
Mechanical service life, min.		1 x 10^6 *actuations*		
Actuating travel		0.3 ... 0.7 mm		
Spezification output OUT		*Output stage*		
		A05/G05	A12/G12/G24	
Operating voltage U_B		DC 5 V ± 5 %	DC 10 ... 30 V	
Output voltage	HIGH (1), min.	4.0 V/0 mA	–	
		3.4 V/5 mA	–	
		3.0 V/20 mA	U_B - 3 V/20 mA	
	LOW (0), max.	1.3 V/15 mA	3 V/20 mA	
Output circuit RS422A				
Output circuit		**A05**	**A12**	
Output signals		A, /A, B, /B		
Operating voltage U_B		5 ± 5 %	10 ... 30	V DC
Operating current, no load, max.		80		mA
Output circuit		According to RS422A, RS422 use differential receiver module		
Output signals cw (clockwise rotation)		25 pulses 	100 pulses 	
Pin assignment		Screw terminal 7-pole, wire cross section 0.08² ... 1.5² (AWG 22 ... 16), tightening torquemax. 0.5 Nm without pushbutton function 	with pushbutton function 	
Output circuit, push pull				
Output circuit		**G05**	**G12**	**G24**
Output signals		A, B		
Operating voltage U_B		5 ± 5 %	10 ... 30	V DC
Operating current, no load, max.		80		mA
Output voltage	HIGH (1), min.	4.0 V / 0 mA	4.9 V / 0 mA	–
		3.4 V / 5 mA	3.9 V / 5 mA	–
		3.0 V / 20 mA	3.6 V / 20 mA	U_B - 3 V / 20 mA
	LOW (0), max.	1.3 V / 15 mA	1.3 V / 15 mA	3 V / 20 mA
Output current per output, max.		20		mA
Output signals cw (clockwise rotation)		25 pulses 	100 pulses 	
Pin assignment		Screw terminal 7-pole, wire cross section 0.08² ... 1.5² (AWG 22 ... 16), tightening torque max. 0.5 Nm without pushbutton function 	with pushbutton function 	

Handwheel HKC

- **100 detent positions per revolution**
- **Wear-free magnetic detent mechanism**
- **100 or 25 pulses per revolution**
- **Flat design**

Dimension drawing



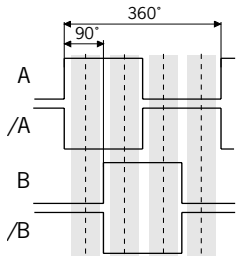
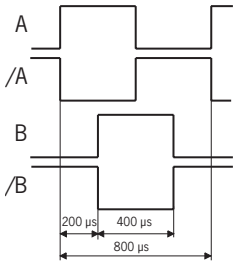
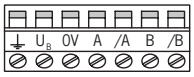
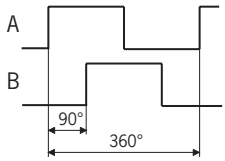
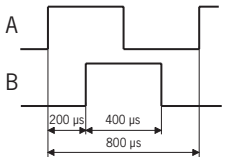
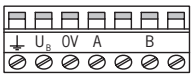
Notes

- A05 output suitable for Siemens controllers with RS422 input
- G05 output suitable for Fanuc control systems

Ordering table

Design	Number of pulses per revolution	Connection type	Detent positions	Outputs	Order No. / Item
HKC	25	**S** Screw terminal	100	**G12** Push pull 5 V U_B= 10 ... 30 V DC	**072 940** HKC025S100G12
	100	**S** Screw terminal	100	**A05** RS422A U_B= 5 V DC	**087 733** HKC100S100A05
				G05 Push pull 5 V U_B= 5 V DC	**082 573** HKC100S100G05
				G24 Push pull 10...30 V U_B= 10 ... 30 V DC	**087 739** HKC100S100G24

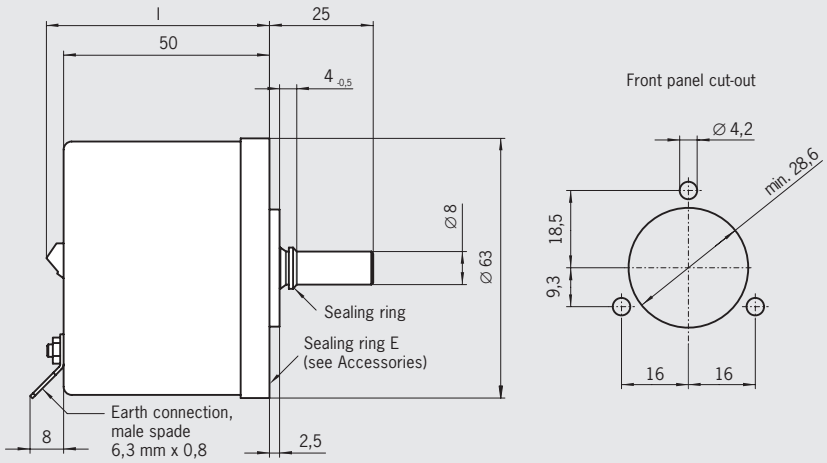
Technical data

Parameter	Value			Unit
Pulses per revolution	2 x 25 or 2 x 100			
Detent positions	100			
Housing material	Thermoplastic			
Weight	0.25			kg
Detent	Magnetic			
Shaft loading, axial, max.	25			N
Shaft loading, radial, max.	40			N
Mechanical life, min.	20 x 10^6			rev.
Operating temperature	0 ... +50			°C
Storage temperature	-20 ... +50			°C
Atmospheric humidity, max.	80 % (condensation not allowed)			
Front degree of protection EN 60529 / IEC 529	IP 65			
NEMA 250	250-12			
Resistance to vibration Vibrations (3 axes) Shock (3 axes)	 DIN/IEC 68-2-6 DIN/IEC 68-2-27			
EMC protection requirements in accordance with CE	EN 61000-6-2, EN 61000-6-4			
Output circuit RS422A				
Output circuit	**A05**			
Output signals	A, /A, B, /B			
Operating voltage U_B	5 ± 5 %			V DC
Operating current, no load, max.	80			mA
Output specifications	According to RS422A, RS422 use differential receiver module			
Output signals cw (clockwise rotation)	25 pulses 		100 pulses 	
Pin assignment	Screw terminal S 			
Output circuit, push-pull				
Output circuit	**G05**	**G12**	**G24**	
Output signals		A, B		
Operating voltage U_B	5 ± 5 %	10 ... 30		V DC
Operating current, no load, max.		80		mA
Output voltage HIGH (1), min.	4.0 V / 0 mA	4.9 V / 0 mA	-	
	3.4 V / 5 mA	3.9 V / 5 mA	-	
	3.0 V / 20 mA	3.6 V / 20 mA	U_B - 3 V / 20 mA	
LOW (0), max.	1.3 V / 15 mA	1.3 V / 15 mA	3 V / 20 mA	
Output current per output, max.		20		mA
Output signals cw (clockwise rotation)	25 pulses 		100 pulses 	
Pin assignment	Screw terminal S 			

Handwheel HKD

- **100 detent positions per revolution**
- **Wear-free magnetic detent mechanism**
- **100 or 25 pulses per revolution**
- **Installation in control panels and EUCHNER HBL series hand-held pendant stations**

Dimension drawing



Notes

- A05 output suitable for Siemens controllers with RS422 input
- G05 output suitable for Fanuc control systems
- For dial, see Accessories page 62
- For front plate, see Accessories page 62

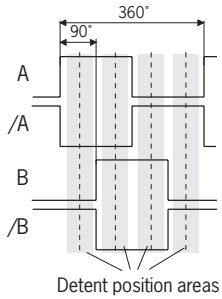
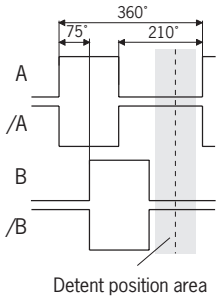
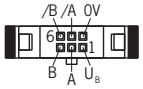
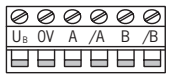
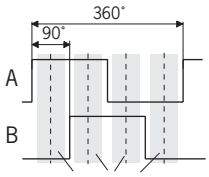
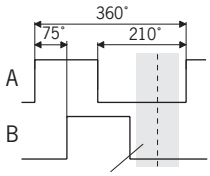
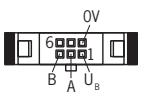
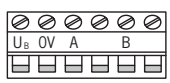
Mounting depth l

Connection type	l [mm]
Screw terminal S	55
Ribbon cable, 6-core V	53

Ordering table

Design	Number of pulses per revolution	Connection type	Detent positions	Outputs	Order No. / Item
HKD	25	**S** Screw terminal	100	**G12** Push pull 5 V U_B= 10 ... 30 V DC	**091 525** HKD025S100G12
		V Ribbon cable 6-core with connector	100	**G12** Push pull 5 V U_B= 10 ... 30 V DC	**091 526** HKD025V100G12
	100	**S** Screw terminal	100	**A05** RS422A U_B= 5 V DC	**054 866** HKD100S100A05
				G05 Push pull 5 V U_B= 5 V DC	**083 354** HKD100S100G05
				G24 Push pull 10...30 V U_B= 10 ... 30 V DC	**054 868** HKD100S100G24
		V Ribbon cable 6-core with connector	100	**A05** RS422A U_B= 5 V DC	**057 036** HKD100V100A05
				G05 Push pull 5 V U_B= 5 V DC	**091 527** HKD100V100G05
				G24 Push pull 10...30 V U_B= 10 ... 30 V DC	**057 037** HKD100V100G24

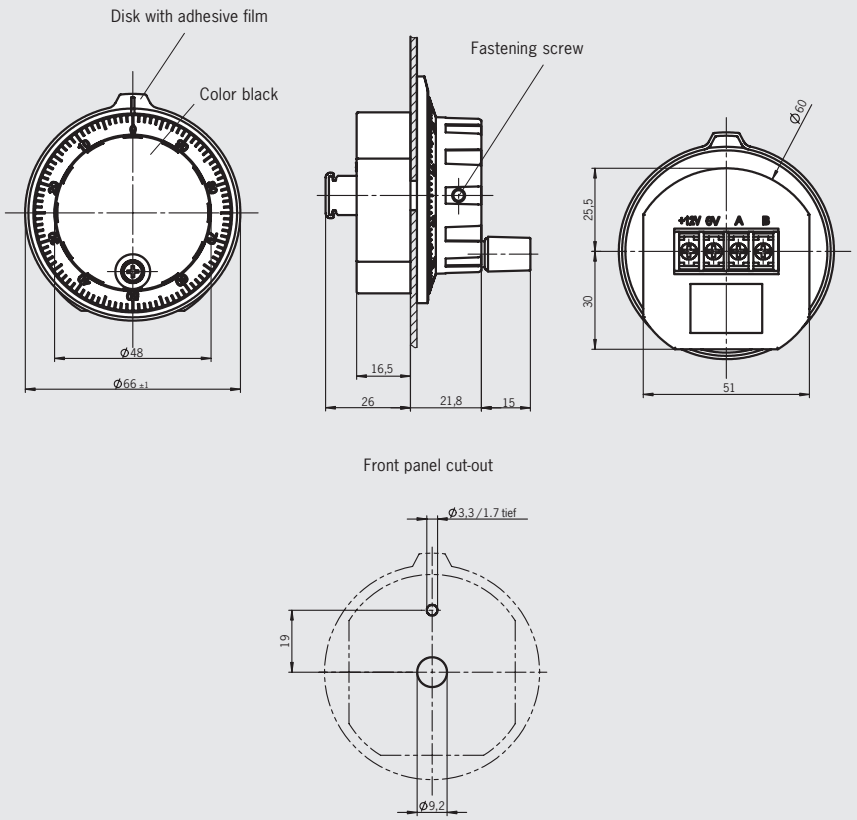
Technical data

Parameter	Value			Unit
Pulses per revolution	2 x 25 or 2 x 100			
Detent positions	100			
Housing material	Aluminum			
Weight	0.5			kg
Detent	Magnetic			
Shaft loading, axial, max.	25			N
Shaft loading, radial, max.	40			N
Mechanical life, min.	20 x 10^6			rev.
Operating temperature	0 ... +70			°C
Storage temperature	-25 ... +85			°C
Atmospheric humidity, max.	80 % (condensation not allowed)			
Front degree of protection EN 60529 / IEC 529	IP 65			
NEMA 250	250-12			
Resistance to vibration Vibrations (3 axes) Shock (3 axes)	 DIN/IEC 68-2-6 DIN/IEC 68-2-27			
EMC protection requirements in accordance with CE	EN 61000-6-2, EN 61000-6-4			
Output circuit RS422A				
Output circuit	**A05**			
Output signals	A, /A, B, /B			
Operating voltage U_B	5 ± 5 %			V DC
Operating current, no load, max.	80			mA
Output circuit	According to RS422A, RS422 use differential receiver module			
Output signals cw (clockwise rotation)	25 pulses  Detent position areas		100 pulses  Detent position area	
Pin assignment	Ribbon cable V  		Screw terminal S  	
Output circuit, push-pull				
Output circuit	**G05**	**G12**	**G24**	
Output signals	A, B			
Operating voltage U_B	5 ± 5 %	10 ... 30		V DC
Operating current, no load, max.	80			mA
Output voltage HIGH (1), min.	4.0 V / 0 mA	4.9 V / 0 mA	-	
	3.4 V / 5 mA	3.9 V / 5 mA	-	
	3.0 V / 20 mA	3.6 V / 20 mA	U_B - 3 V / 20 mA	
LOW (0), max.	1.3 V / 15 mA	1.3 V / 15 mA	3 V / 20 mA	
Output current per output, max.	20			mA
Output signals cw (clockwise rotation)	25 pulses  Detent position areas		100 pulses  Detent position area	
Pin assignment	Ribbon cable V  		Screw terminal S  	

Handwheel HWA

- **100 detent positions per revolution**
- **Mechanical detent mechanism**
- **100 or 25 pulses per revolution**
- **Single-hole bushing mounting**

Dimension drawing



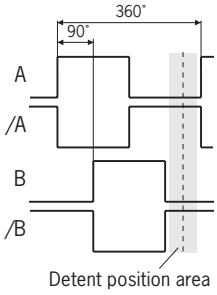
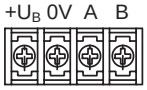
Notes

- A05 output suitable for Siemens controllers with RS422 input
- G05 output suitable for Fanuc control systems

Ordering table

Design	Number of pulses per revolution	Type of connection	Detent positions	Outputs	Order No. / Item
HWA Packaging unit 10 pcs.	**25**	**T** Screw terminal	**100**	**G12** Push pull 5 V U_B= 10 ... 30 V DC	**072 972** HWA025T100G12/V10 (10 pcs.)
	100	**T** Screw terminal	**100**	**A05** RS422A U_B= 5 V DC	**072 970** HWA100T100A05/V10 (10 pcs.)
				G05 Push pull 5 V U_B= 5 V DC	**072 971** HWA100T100G05/V10 (10 pcs.)

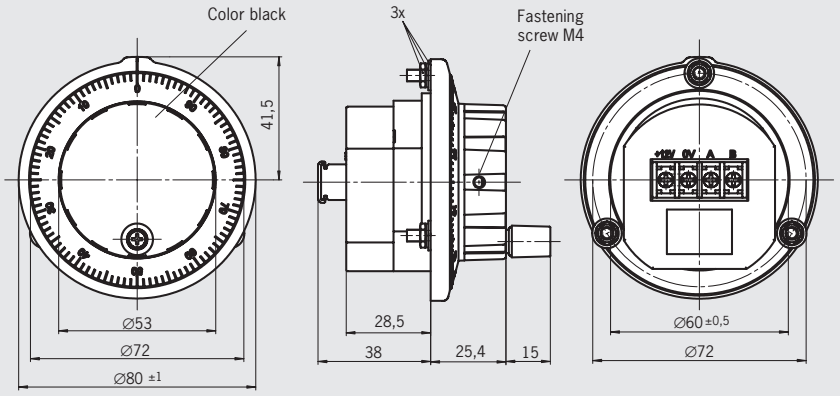
Technical data

Parameter	Value	Unit
Pulses per revolution	2 x 25 or 2 x 100	
Detent positions	100	
Housing material	Plastic/metal	
Weight	0.1	kg
Detent	Mechanical	
Shaft loading, axial, max.	25	N
Shaft loading, radial, max.	40	N
Mechanical life, min.	1 x 10^6	rev.
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Atmospheric humidity, max.	80 % (condensation not allowed)	
Front degree of protection EN 60529 / IEC 529	IP65	
NEMA 250	250-12	
Output circuit RS422A		
Output circuit	**A05**	
Output signals	A, /A, B, /B	
Operating voltage U_B	5 ± 10 %	V DC
Operating current, no load, max.	80	mA
Output specifications	According to RS422A, RS422 use differential receiver module	
Output signals cw (clockwise rotation)	100 pulses 	
Pin assignment	Screw terminal T 	
Output circuit, push-pull		
Output circuit	**G05** / **G12**	
Output signals	A, B	
Operating voltage U_B	5 ± 10 % / 12 ± 10 %	V DC
Operating current, no load, max.	80	mA
Output voltage HIGH (1), min.	4.0 V / 20 mA	
Output voltage LOW (0), max.	0.5 V / 20 mA	
Output current per output, max.	20	mA
Output signals CW (clockwise rotation)	100 pulses / 25 pulses 	
Pin assignment	Screw terminal T 	

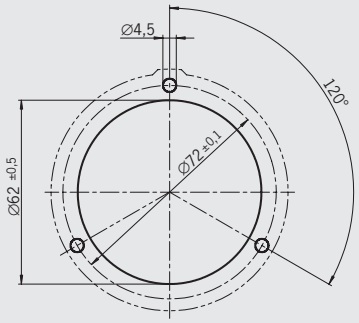
Handwheel HWB

- **100 detent positions per revolution**
- **Mechanical detent mechanism**
- **100 or 25 pulses per revolution**
- **3-point fixing**

Dimension drawing



Front panel cut-out



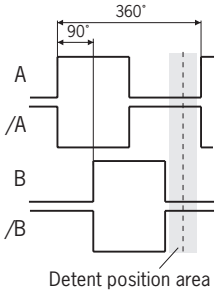
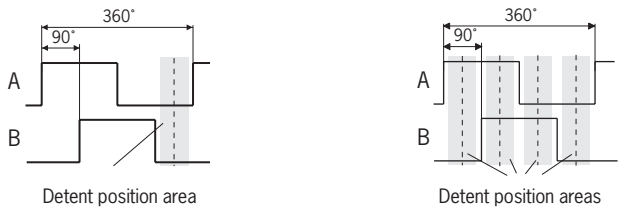
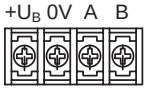
Notes

- A05 output suitable for Siemens controllers with RS422 input
- G05 output suitable for Fanuc control systems

Ordering table

Design	Number of pulses per revolution	Connection Type	Detent positions	Outputs	Order No. / Item
HWB Packaging unit 5 pcs.	**25**	**T** Screw connection	**100**	**G12** Push pull 5 V U_B= 10 ... 30 V DC	**072 975** HWB025T100G12/V05 (5 pcs.)
	100	**T** Screw connection	**100**	**A05** RS422A U_B= 5 V DC	**072 973** HWB10T100A05/V05 (5 pcs.)
				G05 Push pull 5 V U_B= 5 V DC	**072 974** HWB100T100G05/V05 (5 pcs.)

Technical data

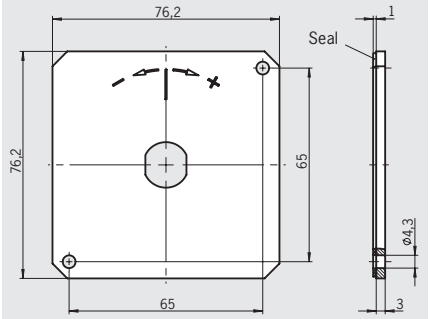
Parameter	Value	Unit
Pulses per revolution	2 x 25 or 2 x 100	
Detent positions	100	
Housing material	Plastic/metal	
Weight	0.125	kg
Detent	Mechanical	
Shaft loading, axial, max.	25	N
Shaft loading, radial, max.	40	N
Mechanical life, min.	1 x 10^6	rev.
Operating temperature	0 ... +50	°C
Storage temperature	-20 ... +50	°C
Atmospheric humidity, max.	80 % (condensation not allowed)	
Front degree of protection EN 60529 / IEC 529	IP65	
NEMA 250	250-12	
Output circuit RS422A		
Output circuit	**A05**	
Output signals	A, /A, B, /B	
Operating voltage U_B	5 ± 10 %	V DC
Operating current, no load, max.	80	mA
Output specifications	According to RS422A, RS422 use differential receiver module	
Output signals cw (clockwise rotation)	100 pulses 	
Pin assignment	Screw terminal T 	
Output circuit, push-pull		
Output circuit	**G05** / **G12**	
Output signals	A, B	
Operating voltage U_B	5 ± 10 % / 12 ± 10 %	V DC
Operating current, no load, max.	80	mA
Output voltage HIGH (1), min.	4.0 V / 20 mA	
Output voltage LOW (0), max.	0.5 V / 20 mA	
Output current per output, max.	20	mA
Output signals CW (clockwise rotation)	100 pulses / 25 pulses 	
Pin assignment	Screw terminal T 	

Accessories

Front plate for handwheel HKB

- Front plate with bonded seal
- Seal handwheels without front plate using sealing ring E

Dimension drawing



Ordering table

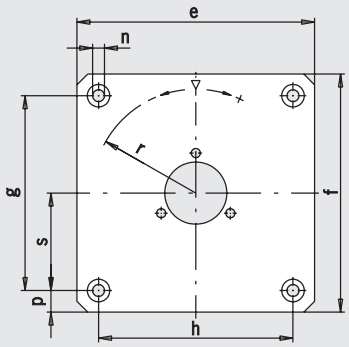
Item	Order No.
Front plate for handwheel HKB silver anodized	**105 072**
Front plate for handwheel HKB black anodized	**105 073**

Front plate for handwheel HKD

- Front plate with bonded seal
- Seal handwheels without front plate using sealing ring E

Dimension drawing

Front plate F, G, M



Dimensions

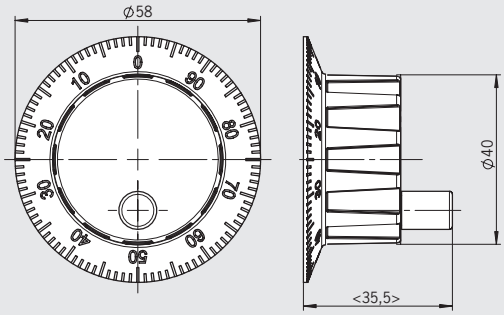
Design	e	f	g	h	k	m	n	p	s	r
F	110	110	90	90	-	-	DIN74-Am5	-	-	R48
G	108	108	89	89	-	-	5.2	-	-	R48
M	76.2	76.2	-	-	65	65	4.2	-	-	R35.5

Ordering table

Item	Order No.
Sealing ring E	**054 861**
Front plate F with seal	**028 760**
Front plate G with seal	**028 761**
Front plate M with seal	**041 758**

Dial for handwheel HKB

Dimension drawing

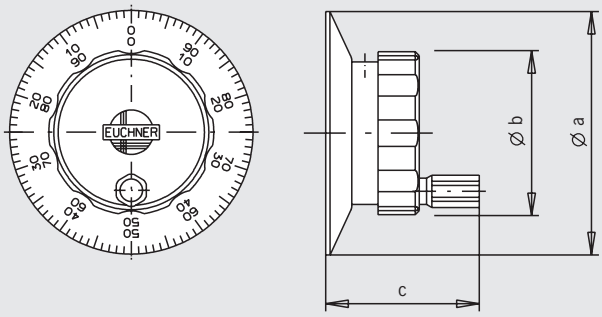


Ordering table

Item	Order No.
Dial 58 mm silver	**100 914**

Dials for handwheel HKD

Dimension drawing



Dimensions

Design	Ø a	Ø b	c
Dial 90 mm	90	63	41
Dial 78 mm	78	63	39
Dial 75 mm	75	63	39
Dial 65 mm	65	44	42
Dial 58 mm	58	44	40

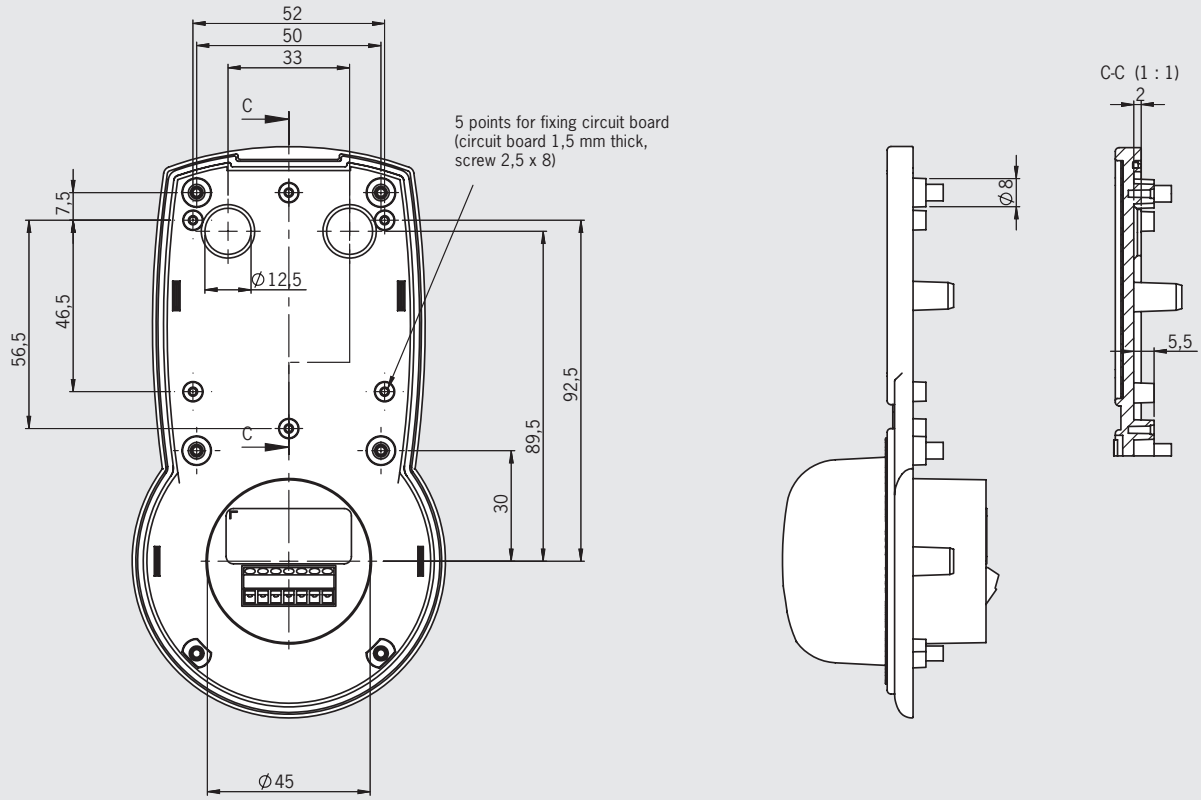
Ordering table

Item	Order No.
Dial 90 mm black	**057 266**
Dial 90 mm silver	**057 268**
Dial 78 mm black	**057 280**
Dial 78 mm silver	**057 272**
Dial 75 mm black	**072 633**
Dial 75 mm silver	**072 597**
Dial 65 mm black, for kit HBL	**057 318**
Dial 65 mm silver, for kit HBL	**057 314**
Dial 58 mm black	**059 276**

Dimension drawing hand-held pendant stations HBA

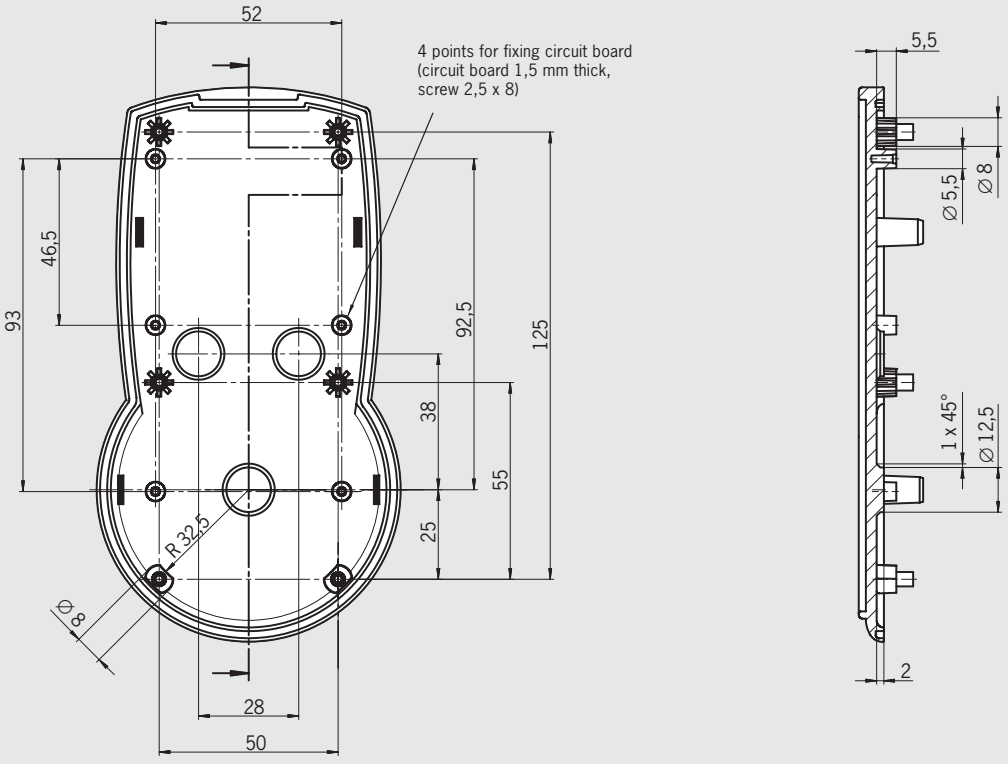
Top shell HBA with handwheel

Dimension drawing



Top shell HBA without handwheel

Dimension drawing

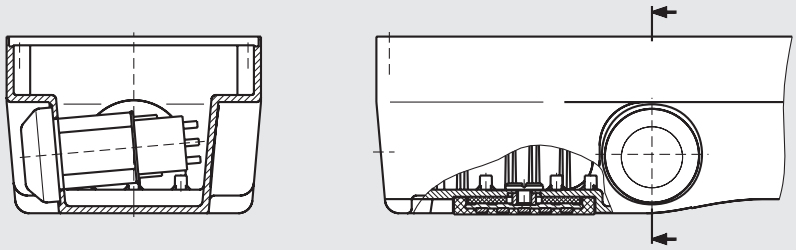


Assembly drawings

Housing HBL - 073 109 and HBL - 072 632

- Mounting enabling switch ZSE2-2 C1692 (2 NO contacts, 1 positively driven contact)
- No hole for EMERGENCY STOP device

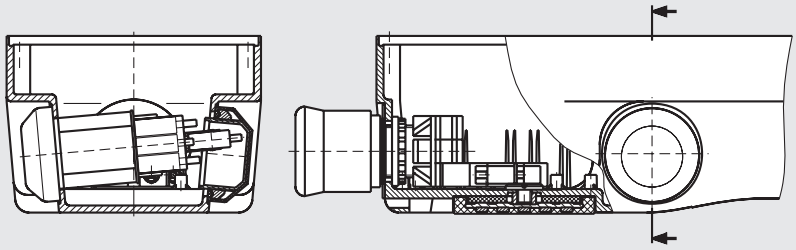
Dimension drawing



Housing HBL - 072 983 and HBL - 083 484

- Mounting enabling switch ZSE2-4 C1943 (2 NO contacts, 2 positively driven contacts)
- Mounting EMERGENCY STOP device 073 985

Dimension drawing



Request form for hand-held pendant stations HBA without handwheels

Customer			
Company		**Telephone**	
Address		**Fax**	
		E-mail	
Name		**Department**	
First name		**Date**	

Housing
- ☐ **Gray**
- ☐ Black

Front foil
- ☐ **EUCHNER Standard**
- ☐ Customer-specific as per attachment

Pushbuttons
- ☐ **Without**
- ☐ 3 membrane buttons
- ☐ ____ single button

LED
- ☐ **Without**
- ☐ With

Key-operated switch
- ☐ **Without**
- ☐ With

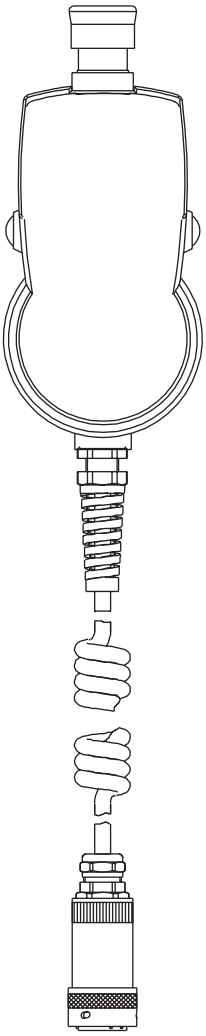
Toggle switch
- ☐ **Without**
- ☐ With: _____

Potentiometer
- ☐ **Without**
- ☐ Technical specification: _____

Joystick
- ☐ **Without**
- ☐ With KE

Cable
- ☐ **Coiled 1.5 m, can be streched to 3.5 m**
- ☐ Coiled 2.0 m, can be streched to 5.0 m
- ☐ Straight: ____ m

Plug connector
- ☐ **Burndy metal**
- ☐ Coninvers metal
- ☐ Other: _____
- ☐ Without plug connector



EMERGENCY STOP
- ☐ **2 NC contacts**
- ☐ 3 NC contacts

Selector switch left
- ☐ **Without**
- ☐ ____ positions Gray code
- ☐ ____ positions HEX code
- ☐ ____ positions 1 of X
- ☐ Labeling: _____

Selector switch right
- ☐ **Without**
- ☐ ____ positions Gray code
- ☐ ____ positions HEX code
- ☐ ____ positions 1 of X
- ☐ Labeling: _____

Enabling device
- ☐ **Without**
- ☐ 2-stage, each 1 NO, right and left
- ☐ 3-stage, 2 NO, left

Further components and versions on request

Special requirements

Quotation				
Quantity	☐	One-off project requirement	☐	Series production requirement per year ☐
Delivery date requested	☐	Week	☐	

Date	Signature

Request form for hand-held pendant stations HBA with handwheels

Customer			
Company		**Telephone**	
Address		**Fax**	
		E-mail	
Name		**Department**	
First name		**Date**	

Housing
- ☐ **Gray**
- ☐ Black

Front foil
- ☐ **EUCHNER Standard**
- ☐ Customer-specific as per attachment

Pushbuttons
- ☐ **Without**
- ☐ 3 membrane buttons
- ☐ ____ single button

LED
- ☐ **Without**
- ☐ With

Key-operated switch
- ☐ **Without**
- ☐ With

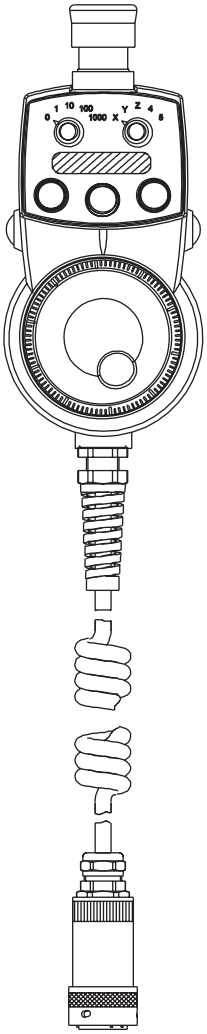
Toggle switch
- ☐ **Without**
- ☐ With: _____

Potentiometer
- ☐ **Without**
- ☐ Technical specification: _____

Joystick
- ☐ **Without**
- ☐ With KE

Cable
- ☐ **Coiled 1.5 m, can be streched to 3.5 m**
- ☐ Coiled 2.0 m, can be streched to 5.0 m
- ☐ Straight: ____ m

Plug connector
- ☐ **Burndy metal**
- ☐ Coninvers metal
- ☐ Other: _____
- ☐ Without plug connector



EMERGENCY STOP
- ☐ **2 NC contacts**
- ☐ 3 NC contacts

Selector switch left
- ☐ **Without**
- ☐ ____ positions Gray code
- ☐ ____ positions HEX code
- ☐ ____ positions 1 of X
- ☐ Labeling: _____

Selector switch right
- ☐ **Without**
- ☐ ____ positions Gray code
- ☐ ____ positions HEX code
- ☐ ____ positions 1 of X
- ☐ Labeling: _____

Enabling device
- ☐ **Without**
- ☐ 2-stage, each 1 NO, right and left
- ☐ 3-stage, 2 NO, left

Handwheel
See catalogue page 37
- ☐ Without
- ☐ magnetic
- ☐ mechanical
- ☐ A05, 100 pulses, RS422
- ☐ G05, 100 pulses
- ☐ G12, 25 pulses
- ☐ G24, 100 pulses

On which control system will the handwheel be operated?
- ☐ Siemens, type: _____
- ☐ Fanuc, type: _____
- ☐ Mitsubishi, type: _____
- ☐ Other / brand: _____

Further components and versions on request

Special requirements

Quotation					
Quantity	☐	One-off project requirement	☐	Series production requirement per year	☐
Delivery date requested	☐	Week	☐		

Date	Signature

Hand-held pendant stations HBL request form

Customer			
Company		Telephone	
Address		Fax	
		E-mail	
Name		Department	
First name		Date	

Front plate
- ☐ **EUCHNER Standard black anodized silver labeling**
- ☐ Customer-specific as per attachment

Logo
- ☐ **Without**
- ☐ Customer-specific as per attachment

Pushbutton
- ☐ **Without**
- ☐ Number of NO contacts
- ☐ Number of NC contacts
- ☐ **Not illuminated**
- ☐ Illuminated
- ☐ Symbol plate labeling as per attachment
- ☐ Front plate labeling as per attachment

Key-operated switch
- ☐ **Without**
- ☐ With

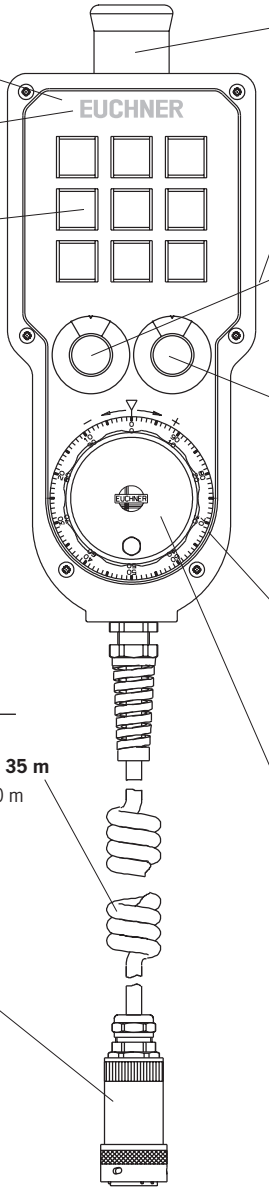
Lamp/LED
- ☐ **Without**
- ☐ Customer-specific as per attachment

Potentiometer
- ☐ **Without**
- ☐ Technical specification: _____

Cable
- ☐ **Coiled 1.5 m, can be streched to 35 m**
- ☐ Coiled 2.0 m, can be streched to 5.0 m
- ☐ Straight: _____ m

Plug connector
- ☐ **Burndy metal**
- ☐ Coninvers metal
- ☐ Other: _____
- ☐ Without plug connector

Further components and versions on request



EMERGENCY STOP
- ☐ **2 NC contacts**
- ☐ 1 NC contacts
- ☐ **Without**

Enabling device
- ☐ **2-tage, ZSG, each 1 NO, right + left**
- ☐ 3-stage, ZSE 2-2 (2 NO + 1 NC) only left
- ☐ 3-stage, ZSE 2-4 (2 NO + 2 NC) only left
- ☐ Without enabling device

Selector switch left
- ☐ **Without**
- ☐ ___ Positions Gray code
- ☐ ___ Positions HEX code
- ☐ ___ Positions 1 of X
- ☐ Labeling: _____

Selector switch left
- ☐ **Without**
- ☐ ___ Positions Gray code
- ☐ ___ Positions HEX code
- ☐ ___ Positions 1 of X
- ☐ Labeling: _____

Labeling selector switches
- ☐ **Through scale wheels**
- ☐ On front plate

Handwheel see catalogue page 60 - 72
- ☐ without
- ☐ Magnetic
- ☐ Mechanical
- ☐ A05, 100 pulses, RS422
- ☐ G05, 100 pulses
- ☐ G12, 25 pulses
- ☐ G24, 100 pulses

Dial
- ☐ **EUCHNER Logo**
- ☐ Customer-specific logo as per attachment
- ☐ **Silver 65 mm**
- ☐ Black 65 mm
- ☐ Silver 75 mm
- ☐ Black 75 mm

On which control system will the handwheel be operated?
- ☐ Siemens, type: _____
- ☐ Fanuc, type: _____
- ☐ Mitsubishi, type: _____
- ☐ Other / brand: _____

Special requirements

Quotation					
Quantity	☐	One-off project requirement	☐	Series production requirement per year	☐
Delivery date requested	☐	Week	☐		

Date	Signature

Index by item designation

Item	Order No.	Page

Index by order number

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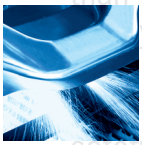
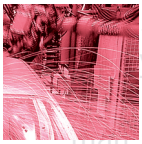
Automation



Safety



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