Safety in System
Protection for man and machine

COMMAND AND SIGNALLING DEVICES
PRODUCT INFORMATION

SCHMERSAL
THE DNA OF SAFETY

INTRODUCTION

Heinz and Philip Schmersal,
Managing Directors of the Schmersal Group

New solutions to improve production efficiency and machine safety

Safety in system – Protection for man and machine

Often, it is unavoidable that people have to intervene with the workings of a machine. When this is done, the safety of the operator is imperative. This demands the responsibility of the machine operator, which is also required by the world's standards and guidelines for machine safety.

The Schmersal Group has concentrated for many years on safety at work with our products and solutions; today we can offer the industry the world's largest range of safety switchgear and systems for the protection of man and machine.

Under the guiding principle "Safety with system – protection for man and machine" we develop and produce products that carry the system concept and can be optimally integrated into the work processes. Because we are convinced that safety does not contradict higher productivity.

In our fields of activity we have a leading position due to our expertise, our innovative power and our comprehensive range of products. With this we follow a central theme: Together with you, we want to make the world safer. Talk to us – we look forward to working with you.

CONTENT

Web shop

Already familiar with our new web shop? Here you will find all details and data on our products which you can order directly online:

products.schmersal.com

P

HISTORY
MILESTONES 1945 – 2024

Schmersal Brazil 1974

Schmersal China 2013

Startup of the new central warehouse in 2013

1945	The brothers Kurt Andreas Schmersal and Ernst Schmersal **form** the company in Wuppertal.
1974	**ACE Schmersal** is formed in Boituva, Brazil.
1982	**Generational change**: Heinz and Stefan Schmersal take over the company from their fathers.
1997	**ELAN Schaltelemente GmbH & Co. KG** based in Wettenberg is acquired.
1999	The production facility **Schmersal Industrial Switchgear Co. Ltd** (SISS) is formed in Shanghai, China.
2007	Philip Schmersal joins the **third generation of the** Schmersal Group.
2008	Schmersal takes over **Safety Control GmbH** based in Mühldorf/Inn.
2013	**Böhnke + Partner Steuerungssysteme GmbH** is acquired. **Schmersal India** becomes a production facility. Startup of the new **European central warehouse** in Wuppertal.
2016	The Schmersal Group is establishing its own business area for services under the name **tec.nicum**.
2017	Schmersal founds an independent **subsidiary** in Japan.
2019	Schmersal establishes **new branches** in Bangkok (Thailand) and Dubai (UAE).
2020	In 2020, the Schmersal Group celebrated its **75th anniversary**.
2023	Foundation of a new company: **DICEO Group GmbH** The DICEO Group GmbH is a consortium of two partners, the Schmersal Group and the management consultancy compreneur AG. Foundation of **Schmersal Middle East Industrial Equipment Trading LLC** in Riyadh

SCHMERSAL WORLDWIDE

- Germany, Wuppertal
- Germany, Wettenberg
- Germany, Mühldorf
- Germany, Bergisch Gladbach
- Brazil, Boituva
- China, Shanghai
- India, Pune
- USA, Indianapolis

- Austria, Vienna
- Belgium, Aarschot
- Canada, Orangeville
- Denmark, Hvidovre
- Finland, Vantaa
- France, Seyssins
- Italy, Borgosatollo
- Japan, Yokohama
- Netherlands, Harderwijk
- Norway, Oslo
- Poland, Warsaw
- Portugal, Lisbon
- Spain, Barcelona
- Sweden, Västra Frölunda
- Switzerland, Arni
- Thailand, Bangkok
- Turkey, Istanbul
- United Arab Emirates, Sharjah
- United Kingdom, Malvern, Worcestershire
- USA, Valhalla NY

- Argentina, Buenos Aires
- Australia, Brisbane
- Baltic States, Kaunas
- Bolivia, Santa Cruz de la Sierra
- Bosnia and Herzegovina, Sarajevo
- Bulgaria, Ruse City
- Chile, Santiago
- Colombia, Medellín
- Croatia, Zagreb
- Czech Republic, Prague
- Ecuador, Quito
- El Salvador, San Salvador
- Greece, Athens
- Guatemala, Guatemala City
- Hungary, Györ
- Iceland, Reykjavik
- Indonesia, Jakarta
- Israel, Petach Tikva
- Lithuania, Minsk
- Macedonia, Skopje
- Mexico, Mexico City
- New Zealand, Christchurch
- Paraguay, Minga Guazú
- Peru, Lima
- Romania, Sibiu
- Serbia, Belgrade
- Singapore, Singapore
- Slovenia, Ljubljana
- South Africa, Johannesburg
- South Korea, Seoul
- Taiwan, Taichung
- Ukraine, Kiev
- Uruguay, Montevideo
- Venezuela, Caracas
- Vietnam, Ho Chi Minh City

With its own affiliates in around 20 countries and capable sales and service partners in 45 more countries, the Schmersal Group has operations worldwide.

We started quite early with the internationalisation of sales, consultancy and production. This is also one of the reasons that we are a favoured global partner for machinery and plant construction and also an approved partner for many medium sized engineering companies with local presence. Wherever there are machines that work with Schmersal safety switches, the nearest branch or representative is not far away.

SCHMERSAL WORLDWIDE
OFFICES IN GERMANY

WUPPERTAL

K.A. Schmersal GmbH & Co. KG
- Founded in 1945
- Around 760 employees

Focal points
- Headquarters of the Schmersal Group
- Development and manufacture of switchgears and switching systems for safety, automation and lift engineering
- Accredited test laboratory
- Central research and development
- Logistics centre for European markets

WETTENBERG

K.A. Schmersal GmbH & Co. KG
- Founded in 1952 (1997)
- Around 130 employees

Focal points
- Development and manufacture of switchgears for operation and monitoring, safety-related relay modules and controls as well as switchgears for explosion protection

MÜHLDORF / INN

Safety Control GmbH
- Founded in 1994 (2008)
- Around 30 employees

Focal points
- Development and manufacture of optical electronic components for safety and automation engineering

BERGISCH GLADBACH

Böhnke + Partner GmbH Steuerungssysteme
- Founded in 1991 (2013)
- Around 90 employees

Focal points
- Development and manufacture of components, controls and remote diagnostic systems for the lift industry

( ) = inclusion in the Schmersal Group

SCHMERSAL WORLDWIDE
INTERNATIONAL OFFICES

BOITUVA / BRAZIL

ACE Schmersal
- Founded in 1974
- Around 400 employees

Focal points
- Development and manufacture of electromechanical and electronic switchgears
- Customer-specific control systems for the North and South American market

SHANGHAI / CHINA

Schmersal Industrial Switchgear Co. Ltd
- Founded in 1999
- Around 150 employees

Focal points
- Development and manufacture of switchgears for safety, automation and lift engineering

PUNE / INDIA

Schmersal India Private Limited
- Founded in 2013
- Around 60 employees

Focal points
- Development and manufacture of switchgears for safety, automation and lift engineering

INDIANAPOLIS / USA

Schmersal, Inc.
- Founded in 2023
- Around 30 employees

Focal points
- Logistics center for US market
- Development and manufacture of customer-specific assemblies for safety, automation and elevators

COMMAND AND SIGNALLING DEVICES
DESCRIPTION

COMMAND AND SIGNALLING DEVICES

Command and signalling devices makes communication possible between human beings and machines. People expect high levels of reliability from them. Intuitive operation is desirable not just from an ergonomic point of view, but also with regards to safety at work.

The type of machine and the environmental conditions mean that the demands made of command and signalling devices are very different. Consequently, there is a wide range of different designs available. In addition to classic command devices and indicator lights for installation on operator panels, pull-wire switches, foot switches, cross-switches and buttons as well as two-hand controls and enabling devices, for example are in common use.

As an all-rounder in the field of HMI components and systems, the Schmersal Group offers a range of products for (virtually) all areas of application. These include command and signalling device series that have been developed for dedicated use in hygiene-sensitive areas (Series N) as well as for extremely harsh ambient conditions (Series R).

All our series are distinguished by their very high levels of quality and their long service lives. They are of modular structure, which means you can adapt them in an optimum way to meet the exact requirements of your own individual application.

With contact systems too, users have different choices (see page 108: Contact and lighting elements). Apart from this, assembly housings are available for all four series. If desired, command and signalling devices are supplied pre-assembled or ready-to-connect to operating systems with housings (see page 132: Enclosure for surface mounting).



	E programme	E.V programme	N programme	H programme	R programme	A programme
Area of application	Difficult operating conditions	Difficult operating conditions	Food, hygiene and outdoor applications	Food and hygiene applications	Heavy-duty applications	Industrial applications
Emergency-Stop pushbuttons	 Page 12	 Page 28	 Page 44	 Page 60	 Page 80	 Page 96
Indicator lights	 Page 14	 Page 30	 Page 46	 Page 62	 Page 82	 Page 98
Pushbuttons	 Page 16	 Page 32	 Page 48	 Page 64	 Page 84	 Page 100
Illuminated pushbuttons	 Page 16	 Page 32	 Page 48	 Page 64	 Page 84	 Page 100
Mushroom head impact buttons/ Mushroom pushbuttons	 Page 18	 Page 34	 Page 50	 Page 67	 Page 86	 Page 102
Selector switches / buttons	 Page 20	 Page 36	 Page 52	 Page 70	 Page 88	 Page 104
Key-operated selector switches/ buttons	 Page 22	Page 38	—	—	Page 90	Page 106
Step selector switches	Page 24	Page 40	Page 56	Page 76	Page 92	—
Potentiometer drives	Page 24	Page 40	Page 56	Page 76	Page 92	—
Main switches	—	—	Page 54	Page 72	—	—

COMMAND AND SIGNALLING DEVICES
E PROGRAMME

AREA OF APPLICATION

The Series E.V command and signalling devices for 22.3 mm installation boreholes have been developed as universal operator input and display elements for all mechanical engineering, plant construction and automotive applications. They are generally integrated in the control panels or enclosures of machines and are in use all over the world.

The separate N and R product portfolios are available for applications that make particular demands of either hygiene or the toughness of the command and signalling devices.

DESIGN AND WAY OF FUNCTIONING

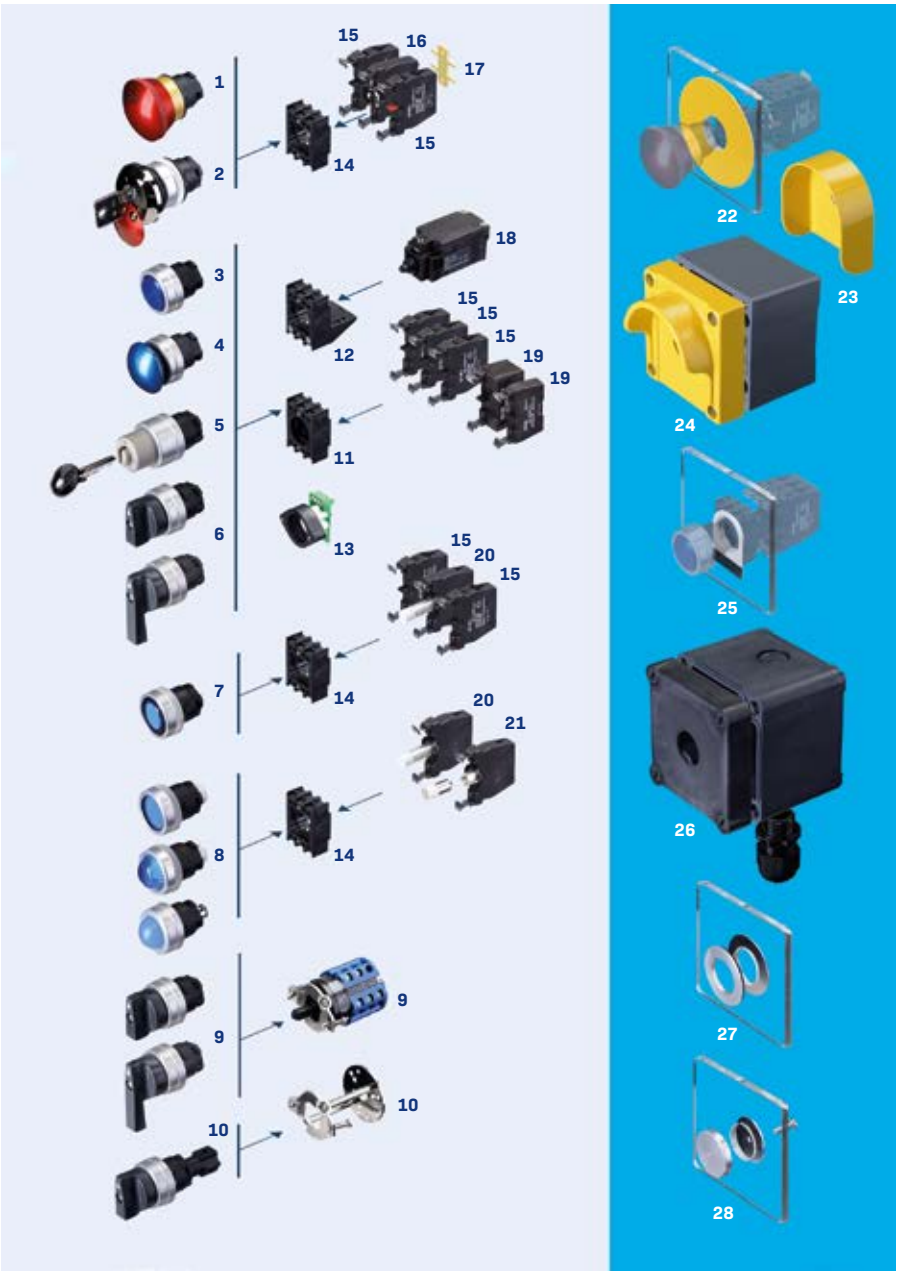
The command and signalling devices of Series E are each designed with an operating button and an EF contact system. Both parts are simply joined by catch springs. This principle ensures fast assembly on the front panel of the control panel and a permanent connection between the head and the contact system. When doing this, the modular principle of this range makes it possible to increase flexibility and to adapt the Human Machine Interface to individual requirements in an optimum way.

The control heads of Series E are made from anodised aluminium, with the collars being glass. The seals on the front of the devices complies with degree of protection IP65.

Users can choose between a vast range of different variants. The product portfolio includes amongst other things, push buttons, mushroom head impact buttons, illuminated control push buttons and indicator lights, selector switches and selection buttons as well as key selector switches and key selection buttons.

In the E range, the mushroom head impact buttons are particularly important. They are used all over the world in mechanical engineering and plant construction and stand out due to their extremely robust design. On vibrating machines or with frequent shock loading, these EMERGENCY STOP buttons function reliably and thus increases the machines' productivity and extend their service lives. If the EMERGENCY STOP button fails, the safety system shuts down the machine, this rarely happens with E range switchgears with an external snap-action mechanism.

Product overview		Page
1	Emergency stop	12
2	EMERGENCY STOP with release by key	12
3	Pushbuttons	16
4	Mushroom head impact button/ Mushroom push button	18
5	Key-operated selector switch/ button	22
6	Selector switch/key button	20
7	Illuminated pushbutton	16
8	Indicator light	14
9	Step selector switch	24
10	Potentiometer drive	24
11	Mounting flange EFM	129
12	Mounting flange EFMH	129
13	Short-stroke key element	–
14	Mounting flange ELM	129
15	Contact element EF	112
16	Spring element EFR	112
17	Securing plate	–
18	Position switch	–
19	Contact element EFK...	–
20	Light terminal block ELDE...	112
21	Light terminal block EL...	112
22	Emergency stop label	126
23	Emergency stop protective collar	126
24	EMERGENCY STOP enclosure for surface mounting	132
25	Identification label	126
26	Plastic enclosure for surface mounting	132
27	Adapter ring	128
28	Blanking plug	128



COMMAND AND SIGNALLING DEVICES – E PROGRAMME
EMERGENCY STOP CONTROL DEVICES



	■ EDRR40RT	■ EDRZ40RT	■ EDRRS40RT
Key Features			
General description	Emergency stop command device – with twist and pull-to-unlatch mechanism	Emergency stop command device – with pull-to-unlatch mechanism	Emergency stop command device – with key unlatching mechanism
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	22.3 mm	22.3 mm	22.3 mm
Housing material			
Material of operating element	Aluminium	Aluminium	Chrome-plated brass
Material front ring	Aluminium	Aluminium	Aluminium
Technical features			
Mechanical data			
Color	■	■	■
Design	Round	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1 ... 6 mm
Unlocking type	Twist and pull-to-unlatch mechanism	Pull-to-unlatch mechanism	Key reset
Snap-action mechanism			
Integrated	–	■	–
Externally via additional module	■	–	■
Assembly			
Mounting flange included in delivery	■	■	■
Mounting position	Arbitrarily	Arbitrarily	Arbitrarily
Ambient conditions			
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65	IP65
Safety classification			
Standards	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850
Mechanical life	100,000 operations	100,000 operations	100,000 operations
Certificates	cULus	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only		

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
EMERGENCY STOP CONTROL DEVICES

Type	Unlocking	Snap-action mechanism	A	B	C	Type	Material number
Emergency stop command devices	Pull-to-unlatch mechanism	Integrated	29	22.3	38.5	**EDRZ40 RT**	**101177107**
	Twist and pull-to-unlatch mechanism	External with spring element EFR *	29	22.3	38.5	**EDRR40 RT**	**101021009**
					49	**EDRR50 RT**	**101021015**
	Release by key (cover red)	External with spring element EFR.EDRRS *	29	22.3	37.5	**EDRRS40 RT**	**101025432**

* Spring element EFR or EFR.EDRRS must be ordered separately!

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
INDICATOR LIGHTS

	■ EML / EMLH	■ EME
Key Features		
General description	Illuminated signal for BA9s	Illuminated signal with integrated LED
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Glass	Plastic
Material front ring	Aluminium	Aluminium
Technical features		
Mechanical data		
Color		
Design	Round with flat or high glass	Round with flat or high glass
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Integrated LED 24 VAC/DC *	–	■
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +40 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	–	–
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

* A voltage sensor, e.g. an ELE is also needed for driving. You can find the voltage sensors from page 108

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
INDICATOR LIGHTS

Type	Illuminant	Collar	A	B	C	Type
Indicator lights	Without integrated illuminant	Flat collar	14	22.3	29.5	**EML** ①
		High collar	20	22.3	29.5	**EMLH** ①
LED indicator light	With integrated illuminant	High collar	20	22.3	29.5	**EME** ①

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

EML GN

EMLH RT

EME GB

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

	■ EDT	■ EDL
Key Features		
General description	Pushbuttons	Illuminated pushbutton
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Aluminium	Glass
Material front ring	Aluminium	Aluminium
Technical features		
Mechanical data		
Color	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

Type	Description		A	B	C	Type
Pushbuttons	Included in standard version	Included in standard version	14	22.3	29.5	**EDT** ①
		6 mm edge to prevent unwanted activation	20	22.3	29.5	**EDTH** ①
	With membrane	Included in standard version	14	22.3	29.5	**EDM** ①
		6 mm edge to prevent unwanted activation	20	22.3	29.5	**EDMH** ①
	With latching	Included in standard version	14	22.3	29.5	**EDTR** ①
Illuminated pushbuttons	Included in standard version	Included in standard version	14	22.3	29.5	**EDL** ①
		6 mm edge to prevent unwanted activation	20	22.3	29.5	**EDLH** ①
	With membrane	Included in standard version	14	22.3	29.5	**EDLM** ①
		6 mm edge to prevent unwanted activation	20	22.3	29.5	**EDLMH** ①
	With latching	Included in standard version	14	22.3	29.5	**EDLR** ①

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head


EDM RT


EDT2 GB


EDLMH BL


EDL GN

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
MUSHROOM HEAD IMPACT BUTTON



	■ EDP	■ EDR	■ EDRS40
Key Features			
General description	Mushroom button without latching function	Mushroom button with latching function	Mushroom button with latching function and release by key
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	22.3 mm	22.3 mm	22.3 mm
Housing material			
Material of operating element	Aluminium	Aluminium	Chrome-plated brass
Material front ring	Aluminium	Aluminium	Aluminium
Technical features			
Mechanical data			
Color	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■
Design	Round	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1 ... 6 mm
With latching	–	■	■
Assembly			
Mounting flange included in delivery	■	■	■
Mounting position	Arbitrarily	Arbitrarily	Arbitrarily
Ambient conditions			
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65	IP65
Safety classification			
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	100,000 operations	100,000 operations
Certificates	cULus	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only		

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
MUSHROOM BUTTON

Type	Description	Key	A	B	C	Type
Mushroom head impact buttons	Mushroom head impact button	Mushroom-shaped	27.5	22.3	32	**EDP** ①
			27.5	22.3	37	**EDP40** ①
			27.5	22.3	55	**EDP55** ①
		Flat key	27.5	22.3	35	**EDP35** ①
	Mushroom button with latching function	Mushroom-shaped	29	22.3	38.5	**EDR40** ①
		Flat key	27.5	22.3	35	**EDR35** ①
		Key reset	29	22.3	38	**EDRS40** ①

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

EDP SW

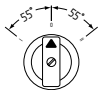
EDR35 GN

EDRS40 RT

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

	■ EWS / EWT	■ EWS .1 / EWT .1
Key Features		
General description	Selector switch/button with short toggle	Selector switch/button with long toggle
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	22.3 mm	22.3 mm
Toggle length	28 mm	45 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Aluminium	Aluminium
Technical features		
Mechanical data		
Color	■	■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	2 ... 3 positions	2 ... 3 positions
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +75 °C	0 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	300,000 operations	300,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

Type	Maintained and momentary positions	Positions	Actuator	A	B	C	Type designation
Selector switches	2 maintained positions		Short toggle	28	22.3	29.5	**EWS21**
			Long toggle				**EWS21.1**
	3 maintained positions		Short toggle	28	22.3	29.5	**EWS32**
			Long toggle				**EWS32.1**
Selector switches	1 momentary position and automatic return to the zero position		Short toggle	28	22.3	29.5	**EWT21**
			Long toggle				**EWT21.1**
	1 momentary position each to the right and left of the zero position		Short toggle	28	22.3	29.5	**EWT32**
			Long toggle				**EWT32.1**
Spring-return selector switches	Maintained position to left and momentary position to right		Short toggle	28	22.3	29.5	**EWTS32**
			Long toggle				**EWTS32.1**
	Maintained position on right and momentary position on left		Short toggle	6	22.3	36	**EWTS321**
			Long toggle				**EWTS321.1**

① **Toggle length:**
If you want a long toggle, append a "1" to the type designation.

All dimensions in mm.

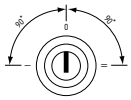
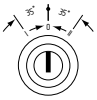
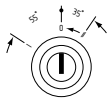
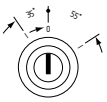
Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
KEY SELECTOR SWITCHES, BUTTONS AND TOUCH CONTACT SWITCHES

	■ ESS	■ EST
Key Features		
General description	Key Selector Switch	Key-operated selector switch
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Aluminium	Aluminium
Material front ring	Aluminium	Aluminium
Technical features		
Mechanical data		
Color	Metal (silver)	Metal (silver)
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	2 or 3 positions	2 or 3 positions
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +75 °C	0 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	100,000 operations	100,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
KEY SELECTOR SWITCHES, BUTTONS AND TOUCH CONTACT SWITCHES

Type	Maintained and momentary positions	Key positions	Key-withdrawal position	A	B	C	Type designation
Key-operated selector switches	2 maintained positions		0	33	22.3	29.5	**ESS21S1**
			I				**ESS21S2**
			0 + I				**ESS21S12**
	3 maintained positions		I	33	22.3	29.5	**ESS32S1**
			0				**ESS32S2**
			II				**ESS32S3**
			I + 0 + II				**ESS32S123**
Key-selector switches	1 momentary position and automatic return to the zero position		0	33	22.3	29.5	**EST21S1**
	2 momentary positions on the right and left with automatic return to the zero position		0	33	22.3	29.5	**EST32S2**
Key-operated selector switch pushbuttons	3 positions: momentary position 35° actuating angle and maintained position 55° actuating angle (zero position in middle, key position at top)		I	33	22.3	29.5	**ESTS32S1**
			0				**ESTS32S2**
			0				**ESTS321S2**
			II				**ESTS321S3**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel without key
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
SPECIAL DEVICES

	■ EWSE..K	■ EDAN6
Key Features		
General description	Step selector switch	Potentiometer drive
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Aluminium	Aluminium
Technical features		
Electrical data		
Cam-operated switch	Kraus & Naimer Series CA10	–
Contacts	One NO contact per stage	–
Insulation voltage U_i	690 V	–
Utilisation category AC-15	220 V ... 240 V / 5 A, 380 V ... 440 V / 4 A	–
Rated impulse withstand voltage. U_{imp}	6 kV	–
Rated continuous current I_{the}	20 A	–
Fuse rating	gG 25 A	–
Cable section	max. 2 × 2.5 mm² *	–
Mechanical data		
Color		
Operating element	■	■
Front ring	Silver	Silver
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	3 ... 12 positions	Infinite
Assembly		
Integrated mounting plate	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +60 °C	0 °C ... +75 °C
Degree of protection (device head)	IP65	IP65
Safety classification		
Standards	IEC 60947-3	–
Mechanical life	Load-dependent	–
Certificates	cULus, CCC	–

* Use copper conductors only

COMMAND AND SIGNALLING DEVICES – E PROGRAMME
SPECIAL DEVICES

Type	Circuit diagram and connecting terminals	Switching angle	L	LE	A	B	C	Type designation
Cam switching design step switches with latching mechanism, 1-pole no zero position		60°	40.7	60	28	22.3	29.5	**EWSE3K**
		60°	40.7	60	28	22.3	29.5	**EWSE4K**
		60°	50.2	69.5	28	22.3	29.5	**EWSE5K**
		60°	50.2	69.5	28	22.3	29.5	**EWSE6K**
		45°	59.7	78	28	22.3	29.5	**EWSE7K**
		45°	59.7	78	28	22.3	29.5	**EWSE8K**
		30°	69.2	87.5	28	22.3	29.5	**EWSE9K**
		30°	69.2	87.5	28	22.3	29.5	**EWSE10K**
		30°	78.7	97	28	22.3	29.5	**EWSE11K**
		30°	78.7	97	28	22.3	29.5	**EWSE12K**

Type	Description	LE	A	B	C	Type designation
Potentiometer drive	for 6 mm shaft Ø, shaft length 30 ... 40 mm	63	28	22.3	29.5	**EDAN 6**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head
L	Length	Length of step switch block
LE	Installation depth	Length between command device head and bottom edge of switch when mounted

COMMAND AND SIGNALLING DEVICES
E.V PROGRAMME

AREA OF APPLICATION

The Series E.V command and signalling devices for 30.5 mm installation boreholes have been developed as universal operator input and display elements for all mechanical engineering, plant construction and automotive applications. They are generally integrated in the control panels or enclosures of machines and are in use all over the world.

The separate N and R product portfolios are available for applications that make particular demands of either hygiene or the toughness of the command and signalling devices.

DESIGN AND WAY OF FUNCTIONING

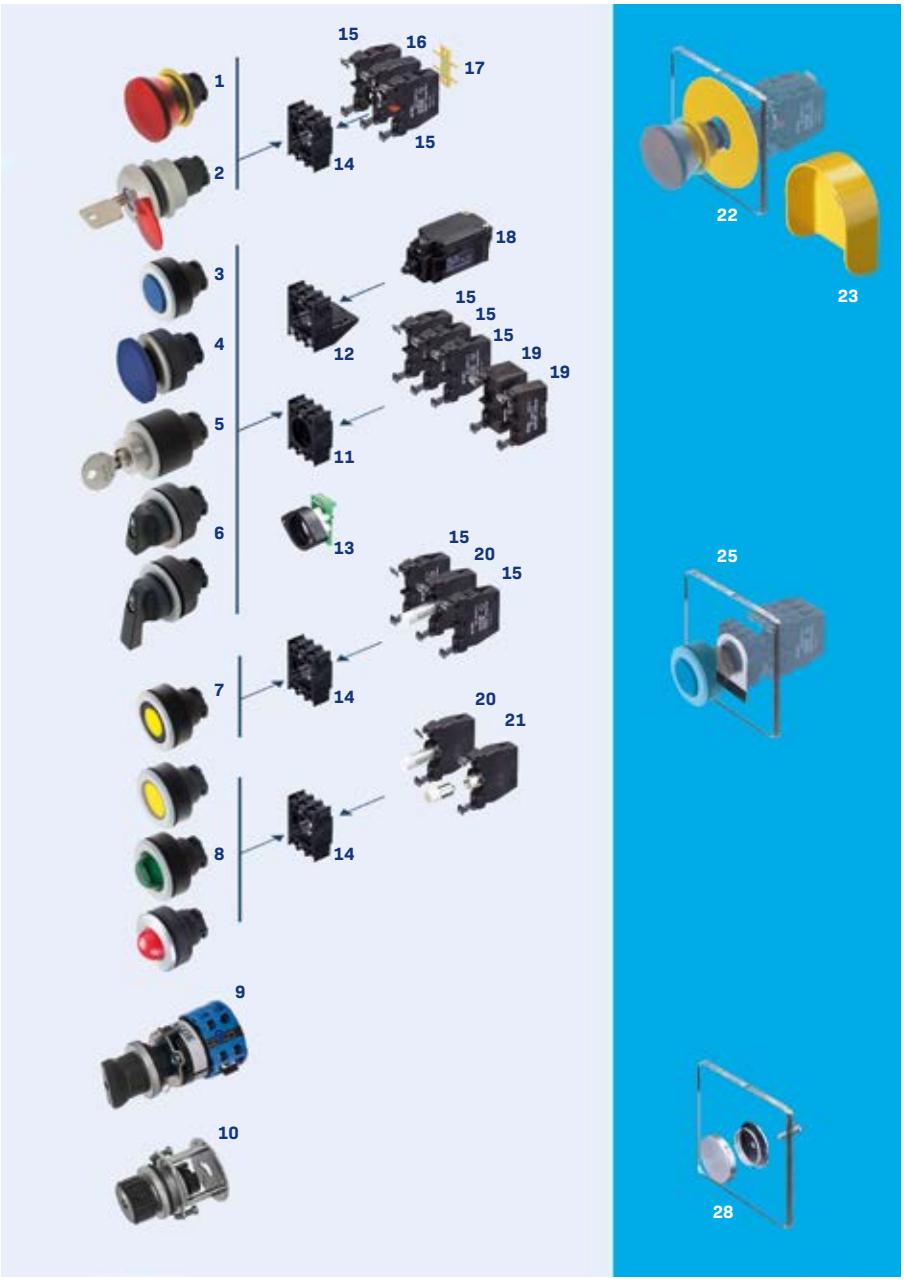
The command and signalling devices of Series E are each designed with an operating button and an EF contact system. Both parts are simply joined by catch springs. This principle ensures fast assembly on the front panel of the control panel and a permanent connection between the head and the contact system. When doing this, the modular principle of this range makes it possible to increase flexibility and to adapt the Human Machine Interface to individual requirements in an optimum way.

The control heads of Series E.V are made from anodised aluminium, with the collars being glass. The seals on the front of the devices comply with degree of protection IP65.

Users can choose between a vast range of different variants. The product portfolio includes amongst other things, push buttons, mushroom head impact buttons, illuminated control push buttons and indicator lights, selector switches and selection buttons as well as key selector switches and key selection buttons.

In the E.V range, the mushroom head impact buttons are particularly important. They are used all over the world in mechanical engineering and plant construction and stand out due to their extremely robust design. On vibrating machines or with frequent shock loading, these EMERGENCY STOP buttons function reliably and thus increases the machines' productivity and extend their service lives. If the EMERGENCY STOP button fails, the safety system shuts down the machine, this rarely happens with E.V range switchgears with an external snap-action mechanism.

Product overview		Page
1	Emergency stop	28
2	EMERGENCY STOP with release by key	28
3	Pushbutton	32
4	Mushroom head impact button/ Mushroom push button	34
5	Key-operated selector switch/ button	38
6	Selector switch/key button	36
7	Illuminated pushbutton	32
8	Indicator light	30
9	Step selector switch	40
10	Potentiometer drive	40
11	Mounting flange EFM	129
12	Mounting flange EFMH	129
13	Short-stroke key element	–
14	Mounting flange ELM	129
15	Contact element EF	112
16	Spring element EFR	112
17	Securing plate	–
18	Position switch	–
19	Contact element EFK...	–
20	Light terminal block ELDE...	112
21	Light terminal block EL...	112
22	Emergency stop label	126
23	Emergency stop protective collar	126
24	EMERGENCY STOP enclosure for surface mounting	132
25	Identification label	126
26	Plastic enclosure for surface mounting	132
27	Adapter ring	128
28	Blanking plug	<?>



COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
EMERGENCY STOP CONTROL DEVICES



	■ EDRR40.VH	■ EDRZ40.VH	■ EDRRS40.VH
Key Features			
General description	Emergency stop command device – with twist and pull-to-unlatch mechanism	Emergency stop command device – with pull-to-unlatch mechanism	Emergency stop command device – with key unlatching mechanism
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	30.5 mm	30.5 mm	30.5 mm
Housing material			
Material of operating element	Aluminium	Aluminium	Chrome-plated brass
Material front ring	Aluminium	Aluminium	Aluminium
Technical features			
Mechanical data			
Color	■	■	■
Design	Round	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1 ... 6 mm
Unlocking type	Twist and pull-to-unlatch mechanism	Pull-to-unlatch mechanism	Key reset
Snap-action mechanism			
Integrated	–	■	–
Externally via additional module	■	–	■
Assembly			
Mounting flange included in delivery	■	■	■
Mounting position	Arbitrarily	Arbitrarily	Arbitrarily
Ambient conditions			
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65	IP65
Safety classification			
Standards	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850
Mechanical life	100,000 operations	100,000 operations	100,000 operations
Certificates	cULus	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only		

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
EMERGENCY STOP CONTROL DEVICES

Type	Unlocking	Snap-action mechanism	A	B	C	Type	Material number
Emergency stop command devices	Pull-to-unlatch mechanism	Integrated	29	30.5	38.5	**EDRZ40.VHRT**	**101182360**
	Twist and pull-to-unlatch mechanism	External with spring element EFR *			38.5	**EDRR40.VHRT**	**101024290**
					49	**EDRR50.VHRT**	**101024299**
	Release by key (cover red)	External with spring element EFR.EDRRS *			37.5	**EDRRS40.VHRT**	**101025435**

* Spring element EFR or EFR.EDRRS must be ordered separately!

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
INDICATOR LIGHTS

	■ EML.V / EMLH.V	■ EME.V
Key Features		
General description	Illuminated signal for BA9s	Illuminated signal with integrated LED
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	30.5 mm	30.5 mm
Housing material		
Material of operating element	Glass	Plastic
Material front ring	Aluminium	Aluminium
Technical features		
Mechanical data		
Color		
Design	Round with flat or high glass	Round with flat or high glass
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Integrated LED 24 VAC/DC *	–	■
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +40 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	–	–
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

* A voltage sensor, e.g. an ELE is also needed for driving. You can find the voltage sensors from page 108

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
INDICATOR LIGHTS

Type	Illuminant	Collar	A	B	C	Type
Indicator lights	Without integrated illuminant	Flat collar	2.5	30.5	34.5	**EML.V** ①
		High collar				**EMLH.V** ①
LED indicator lights	With integrated illuminant	High collar				**EME.V** ①

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head


EMLHV.GB


EML.VGN


EME.VBL


EME.VRT

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

	■ EDT.V	■ EDL.V
Key Features		
General description	Pushbuttons	Illuminated pushbutton
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	30.5 mm	30.5 mm
Housing material		
Material of operating element	Aluminium	Glass
Material front ring	Aluminium	Aluminium
Technical features		
Mechanical data		
Color	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

Type	Description		A	B	C	Type
Pushbuttons	Included in standard version	Included in standard version	2.5	30.5	34.6	**EDT.V** ①
	With latching	Included in standard version	2.5	30.5	34.5	**EDTR①V**
Illuminated pushbuttons	Included in standard version	Included in standard version	2.5	30.5	34.5	**EDL.V** ①
	With latching	Included in standard version	2.5	30.5	34.5	**EDLR①V**

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head


EDT.VSW


EDT.VGB


EDL.VWS


EDL.VGN

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
MUSHROOM BUTTON

	■ EDP.V	■ EDR.V	■ EDRS40.V
			
Key Features			
General description	Mushroom button without latching function	Mushroom button with latching function	Mushroom button with latching function and release by key
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	30.5 mm	30.5 mm	30.5 mm
Housing material			
Material of operating element	Aluminium	Aluminium	Chrome-plated brass
Material front ring	Aluminium	Aluminium	Aluminium
Technical features			
Mechanical data			
Color	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■
Design	Round	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1 ... 6 mm
With latching	–	■	■
Assembly			
Mounting flange included in delivery	■	■	■
Mounting position	Arbitrarily	arbitrarily	Arbitrarily
Ambient conditions			
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65	IP65
Safety classification			
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	100,000 operations	100,000 operations
Certificates	cULus	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only		

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
MUSHROOM BUTTON

Type	Description	Key	A	B	C	Type
Mushroom head impact button	Mushroom head impact button	Mushroom-shaped	19	30.5	37	**EDP40.V** ①
			19	30.5	55	**EDP55.V** ①
	Mushroom button with latching function	Mushroom-shaped	19	30.5	35	**EDR35.V** ①
			19	30.5	38.5	**EDR40.V** ①
		Key reset	19	30.5	38	**EDRS40.V** ①

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

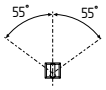
EDP.VGB

EDRS40.VRT

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

	■ EWS.V / EWT.V	■ EWS.1V / EWT.1V	■ EWS DB / EWT DB
Key Features			
General description	Selector switch/button with short toggle	Selector switch/button with long toggle	Selector switch/ key button with rectangular activator
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	30.5 mm	30.5 mm	30.5 mm
Toggle length	28 mm	45 mm	–
Housing material			
Material of operating element	Plastic	Plastic	Metal film
Material front ring	Aluminium	Aluminium	Aluminium
Technical features			
Mechanical data			
Color	■	■	Metal (silver)
Design	Round	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1.5 ... 14 mm
Maintained switching positions	2 ... 3 positions	2 ... 3 positions	2 ... 3 positions
Assembly			
Mounting flange included in delivery	■	■	–
Mounting position	Arbitrarily	Arbitrarily	Arbitrarily
Ambient conditions			
Ambient temperatures	0 °C ... +75 °C	0 °C ... +75 °C	–40 °C ... +80 °C
Degree of protection	IP65	IP65	IP65
Safety classification			
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	300,000 operations	300,000 operations	300,000 operations
Certificates	cULus	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only		

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

Type	Maintained and momentary positions	Positions	Actuator	A	B	C	Type designation
Selector switches	2 maintained positions		Short toggle	22	30.5	29.5	**EWS21.V**
			Long knob				**EWS21.1.V**
			Rectangular actuator	6	30.5	36	**EWS21DB**
							EWS21ÖBB
	3 maintained positions		Short toggle	22	30.5	29.5	**EWS32.V**
			Long knob				**EWS32.1V**
			Rectangular actuator	6	30.5	36	**EWS32DB**
							EWS32ÖBB
Selector switches	1 momentary position and automatic return to the zero position		Short toggle	22	30.5	29.5	**EWT21.V**
			Long knob				**EWT21.1V**
			Rectangular actuator	6	30.5	36	**EWT21DB**
							EWT21ÖBB
	1 momentary position each to the right and left of the zero position		Short toggle	22	30.5	29.5	**EWT32.V**
			Long knob				**EWT32.1V**
			Rectangular actuator	6	30.5	36	**EWT32DB**
							EWT32ÖBB
Spring-return selector switches	Maintained position to left and momentary position to right		Short toggle	22	30.5	29.5	**EWTS32.V**
			Long knob				**EWTS32.1.V**
	Maintained position on right and momentary position on left		Short toggle	22	30.5	36	**EWTS321.V**
			Long knob				**EWTS321.1V**

① **Toggle length:**
If you want a long toggle, append a "1" to the type designation.

All dimensions in mm.

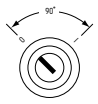
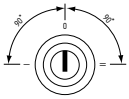
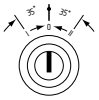
Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
KEY SELECTOR SWITCHES, BUTTONS AND TOUCH CONTACT SWITCHES

	■ ESS	■ EST
Key Features		
General description	Key Selector Switch	Key-operated selector switch
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	30.5 mm	30.5 mm
Housing material		
Material of operating element	Aluminium	Aluminium
Material front ring	Aluminium	Aluminium
Technical features		
Mechanical data		
Color	Metal (silver)	Metal (silver)
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	2 or 3 positions	2 or 3 positions
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +75 °C	0 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	100,000 operations	100,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
KEY SELECTOR SWITCHES, BUTTONS AND TOUCH CONTACT SWITCHES

Type	Maintained and momentary positions	Key positions	Key-withdrawal position	A	B	C	Type designation
Key-operated selector switches	2 maintained positions		0	33	30.5	34.5	**ESS21S1.V**
			I				**ESS21S2.V**
			0 + I				**ESS21S12.V**
	3 maintained positions		I	33	30.5	34.5	**ESS32S1.V**
			0				**ESS32S2.V**
			II				**ESS32S3.V**
			I + 0 + II				**ESS32S123.V**
Key-selector switches	1 momentary position and automatic return to the zero position		0	33	30.5	34.5	**EST21S1.V**
	2 momentary positions on the right and left with automatic return to the zero position		0	33	30.5	34.5	**EST32S2.V**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel without key
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
SPECIAL DEVICES

	■ WSE..K	■ DAN6
Key Features		
General description	Step selector switch	Potentiometer drive
Area of application	Applications under difficult operating conditions	Applications under difficult operating conditions
Mounting-Ø	30.5 mm	30.5 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Aluminium	Aluminium
Technical features		
Electrical data		
Cam-operated switch	Kraus & Naimer Series CA10	–
Contacts	One NO contact per stage	–
Insulation voltage U_i	690 V	–
Utilisation category AC-15	220 V ... 240 V / 5 A, 380 V ... 440 V / 4 A	–
Rated impulse withstand voltage. U_{imp}	6 kV	–
Rated continuous current I_{the}	20 A	–
Fuse rating	gG 25 A	–
Cable section	max. 2 × 2.5 mm² *	–
Mechanical data		
Color		
Operating element	■	■
Front ring	Silver	Silver
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	3 ... 12 positions	Infinite
Assembly		
Integrated mounting plate	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +60 °C	0 °C ... +75 °C
Degree of protection (device head)	IP65	IP65
Safety classification		
Standards	IEC 60947-3	–
Mechanical life	Load-dependent	–
Certificates	cULus, CCC	–

* Use copper conductors only

COMMAND AND SIGNALLING DEVICES – E.V PROGRAMME
SPECIAL DEVICES

Type	Circuit diagram and connecting terminals	Switching angle	L	LE	A	B	C	Type designation
Cam switching design step switches with latching mechanism, 1-pole no zero position		60°	40.7	60	22	30.5	29.5	**WSE3K**
		60°	40.7	60	22	30.5	29.5	**WSE4K**
		60°	50.2	69.5	22	30.5	29.5	**WSE5K**
		60°	50.2	69.5	22	30.5	29.5	**WSE6K**
		45°	59.7	78	22	30.5	29.5	**WSE7K**
		45°	59.7	78	22	30.5	29.5	**WSE8K**
		30°	69.2	87.5	22	30.5	29.5	**WSE9K**
		30°	69.2	87.5	22	30.5	29.5	**WSE10K**
		30°	78.7	97	22	30.5	29.5	**WSE11K**
		30°	78.7	97	22	30.5	29.5	**WSE12K**

Type	Description	LE	A	B	C	Type designation
Potentiometer drive	for 6 mm shaft Ø, shaft length 30 ... 40 mm	63	28	30.5	29.5	**DAN 6**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head
L	Length	Length of step switch block
LE	Installation depth	Length between command device head and bottom edge of switch when mounted

COMMAND AND SIGNALLING DEVICES
N PROGRAMME

AREA OF APPLICATION

Series N was originally developed for the specific requirements of food industry mechanical engineering. The command and signalling devices of the machines for this branch of industry must comply with strict hygiene requirements and be easy to clean.

Series N command and signalling devices meet the requirements of degree of protection IP69K. This means that even when cleaned on a regular basis using high-pressure cleaners they have an outstanding long service life. They were designed on the basis of the general design concepts for hygienic construction of food processing machinery (EN 1672-2). This means, for example, that the geometry of the devices has no sharp edges. Type examination carried out by the BGN confirmed that the design of the N programme was hygiene-appropriate.

In addition, the devices are clean room-approved and also due to their resistance to spray water, they are deployed in outdoor-applications, e.g on municipal vehicles and in car washes. Apart from this, they are tried and tested in extreme applications in food processing, e.g. fish filleting and packaging lines that are installed directly on trawlers.

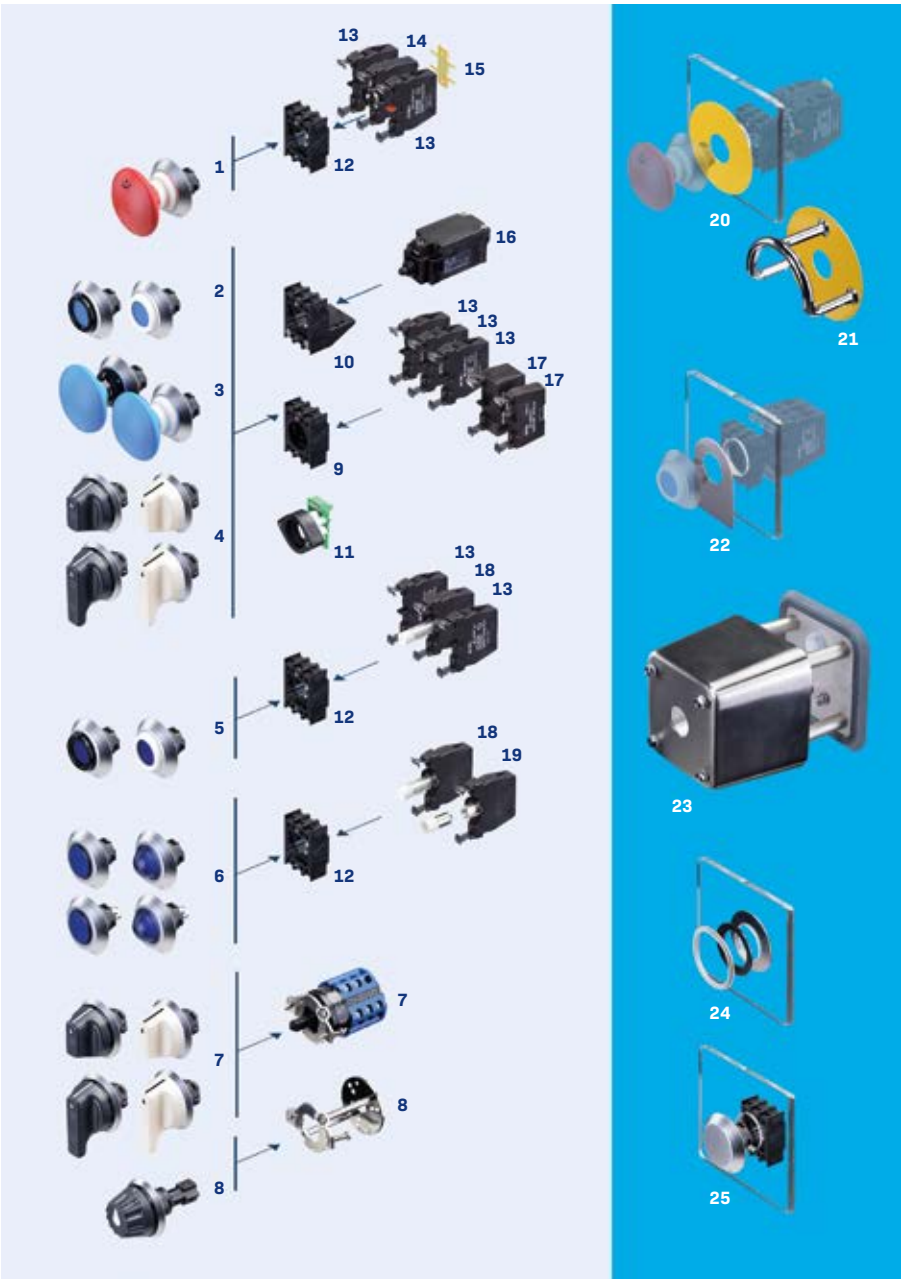
DESIGN AND WAY OF FUNCTIONING

The N series is of modular structure too which means that machine tool builders always have a wide selection of command and signalling devices available. The device heads each have one mounting flange that provides effective sealing in conjunction with a labyrinth seal. The EF contact system (see page 110) is used in exactly the same way as with the series E.

The N range is characterised by the short actuating stroke of the command devices and the high degree of protection even behind the front plate. This is a significant benefit in butchers' machines, for example, since condensation can form inside the machines.

The special features of the N range include main switches for up to 63 A. They allow design engineers to design the entire control unit of a (food) machine using just one range of products.

Product overview		Page
1	Emergency stop	44
2	Pushbutton	48
3	Mushroom head impact button/ Mushroom push button	50
4	Selector switch/key button	52
5	Illuminated pushbutton	48
6	Indicator light	46
7	Step selector switch	56
8	Potentiometer drive	56
9	Mounting flange EFM	129
10	Mounting flange EFMH	129
11	Short-stroke key element	–
12	Mounting flange ELM	129
13	Contact element EF	112
14	Spring element EFR	112
15	Securing plate	–
16	Position switch	–
17	Contact element EFK...	113
18	Light terminal block ELDE...	113
19	Light terminal block EL...	113
20	Emergency stop label	126
21	Emergency stop protective collar	126
22	Identification label	126
23	Stainless steel enclosure for surface mounting	132
24	Adapter ring	128
25	Blanking plug	128



COMMAND AND SIGNALLING DEVICES – N PROGRAMME
EMERGENCY STOP CONTROL DEVICES

	 ■ NDRZ50RT	 ■ NDRR50RT
Key Features		
General description	Emergency stop command device with pull-to-unlatch mechanism by integrated snap-action mechanism	Emergency stop command device with pull-to-unlatch mechanism by separate spring element
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	ABS, chrome-plated	ABS, chrome-plated
Technical features		
Mechanical data		
Colour of the operating element	■	■
Colour of sealing membranes	□ ■ ■	□ ■ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Unlocking type	Pull-to-unlatch mechanism	Pull-to-unlatch mechanism
Snap-action mechanism		
Integrated	–	■
Externally via additional module	■	–
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +80 °C	–25 °C ... +80 °C
Degree of protection	IP69K	IP69K
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850
Mechanical life	100,000 operations	100,000 operations
Certificates	BG, cULus	BG, cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
EMERGENCY STOP CONTROL DEVICES

Type	Unlocking	Snap-action mechanism	Bellows	Front ring	A	B	C	Type designation	Material number
Emergency stop command devices	Pull-to-unlatch mechanism	Integrated	white	silver	45	22.3	50	**NDRZ50RT**	**101177168**
			black					**NDRZ50GR/RT**	**101177170**
			blue					**NDRZ50BL/RT**	**103009270**
			white	yellow				**NDRZ50RT-2905-1**	**103011890**
			black					**NDRZ50GR/RT-2905-1**	**103011811**
			blue					**NDRZ50BL/RT-2905-1**	**103011891**
		External with spring element EFR *	white	silver				**NDRR50RT**	**101163587**
			black					**NDRR50GR/RT**	**101163594**
			blue					**NDRR50BL/RT**	**103009269**
			white	yellow				**NDRR50RT-2905-1**	**103013775**
			black					**NDRR50GR/RT-2905-1**	**103013777**
			blue					**NDRR50BL/RT-2905-1**	**103013778**

* Spring element EFR must be ordered separately.

Note: Front ring is yellow on devices with SPEZ 2905-1

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
INDICATOR LIGHTS

	■ NML / NMLH	■ NME / NMEH
Key Features		
General description	LED indicator light for LED illuminants	Illuminated signal with integrated LED
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	ABS, chrome-plated	ABS, chrome-plated
Technical features		
Mechanical data		
Colour of the operating element	■ ■ ■ □ ■	■ ■ ■ □ ■
Colour of seal	–	–
Design	Round, flat or high collar	Round, flat or high collar
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Integrated LED 24 VAC/DC *	–	■
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +80 °C	–25 °C ... +80 °C
Degree of protection	IP69K	IP69K
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	–	–
Certificates	BG, cULus	BG, cULus
Notice	cULus in conjunction with the corresponding contact elements only	

* A voltage sensor, e.g. an ELE is also needed for driving. You can find the voltage sensors from page 108

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
INDICATOR LIGHTS

Type	Description		A	B	C	Type
Indicator lights	Without integrated illuminant	Flat collar	9	22.3	44.5	**NML** ①
		High collar	17.4	22.3	44.5	**NMLH** ①
LED indicator light	With integrated illuminant	Flat collar	9	22.3	44.5	**NMEF** ①
		High collar	17.4	22.3	44.5	**NME** ①

① **Abbreviations of colours:** BK GB RD GN WH BL GR
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

	■ NDT	■ NDL
Key Features		
General description	Pushbuttons	Illuminated pushbutton
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	ABS, chrome-plated	ABS, chrome-plated
Technical features		
Mechanical data		
Colour of the operating element	■ ■ ■ ■ □ ■	■ ■ ■ □ ■
Colour of seal	□ ■ ■	□ ■ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +80 °C	–25 °C ... +80 °C
Degree of protection	IP69K	IP69K
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations
Certificates	BG, cULus	BG, cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

Type	Description		A	B	C	Type
Pushbuttons	Hygiene application	"White" bellows	11	22.3	44.5	**NDT** ①
	Outdoor usage	Black "bellows"	11	22.3	44.5	**NDTGR** ①
	Hygiene application	"Blue" bellows	11	22.3	44.5	**NDTBL** ①
Illuminated pushbuttons	Hygiene application	"White" bellows	11	22.3	44.5	**NDL** ①
	Outdoor usage	Black "bellows"	11	22.3	44.5	**NDLGR** ①
	Hygiene application	"Blue" bellows	11	22.3	44.5	**NDLBL** ①

① **Abbreviations of colours:** BK GB RD GN WH BL GR
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
MUSHROOM BUTTON

	■ NDP	■ NDR	■ NDTP30
Key Features			
General description	Mushroom button without latching function	Mushroom button with latching function	Mushroom button without latching function
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting-Ø	22.3 mm	22.3 mm	22.3 mm
Housing material			
Material of operating element	Plastic	Plastic	Plastic
Material front ring	ABS, chrome-plated	ABS, chrome-plated	ABS, chrome-plated
Technical features			
Mechanical data			
Colour of the operating element	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■
Colour of sealing membranes	□ ■ ■	□ ■ ■	□ ■ ■
Design	Round	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1 ... 6 mm
With latching	–	■	–
Assembly			
Mounting flange included in delivery	■	■	■
Mounting position	Arbitrarily	Arbitrarily	Arbitrarily
Ambient conditions			
Ambient temperatures	–25 °C ... +80 °C	–25 °C ... +80 °C	–25 °C ... +80 °C
Degree of protection	IP69K	IP69K	IP69K
Safety classification			
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations	1,000,000 operations
Certificates	BG, cULus	BG, cULus	BG, cULus
Notice	cULus in conjunction with the corresponding contact elements only		

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
MUSHROOM HEAD IMPACT BUTTON

Type	Description		A	B	C	Type
Mushroom head impact button	Without latching	"White" bellows	45	22.3	50	**NDP50** ①
		"Black" bellows	45	22.3	50	**NDP50GR** ①
		"Blue" bellows	45	22.3	50	**NDP50BL** ①
		"White" bellows	20	22.3	30	**NDTP30** ①
		"Black" bellows	20	22.3	30	**NDTP30GR** ①
		"Blue" bellows	20	22.3	30	**NDTP30BL** ①
	Without latching, illuminated	"White" bellows	20	22.3	30	**NDLP30** ①
		"Black" bellows	20	22.3	30	**NDLP30GR** ①
		"Blue" bellows	20	22.3	30	**NDLP30BL** ①
	With integrated latching	"White" bellows	45	22.3	50	**NDRZ50** ①
		"Black" bellows	45	22.3	50	**NDRZ50GR** ①
		"Blue" bellows	45	22.3	50	**NDRZ50BL** ①
	With latching via spring element EFR*	"White" bellows	45	22.3	50	**NDRR50** ①
		"Black" bellows	45	22.3	50	**NDRR50GR** ①
		"Blue" bellows	45	22.3	50	**NDRR50BL** ①

* Spring element EFR must be ordered separately.

① **Abbreviations of colours:** BK GB RD GN WH BL GR
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

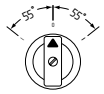
Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

	■ NWS / NWT	■ NWS .1 / NWT .1
Key Features		
General description	Selector switches/spring-return selector switches with short toggle	Selector switches/spring-return selector switches with long toggle
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting-Ø	22.3 mm	22.3 mm
Toggle length	33 mm	46 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	ABS, chrome-plated	ABS, chrome-plated
Technical features		
Mechanical data		
Colour of the operating element	□ ■	□ ■
Colour of seal	□ ■	□ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +80 °C	0 °C ... +80 °C
Degree of protection	IP69K	IP69K
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	300,000 operations	300,000 operations
Certificates	BG, cULus	BG, cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

Type	Maintained and momentary positions	Positions	Actuator	A	B	C	Type designation
Selector switches	2 maintained positions		Short toggle	26	22.3	44.5	**NWS21** ①
			Long toggle	26	22.3	44.5	**NWS21.1** ①
	3 maintained positions		Short toggle	26	22.3	44.5	**NWS32** ①
			Long toggle	26	22.3	44.5	**NWS32.1** ①
Selector switches	1 momentary position and automatic return to the zero position		Short toggle	26	22.3	44.5	**NWT21** ①
			Long toggle	26	22.3	44.5	**NWT21.1** ①
	1 momentary position each to the right and left of the zero position		Short toggle	26	22.3	44.5	**NWT32** ①
			Long toggle	26	22.3	44.5	**NWT32.1** ①
Spring-return selector switches	1 momentary position on the right and 2 maintained positions		Short toggle	26	22.3	44.5	**NWTS32** ①
			Long toggle	26	22.3	44.5	**NWTS32.1** ①
	1 momentary position on the left and 2 maintained positions		Short toggle	26	22.3	44.5	**NWTS321** ①
			Long toggle	26	22.3	44.5	**NWTS321.1** ①

① **Abbreviations of colours:** ☐ WS ■ SW
The colour abbreviations are appended to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
MAIN SWITCH



	■ NHS16/2-pol	■ NHS40	■ NHS63
Key Features			
General description	Main switches 16A	Main switches 40A	Main switches 63A
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting	Ø 22.3 mm	110 × 110 mm or Ø 22.3 mm	110 × 110 mm or Ø 22.3 mm
Housing material			
Material of operating element	Plastic	Plastic	Plastic
Material front ring	ABS, chrome-plated	ABS, chrome-plated	ABS, chrome-plated
Other versions are available			
Emergency stop design	■	■	■
Technical features			
Mechanical data			
Colour of the operating element	■ ■	■ ■	■ ■
Colour of seal	■	■	■
Design	Round	Square	Square
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	2 positions	2 positions	2 positions
Assembly			
Mounting flange included in delivery	–	–	–
Integrated mounting plate	■	■	■
Mounting position	Arbitrarily	Arbitrarily	Arbitrarily
Ambient temperatures			
open	–25 °C ... +50 °C	–25 °C ... +50 °C	–25 °C ... +50 °C
Enclosed	–25 °C ... +40 °C	–25 °C ... +40 °C	–25 °C ... +40 °C
Degree of protection	IP69K	IP69K	IP69K
Safety classification			
Standards	IEC EN 60947, IEC EN 60204, UL 508, CSA22.2 No. 14	IEC EN 60947, IEC EN 60204, UL 508, CSA22.2 No. 14	IEC EN 60947, IEC EN 60204, UL 508, CSA22.2 No. 14
Mechanical life	1,000,000 operations	100,000 operations	100,000 operations
Certificates	BG, cULus	BG, cULus	BG, cULus

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
MAIN SWITCH

Type	Series	Description			A	B	C	Type designation	Material number
Main switches	NHS16	16 A, 2-pole	Included in standard version	With black grip	29	22.3	70 × 80	**NHS16/2-POL**	**101204196**
			Emergency stop	With red grip + yellow background	29	22.3	Ø 100	**NHSNH16/2-POL**	**101209839**
		16 A, 4-pole	Included in standard version	With black grip	29	22.3	70 × 80	**NHS16/4-POL**	**103002746**
			Emergency stop	With red grip + yellow background	29	22.3	Ø 100	**NHSNH16/4-POL**	**103002747**
	NHS40	40 A, 3-pole	Included in standard version	With black grip	29	22.3	110 × 110	**NHS40**	**101185098**
			Emergency stop	With red grip + yellow background	29	22.3	110 × 110	**NHSNH40**	**101185097**
	NHS63	63 A, 3-pole	Included in standard version	With black grip	29	22.3	110 × 110	**NHS63**	**101184920**
			Emergency stop	With red grip + yellow background	29	22.3	110 × 110	**NHSNH63**	**101184919**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Panel size	Dimensions of panel (if present)

	■ NWSE..K	■ NDAN6
Key Features		
General description	Step selector switch	Potentiometer drive
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	ABS, chrome-plated	ABS, chrome-plated
Technical features		
Electrical data		
Cam-operated switch	Kraus & Naimer Series CA10	–
Contacts	One NO contact per stage	–
Insulation voltage U_i	690V	–
Utilisation category AC-15	220 V ... 240 V / 5 A, 380 V ... 440 V / 4 A	–
Rated impulse withstand voltage. U_{imp}	6 kV	–
Rated continuous current I_{the}	20 A	–
Fuse rating	gG 25 A	–
Cable section	max. 2 × 2.5 mm² *	–
Mechanical data		
Color		
Operating element	□■	□■
Front ring	Silver	Silver
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	3 ... 12 positions	Infinite
Assembly		
Integrated mounting plate	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +60 °C	0 °C ... +75 °C
Degree of protection (device head)	IP69K	IP69K
Safety classification		
Standards	IEC 60947-3	–
Mechanical life	Load-dependent	–
Certificates	BG, cULus, CCC	BG

* Use copper conductors only

COMMAND AND SIGNALLING DEVICES – N PROGRAMME
SPECIAL DEVICES

Type	Circuit diagram and connecting terminals	Switching angle	L	LE	A	B	C	Type designation
Cam switching design step switches with latching mechanism, 1-pole no zero position		60°	40.7	60	26	22.3	44.5	**NWSE3K**
		60°	40.7	60	26	22.3	44.5	**NWSE4K**
		60°	50.2	69.5	26	22.3	44.5	**NWSE5K**
		60°	50.2	69.5	26	22.3	44.5	**NWSE6K**
		45°	59.7	78	26	22.3	44.5	**NWSE7K**
		45°	59.7	78	26	22.3	44.5	**NWSE8K**
		30°	69.2	87.5	26	22.3	44.5	**NWSE9K**
		30°	69.2	87.5	26	22.3	44.5	**NWSE10K**
		30°	78.7	97	26	22.3	44.5	**NWSE11K**
		30°	78.7	97	26	22.3	44.5	**NWSE12K**

Type	Description	LE	A	B	C	Type designation
Potentiometer drive	for 6 mm shaft Ø, shaft length 30 ... 40 mm	63	26	22.3	44.5	**NDAN6**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head
L	Length	Length of step switch block
LE	Installation depth	Length between command device head and bottom edge of switch when mounted

COMMAND AND SIGNALLING DEVICES
H PROGRAMME

AREA OF APPLICATION

With the H series, Schmersal presents a complete programme of new command and signalling devices for hygiene-sensitive applications – especially for food processing.

The characteristic features of the command and signalling devices in this programme include gap-free transitions between sealing elements and surfaces and the absence of protruding parts. The devices are easy to clean and are so well sealed that they can withstand regular cleaning, e.g. with high-pressure cleaners or aggressive cleaning agents.

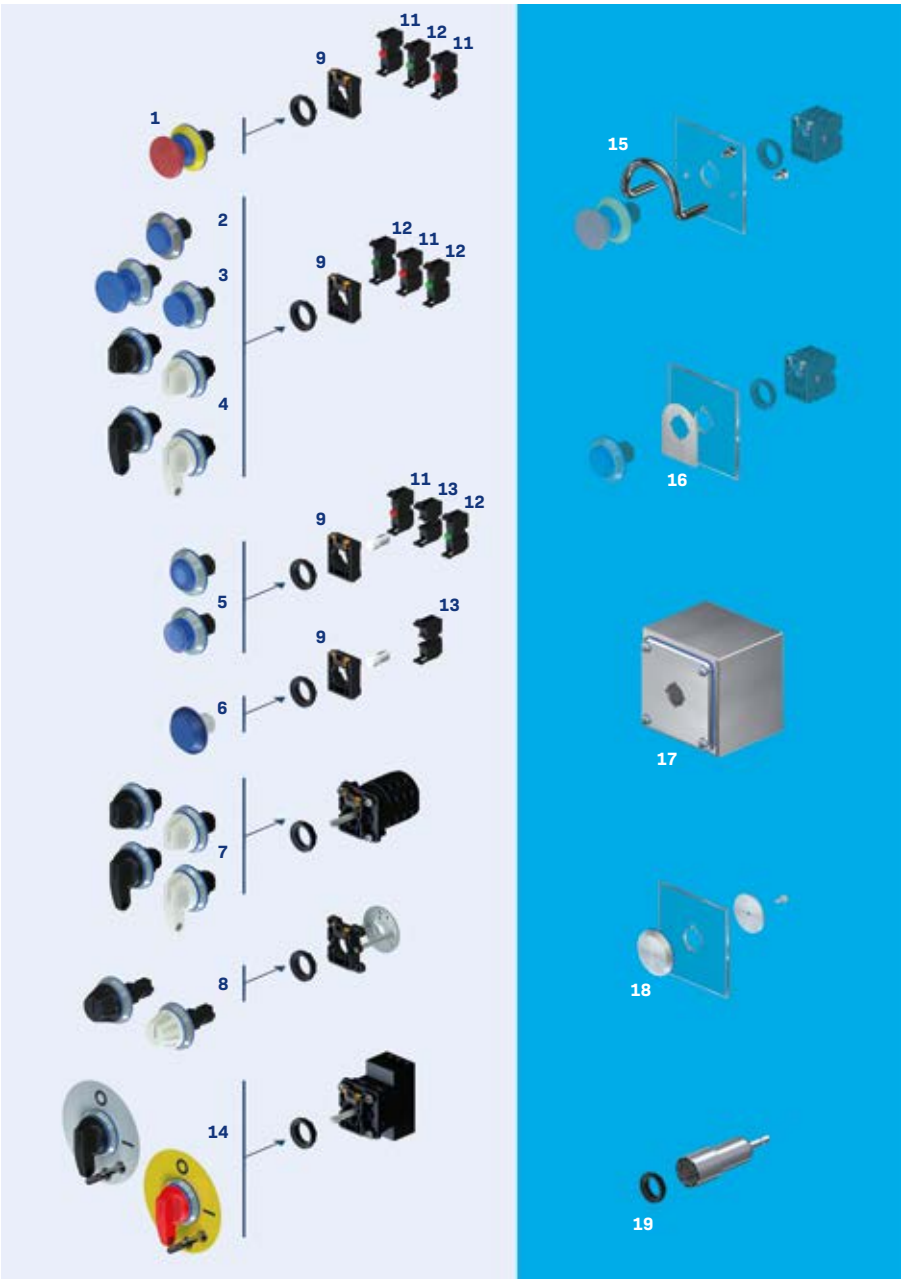
The new series fulfils the requirements of DIN EN ISO 14159 ("Safety of machinery – Hygiene requirements for the design of machinery") and the new version of EN 1672-2 ("Food processing machinery – General principles for design"). This standard specifies very precise requirements for the hygienic design of all operating elements on the human-machine interface (HMI) of food processing machines. Another regulation that formulates requirements for the selection of materials for this Area of application was also taken into account.

DESIGN AND WAY OF FUNCTIONING

The new H programme not only meets the requirements of the standards and the "Hygienic Design" construction principle, but also has a fully modular structure. Thanks to snap-on contact carriers and individual contacts that can be combined – even in piggyback mode – this concept firstly enables very simple and quick installation, secondly a high degree of flexibility and thirdly it provides the prerequisite for pre-wiring.

There is a total of 147 different devices to choose from, including 26 mushroom pushbuttons, 24 selector switches with two or three positions and four potentiometer rotary switches. The designer of a food machine is therefore free to choose which type of operating elements of the H programme to use for the design of the HMI. With its variety of different hygiene-compliant switchgear, the H programme is unique on the market. In addition – and this is also new – the designer can order the control and signalling devices with individual laser marking, e.g. as an OEM version with a logo.

Product overview		Page
1	Emergency stop	60
2	Pushbutton	64
3	Mushroom head impact button/ Mushroom push button	66
4	Selector switch/key button	70
5	Illuminated pushbutton	64
6	Indicator light	62
7	Step selector switch	76
8	Potentiometer drive	76
9	Mounting flange SMF	129
10	Mounting flange SMF-SG	129
11	Contact element CLP101	115
12	Contact element CLP110	115
13	Light element CLP001	115
14	Main switch	73
15	Emergency stop protective collar	126
16	Identification label	126
17	Stainless steel enclosure for surface mounting	132
18	Blanking plug	128
19	Mounting tool	



COMMAND AND SIGNALLING DEVICES – H PROGRAMME
EMERGENCY STOP CONTROL DEVICES

	■ HDRZ40
Key Features	
General description	Emergency stop command device with pull-to-unlatch mechanism by integrated snap-action mechanism
Area of application	Food and hygiene applications
Mounting-Ø	22.3 mm
Housing material	
Material of operating element	Plastic
Material front ring	Plastic
Technical features	
Mechanical data	
Colour of the operating element	■ ■ ■ □ ■ ■
Colour of sealing membranes	■
Design	Round
Front plate thickness	1.5 ... 6 mm
Unlocking type	Pull-to-unlatch mechanism
Snap-action mechanism	
Integrated	–
Externally via additional module	■
Assembly	
Mounting flange included in delivery	■
Mounting position	Arbitrarily
Ambient conditions	
Ambient temperatures	–25 °C ... +80 °C
Degree of protection	IP67 / IP69K
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850
Mechanical life	100,000 operations
Certificates	BG, UL, CCC (under preparation)

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
EMERGENCY STOP CONTROL DEVICES

Type	Unlocking	Operators	Bellows	Front ring	A	B	C	Type designation	Material number
Emergency stop command device	Pull-to-unlatch mechanism	red	blue	yellow	38	22.3	40	**HDRZ40-BL-RT-GB**	**103037906**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

	■ HML
Key Features	
General description	LED indicator light for LED illuminants
Area of application	Food and hygiene applications
Mounting-Ø	22.3 mm
Housing material	
Material of operating element	Plastic
Material front ring	ABS, chrome-plated
Technical features	
Mechanical data	
Colour of the operating element	■ ■ ■ □ ■
Colour of seal	■
Design	All-round illuminated collar
Front plate thickness	1.5 ... 6 mm
Integrated LED 24 V	–
Assembly	
Mounting flange included in delivery	■
Mounting position	Arbitrarily
Ambient conditions	
Ambient temperatures	–25 °C ... +80 °C
Degree of protection	IP67 / IP69K
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-1
Mechanical life	–
Certificates	BG, UL, CCC (under preparation)

* A voltage sensor CLP001 is also needed for driving. You can find the voltage sensors from page 115

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
INDICATOR LIGHTS

Type	Operators	Bellows	A	B	C	Type	Material number
Indicator lights	blue	blue	10	22.3	45	**HML-BL-BL**	**103039525**
	yellow					**HML-BL-GB**	**103039526**
	green					**HML-BL-GN**	**103039522**
	red					**HML-BL-RT**	**103039524**
	white					**HML-BL-WS**	**103039523**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

	■ HDT	■ HDL
Key Features		
General description	Pushbuttons	Illuminated pushbutton
Area of application	Food and hygiene applications	Food and hygiene applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Stainless steel	Stainless steel
Technical features		
Mechanical data		
Colour of the operating element	■ ■ ■ ■ □ ■	■ ■ ■ □ ■
Colour of seal	■	■
Design	Round	Round
Front plate thickness	1.5 ... 6 mm	1.5 ... 6 mm
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +80 °C	–25 °C ... +80 °C
Degree of protection	IP67 / IP69K	IP67 / IP69K
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations
Certificates	BG, UL, CCC (under preparation)	BG, UL, CCC (under preparation)

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

Type	Operators	Bellows	A	B	C	Type	Material number
Pushbuttons	blue	blue	13	22.3	22	**HDT-BL-BL**	**103039534**
	yellow					**HDT-BL-GB**	**103039533**
	green					**HDT-BL-GN**	**103039530**
	red					**HDT-BL-RT**	**103039535**
	black					**HDT-BL-SW**	**103039532**
	white					**HDT-BL-WS**	**103039536**
Illuminated pushbuttons	blue					**HDL-BL-BL**	**103039540**
	yellow					**HDL-BL-GB**	**103039541**
	green					**HDL-BL-GN**	**103039537**
	red					**HDL-BL-RT**	**103039539**
	white					**HDL-BL-WS**	**103039538**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
MUSHROOM HEAD IMPACT BUTTONS

	■ HDTP30	■ HDTP40
Key Features		
General description	Mushroom head impact button	Mushroom head impact button
Area of application	Food and hygiene applications	Food and hygiene applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Stainless steel	Stainless steel
Technical features		
Mechanical data		
Colour of the operating element	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■
Colour of sealing membranes	■	■
Design	Round	Round
Front plate thickness	1.5 ... 6 mm	1.5 ... 6 mm
With latching	–	–
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +80 °C	–25 °C ... +80 °C
Degree of protection	IP67 / IP69K	IP67 / IP69K
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations
Certificates	BG, UL, CCC (under preparation)	BG, UL, CCC (under preparation)

	
■ HDLP30	■ HDRZ40
Mushroom head impact button, illuminated	Emergency stop command device with pull-to-unlatch mechanism by integrated snap-action mechanism
Food and hygiene applications	Food and hygiene applications
22.3 mm	22.3 mm
Plastic	Plastic
Stainless steel	Stainless steel
Round	Round
1.5 ... 6 mm	1.5 ... 6 mm
–	–
■	■
Arbitrarily	Arbitrarily
–25 °C ... +80 °C	–25 °C ... +80 °C
IP67 / IP69K	IP67 / IP69K
IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1,
1,000,000 operations	100,000 operations
BG, UL, CCC (under preparation)	BG, UL, CCC (under preparation)

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
MUSHROOM HEAD IMPACT BUTTONS

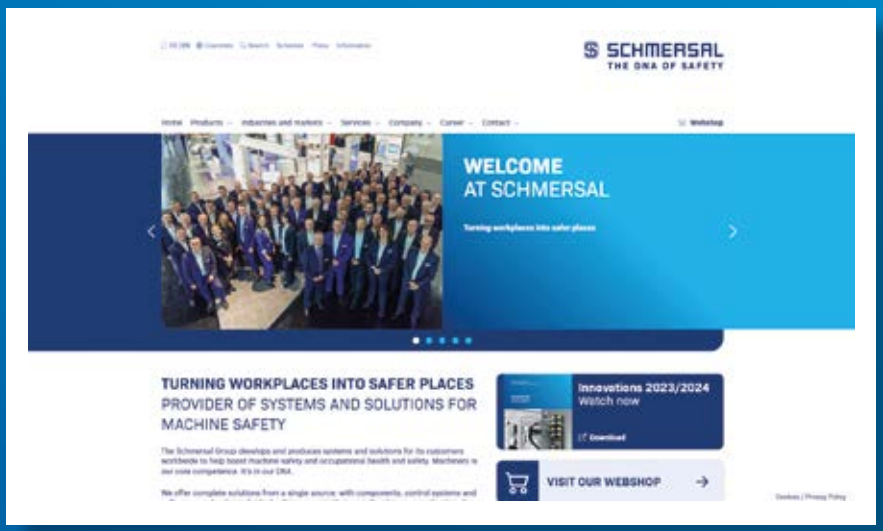
Type	Operators	Bellows	A	B	C	Type	Material number
Mushroom head impact buttons	blue	blue	22	22.3	30	HDTP30-BL-BL	103039553
	yellow					HDTP30-BL-GB	103039552
	green					HDTP30-BL-GN	103039549
	red					HDTP30-BL-RT	103043738
	black					HDTP30-BL-SW	103039551
	white					HDTP30-BL-WS	103039554
	blue		38		40	HDTP40-BL-BL	103039547
	yellow					HDTP40-BL-GB	103039545
	green					HDTP40-BL-GN	103039542
	red					HDTP40-BL-RT	103043737
	black					HDTP40-BL-SW	103039544
	white					HDTP40-BL-WS	103039548
Mushroom head impact buttons, illuminated	blue		22		30	HDLP30-BL-BL	103039558
	yellow					HDLP30-BL-GB	103039559
	green					HDLP30-BL-GN	103039555
	red					HDLP30-BL-RT	103039557
	white					HDLP30-BL-WS	103039556
Mushroom head impact buttons with latching function	blue		38		40	HDRZ40-BL-BL	103039518
	yellow					HDRZ40-BL-GB	103039517
	green					HDRZ40-BL-GN	103039514
	red					HDRZ40-BL-RT	103044256
	black					HDRZ40-BL-SW	103039516
	white					HDRZ40-BL-WS	103039519

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

UP-TO-DATE WITHOUT FAIL
ONLINE ON THE WORLD WIDE WEB

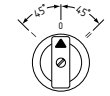
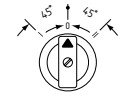
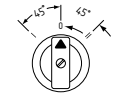
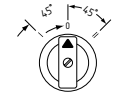


FOR DETAILED INFORMATION, CHECK OUT
WWW.SCHMERSAL.COM

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

		
	■ HWS / HWT	■ HWS.1 / HWT.1
Key Features		
General description	Selector switch/ spring-return selector switch with short toggle	Step selector switch with long toggle
Area of application	Food and hygiene applications	Food and hygiene applications
Mounting-Ø	22.3 mm	22.3 mm
Toggle length	26 mm	52.5 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Stainless steel	Stainless steel
Technical features		
Mechanical data		
Colour of the operating element	□ ■	□ ■
Colour of seal	■	■
Design	Round	Round
Front plate thickness	1.5 ... 6 mm	1.5 ... 6 mm
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +80 °C	0 °C ... +80 °C
Degree of protection	IP67 / IP69K	IP67 / IP69K
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	300,000 operations	300,000 operations
Certificates	BG, UL, CCC (under preparation)	BG, UL, CCC (under preparation)

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

Type	Maintained and momentary positions	Positions	A	B	C	Type designation
Selector switches	2 maintained positions		31	22.3	45	**HWS21①-BL-②**
	3 maintained positions					**HWS32①-BL-②**
Selector switches	1 momentary position and automatic return to the zero position					**HWT21①-BL-②**
	1 momentary position each to the right and left of the zero position					**HWT32①-BL-②**
Spring-return selector switches	1 momentary position on the right and 2 maintained positions					**HWST32①-BL-②**
	1 momentary position on the left and 2 maintained positions					**HWTS32①-BL-②**

All dimensions in mm.

Ordering code

① **Toggle length:**

Without	Short toggle
.1	Long toggle

② **Colour of toggle**

BK	Black
WS	White

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
MAIN SWITCHES

	■ HHS16	■ HHS40
Key Features		
General description	Main switch 16A	Main switch 40A
Area of application	Food and hygiene applications	Food and hygiene applications
Mounting	Ø 22.3 mm	110 × 110 mm or Ø 22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Stainless steel	Stainless steel
Other versions are available		
Emergency stop design	■	■
Technical features		
Mechanical data		
Colour of the operating element	■■	■■
Colour of seal	■	■
Design	Round	Square
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	2 positions	2 positions
Assembly		
Mounting flange included in delivery	–	–
Integrated mounting plate	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient temperatures		
Pushbutton	0 °C ... +80 °C	0 °C ... +80 °C
Contact element, open	–25 °C ... +50 °C	–25 °C ... +50 °C
Contact element, enclosed	–25 °C ... +40 °C	–25 °C ... +40 °C
Degree of protection	IP67 / IP69K	IP67 / IP69K
Safety classification		
Standards	IEC EN 60947, IEC EN 60204	IEC EN 60947, IEC EN 60204
Mechanical life	1,000,000 operations	100,000 operations
Certificates	BG, UL, CCC (under preparation)	BG, UL, CCC (under preparation)

	
■ HHS63	■ HHS125
Main switch 63A	Main switch 125A
Food and hygiene applications	Food and hygiene applications
110 × 110 mm or Ø 22.3 mm	110 × 110 mm or Ø 22.3 mm
Plastic	Plastic
Stainless steel	Stainless steel
■	■
Square	Square
1 ... 6 mm	1 ... 6 mm
2 positions	2 positions
–	–
■	■
Arbitrarily	Arbitrarily
0 °C ... +80 °C	0 °C ... +80 °C
–25 °C ... +50 °C	–25 °C ... +50 °C
–25 °C ... +40 °C	–25 °C ... +40 °C
IP67 / IP69K	IP67 / IP69K
IEC EN 60947, IEC EN 60204	IEC EN 60947, IEC EN 60204
100,000 operations	25,000 operations
BG, UL, CCC (under preparation)	BG, UL, CCC (under preparation)

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
MAIN SWITCHES

Type	Description			A	B	C	Type designation	Material number
Main switches	16 A, 2-pole	Included in standard version	With black grip	32	22.3	70 × 80	**HHS16-BL-SW-2-POL**	**103044285**
			With black grip + mounting plate	37	–	110 × 110	**HHS16-BL-SW-2-POL-MP**	**103044286**
		Emergency stop	With red grip + yellow background	32	22.3	70 × 80	**HHSNH16-BL-RT-2-POL**	**103044289**
			With red grip, yellow background + mounting plate	37	–	110 × 110	**HHSNH16-BL-RT-2-POL-MP**	**103044290**
	16 A, 4-pole	Included in standard version	With black grip	32	22.3	70 × 80	**HHS16-BL-SW-4-POL**	**103044287**
			With black grip + mounting plate	37	–	110 × 110	**HHS16-BL-SW-4-POL-MP**	**103044288**
		Emergency stop	With red grip + yellow background	32	22.3	70 × 80	**HHSNH16-BL-RT-4-POL**	**103044291**
			With red grip, yellow background + mounting plate	37	–	110 × 110	**HHSNH16-BL-RT-2-POL-MP**	**103044290**
	40 A, 3-pole	Included in standard version	With black grip	32	22.3	Ø 100	**HHS40-BL-SW**	**103044293**
			With black grip + mounting plate	37	–	110 × 110	**HHS40-BL-SW-MP**	**103044294**
		Emergency stop	With red grip + yellow background	32	22.3	Ø 100	**HHSNH40-BL-RT**	**103044295**
			With red grip, yellow background + mounting plate	37	–	110 × 110	**HHSNH40-BL-RT-MP**	**103044296**
	63 A, 3-pole	Included in standard version	With black grip	32	22.3	Ø 100	**HHS63-BL-SW**	**103044297**
			With black grip + mounting plate	37	–	110 × 110	**HHS63-BL-SW-MP**	**103044298**
		Emergency stop	With red grip + yellow background	32	22.3	Ø 100	**HHSNH63-BL-RT**	**103044299**
			With red grip, yellow background + mounting plate	37	–	110 × 110	**HHSNH63-BL-RT-MP**	**103044300**
	125 A, 3-pole	Included in standard version	With black grip	32	22.3	Ø 100	**HHS125-BL-SW**	**103044301**
			With black grip + mounting plate	37	–	110 × 110	**HHS125-BL-SW-MP**	**103044302**
		Emergency stop	With red grip + yellow background	32	22.3	Ø 100	**HHSNH125-BL-RT**	**103044303**
			With red grip, yellow background + mounting plate	37	–	110 × 110	**HHSNH125-BL-RT-MP**	**103044304**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Panel size	Dimensions of panel (if present)

UP-TO-DATE WITHOUT FAIL
ONLINE PRODUCT CATALOGUE

FOR DETAILED INFORMATION, CHECK OUT
PRODUCTS.SCHMERSAL.COM

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
SPECIAL DEVICES

	■ HWSE	■ HDAN6
Key Features		
General description	Step selector switch	Potentiometer drive
Area of application	Food, hygiene and outdoor applications	Food, hygiene and outdoor applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Stainless steel	Stainless steel
Technical features		
Electrical data		
Cam-operated switch	Sälzer cam switch, M200 product series, M220 series	–
Contacts	One NO contact per stage	–
Insulation voltage U_i	690 V	–
Operating current I_e, AC-21A	20 A	–
Rated impulse withstand voltage. U_{imp}	4 kV	–
Rated continuous current I_{the}	20 A	–
Fuse rating	20 A gL	–
Cable section	max. 2.5 mm² *	–
Mechanical data		
Color		
Operating element	□■	□■
Front ring	Silver	Silver
Front plate thickness	1.5 ... 6 mm	1.5 ... 6 mm
Maintained switching positions	2 ... 12 positions	Infinite
Assembly		
Integrated mounting plate	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures of the device head	0 °C ... +80 °C	0 °C ... +80 °C
Degree of protection (device head)	IP67 / IP69K	IP67 / IP69K
Safety classification		
Standards	EN 60947, EN 60204, ANSI/UL 60947-1, ANSI/UL 60947-4-1	–
Mechanical life	Load-dependent	–
Certificates	BG, cULus, CCC (under preparation)	BG, cULus, CCC (under preparation)

* Use copper conductors only

COMMAND AND SIGNALLING DEVICES – H PROGRAMME
SPECIAL DEVICES

Type	Circuit diagram and connecting terminals	Switching angle	L	LE	A	B	C	Type designation
Cam switching design step switches with latching mechanism, 1-pole no zero position		60°	40.7	60	31	22.3	45	**HWSE3①-BL-②**
		60°	40.7	60	31	22.3	45	**HWSE4①-BL-②**
		60°	50.2	69.5	31	22.3	45	**HWSE5①-BL-②**
		60°	50.2	69.5	31	22.3	45	**HWSE6①-BL-②**
		45°	59.7	78	31	22.3	45	**HWSE7①-BL-②**
		45°	59.7	78	31	22.3	45	**HWSE8①-BL-②**
		30°	69.2	87.5	31	22.3	45	**HWSE9①-BL-②**
		30°	69.2	87.5	31	22.3	45	**HWSE10①-BL-②**
		30°	78.7	97	31	22.3	45	**HWSE11①-BL-②**
		30°	78.7	97	31	22.3	45	**HWSE12①-BL-②**

Type	Description	LE	A	B	C	Type designation
Potentiometer drive	for 6 mm shaft Ø, shaft length 30 ... 40 mm, control unit black	63	31	22.3	45	**HDAN6-BL-SW-③**
	for 6 mm shaft Ø, shaft length 30 ... 40 mm, control unit white					**HDAN6-BL-WS-③**

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head
L	Length	Length of step switch block
LE	Installation depth	Length between command device head and bottom edge of switch when mounted

Ordering code

① **Switching stages:**

2	2 switching stages
...	...
12	12 switching stages

② **Colour of toggle**

BK	Black
WS	White

③ **End stop:**

250	End stop at 250°

COMMAND AND SIGNALLING DEVICES
R PROGRAMME

AREA OF APPLICATION

When designing control panels on machines that will be working under particularly harsh conditions, it is advisable to use the R product portfolio.

The "R" stands for "robust", which represents a main feature of this switchgear.

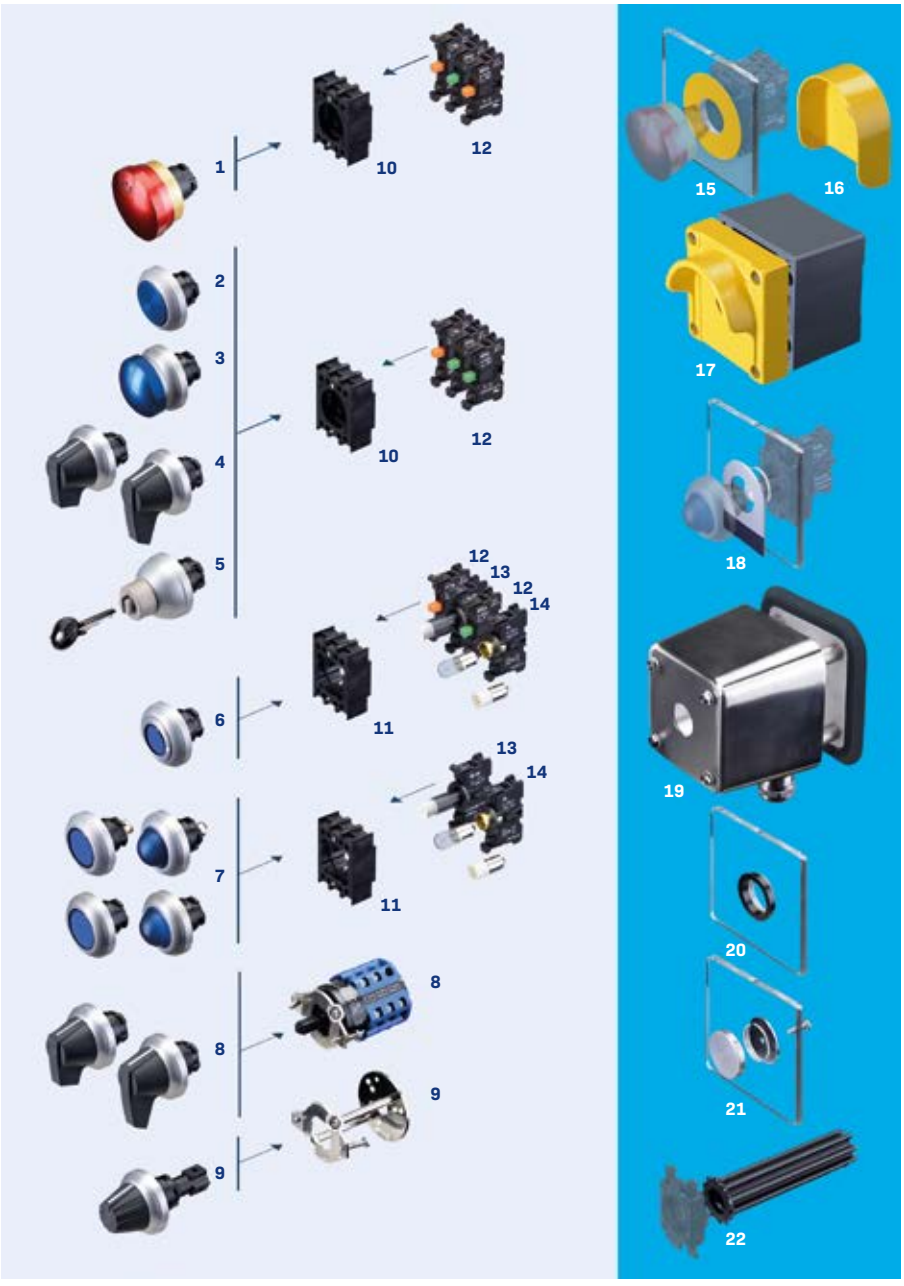
DESIGN AND WAY OF FUNCTIONING

Both the mechanical systems and the electrical components are of heavy-duty design. The R series is resistant to mechanical loading and you can also operate -it easily when wearing gloves. The use of an adapter ring makes it possible to easily mount series R devices in a 30.5 mm installation diameter without needing additional sealing on the front panel of the machine to seal the installation hole..

The contact system (see page 118) that Schmersal developed has also been designed for a long service life under heavy loading. In the same way as with the E and N product portfolios, users can choose from a wide range of different command devices and indicator lights.

If desired, we can supply command devices pre-wired and pre-assembled in the enclosure. An ATEX-compliant version of the R series is also available.

Product overview		Page
1	Emergency stop	80
2	Pushbutton	84
3	Mushroom head impact button/ Mushroom push button	86
4	Selector switch/key button	88
5	Key-operated selector switch/ button	90
6	Illuminated pushbutton	84
7	Indicator light	82
8	Step selector switch	92
9	Potentiometer drive	92
10	Mounting flange EFM	129
11	Mounting flange ELM	129
12	Contact element RF...	118
13	Light terminal block RLDE...	118
14	Light terminal block RL...	118
15	Emergency stop label	126
16	EMERGENCY STOP protective collar	126
17	EMERGENCY STOP enclosure for surface mounting	132
18	Identification label	126
19	Stainless steel enclosure for surface mounting	132
20	Adapter ring	128
21	Blanking plug	<?>
22	Mounting tool	129



COMMAND AND SIGNALLING DEVICES – R PROGRAMME
EMERGENCY STOP CONTROL DEVICES

	■ RDRZ45RT
Key Features	
General description	Emergency stop command device with pull-to-unlatch mechanism
Area of application	Heavy-duty applications
Mounting-Ø	22.3 mm
Housing material	
Material of operating element	Aluminium
Material front ring	Aluminium
Other versions are available	
ATEX design	■
Technical features	
Mechanical data	
Colour of the operating element	■
Design	Round
Front plate thickness	1 ... 6 mm
Unlocking type	Pull-to-unlatch mechanism
Snap-action mechanism	
Integrated	■
Externally via additional module	–
Assembly	
Mounting flange included in delivery	■
Mounting position	Arbitrarily
Ambient conditions	
Ambient temperatures	–25 °C ... +75 °C
Degree of protection	IP65
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850
Mechanical life	100,000 operations
Certificates	cULus
Notice	cULus in conjunction with the corresponding contact elements only

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
EMERGENCY STOP CONTROL DEVICES

Type	Unlocking	Snap-action mechanism	A	B	C	Type	Material number
Emergency stop command device	Pull-to-unlatch mechanism	Integrated	27.5	22.3	45	**RDRZ45RT**	**101193576**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
INDICATOR LIGHTS

	■ RMLF/RMLH	■ RMEF/RMEH
Key Features		
General description	Illuminated signal for BA9s	Illuminated signal with integrated LED
Area of application	Heavy-duty applications	Heavy-duty applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Glass / plastic	Glass / plastic
Material front ring	Aluminium	Aluminium
Other versions are available		
ATEX design	■	–
Technical features		
Mechanical data		
Color	■ ■ ■ □ ■	■ ■ ■ □ ■
Design	Round with flat or high glass	Round with flat or high glass
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Integrated LED 24 VAC/DC *	–	■
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +40 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	–	–
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

* A voltage sensor, e.g. an RE is also needed for driving. You can find the voltage sensors from page 118

Type	Description		A	B	C	Type
Indicator lights	Without integrated illuminant	Flat collar	11	22.3	39.5	**RML** ①
		High collar	21.5	22.3	39.5	**RMLH** ①
LED indicator light	With integrated illuminant	Flat collar	11	22.3	39.5	**RMEF** ①
		High collar	21.5	22.3	39.5	**RMEH** ①

① **Abbreviations of colours:** BK GB RD GN WH BL GR
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

	■ RDT	■ RDL
Key Features		
General description	Pushbutton	Illuminated pushbutton
Area of application	Heavy-duty applications	Heavy-duty applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Aluminium	Glass
Material front ring	Aluminium	Aluminium
Other versions are available		
ATEX design	■	■
Technical features		
Mechanical data		
Color	■ ■ ■ ■ □ ■	■ ■ ■ □ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

Type	Description	A	B	C	Type
Pushbuttons	Included in standard version	11	22.3	39.5	**RDT** ①
	With membrane	11	22.3	39.5	**RDM** ①
Illuminated pushbuttons	Included in standard version	11	22.3	39.5	**RDL** ①
	With membrane	11	22.3	39.5	**RDLM** ①

① **Abbreviations of colours:** BK GB RD GN WH BL GR
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
MUSHROOM HEAD IMPACT BUTTONS

	■ RDP40	■ RDRZ45
Key Features		
General description	Mushroom button without latching function	Mushroom button with latching function
Area of application	Heavy-duty applications	Heavy-duty applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Aluminium	Aluminium
Material front ring	Aluminium	Aluminium
Other versions are available		
ATEX design	■	■
Technical features		
Mechanical data		
Color	■ ■ ■ ■ □ ■	■ ■ ■ ■ □ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
With latching	–	■
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +75 °C	–25 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	100,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
MUSHROOM HEAD IMPACT BUTTONS

Type	Description		A	B	C	Type
Mushroom head impact buttons	without latching	Mushroom-shaped	27	22.3	39.5	**RDP40** ①
	with latching	Mushroom-shaped	27	22.3	45	**RDRZ45** ①

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

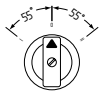
Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

	■ RWS / RWT	■ RWS .1 / RWT .1
Key Features		
General description	Selector switches/spring-return selector switches with short toggle	Selector switches/spring-return selector switches with long toggle
Area of application	Heavy-duty applications	Heavy-duty applications
Mounting-Ø	22.3 mm	22.3 mm
Toggle length	40 mm	49 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Aluminium	Aluminium
Other versions are available		
ATEX design	■	■
Technical features		
Mechanical data		
Color	■	■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	2 ... 3 positions	2 ... 3 positions
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +75 °C	0 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	300,000 operations	300,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
MAINTAINED SELECTOR SWITCHES AND SPRING RETURN SELECTOR SWITCHES

Type	Maintained and momentary positions	Positions	Actuator	A	B	C	Type designation
Selector switches	2 maintained positions		Short toggle	32	22.3	39.5	**RWS21**
			Long toggle	32	22.3	39.5	**RWS21.1**
	3 maintained positions		Short toggle	32	22.3	39.5	**RWS32**
			Long toggle	32	22.3	39.5	**RWS32.1**
Selector switches	1 momentary position and automatic return to the zero position		Short toggle	32	22.3	39.5	**RWT21**
			Long toggle	32	22.3	39.5	**RWT21.1**
	1 momentary position each to the right and left of the zero position		Short toggle	32	22.3	39.5	**RWT32**
			Long toggle	32	22.3	39.5	**RWT32.1**
Spring-return selector switches	1 momentary position on the right and 2 maintained positions		Short toggle	32	22.3	39.5	**RWTS32**
			Long toggle	32	22.3	39.5	**RWTS32.1**
	1 momentary position on the left and 2 maintained positions		Short toggle	32	22.3	39.5	**RWTS321**
			Long toggle	32	22.3	39.5	**RWTS321.1**

① **Toggle length:**
If you want a long toggle, append a "1" to the type designation.

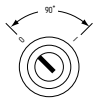
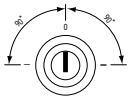
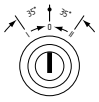
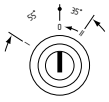
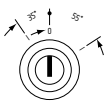
All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

	■ RSS	■ RST
Key Features		
General description	Key-selector switch	Key-operated selector switch
Area of application	Heavy-duty applications	Heavy-duty applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Aluminium	Aluminium
Material front ring	Aluminium	Aluminium
Other versions are available		
ATEX design	–	–
Technical features		
Mechanical data		
Color	Metal (silver)	Metal (silver)
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	2 or 3 positions	2 or 3 positions
Assembly		
Mounting flange included in delivery	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +75 °C	0 °C ... +75 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	100,000 operations	100,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
KEY SELECTOR SWITCHES, BUTTONS AND TOUCH CONTACT SWITCHES

Type	Maintained and momentary positions	Positions	Key-withdrawal position	A	B	C	Type designation
Key-operated selector switches	2 maintained positions		0	31.5	22.3	39.5	**RSS21S1**
			I	31.5	22.3	39.5	**RSS21S2**
			0 + I	31.5	22.3	39.5	**RSS21S12**
	3 maintained positions		I	31.5	22.3	39.5	**RSS32S1**
			0	31.5	22.3	39.5	**RSS32S2**
			II	31.5	22.3	39.5	**RSS32S3**
			I + 0 + II	31.5	22.3	39.5	**RSS32S123**
Key-selector switches	1 momentary position and automatic return to the zero position		0	31.5	22.3	39.5	**RST21S1**
	2 momentary positions on the right and left with automatic return to the zero position		0	31.5	22.3	39.5	**RSTS32S2**
Key-operated selector switch pushbuttons	3 positions:momentary position 35° actuating angle and maintained position 55° actuating angle (zero position in middle, key position at top)		I	31.5	22.3	39.5	**RSST32S1**
			0	31.5	22.3	39.5	**RSTS32S2**
			0	31.5	22.3	39.5	**RSTS321S2**
			II	31.5	22.3	39.5	**RSTS32S3**

All dimensions in mm.

Key

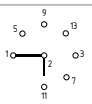
A	Height	Height of command device in front of the front panel without key
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
SPECIAL DEVICES

	■ RWSE..K	■ RDAN6
Key Features		
General description	Step selector switch	Potentiometer drive
Area of application	Heavy-duty applications	Heavy-duty applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Aluminium	Aluminium
Other versions are available		
ATEX design	–	–
Technical features		
Electrical data		
Cam-operated switch	Kraus & Naimer Series CA10	–
Contacts	One NO contact per stage	–
Insulation voltage U_i	690 V	–
Utilisation category AC-15	220 V ... 240 V / 5 A, 380 V ... 440 V / 4 A	–
Rated impulse withstand voltage. U_{imp}	6 kV	–
Rated continuous current I_{the}	20 A	–
Fuse rating	gG 25 A	–
Cable section	max. 2 × 2.5 mm² *	–
Mechanical data		
Color		
Operating element	■	■
Front ring	Silver	Silver
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Maintained switching positions	3 ... 12 positions	Infinite
Assembly		
Integrated mounting plate	■	■
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	0 °C ... +60 °C	0 °C ... +75 °C
Degree of protection (device head)	IP65	IP65
Safety classification		
Standards	IEC 60947-3	–
Mechanical life	Load-dependent	–
Certificates	cULus, CCC	–

* Use copper conductors only.

COMMAND AND SIGNALLING DEVICES – R PROGRAMME
SPECIAL DEVICES

Type	Circuit diagram and connecting terminals	Switching angle	L	LE	A	B	C	Type designation	Material number
Cam switching design step switches with latching mechanism, 1-pole no zero position		60°	40.7	60	32	22.3	54	**RWSE3K.1**	**101195857**
		60°	40.7	60	32	22.3	54	**RWSE4K.1**	**101195858**
		60°	50.2	69.5	32	22.3	54	**RWSE5K.1**	**101195859**
		60°	50.2	69.5	32	22.3	54	**RWSE6K.1**	**101195860**
		45°	59.7	78	32	22.3	54	**RWSE7K.1**	**101195861**
		45°	59.7	78	32	22.3	54	**RWSE8K.1**	**101195862**
		30°	69.2	87.5	32	22.3	54	**RWSE9K.1**	**101195863**
		30°	69.2	87.5	32	22.3	54	**RWSE102K.1**	**101195864**
		30°	78.7	97	32	22.3	54	**RWSE11K.1**	**101195865**
		30°	78.7	97	32	22.3	54	**RWSE12K.1**	**101195866**

Type	Description	LE	A	B	C	Type designation
Potentiometer drive	for 6 mm shaft Ø, shaft length 30 ... 40 mm	63	31	22.3	39.5	**RDAN6**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head
L	Length	Length of step switch block
LE	Installation depth	Length between command device head and bottom edge of switch when mounted

COMMAND AND SIGNALLING DEVICES
A PROGRAMME

RANGE AVANTGARDE

If you consider the exceptional design and follow the definition "direction (in art, science and politics), that stands aggressively for new ideas", this helps to understand the reason for the name, and you certainly realise that the name AVANTGARDE for this command and signalling device is certainly the right one.

Control panels and command panels receive a special outfit with these devices, they are highlighted and their frequent wallflower existence has been removed.

Technical advantages
However, the special features of the AVANTGARDE programme are not limited to the design. Additionally there are a range of constructive and functional benefits, some ergonomic, some functional, which highlight and emphasise the exclusiveness of the design.

Included here for example is an installation depth of less than 40 mm behind the front plate, a push button stroke of only 3.5 mm, also a flexible and installation friendly element system.

With the AVANTGARDE programme, all commercially available device types are offered with the design of a modern command and signalling device programme, which includes illuminated selector switches and switches in different colours. The devices comply with all relevant norms and reach the degree of protection IP65.

DESIGN AND WAY OF FUNCTIONING

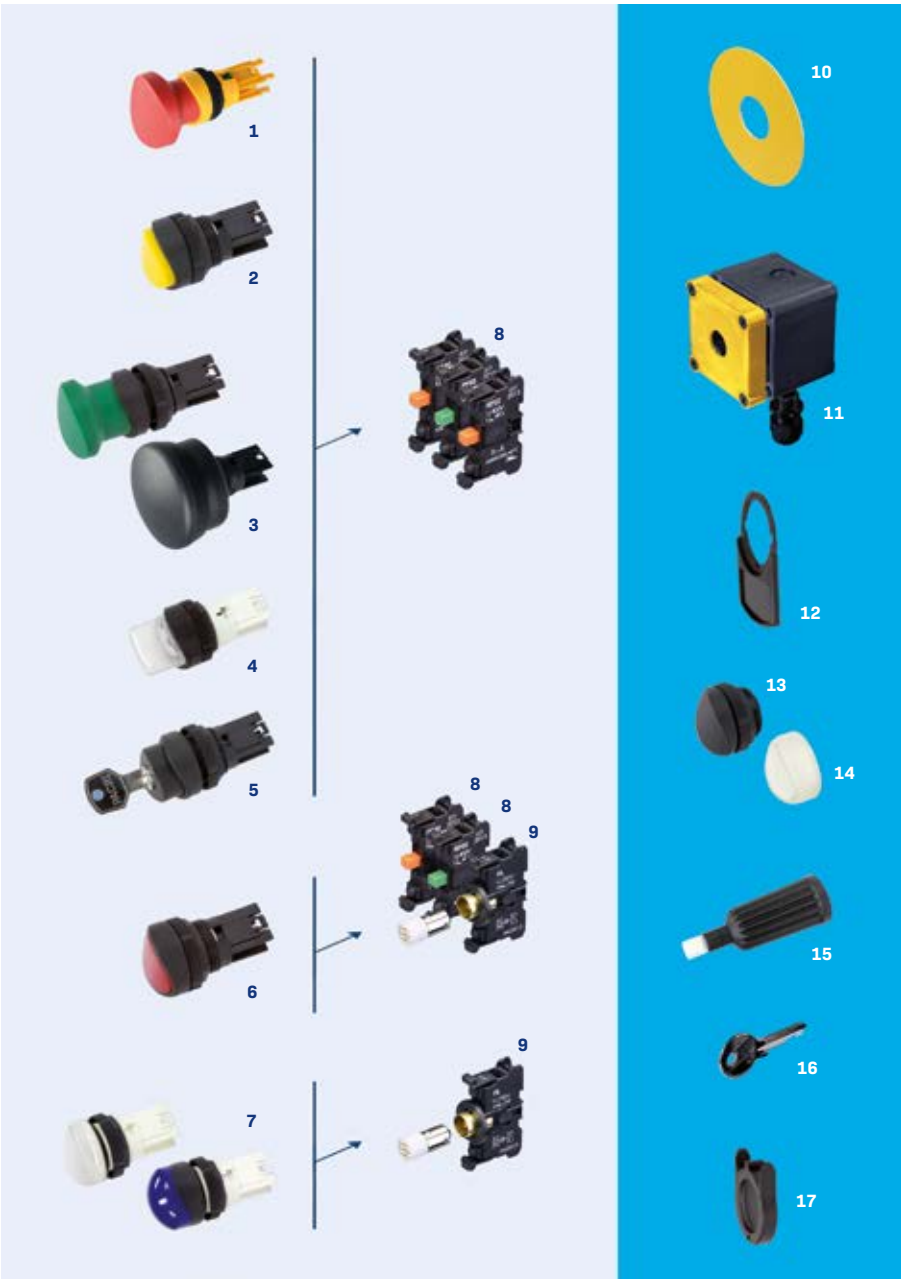
Push button with patented shape (DE 197 30 680 C 1)
The special form of the button and in connection with an actuating stroke of only 3.5 mm and a lower actuating force in comparison to many other devices, allow an ergonomic and tireless actuation of the push buttons, illuminated push buttons and similar. Also long finger nails are not a problem or better still are protected
(keyword: "fingernail safe").

Time saving device installation.
The installation of the device requires an installation height of only 22.3 mm using coupling nuts, snap-contact elements and minimal time.

Modular element system
Equipping: Up to a maximum of 5 contacts, with illuminated devices up to a maximum of 4 contact elements and with emergency stop devices up to a maximum of 3 contact elements using the safety plate to secure the contacts. Both NC and NO contact elements are available with screw clamps.

Low installation depth
Installation compatibility even with limited space behind the front plate. Installation depth with a maximum of three elements: < 40mm. Can be installed in many commercially available command boxes (recommended overall depth: min. 57 mm.

Product overview		Page
1	Emergency stop	96
2	Pushbutton	100
3	Mushroom head impact button/ Mushroom push button	102
4	Maintained selector switch / spring-return selector switch	104
5	Key-selector switch	106
6	Illuminated pushbutton	100
7	Indicator light	98
8	Contact element AF...	122
9	Light element AL...	123
10	Emergency stop label	126
11	EMERGENCY STOP enclosure for surface mounting	132
12	Identification label	126
13	Blanking plug	<?>
14	Dust shield cap	128
15	Mounting tool	129
16	Replacement key	129
17	Removal tool	129



	■ ADRR40
Key Features	
General description	Emergency stop command device
Area of application	Industrial applications
Mounting-Ø	22.3 mm
Housing material	
Material of operating element	Plastic
Material front ring	Plastic
Other versions are available	
Mounted in housing	MBKAC311YE-ADRR40RT-2NC
Technical features	
Mechanical data	
Color	■ ■
Design	Round
Front plate thickness	1 ... 6 mm
Unlocking type	Pull-to-unlatch mechanism
Snap-action mechanism	
Integrated	■
Externally via additional module	–
Assembly	
Connection:	Knurled nut, central mounting
Mounting position	Arbitrarily
Ambient conditions	
Ambient temperatures	–25 °C ... +60 °C
Degree of protection	IP65
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, EN ISO 13850
B10D NC contact	100,000 operations
Certificates	cULus
Notice	cULus in conjunction with the corresponding contact elements only

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
EMERGENCY STOP CONTROL DEVICES

Type	Unlocking	Snap-action mechanism	A	B	C	Type	Material number
Emergency stop command devices	Pull-to-unlatch mechanism	Integrated	38	22.3	40	**ADRR40RT**	**101030271**
EMERGENCY STOP complete housing	Pull-to-unlatch mechanism	Integrated	93	–	40	**MBKAC311YE-ADRR40RT-2NC**	**103009572**
EMERGENCY STOP complete housing	Pull-to-unlatch mechanism	Integrated	93	–	40	**MBKAC311YE-ADRR40RT-2NC-1NO**	**103011887**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

EMERGENCY STOP complete housing

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
INDICATOR LIGHTS

	■ AML	■ AMLH
Key Features		
General description	Flatter indicator light	Higher indicator light
Area of application	Industrial applications	Industrial applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Plastic	Plastic
Other versions are available		
With symbols	–	–
Technical features		
Mechanical data		
Color		
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Illumination *	■	■
Assembly		
Connection:	Knurled nut, central mounting	Knurled nut, central mounting
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +60 °C	–25 °C ... +60 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	–	–
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

* A voltage sensor (AL) is also required and Ba9s LED.

Type	Illuminant	Collar	A	B	C	Type	Material number
Indicator lights	Without integrated illuminant	Flat collar	10.3	22.3	29	**AMLGB**	**101031181**
			10.3	22.3	29	**AMLRT**	**101031180**
			10.3	22.3	29	**AMLGN**	**101031182**
			10.3	22.3	29	**AMLWS**	**101031179**
			10.3	22.3	29	**AMLBL**	**101031183**
		High collar	13.8	22.3	29	**AMLHGB**	**101031573**
			13.8	22.3	29	**AMLHRT**	**101031572**
			13.8	22.3	29	**AMLHGN**	**101031574**
			13.8	22.3	29	**AMLHWS**	**101031571**
			13.8	22.3	29	**AMLHBL**	**101031575**

Abbreviations of colours: SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

	■ ADT	■ ADDT	■ ADL
Key Features			
General description	Pushbutton	Double push button	Illuminated pushbutton
Area of application	Industrial applications	Industrial applications	Industrial applications
Mounting-Ø	22.3 mm	22.3 mm	22.3 mm
Housing material			
Material of operating element	Plastic	Plastic	Plastic
Material front ring	Plastic	Plastic	Plastic
Other versions are available			
With high edge	On request	–	On request
Technical features			
Mechanical data			
Color	■ ■ ■ ■ □ ■	■ □ ■ ■	■ ■ ■ □ ■
Design	Round	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm	1 ... 6 mm
Illumination *	–	optionally in the middle	■
Assembly			
Connection:	Knurled nut, central mounting	Knurled nut, central mounting	Knurled nut, central mounting
Mounting position	Arbitrarily	Arbitrarily	Arbitrarily
Ambient conditions			
Ambient temperatures	–25 °C ... +60 °C	–25 °C ... +60 °C	–25 °C ... +60 °C
Degree of protection	IP65	IP65	IP65
Safety classification			
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations	1,000,000 operations
Certificates	cULus	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only		

* A voltage sensor (AL) is also required and Ba9s LED.

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
PUSHBUTTONS AND ILLUMINATED PUSHBUTTONS

Type	Description		A	B	C	Type	Material number
Pushbuttons	Included in standard version	Included in standard version	10.3	22.3	29	**ADTSW**	**101031584**
			10.3	22.3	29	**ADTGB**	**101031593**
			10.3	22.3	29	**ADTRT**	**101031592**
			10.3	22.3	29	**ADTGN**	**101031594**
			10.3	22.3	29	**ADTWS**	**101031591**
			10.3	22.3	29	**ADTBL**	**101031595**
		With high button	13.3	22.3	29	**ADT3SW**	**101031585**
			13.3	22.3	29	**ADT3GB**	**101031588**
			13.3	22.3	29	**ADT3RT**	**101031587**
			13.3	22.3	29	**ADT3GN**	**101031589**
			13.3	22.3	29	**ADT3WS**	**101031586**
			13.3	22.3	29	**ADT3BL**	**101031590**
Illuminated pushbuttons	Included in standard version	Included in standard version	10.3	22.3	29	**ADLGB**	**101031176**
			10.3	22.3	29	**ADLRT**	**101031175**
			10.3	22.3	29	**ADLGN**	**101031177**
			10.3	22.3	29	**ADLWS**	**101031174**
			10.3	22.3	29	**ADLBL**	**101031178**
		With high button	13.3	22.3	29	**ADL3GB**	**101031713**
			13.3	22.3	29	**ADL3RT**	**101031712**
			13.3	22.3	29	**ADL3GN**	**101031714**
			13.3	22.3	29	**ADL3WS**	**101031711**
			13.3	22.3	29	**ADL3BL**	**101031715**
Double pushbuttons	2 button surfaces	With illumination	10.3	22.3	29 × 57	**ADDT-GN-RT-G24**	**103010797**
		Without illumination	10.3	22.3	29 × 57	**ADDT-GN-RT**	**103010798**
			10.3	22.3	29 × 57	**ADDT-SW-SW**	**103010799**

Abbreviations of colours: SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
MUSHROOM HEAD IMPACT BUTTONS

	■ ADP	■ ADP 55.3
Key Features		
General description	Mushroom button without latching function	Mushroom button without latching function
Special features	–	**Actuating force 7 N**
Area of application	Industrial applications	Industrial applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Plastic	Plastic
Other versions are available		
With symbols	■	■
Technical features		
Mechanical data		
Color	■ ■ ■ ■ □ ■	■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
With latching	–	–
Assembly		
Connection:	Knurled nut, central mounting	Knurled nut, central mounting
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +60 °C	–25 °C ... +60 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000 operations	1,000,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
MUSHROOM HEAD IMPACT BUTTONS

Type	Key	Actuating force	A	B	C	Type	Material number
Mushroom buttons without latching function	Palm form	approx. 9 N	31.3	22.3	33	**ADPSW**	**101031583**
			31.3	22.3	33	**ADPRT**	**101031596**
			31.3	22.3	33	**ADPGN**	**101031597**
	Flatter wider mushroom	approx. 7 N	36	22.3	55	**ADP55.3SW/O.F**	**101054131**
		approx. 10.5 N	36	22.3	55	**ADP55.3SW**	**101054132**

Abbreviations of colours: SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

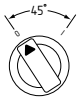
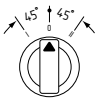
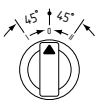
Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
SELECTOR SWITCHES / BUTTONS

	■ AWS / AWT	■ AWSL / AWTL
Key Features		
General description	Selector switch/button	Illuminated selector switch/button
Area of application	Industrial applications	Industrial applications
Mounting-Ø	22.3 mm	22.3 mm
Housing material		
Material of operating element	Plastic	Plastic
Material front ring	Plastic	Plastic
Other versions are available		
With long toggle	■	–
Technical features		
Mechanical data		
Color	■ ■ ■ ■ □ ■	■ ■ ■ □ ■
Design	Round	Round
Front plate thickness	1 ... 6 mm	1 ... 6 mm
Illumination *	–	■
Switch position	2 ... 3 positions	2 ... 3 positions
Assembly		
Connection:	Knurled nut, central mounting	Knurled nut, central mounting
Mounting position	Arbitrarily	Arbitrarily
Ambient conditions		
Ambient temperatures	–25 °C ... +60 °C	–25 °C ... +60 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	100,000 operations	100,000 operations
Certificates	cULus	cULus
Notice	cULus in conjunction with the corresponding contact elements only	

* A voltage sensor (AL) for actuation is also required and Ba9s LED.

Type	Maintained and momentary positions	Switching angle	Actuator	A	B	C	Type designation
Selector switches	2 maintained positions		Short toggle	25.8	22.3	29	**AWS21** ①
			Long knob	25.8	22.3	40	**AWS21.1** ①
			Illuminated short toggle	25.8	22.3	29	**AWSL21** ①
	3 maintained positions		Short toggle	25.8	22.3	29	**AWS32** ①
			Long knob	25.8	22.3	40	**AWS32.1** ①
			Illuminated short toggle	25.8	22.3	29	**AWSL32** ①
Selector buttons	2 sensing positions		Short toggle	25.8	22.3	29	**AWT21** ①
			Long knob	25.8	22.3	40	**AWT21.1** ①
			Illuminated short toggle	25.8	22.3	29	**AWTL21** ①
	3 sensing positions		Short toggle	25.8	22.3	29	**AWT32** ①
			Long knob	25.8	22.3	40	**AWT32.1** ①
			Illuminated short toggle	25.8	22.3	29	**AWTL32** ①

① **Abbreviations of colours:** SW GB RT GN WS BL
You append the abbreviations of the colours to the type designation.
For details of possible colour combinations, refer to the technical data on the previous page.

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

	■ ASS
Key Features	
General description	Key-selector switch
Area of application	Industrial applications
Mounting-Ø	22.3 mm
Housing material	
Material of operating element	Plastic
Material front ring	Plastic
Other versions are available	
Other closure possibilities	On request
Other removal positions	On request
Technical features	
Mechanical data	
Color	■
Design	Round
Front plate thickness	1 ... 6 mm
Maintained switching positions	2 ... 3 positions
Assembly	
Connection:	Knurled nut, central mounting
Mounting position	Arbitrarily
Ambient conditions	
Ambient temperatures	–25 °C ... +60 °C
Degree of protection	IP65
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-1
Mechanical life	100,000 operations
Certificates	cULus
Notice	cULus in conjunction with the corresponding contact elements only

COMMAND AND SIGNALLING DEVICES – A PROGRAMME
KEY-SELECTOR SWITCHES

Type	Maintained positions	Key positions	Key-withdrawal position	A	B	C	Type designation	Material number
Key-operated selector switches	2 maintained positions		0	50	22.3	29	**ASS21S1**	**101192840**
			0 + I	50	22.3	29	**ASS21S12**	**101031173**
	3 maintained positions		0	50	22.3	29	**ASS32S2**	**103001868**
			I + 0 + II	50	22.3	29	**ASS32S123**	**101031598**

All dimensions in mm.

Key

A	Height	Height of command device in front of the front panel with key
B	Mounting-Ø	Installation diameter for the command device head
C	Key Ø	Width of the command device head

COMMAND AND SIGNALLING DEVICES
CONTACT AND LIGHT TERMINAL BLOCKS

AREA OF APPLICATION

The Schmersal Group has developed its own contact systems for series E, N and R command and signalling devices, which guarantee exceptional contacting even under the harshest ambient conditions.

The command and signalling devices from the AVANTGARDE range are specially designed for the needs of industrial applications. The devices can be mounted quickly and efficiently using a knurled nut. A contact carrier is integrated directly on the command device so that the contact elements can be pushed on and engaged on the command device easily without an additional mounting flange. Also the contact elements are easy to install with a screwdriver or to remove with the removing tool. This reduces expensive installation time to a minimum.

DESIGN AND WAY OF FUNCTIONING

All the elements of the EF system have a special low-voltage-capable and self-cleaning four-way contact bridge system. This is a twin contact bridge that works in-parallel as well as crosswise. In this way, the fixed contact and the moveable contact bridge always achieve several contacts. This ensures high levels of contact security that is enhanced by the shape of the fixed contacts. Apart from this, the contacts have a self-cleaning function that removes oxide and dirt particles before they are deposited and are able to affect operation of the switchgear.

The EF contact system can be supplied in three terminations:
- Screw terminals
- Cage clamp
- Blade terminal

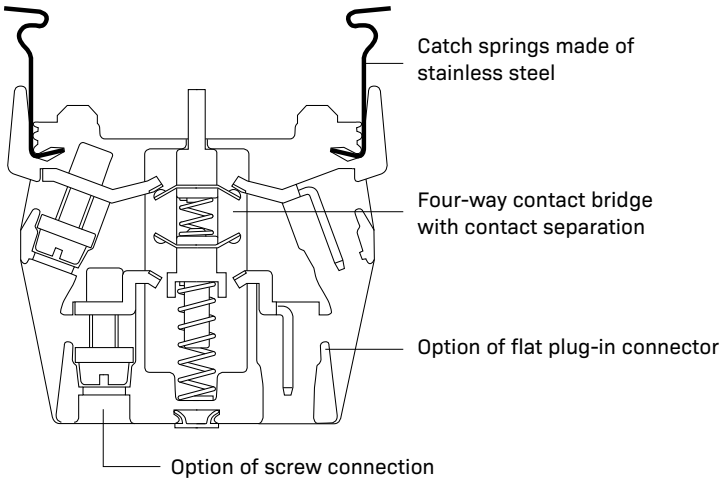
The **RF contact system** is used with series R command devices. Installation is particularly user-friendly as the RF contact system's mounting flange comprises of two parts and allows users to pre-mount the contact elements, while the other part is used for fastening the device head and subsequent attachment of the contact carrier. With this contact system, users have a free choice of contacts, since the contact elements can be mounted on two levels.

The contact element of the type AF is specially designed for a time-saving device installation. Thanks to the recessed guide rails, they are connected directly to the command device without a contact carrier or similar. Thanks to the omission of an attachment or mounting flange, a very low installation depth of under 40 mm is also achieved (emergency stop 47 mm).

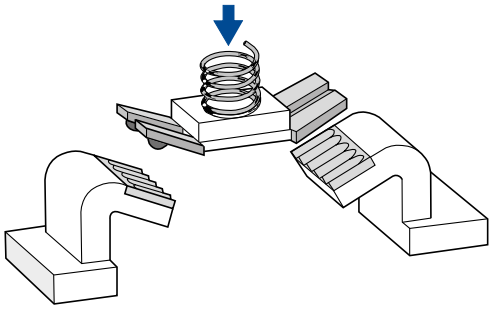
Also the AF contact system is a modular contact system, that due to the doubling of the contacts can accept up to five contact elements (different with emergency stop). This offers the machine and plant manufacturer the possibility to decide how many NO or NC contacts are to be used and installed. This modular contact system also contributes to a reduction in costs. Emergency stop command devices can accept up to three contact elements. These are secured against popping off with an additional safety plate.

EF CONTACT ELEMENTS

Principle design of EF contact elements



FOUR-WAY CONTACT BRIDGE



The electrical way of working of the contact elements is based on the Elan four-way contact. This is a twin contact bridge that works in-parallel as well as crosswise. The high contact security that is provided due to several contactings by the fixed contact and the moveable contact bridge is enhanced for industrial practice by the fixed contacts being angled and embossed several times. The self-cleaning feature of the contacts reliably removes any oxide or dirt particles that may be produced due to operation at extra-low voltages.

CONTACT AND LIGHT TERMINAL BLOCKS
TECHNICAL DATA – RANGE EF

	■ EF
Key Features	
General description	Contact element
Can be used with	E and N product portfolios
Other versions are available	
ATEX design	–
Technical features	
Design	EF
Material	
Material of the housings	Plastic, glass-fibre-reinforced, self-extinguishing
Material of the contacts	Fine-silver, phosphor bronze or brass carrier
Utilisation category AC-15; DC-13	250 V / 8 A; 24 V / 5 A
Suitability for low voltages	> 5 VDC / 3.2 mA
Rated insulation voltage U_i	400 V
Rated impulse withstand voltage. U_{imp}	4 kV
Thermal test current I_{the}	10 A
Max. fuse rating	gG 10 A
Switching frequency	1200 s/h
Mechanical life	10,000,000 operations
Resistance to shock	30 g/18 ms, no bouncing
Resistance to vibration	> 20 g / 10 ... 150 Hz *
Ambient temperature	–25 °C ... +60 °C
Termination	
Screw terminals	Yes
Flat plug-in connector	Yes
Cage clamp connection	Yes
Cable section	
Solid wire	2 × (0.5 ... 2.5 mm²)
Stranded wire	2 × (0.5 ... 1.5 mm²)
Blade terminal	6.3 mm × 0.8 mm / 2 × 2.8 mm × 0.8 mm
Degree of protection terminals ** / switch rooms	IP20 / IP40
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-1
B_{10D}	100,000 operations
Certificates	cULus, CCC ***

* For actuating heads with higher mass, appropriately lower
** With plug-in connectors, depends on the connector plug used
*** Except for cage clamp connections

■ EL / ELE	■ ELDE
Light terminal block with Ba9S base E and N product portfolios	Light terminal block with LED E and N product portfolios
–	–
EL	EL
Plastic, glass-fibre-reinforced, self-extinguishing	Plastic, glass-fibre-reinforced, self-extinguishing
–	–
–	–
–	–
–	–
–	–
–	–
Appropriate to the respective version	Appropriate to the respective version
–	–
–	–
–	–
–	–
–25 °C ... +60 °C	–25 °C ... +60 °C
Yes	Yes
Depending on the version	No
Depending on the version	No
2 × (0.5 ... 2.5 mm²)	2 × (0.5 ... 2.5 mm²)
2 × (0.5 ... 1.5 mm²)	2 × (0.5 ... 1.5 mm²)
6.3 mm × 0.8 mm / 2 × 2.8 mm × 0.8 mm	6.3 mm × 0.8 mm / 2 × 2.8 mm × 0.8 mm
IP20 / –	IP20 / –
IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
–	–
cULus, CCC ***	cULus, CCC ***

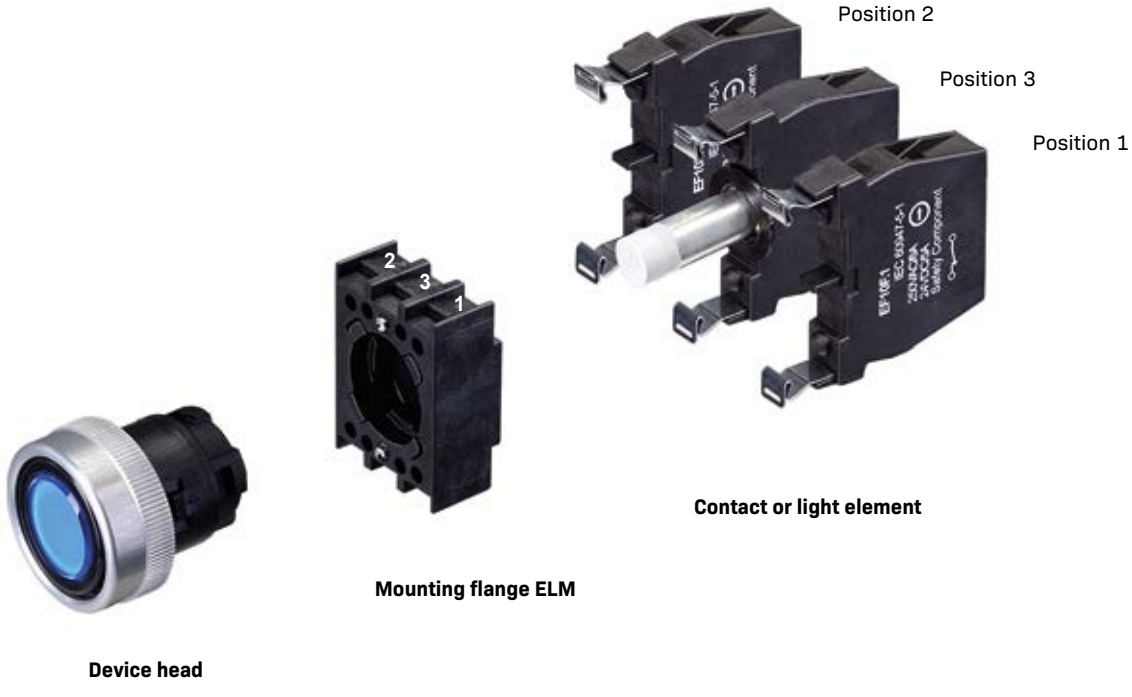
CONTACT AND LIGHTING ELEMENTS
TYPE EF AND EL

Device head	Mounting flange EFM/ELM		
	Position 2	Position 3	Position 1
Emergency stop command device	Contact element EF	Spring element EFR	Contact element EF
Pushbutton	Contact element EF	Contact element EF	Contact element EF
Mushroom head impact button			
Selector switch/key button			
Key-operated selector switch/button			

Device head	Mounting flange ELM		
	Position 2	Position 3	Position 1
Illuminated pushbutton	Contact element EF	Light terminal block EL...	Contact element EF
Indicator light	–	Light terminal block EL...	–

Design
A command and signalling device consists of an actuator, a mounting flange and a contact or light element (in the case of EMERGENCY STOP devices, possibly using a spring element).

Assembly example
This example shows an illuminated push button with ELM mounting flange, 2 EF... contact elements and an EL... lighting element



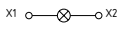
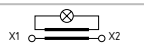
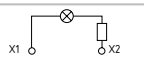
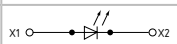
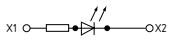
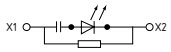
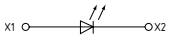
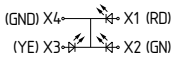
Device head

Mounting flange ELM

Contact or light element

CONTACT AND LIGHT TERMINAL BLOCKS
TYPE EF AND EL

Type	Application	Function	Switch travel diagram	Position	Wiring configuration according to DIN 50005	Screw terminals	Flat plug-in connector	WAGO-Cage clamp
Contact element	Emergency stop	2 NC		1	11-12/21-22	**EF220.1**	**EF220F.1**	–
				2	31-32/41-42	**EF220.2**	**EF220F.2**	–
		1 NC / 1 NO		1	11-12/23-24	**EF303.1**	**EF303F.1**	–
				2	31-32/43-44	**EF303.2**	**EF303F.2**	–
	Included in standard version	1 NC		1	11-12	**EF10.1**	**EF10F.1**	**EFK10.1**
				2	21-22	**EF10.2**	**EF10F.2**	**EFK10.2**
				3	31-32	**EF10.3**	**EF10F.3**	**EFK10.3**
		1 NO		1	13-14	**EF03.1**	**EF03F.1**	**EFK03.1**
				2	23-24	**EF03.2**	**EF03F.2**	**EFK03.2**
				3	33-34	**EF03.3**	**EF03F.3**	**EFK03.3**
		2 NO		1	13-14/23-24	**EF033.1**	**EF033F.1**	**EFK033.1**
				2	33-34/43-44	**EF033.2**	**EF033F.2**	**EFK033.2**
				3	53-54/63-64	**EF033.3**	**EF033F.3**	–
		1 NC / 1 NO		1	11-12/23-24	**EF103.1**	**EF103F.1**	**EF103.1**
				2	31-32/43-44	**EF103.2**	**EF103F.2**	**EF103.2**
				3	51-52/63-64	**EF103.3**	**EF103F.3**	–

Type	Illuminant	Function	Diagram	Position	Description	Screw terminals	Flat plug-in connector	WAGO-Cage clamp
Light terminal block	Ba9S socket *	Lighting element / voltage sensor for lamps + acoustic signal		3	Included in standard version	**EL**	**ELF**	–
				3	with transformer	**ELT**	**ELTF**	–
				3	with series resistor	**ELV**	**ELVF**	–
		Lighting element / voltage sensor for LED		3	24 VAC/DC	**ELE**	–	**ELEK**
				3	48 VAC/DC primary ... 24 V secondary	**ELE 48**	–	–
				3	115 ... 230 VAC primary 24 V secondary	**ELE 230**	–	–
	Integrated LED	Light element with integrated LED		3	LED red	**ELDE.N RT 24**	–	**ELDEK RT**
				3	LED yellow	**ELDE.N GB 24**	–	**ELDEK GB**
				3	LED green	**ELDE.N GN 24**	–	**ELDEK GN**
				3	LED blue	**ELDE.N BL 24**	–	**ELDEK BL**
				3	LED white	**ELDE.N WS 24**	–	**ELDEK WS**
	Integrated LED	Light element with integrated LED's		3	LED red, green, yellow	**ELDE.N-RD-GN-YE-24VDC**	–	–

Type	Application	Function	Position	Description	Screw terminals	Flat plug-in connector	WAGO-Cage clamp
EFR.EDRRS or EFR	Emergency stop	Snap-action mechanism with latching	3	Spring element	–	–	–

* Illuminant not included in delivery!

CONTACT AND LIGHT TERMINAL BLOCKS
TECHNICAL DATA – RANGE AF

	■ CLP001
Key Features	
General description	Light terminal block
Can be used with	H programme
Technical features	
Design	CLP
Material	
Material of the housings	Plastic, self-extinguishing
Material of the contacts	
Utilisation category AC-15; DC-13	
Rated insulation voltage U_i	
Rated impulse withstand voltage. U_{imp}	
Thermal test current I_{the}	
Max. fuse rating	Appropriate to the respective version
Switching frequency	
Mechanical life	
Resistance to shock	30 g / 18 ms
Resistant to vibration	
Ambient temperature	–25 °C ... +60 °C
Termination	
Screw connection	■
Cable section	
Solid wire	2 × 1.5 mm²
Stranded wire	2 × 1.5 mm²
Degree of protection terminals ** / switch rooms	IP20 / IP40
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-1
B_{10D}	
Certificates	cULus

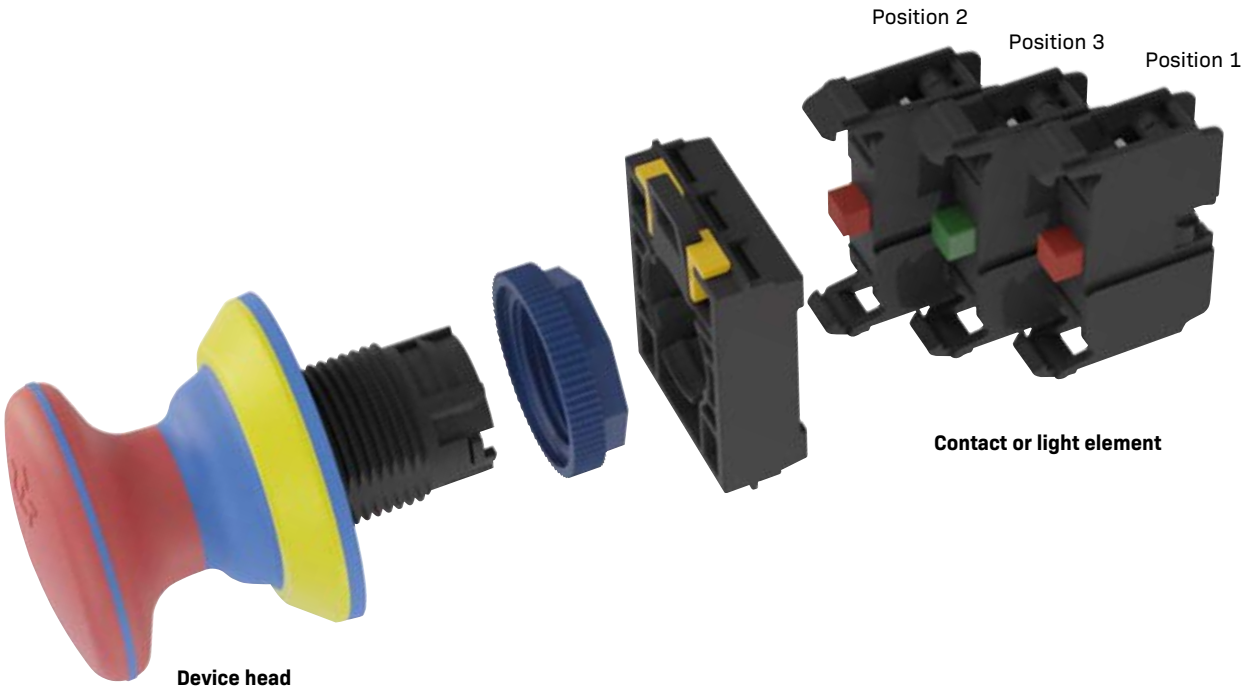
* For actuating heads with higher mass, appropriately lower
** With plug-in connectors, depends on the connector plug used

	
■ CLP101	**■ CLP110**
Contact element	Contact element
H programme	H programme
CLP	CLP
Plastic, self-extinguishing	Plastic, self-extinguishing
Carrier made from fine silver, Phosphor bronze or brass	Carrier made from fine silver, Phosphor bronze or brass
250 V / 6 A; 24 V / 3 A	250 V / 6 A; 24 V / 3 A
500 V	500 V
2.5 kV	2.5 kV
6 A	6 A
gG 6 A	gG 6 A
1,200 s/h	1,200 s/h
5,000,000 operations	5,000,000 operations
30 g / 18 ms	30 g / 18 ms
20 g / 10 ... 150 Hz *	20 g / 10 ... 150 Hz *
−25 °C ... +60 °C	−25 °C ... +60 °C
■	■
2 × 0.5 ... 1.5 mm²	2 × 0.5 ... 1.5 mm²
2 × 0.5 ... 1.5 mm²	2 × 0.5 ... 1.5 mm²
IP20 / IP40	IP20 / IP40
IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
100,000 operations	100,000 operations
cULus	cULus

CONTACT AND LIGHT TERMINAL BLOCKS
TYPE CLP

Device head	Position 1	Position 3	Position 2
Emergency stop command device	Contact element CLP101 or CLP110	Contact element CLP101 or CLP110	Contact element CLP101 or CLP110
Pushbutton			
Mushroom button			
Selector switch/key button			
Illuminated pushbutton	Contact element CLP101 or CLP110	Light element CLP001	Contact element CLP101 or CLP110
Indicator light	–	Light element CLP001	–

Assembly example



CONTACT AND LIGHT TERMINAL BLOCKS
TYPE CLP

Type	Application	Function	Position	Connector	Plunger colour	Contact labelling	Type designation	Material number
Contact element	Standard and emergency stop	1 NC	1, 2 and 3	Screw connection	Red	1, 2	**CLP101**	**103040378**
		1 NO	1, 2 and 3	Screw connection	Green	3, 4	**CLP110**	**103040379**

Type	Illuminant	Diagram	Position	Connector	Contact labelling	Type designation	Material number
Light terminal block	Without *		3	Screw connection	X1 – X2	**CLP001**	**103040380**

* The right lamp with the size Ba9S has to be ordered separately.

* Illuminant not included in delivery!

CONTACT AND LIGHT TERMINAL BLOCKS
TECHNICAL DATA – RANGE RF

	■ RF
Key Features	
General description	Contact element
Can be used with	R programme
Other versions are available	
ATEX design	■
Technical features	
Design	RF
Material	
Material of the housings	PA GV self-extinguishing, hardly flammable
Material of the contacts	Fine-silver, phosphor bronze or brass carrier
Utilisation category AC-15; DC-13	250 V / 6 A; 24 V / 3 A
Suitability for low voltages	>5VDC / 1 mA
Rated insulation voltage U_i	400 V
Rated impulse withstand voltage. U_{imp}	4 kV
Thermal test current I_{the}	6 A
Max. fuse rating	gG 6 A
Switching frequency	1200 s/h
Mechanical life	10,000,000 operations
Resistance to shock	30 g/18 ms, no bouncing
Resistance to vibration	> 20 g / 10 ... 150 Hz *
Ambient temperature	–25 °C ... +60 °C
Termination	
Screw terminals	Yes
Flat plug-in connector	No
Cage clamp connection	No
Cable section	
Solid wire	2 × 0.5 ... 2.5 mm²
Stranded wire	2 × 0.5 ... 1.5 mm²
Blade terminal	–
Degree of protection terminals/ switch rooms	IP20 / IP40
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-1
B_{10D}	100,000 operations
Certificates	cULus

* For actuating heads with higher mass, appropriately lower

	
■ RL	**■ RLDE**
Light terminal block with Ba9S base	Light terminal block with LED
R programme	R programme
–	■
RL	RL
PA GV self-extinguishing, hardly flammable	PA GV self-extinguishing, hardly flammable
–	–
–	–
–	–
–	–
–	–
–	–
Appropriate to the respective version	Appropriate to the respective version
–	–
–	–
–	–
–	–
–25 °C ... +60 °C	–25 °C ... +60 °C
Yes	Yes
No	No
No	No
2 × 0.5 ... 2.5 mm²	2 × 0.5 ... 2.5 mm²
2 × 0.5 ... 1.5 mm²	2 × 0.5 ... 1.5 mm²
–	–
IP20 / –	IP20 / –
IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
–	–
cULus	cULus

CONTACT AND LIGHTING ELEMENTS
TYPE RF AND RL

Device head	Mounting flange EFM/ELM		
	Position 2	Position 1	Position 3
Emergency stop command device	Contact element RF...	Contact element RF...	Contact element RF...
Pushbutton			
Mushroom button			
Selector switch/key button			
Key-operated selector switch/button			
Illuminated pushbutton	Contact element RF...	Light terminal block RL...	Contact element RF...
Indicator light	–	Light terminal block RL...	–

Design
A command or signalling device consists of the assemblies "device head with mounting flange" and "contact or lighting element" (in the case of emergency stop devices, plus spring element if necessary).

Assembly example
This example shows a pushbutton with mounting flange ELM and three contact elements RF...

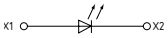
Device head

Mounting flange EFM

Contact or light element

CONTACT AND LIGHTING ELEMENTS
TYPE RF AND RL

Type	Application	Function	Switch travel diagram	Position	Connector	Plunger colour	Contact labelling	Type designation
Contact element	Standard and emergency stop	1 NC		1, 2 and 3	Screw connection	Red	1, 2	**RF10**
							11, 12	**RF10.1**
		1 NO		1, 2 and 3	Screw connection	Green	3, 4	**RF03**
							13, 14	**RF03.1**

Type	Illuminant	Diagram	Position	Connector	Contact labelling	Type designation
Light terminal block	Ba9S socket *		1	Screw terminals	X1-X2	**RL**
	Integrated LED		1	Screw terminals	X1-X2	**RLDEWS24**

* Illuminant not included in delivery!

CONTACT AND LIGHT TERMINAL BLOCKS
TECHNICAL DATA – RANGE AF

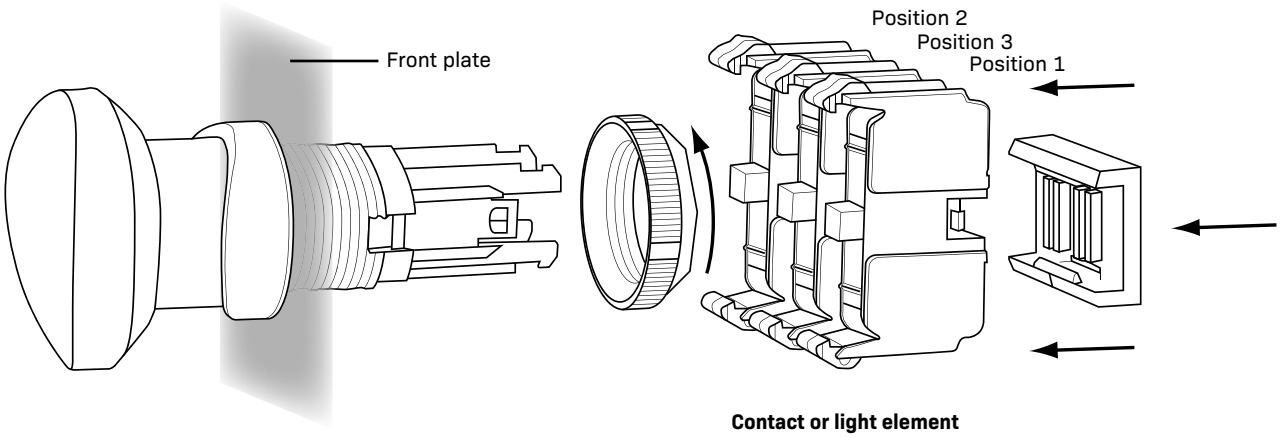
	■ AF
Key Features	
General description	Contact element
Technical features	
Design	AF
Material	
Material of the housings	Plastic, self-extinguishing
Material of the contacts	Fine-silver, phosphor bronze or brass carrier
Utilisation category AC-15; DC-13	250 V / 6 A; 24 V / 3 A
Rated insulation voltage U_i	400 V
Rated impulse withstand voltage. U_{imp}	2.5 kV
Thermal test current I_{the}	6 A
Max. fuse rating	gG 6 A
Switching frequency	1200 s/h
Mechanical life	5,000,000 operations
Resistance to shock	30 g / 18 ms
Resistant to vibration	20 g / 10 ... 150 Hz
Ambient temperature	–25 °C ... +60 °C
Termination	
Screw terminals	Yes
Cable section	
Solid / stranded wire	2 × 0.5 ... 1.5 mm²
Degree of protection terminals / switch rooms	IP20 / IP40
Safety classification	
Standards	IEC 60947-5-1, IEC 60947-1
B_{10D}	100,000 operations
Certificates	cULus

■ AL
Light terminal block
AL
Plastic, self-extinguishing
–
–
–
–
–
Appropriate to the respective version
–
–
30 g / 18 ms (Note lamp value!)
–
–25 °C ... +40 °C
Yes
2 × 1.5 mm²
IP20 / IP40
IEC 60947-5-1, IEC 60947-1
–
cULus

CONTACT AND LIGHT TERMINAL BLOCKS
TYPE AF AND AL

Device head	Position 1	Position 3	Position 2
Emergency stop command device	Contact element AF...	Contact element AF...	Contact element AF...
Pushbutton			
Mushroom head impact button			
Selector switch/key button			
Key-operated selector switch/button			
Illuminated pushbutton	Contact element AF...	Light element AL...	Contact element AF...
Indicator light	–	Light element AL...	–

Assembly example



CONTACT AND LIGHT TERMINAL BLOCKS
TYPE AF AND AL

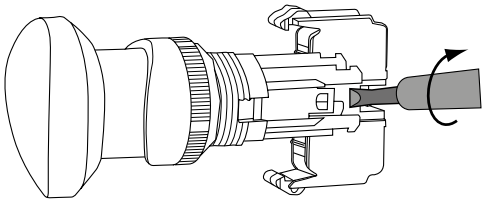
Type	Application	Function	Position	Connector	Plunger colour	Contact labelling	Type designation	Material number
Contact element	Standard and emergency stop	1 NC	1, 2 and 3	Screw connection	Red	1, 2	**AF10**	**101030064**
		1 NO	1, 2 and 3	Screw connection	Green	3, 4	**AF02**	**101030065**

Type	Illuminant	Diagram	Position	Connector	Contact labelling	Type designation	Material number
Light terminal block	Without *		3	Screw connection	X1 – X2	**AL**	**101031578**

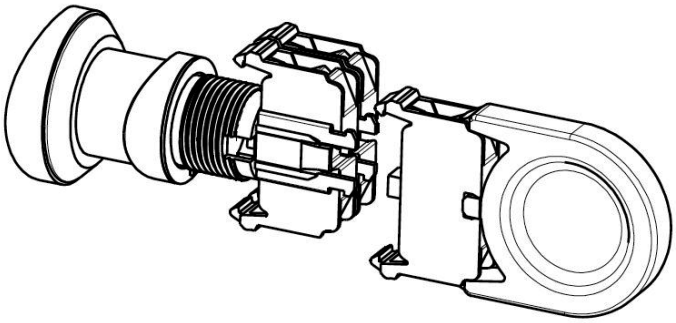
* The right lamp with the size Ba9S has to be ordered separately.

Dismantling example

Using a screwdriver



without any removal tools



COMMAND AND SIGNALLING DEVICES
ACCESSORIES

Type	Description	Type	Recommended for product portfolio				
			E	N	H	R	A
Emergency stop label	Installation Ø for 22.3 mm, 53 mm external Ø	**MDP-8**	■			■	
	Mounting-Ø for 22.3 mm, external Ø 53 mm, plastic	**MDP-8.2**					■
	Installation Ø for 22.3 mm, 100 mm external Ø	**MDP-6**	■			■	
	Installation Ø for 30.5 mm, 53 mm external Ø	**DPF-9**	■			■	
	Installation Ø for 30.5 mm, 100 mm external Ø	**DPF-7**	■			■	
	External Ø 70 mm, V4A version, colour yellow, self-adhesive, no labelling	**NDP-70**	■	■		■	
	External Ø 65 mm plastic – as adhesive foil	**NDP-65**	■	■		■	
Protective collar	Emergency stop protective collar, installation Ø for 22.3 mm operating element Ø 38.5 mm	**EDRR-1 SET**	■				
	Emergency stop protective collar, installation Ø for 22.3 mm operating element Ø 49 mm	**EDRR-2 SET**	■			■	
	Emergency stop protective collar, installation Ø for 30.5 mm operating element Ø 38.5 mm	**EDRR-1.1 SET**	■				
	Emergency stop protective collar, installation Ø for 30.5 mm operating element Ø 49 mm	**EDRR-2.1 SET**	■			■	
	Emergency stop protective collar, material 1.4550, incl. fastening screws	**NSK/V4A/GB**		■			
	Protective collar to prevent accidental touching for pushbuttons and illuminated pushbuttons	**NSK-GR**		■			
Selector switch lock	Selector switch lock for two-position selector switch	**NWSP21GR**		■			
	Selector switch lock for three-position selector switch	**NWSP32GR**		■			
Blanking plug	Blanking plug, metallised	**NB**		■			
	Blanking plug, stainless steel	**NB/VA**		■			
	Blanking plug, installation Ø 22.3 mm	**MBN**	■				
	Blanking plug, installation Ø 30.5 mm	**BN**	■			■	
	Blanking plug, installation Ø 22.3 mm	**ABN**					■
	Blanking plug, stainless steel, mounting diameter 22.3 mm	**HB-BL**			■		
Dust shield cap	Dust shield cap for lamps and push buttons	**AMT**					■
Identification plate	Identification label, small	**NZSO/V4A**		■			
	Identification label, large	**NZSO2/V4A**		■			
	Identification plate	**HZSO/V4A**			■		
	Identification label, small	**RZSO**				■	
	Identification label, medium	**RZSO1**				■	
	Identification label, large	**RZSO2**				■	
	Identification label, aluminium	**MZSO**	■				
	Identification label, plastic	**KZSO**	■				
	Identification label, 30.5 mm, small	**ZSO2**	■				
	Identification label, 30.5 mm, large	**ZSO**	■				
	Identification label, 30.5 mm, large	**ZSNO**	■				
	Identification plate	**AZSO**					■
Adapter ring	Adapter ring with gasket for using Ø 22 mm operating buttons to 30.5 mm drilled holes	**NUE**		■			
	Adapter ring with gasket for using Ø 22 mm operating buttons to 30.5 mm drilled holes	**RUE**				■	
	Adapter ring with gasket for using Ø 22 mm operating buttons to 30.5 mm drilled holes	**MUE**	■				
Spare key	Spare key for key selector switch	**SDS1/SDS2**	■			■	
	Spare key for key selector switch	**A-S**					■

COMMAND AND SIGNALLING DEVICES
ACCESSORIES

Type	Description	Type	Recommended for product portfolio				
			E	N	H	R	A
Mounting flange	Mounting flange	**EFM**	■	■			
	Mounting flange	**ELM**	■	■			
	Mounting flange for position switch	**EFMH**	■	■			
	Mounting flange	**RLM**				■	
	Driver for contact elements	**R-F**				■	
	Mounting flange	**SMF**			■		
	Mounting flange for special devices	**SMF-SG**			■		
Mounting tool	Mounting tool for mounting flange	**RMW**				■	
	Mounting tool for central nut	**HMW**			■		
	Installation tool for knurled nut	**A-14**					■
Disassembly tool	Removal tool for contact elements	**A-DW**					■
Multi LED	Multi LED white Ba9S, 24 VDC	**LE24/9WS**	■	■		■	■
	Multi LED white Ba9S, 230 VDC	**LE230/9WS**	■	■		■	
Lamp	Lamp 24V/1.9W	**L24/9**	■			■	

Emergency stop label

- NDP-70
- Material V4A
- Yellow powder-coated

Emergency stop label

- MDP-8.2
- EMERGENCY STOP Sign Plastic

EMERGENCY STOP protective collar

- EDRR-1 SET
- Aluminium die-cast
- Yellow powder-coated

EMERGENCY STOP protective collar

- NSK/V4A/GB
- Bracket material 1.4550 plate V4A powder-coated

Protective collar

- NSK-GR
- Protective collar to prevent accidental touching
- For pushbuttons and illuminated N product portfolio pushbuttons and Illuminated pushbuttons
- Command device not included in delivery

Selector switch lock

- NWSP21GR / NWSP32GR
- Replacement measure for key-operated selector switch
- For selector switches with long toggle
- Padlock not included in the delivery

COMMAND AND SIGNALLING DEVICES
ACCESSORIES

Blanking plug

- NB
- Plastic, metallised
- For installation diameter 22.3 mm

Blanking plug

- ABN
- Plastic
- For installation diameter 22.3 mm

Blanking plug

- HB-BL
- Stainless steel
- For installation diameter 22.3 mm

Dust shield cap

- AMT
- Dust shield cap for lamps and push buttons

Identification plate

- RZSO2
- Aluminium plate with black anodised labelling area
- Depending on version, 1 to 3 lines can be written

Identification plate

- NZSO...
- Stainless-steel plate V4A
- Depending on version, 1 to 3 lines can be written

Identification plate

- MZSO
- Aluminium plate with black anodised labelling area

Identification plate

- AZSO
- Aluminium plate with black anodised labelling area
- Depending on version, 1 to 2 lines can be written

Adapter ring

- RUE
- Plastic
- Adapter ring from installation diameter of 30.5 mm to 22.3 mm

COMMAND AND SIGNALLING DEVICES
ACCESSORIES

Replacement key

- SDS1/SDS2 and A-S
- Spare key for key selector switch with EKM locking
- Note: You must state the locking number too

Mounting flange

- ELM
- Mounting flange for E and N product portfolio illuminated pushbuttons

Mounting flange

- EFM
- Mounting flange for E and N product portfolio pushbuttons

Mounting flange

- EX-RLM
- Mounting flange for EX-R product portfolio with contact carrier and driver

Mounting flange

- SMF
- Standard mounting flange for H programme

Mounting flange

- SMF-SG
- Mounting flange for special devices for H programme

Mounting flange

- EFMH
- Mounting flange for E and N product portfolio position switches PS116
- Depending on the version, with position switch included in delivery too

Position switch

- PS116-...-S200
- Thermoplastic enclosure
- Symmetrical casing
- Degree of protection IP66, IP67
- Connector plug M12 or cable

Mounting tool

- RMW
- Mounting tool for EX-R product portfolio mounting flange

COMMAND AND SIGNALLING DEVICES
ACCESSORIES

Mounting tool

- A-14
- Installation tool for knurled nut

Disassembly tool

- A-DW
- Removal tool for contact elements

Multi LED

- LE24/9WS
- LED white
- For Ba9S socket
- 24VAC/DC
- Also available as 230V version

UP-TO-DATE WITHOUT FAIL
ONLINE ON THE WORLD WIDE WEB

FOR DETAILED INFORMATION, CHECK OUT
WWW.SCHMERSAL.COM

COMMAND AND SIGNALLING DEVICES
ASSEMBLY HOUSING

ENCLOSURE MBGAC/MBGHAC

The aluminium housings of the MBGAC series enjoy universal application owing to their simple and functional design. They offer the user a high level of sturdiness and a sealing concept that has proven its worth over many years. A special emergency stop enclosure MBGHAC with an integrated protective collar is available in this range and has been coordinated exactly with the emergency stop command devices of product portfolios E and R. This protects the emergency stop from being actuated accidentally and has the advantage for the plant owner of reducing undesirable downtimes.

ENCLOSURE MBK

MBK enclosures are manufactured from a very high-quality plastic. This makes it possible for the user to use the housings under extreme conditions, such as temperatures from –40°C to +100°C. Furthermore, very few chemicals are capable of causing damage to this plastic. These housings have the glass fibre reinforced plastic to thank for their extreme sturdiness. Users have two knock-out drilled holes available for M20 cable glands to route cables in.

ENCLOSURE KG

The KG-series features ABS plastic housings for simple applications that do not require the highest level of sturdiness. The cable outlets are already mounted on these enclosures, which means that plant manufacturers only needs to mount the command devices.

ENCLOSURE NBG/EBG/EX-EBG

Series NBG / EBG / EX-EBG assembly housings are made of high-quality stainless steel using a special deep-drawing process; they have been specially developed for hygiene and heavy-duty applications. The special ribbed gasket that surrounds the base of the enclosure on which the enclosure cover is forged, makes it possible to implement the particularly high IP 69K degree of protection. The EX-EBG enclosures have an additional integrated reinforcement panel that exceeds the extreme requirements for explosion protection.

ENCLOSURE NBGLC

The assembly housings in the NBGLC series have been developed in accordance with the requirements of DIN EN 1672-2 for hygiene-sensitive areas. The housings consist of a welded base box and a solid housing cover. The sealing elements are specially designed in blue for the hygiene sector.

MBGHAC

- Enclosure material, alloy
- For emergency stop with protective collar

MBGAC

- Enclosure material, alloy

MBK

- Housing material, plastic

KG

- Housing material, plastic

NBG/EBG/EX-EBG

- Enclosure material, stainless steel

NBGLC

- Enclosure material, stainless steel

COMMAND AND SIGNALLING DEVICES
ASSEMBLY HOUSING

Type	Description	Housing material	Number of drilled holes	Middle spacing of drilled holes (mm)	Length of enclosure (mm)
MBGAC / MBGHAC	Assembly housing for emergency stop	Alloy	1	–	100
			1	–	100
	Assembly housing		1	–	100
			2	40	160
			3	40	200
			4	40	245
			5	40	305
			6	40	305
			2	50	160
			3	50	200
			4	50	245
			5	50	305
			0	–	100
			0	–	160
			0	–	200
			0	–	245
			0	–	305
MBK	Assembly housing	Plastic	1	40	85
	Assembly housing for emergency stop		1	40	85
KG	Assembly housing	Plastic	1	40	82
			2	40	120
			3	40	160
			2	40	120
			3	40	160
NBG/EBG	Assembly housing	Stainless steel	1	–	110
			0	–	154
			0	–	324
			2	60	154
			3	60	154
			4	60	324
			5	60	324
			5	65 / 55 / 55 / 55	324
	Assembly housing for emergency stop		3	54 / 50	154
			3	54 / 50	154
	Assembly housing		1	–	110
			3	60	154
			5	60	324
EX-EBG	Assembly housing	Stainless steel	1	–	110
			3	60	154
			5	60	324
NBGLC	Assembly housing	Stainless steel	1	–	100
			1	–	100
			2	65	195
			2	65	195
			3	60	195
			3	60	195
			4	60	315
			4	60	315
			5	60	315
			5	60	315
	Assembly housing for protective collar mounting		1	–	100
			2	65	195
			2	65	195
			3	60	195
			3	60	195
			4	60	315
			4	60	315

Width of enclosure (mm)	Height of enclosure (mm)	Drilled hole for cable gland	Type designation	Recommended command device range		
				"E" programme	"N" programme	"R" programme
100	80	M20	**MBGHAC311YE**	■		■
100	80	M20	**MBGAC311YE**	■		■
100	80	M20	**MBGAC311**	■		■
100	80	M20	**MBGAC422**	■		■
100	80	M20	**MBGAC433**	■		■
100	80	M25	**MBGAC444**	■		■
100	80	M25	**MBGAC455**	■		■
100	80	M25	**MBGAC466**	■		■
100	80	M20	**MBGAC532**	■		■
100	80	M20	**MBGAC543**	■		■
100	80	M25	**MBGAC554**	■		■
100	80	M25	**MBGAC565**	■		■
100	80	–	**MBGAC310**	■		■
100	80	–	**MBGAC420**	■		■
100	80	–	**MBGAC430**	■		■
100	80	–	**MBGAC440**	■		■
100	80	–	**MBGAC450**	■		■
85	84	M20	**MBK311**	■		■
85	84	M20	**MBK311GB**	■		■
80	85	M20	**KG411-A**	■		Suitable only to a limited extent
80	85	M20	**KG422-A**	■		
80	85	M20	**KG433-B**	■		
80	85	M20	**KG432-A**	■		
80	85	M20	**KG443-A**	■		
110	88	M20	**NBG311**	■		
110	88	M20	**NBG630**		■	
110	88	2x M20	**NBG660**		■	
110	88	M20	**NBG632/NM**		■	
110	88	M20	**NBG633**		■	
110	88	2x M20	**NBG664/NM**		■	
110	88	2x M20	**NBG665**		■	
110	88	2x M20	**NBG665/65.55**		■	
110	88	M20	**NBG633/54.50/NSK**		■	
110	88	M20	**NBG633/54.50**		■	
110	88	M20	**EBG311.0**	■	■	■
110	88	M20	**EBG633.0**	■	■	■
110	88	M20	**EBG665.0**	■	■	■
110	88	M20	**EX-EBG311.0**			■
110	88	M25	**EX-EBG633.0**			■
110	88	2x M25	**EX-EBG665.0**			■
100	94	M20	**NBGLC11.1**		■	
100	94	M20	**NBGLC11.3**		■	
100	94	M20	**NBGLC32.1**		■	
100	94	M20	**NBGLC32.3**		■	
100	94	M20	**NBGLC33.1**		■	
100	94	M20	**NBGLC33.3**		■	
100	94	M20	**NBGLC54.1**		■	
100	94	M20	**NBGLC54.3**		■	
100	94	M20	**NBGLC55.1**		■	
100	94	M20	**NBGLC55.3**		■	
100	94	M20	**NBGLC11.1/NSK**		■	
100	94	M20	**NBGLC32.1/NSK**		■	
100	94	M20	**NBGLC32.3/NSK**		■	
100	94	M20	**NBGLC33.1/NSK**		■	
100	94	M20	**NBGLC33.3/NSK**		■	
100	94	M20	**NBGLC54.1/NSK**		■	
100	94	M20	**NBGLC54.3/NSK**		■	

CONTROL PANELS
DESCRIPTION

AREA OF APPLICATION

Ergonomic operation of the main machine functions at the human-machine interface is a key factor in safety. The control units should be mounted as close as possible to the safety doors so that operators have an overview of the process.
BDF Series control units meet this requirement. This series has been designed for mounting onto the commercially available aluminium profile systems of machine enclosures and you can quickly attach them and integrate them in the ambient structure.

DESIGN AND WAY OF FUNCTIONING

The range is based on a high-quality design with slim-line housing (only 40 mm) made from impact-resistant plastic. Two designs are available to accommodate one or four command devices or indicator lights.

Users can choose from a large product portfolio of illuminated control push buttons, selector switches and selector buttons, LED illuminated indicators, key-operated switches and standards-compliant Emergency-Stop command devices. Positioning of the pushbuttons on the control panel is also freely selectable. Labelling fields allow you to label the functions individually.

This makes it possible for machine builders to use the BDF range to represent the most common operator functions like Emergency Stop, ON / OFF, Forwards / Backwards, Operating Mode Selection, display of operating status conditions or error messages, etc. All the command devices and indicator lights have been developed for industrial applications and have been tried and tested in other series of the command device product portfolio.

The system also includes a mounting plate to combine the control panel with a solenoid interlock and an ergonomic door handle.

In addition to the standard version for parallel wiring, versions with different communications interfaces are also available such as the AS interface Safety at Work (AS-i SaW) or the serial diagnostic interface (SD) and for use on the secure field box SFB.

An overview of the combination options for the command and signalling devices as well as the preferred types of the AS-i, SD and FB versions can be found on page 144.

SAMPLE APPLICATION

The photo shows a combination with the BDF200 and an AZM201 solenoid interlock, including a B30 door-handle actuator with the mounting plate as an elegant safety door solution. This positive connection between the BDF200 control panel and the AZM201 solenoid interlock offers machine operators a whole new level of convenience.

CONTROL PANELS
TECHNICAL DATA

	■ BDF100...-NH	■ BDF100...
Key Features		
	▪ Control panel with emergency stop ▪ Emergency stop function with and without protective collar ▪ Slim, shock-resistant thermoplastic enclosure ▪ For mounting on commercially available aluminium profile systems	▪ Control panel with one control element ▪ Slim, shock-resistant thermoplastic enclosure ▪ For mounting on commercially available aluminium profile systems ▪ Large product portfolio of operating and lighting elements
Other versions		
AS-i SaW	–	–
SD-Interface	–	–
Technical features		
Electrical characteristics		
Max. switching capacity U/I	24 VAC / 2 A; 24 VDC / 1 A	24 VAC / 2 A; 24 VDC / 1 A
Switching of low voltages	5 V / 1 mA	5 V / 1 mA
Circuit versions		
Emergency stop	2 NC/1 NO	–
Command devices	–	1 NO /1 NC; 2 NO
Emergency stop with indicator lamp	2 NC/1 NO	–
Command devices with indicator lamp	–	1 NO /1 NC; 2 NO
Mechanical data		
Housing material	Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing
Dimensions (W x H x D)		
With protective collar	40 × 99 × 69 mm	–
Without protective collar	40 × 99 × 49 mm	40 × 99 × 49 mm
Termination	Connector plug M12, 8-pole	Connector plug M12, 8-pole
Ambient conditions		
Ambient temperature	–25 °C ... +65 °C	–25 °C ... +65 °C
Degree of protection	IP65	IP65
Safety classification		
Standards	EN ISO 13849-1	EN ISO 13849-1
B_{10D} NC contact	100,000	100,000
Certificates	cULus	cULus

To get detailed information about the products and certificates, visit **products.schmersal.com**.

			
■ BDF200-NH-...	**■ BDF200...**	**■ BDF200-NH-...-2920**	**■ BDF200-...-2920**
▪ Control panel with emergency stop and 3 control elements ▪ Emergency stop function with and without protective collar ▪ Slim, shock-resistant thermoplastic enclosure ▪ For mounting on commercially available aluminium profile systems ▪ Large product portfolio of operating and lighting elements	▪ Control panel with 4 control elements ▪ Slim, shock-resistant thermoplastic enclosure ▪ For mounting on commercially available aluminium profile systems ▪ Large product portfolio of operating and lighting elements	▪ Connector plug M12, 12-pole ▪ Control panel with emergency stop and 3 control elements ▪ Emergency stop function with and without protective collar ▪ Slim, shock-resistant thermoplastic enclosure ▪ For mounting on commercially available aluminium profile systems ▪ Large product portfolio of operating and lighting elements	▪ Connector plug M12, 12-pole ▪ Control panel with 4 control elements ▪ Slim, shock-resistant thermoplastic enclosure ▪ For mounting on commercially available aluminium profile systems ▪ Large product portfolio of operating and lighting elements
■	–	–	–
■	–	–	–
24 VAC / 2 A; 24 VDC / 1 A	24 VAC / 2 A; 24 VDC / 1 A	24 VAC / 1.5 A; 24 VDC / 1 A	24 VAC / 1.5 A; 24 VDC / 1 A
5 V / 1 mA	5 V / 1 mA	5 V / 1 mA	5 V / 1 mA
2 NC/1 NO	–	2 NC contact	–
1 NC /1 NO; 2 NO	1 NC /1 NO; 2 NO	1 NC/1 NO	1 NC/1 NO
2 NC	–	–	–
1 NO	1 NO	–	–
Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing	Glass-fibre reinforced thermoplastic, self-extinguishing
40 × 220 × 69 mm	–	40 × 220 × 69 mm	–
40 × 220 × 49 mm	40 × 220 × 49 mm	40 × 220 × 49 mm	40 × 220 × 49 mm
M20 cable gland with plug-in terminals	M20 cable gland with plug-in terminals	Connector plug M12, 12-pole	Connector plug M12, 12-pole
–25 °C ... +65 °C	–25 °C ... +65 °C	–25 °C ... +65 °C	–25 °C ... +65 °C
IP65	IP65	IP65	IP65
EN ISO 13849-1	EN ISO 13849-1	EN ISO 13849-1	EN ISO 13849-1
100,000	100,000	100,000	100,000
cULus	cULus	cULus	cULus

CONTROL PANELS
CONTROL ELEMENTS

Emergency stop pushbutton NH

- Mushroom-shaped plastic button, Ø 30 mm
- Without protective collar: ordering suffix NH
- Pull to reset
- 1 NO contact / 2 NC contacts

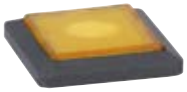
Emergency stop pushbutton NHK

- Mushroom-shaped plastic button, Ø 30 mm
- With protective collar: ordering suffix NHK
- Pull to reset
- 1 NO contact / 2 NC contacts

Pushbutton DT..

- With concave button, button surface 19 × 19 mm
- 2 NO contacts or 1 NO contact / 1 NC contact
- Printing is possible on request
- Refer to the table below for the ordering suffix

Indicator light LM..

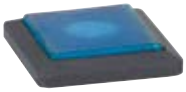


- Illuminated surface 19 × 19 mm
- Lamp replacement at the front
- Printing is possible on request
- Refer to the table below for the ordering suffix

Mushroom push button PT..

- Button surface 25 × 25 with rounded edges
- Without latching
- 2 NO contacts or 1 NO contact / 1 NC contact
- Printing is possible on request
- Refer to the table below for the ordering suffix

Illuminated pushbutton LT..

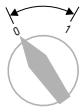
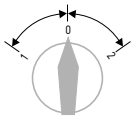
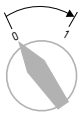
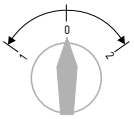
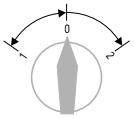


- With concave button, button surface 19 × 19 mm
- 2 NO contacts or 1 NO contact / 1 NC contact
- Lamp replacement at the front
- Printing is possible on request
- Refer to the table below for the ordering suffix

Ordering suffix	yellow	red	green	blue	black	white
 Mushroom push button PT..	PTYE	PTRD	PTGN	PTBU	PTBK	PTWH
 Pushbutton DT..	DTYE	DTRD	DTGN	DTBU	DTBK	DTWH
 Illuminated pushbutton LT..	LTYE	LTRD	LTGN	LTBU		LTWH
 Indicator light LM..	LMYE	LMRD	LMGN	LMBU		LMWH

For detailed information on selection, visit **products.schmersal.com**.

Maintained selector switch / spring-return selector switch	Maintained selector switch / spring-return selector switch	Key-operated selector switch/button
		
■ Version with standard toggle, anthracite ■ Refer to the table below for the ordering suffix	■ Version with long toggle, anthracite ■ Refer to the table below for the ordering suffix	■ Version with high-quality cylinder lock; therefore, IP65 in this case too ■ Key can be removed in all positions ■ Refer to the table below for the ordering suffix

Ordering suffix	Maintained selector switch	Maintained selector switch	Spring-return selector switch	Spring-return selector switch	Selector switches
					
	1 latched position	2 latched positions to the left/right of the zero position	1 momentary position and automatic return to the zero position	2 touch positions to the left/right of the zero position and automatic return to the zero position	1 momentary position on the right and automatic return to the zero position and 1 maintained position to the left of the zero position
	2 NO or 1 NO / 1 NC	1 NO per position or 1 NC (position 1) / 1 NO (position 2)	2 NO or 1 NO / 1 NC	1 NO per position or 1 NC (position 1) / 1 NO (position 2)	1 NO per position or 1 NC (position 1) / 1 NO (position 2)
 Standard toggle	**WS20**	**WS30 ***	**WT20**	**WT30 ***	**WTS30 ***
 Long toggle	**WS21**	**WS31 ***	**WT21**	**WT31 ***	**WTS31 ***
 Key-operated switch	**SWS20**		**SWT20**		

* not for -2920 version .

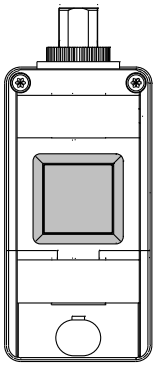
For detailed information on selection, visit **products.schmersal.com**.

CONTROL PANELS
COMBINATION OPTIONS

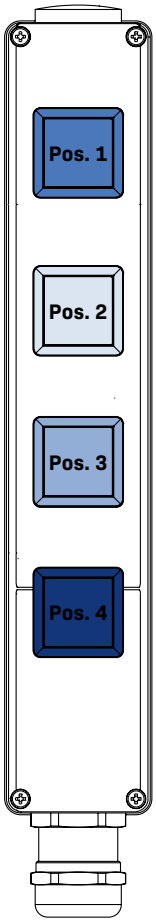
Control elements		BDF100 with	BDF200 At pos. 1	BDF200 At pos. 2	BDF200 At pos. 3	BDF200 At pos. 4
	NH	•	•			
	NHK	•	•			
	PT..		•	•	•	•
	DT..	•	•	•	•	•
	LT..	•	•	•	•	•
	LM..		•	•	•	•
	SW.20	•		•	•	
	W..0	•		•	•	
	W..1	•		•	•	

Control panels

BDF100



BDF200



CONTROL PANELS
PREFERRED TYPES[1)] AND ACCESSORIES

Series	Fitting At pos. 1	Pos. 2	Pos. 3	Pos. 4	Indicator lamp	Type designation	Material number
BDF100 	NH	---	---	---	red	**BDF100-NH-G-ST**	**101215862**
	NHK	---	---	---		**BDF100-NHK-G-ST**	**101211974**
	LTBU	---	---	---	---	**BDF100-11-LTBU-ST**	**101216402**
	LTGN	---	---	---		**BDF100-11-LTGN-ST**	**101216247**
	SWS20	---	---	---		**BDF100-11-SWS20-ST**	**101217193**
	WS20	---	---	---	green	**BDF100-11-WS20-G/GN-ST**	**103001068**
	LTBU	---	---	---	---	**BDF100-20-LTBU-ST**	**101217770**
	LTGN	---	---	---		**BDF100-20-LTGN-ST**	**101217217**
BDF200 	NH	LT	LT	LT	red	**BDF200-NH-10-LT-LT-LT-G24-2875** [1)]	**103007781**
		LT	LT	LT	---	**BDF200-NH-11-LT-LT-LT-2875** [1)]	**103007782**
		LT	LT	LT		**BDF200-NH-11-LT-LT-LT-2875/2920** [1)2)]	**103015461**
		LT	LT	LT		**BDF200-NH-20-LT-LT-LT-2875** [1)]	**103007783**
		SWS20	LT	LT		**BDF200-NH-11-SWS20-LT-LT-2875** [1)]	**103007789**
		SWS20	LT	LT		**BDF200-NH-20-SWS20-LT-LT-2875** [1)]	**103007790**
	NHK	LT	LT	LT	red	**BDF200-NHK-10-LT-LT-LT-G24-2875** [1)]	**103007784**
		LT	LT	LT	---	**BDF200-NHK-11-LT-LT-LT-2875** [1)]	**103007785**
		LT	LT	LT		**BDF200-NHK-11-LT-LT-LT-2875/2920** [1)2)]	**103026143**
		LT	LT	LT		**BDF200-NHK-20-LT-LT-LT-2875** [1)]	**103007786**
		SWS20	LT	LT		**BDF200-NHK-11-SWS20-LT-LT-2875** [1)]	**103007791**
		SWS20	LT	LT		**BDF200-NHK-20-SWS20-LT-LT-2875** [1)]	**103007792**
	LT	LT	LT	LT	---	**BDF200-LT-11-LT-LT-LT-2875** [1)]	**103007787**
		LT	LT	LT		**BDF200-LT-11-LT-LT-LT-2875/2977** [1)2)]	**103025115**
		LT	LT	LT		**BDF200-LT-20-LT-LT-LT-2875** [1)]	**103007788**

[1)] Type designation -2875: the coloured button caps are included in the scope of delivery as an accessory pack for customers to mount themselves.
[2)] with connector plug M12, 12 pole

AZM201

- Can be combined with the AZM201 solenoid interlock
- For more information, visit **products.schmersal.com**

MP BDF 200 101214126

- Mounting plate for combination of AZM201 solenoid interlock with -B30 actuator and BDF200 control panel

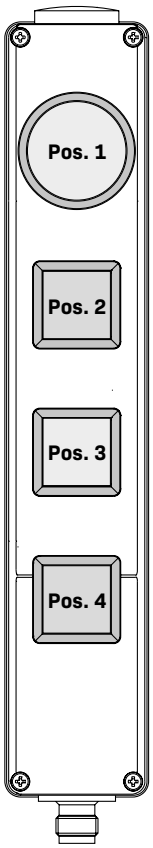
SRB-E-402ST

- 2x function STOP 0
- 2x 1- or 2-channel control
- 2x start button / autostart
- 2 safety contacts
- 2 safety outputs
- For more information, visit **products.schmersal.com**

To see a wide range of other types, visit **products.schmersal.com.**

CONTROL PANELS
COMBINATION OPTIONS AS-I, SD, FB

Control elements		BDF200-AS / SD / FB				Control panels
		At pos. 1	At pos. 2	At pos. 3	At pos. 4	
	NH	•				
	NHK	•				
	PT..		•	•	•	
	DT..		•	•	•	
	LT..		•	•	•	
	LM..		•	•	•	
	SW.20		•	•		
	W..0		•	•		
	W..1		•	•		



CONTROL PANELS
PREFERRED TYPES AS-I, SD, FB

Series	Fitting At pos. 1	Pos. 2	Pos. 3	Pos. 4	Indicator lamp	Type designation	Material number
	**Variant: AS-Interface**						
	NH	LT	LT	LT	red/green	**BDF200-ST1-AS-NH-LT-LT-LT-G24-2875** [1]	**103012552**
		LMRD	LTWH	LTBU	---	**BDF200-ST1-AS-NH-LMRD-LTWH-LTBU**	**101214617**
		LTRD	LTGN	LTBU	---	**BDF200-ST1-AS-NH-LTRD-LTGN-LTBU**	**103003704**
		WS20	LTWH	LTGN	---	**BDF200-ST1-AS-NH-WS20-LTWH-LTGN**	**103013250**
		LTGN	LTYE	LTWH	red/green	**BDF200-ST1-AS-NH-LTGN-LTYE-LTWH-G24**	**103005880**
	NHK	LMRD	LTWH	LTBU	---	**BDF200-ST1-AS-NHK-LMRD-LTWH-LTBU**	**101215387**
		LTRD	LTWH	LTBU	---	**BDF200-ST1-AS-NHK-LTRD-LTWH-LTBU**	**103000961**
		LTBU	LTYE	LTGN	red/green	**BDF200-ST1-AS-NHK-LTBU-LTYE-LTGN-G24**	**103013865**
		WS20	LTWH	LTGN	---	**BDF200-ST1-AS-NHK-WS20-LTWH-LTGN**	**103013250**
		SWS20	LTWH	LTBU	red/green	**BDF200-ST1-AS-NHK-SWS20-LTWH-LT-BU-G24**	**101214618**
	Variant: SD interface						
	NH	LT	LT	LT	---	**BDF200-SD-NH-LT-LT-LT-2875** [1]	**103015446**
	NHK	LT	LT	LT	---	**BDF200-SD-NHK-LT-LT-LT-2875** [1]	**103025848**
		SWS20	WS30	LTWH	red/green	**BDF200-SD-NHK-SWS20-WS30-LTWH-G24**	**103015448**
	Variant: FB interface						
	NH	LT	LT	LT	---	**BDF200-FB-NH-LT-LT-LT-2875** [1]	**103015447**
	NHK	WS20	LTBU	LTBU	red/green	**BDF200-FB-NHK-WS20-LTBU-LTBU-G24**	**103025654**
		SWS20	WS30	LTBU	red/green	**BDF200-FB-NHK-SWS20-WS30-LTBU-G24**	**103015449**

[1] Type designation -2875: the coloured button caps are included in the scope of delivery as an accessory pack for customers to mount themselves.

TWO-HAND CONTROL PANELS
DESCRIPTION

AREA OF APPLICATION

The job of two-hand controls or two-hand control panels is to ensure that the machine operators hands are located on the control panel when they issue the control signal for a hazardous movement. This prevents operators from reaching into the danger area after starting the machine or process.

The main areas of application for two-hand controls are presses and stamping units in the metal processing or powder metallurgy industries as well as similar machines and systems that involve manual insertion and removal operations. These include printing and paper processing machines, rubber and plastics processing machines, machines involved in the chemical industry and assembly plants.

DESIGN AND WAY OF FUNCTIONING

Two-hand control panels are designed as such so the operators need both hands at the same time to start a hazardous movement. This forces operators to keep their hands in the same place which means that they cannot reach into the danger zone while the system is carrying out the hazardous movement.

All Schmersal Group two-hand control panels are fitted with an Emergency Stop button that complies with EN ISO 13850. Apart from this, there are guard hoods over the operating elements, which prevent people from circumventing the protection function using their hands, elbows, stomach, hips, thighs or knees, for example. It is also not possible to operate from the back of the control panels.

The devices comply with the requirements of EN ISO 13851, which, amongst other things, specifies the spacing of the controls. Users can choose between different versions that differ, amongst other things, by virtue of the material of the enclosure (plastic and die-cast aluminium). In the central part of the folding enclosure, it is possible to mount up to eight additional command and signalling devices.

Accessories include, amongst other things, various stand versions. Combined with the PROTECT SRB 201 ZH safety-monitoring module, it is possible to integrate two-hand control panels into the machine controller.

WIDE SELECTION OF MOUNTING POSTS

You can find appropriate mounting posts and other accessories on page 152 and in our online catalogue at **products.schmersal.com**.

TWO-HAND CONTROL PANELS
TECHNICAL DATA

	SEPK02	SEPG05
Key Features		
	▪ Plastic enclosure ▪ Control panel with 8 additional drilled holes that you can knock out if required ▪ 2-piece enclosure for simple and favourable assembly	▪ Aluminium die cast enclosure ▪ Control panel suitable for mounting a minimum of 8 additional command and signalling devices ▪ Easy assembly thanks to 2-piece folding enclosure ▪ Ergonomic operation due to wrist support ▪ Terminal strips and relay assembly possible in the interior
Technical features		
General description	Two-hand control panel	Two-hand control panel
Mechanical data		
Housing material	Plastic	Die-cast aluminium
Color	RAL 7035 (tinted)	RAL 7035 (powder-coated)
Dimensions (L × W × H)	469 × 137 × 185 mm	494 × 160 × 184 mm
Possible fastening		
On mounting post	Yes	Yes
Directly on the machine or wall	Yes	Yes
Command positions		
Number of drilled holes	3	3
Optional possible command positions	8	8
Ø of drilled hole	22.3 mm	22.3 mm
Electrical data	Depends on the pre-mounted command device	Depends on the pre-mounted command device
Ambient conditions		
Degree of protection	IP65	IP65
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1, IEC 60947-5-5, EN ISO 13850, EN ISO 13851	IEC 60947-5-1, IEC 60947-1, IEC 60947-5-5, EN ISO 13850, EN ISO 13851
Certificates	–	–

You can also find appropriate mounting posts, command devices and other accessories in our online catalogue at **products.schmersal.com**.

SEP09

- Aluminium enclosure
- For separate assembly of the controls for two-hand control
- Specify on user side spacing according to EN ISO 13851

Two-hand control
Aluminium
RAL 7035 (powder-coated)
155 × 150 × 160 mm (per operating element)
No
Yes
1 per operating element
–
22.3 mm
Depends on the pre-mounted command device
IP54

IEC 60947-5-1, IEC 60947-1, EN ISO 13851

–

TWO-HAND CONTROL PANELS
PREFERRED TYPES [1)]

Range	Enclosure	Description	Controls	Head Ø	Contacts
SEPK02 	Plastic	2-piece enclosure with 8 additional drilled holes that you can knock out if required	ADP55.3SW 	55 mm	1 NO / 1 NC
			ADP55.3SW/O.F 		
			Empty enclosure		
SEPG05 	Metal film	2-part enclosure suitable for mounting a minimum of 8 additional command and signalling devices	EDP42SW 	42 mm	1 NO / 1 NC
			EDP55SW 	55 mm	1 NO / 1 NC
			ADP55.3SW 	55 mm	1 NO / 1 NC
			Empty enclosure		
SEP09 	Metal film	For separate assembly of the controls for two-hand control with detachable aluminium cover on the bottom	EDP55SW 	55 mm	1 NO / 1 NC
			EDP42SW 	42 mm	1 NO / 1 NC
			Empty enclosure		

[1)] The preferred types designate the choice of devices with faster delivery times.

For the technical data of the command devices, visit **products.schmersal.com**.

	Emergency stop	Head Ø	Contacts	Type	Material number
	ADRR40RT 	40 mm	1 NO / 1 NC	**SEPK02.0.4.0.22/95**	**101027371**
				SEPK02.0.4.0.22/95.E2	**101211126**
				SEPK02.0.L.22	**101027369**
	EDRR40RT 	40 mm	1 NO / 1 NC	**SEPG05.3.3.0.22/95**	**101172764**
	EDRR50RT 	50 mm	1 NO / 1 NC	**SEPG05.3.2.0.22/95**	**101172762**
	EDRR40RT 	40 mm	1 NO / 1 NC	**SEPG05.3.4.0.22/95**	**101172765**
	EDRR50RT 	50 mm	1 NO / 1 NC	**SEPG05.3.1.0.22/95**	**101172760**
	EDRR40RT 	40 mm	1 NO / 1 NC	**SEPG05.3.4.0.22/95.E1**	**101210845**
				SEPG05.3.L.22	**101172767**
	–	–	–	**SEP09.0.1.0.22/95**	**101022849**
	–	–	–	**SEP09.0.3.0.22/95**	**101022851**
				SEP09.0.L.22	**101022856**

TWO-HAND CONTROL PANELS
MOUNTING POST

STPLC1	101024774

- Welded structure with base-fastening tapped holes
- Without height adjustment, without distance ring
- Can be combined with SEP ... control panel for use as a two-hand foot operating station

STP 02.1.1	101022865

- Welded structure with base-fastening tapped holes
- With height adjustment
- Without distance ring

STP 02.4.1	101022867

- Welded structure with base-fastening tapped holes
- With height adjustment
- With distance ring

RECOMMENDED EVALUATIONS

SRB-E-201ST

- Monitoring two-hand control panels to EN ISO 13851
- Function STOP 0
- 1- or 2-channel control
- Start button / autostart
- 2 safety outputs 5.5 A
- 1 signalling output
- For more information, visit **products.schmersal.com**

SRB-E-402ST

- Monitoring two-hand control panels to EN ISO 13851
- 2x function STOP 0
- 2x 1- or 2-channel control
- 2x start button / autostart
- 2 safety contacts
- 2 safety outputs
- For more information, visit **products.schmersal.com**

For detailed information on selection, visit **products.schmersal.com**.

tec.nicum
Schmersal Group

Your partner for machine safety and occupational safety

tec.nicum is the Schmersal Group's business unit for solutions and services related to machine, plant and occupational safety.

Thanks to its worldwide consultancy network, tec.nicum services are available around the globe. tec.nicum provides customers with competent, product- and manufacturer-neutral advice and supports them in the safety-related design of their machines and production lines.

The range of services offered by tec.nicum comprises six segments:

- **tec.nicum academy**
  Knowledge transfer
- **tec.nicum consulting**
  Advisory services
- **tec.nicum engineering**
  Technical planning
- **tec.nicum integration**
  Execution and implementation
- **tec.nicum digitalisation**
  Software solutions and new digital technologies
- **tec.nicum outsourcing**
  Complete solutions

For detailed information, check out
www.tecnicum.com

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES
DESCRIPTION – RANGE MK/WK

AREA OF APPLICATION

Extremely robust, compact, versatile and functional: These properties make MK/WK series joystick buttons and switches highly suitable for use on machinery and plants in the food-processing and process technology industries.

Furthermore, they are suitable for especially harsh industrial applications, including outdoor usage. Compared with multifunctional command systems, such as those used on the control units for cranes and automated guided vehicles (AGV), they need considerably less installation space.

DESIGN AND WAY OF FUNCTIONING

Users can choose between three designs:

- Maintained joystick switch, reset by touch and spring force
- Spring-return joystick switch, reset by spring force
- Maintained and spring-return joystick switch, reset by touch and spring force

All the designs are available with up to four switch positions/actuating directions.

This means that the joystick switches and buttons make the HMI easier: It is possible to actuate different machine functions with a single, compact piece of robust switchgear.

The joystick switches and buttons are available in a wide range of different contact variants with up to eight galvanically isolated contacts as well as in protection classes IP65, IP67 and IP69K. We can also supply versions for outdoor applications that are suitable for temperatures of -25 °C to +80 °C. If you want protection from accidental actuation from the zero position, it is possible to fit the operating devices with a mechanical lock.

The contact system in series MK and WK works on the tried and tested four-way contact ("H bridge") principle that is extremely shock- and jolt-resistant.

OPERATING PRINCIPLE

Spring-return joystick switch
Spring-return switching position (touch position)
Reset by spring force

Joystick switch
Maintained switching positions (latched position)
Reset by touch and spring force

Maintained/spring-return joystick switch
Switching position spring-return and maintained
Reset by touch and spring force

Locking sleeve
All devices are available with an additional mechanical lock as a protection against accidental shifts out of the home position. The holding force of the lock is approx. 100 N for devices with an installation diameter of 22.3 mm and approx. 200 N for devices with an installation diameter of 30.5 mm.

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES
TECHNICAL DATA – RANGE MK/WK

	■ MKT	■ MKS
Key Features		
	▪ Mounting hole Ø 22,3 mm ▪ Spring-return joystick switch	▪ Mounting hole Ø 22,3 mm ▪ Maintained joystick switch
Technical features		
Mechanical data		
Length of actuator	77 mm	77 mm
Material of the front ring	Al anodised	Al anodised
Mounting ramp edge	Knurled nut	Knurled nut
Mounting hole	22.3 mm	22.3 mm
Installation depth	Depending on contact type	Depending on contact type
Front plate thickness	1.5 mm ... 6 mm	1.5 mm ... 6 mm
Spacing	80 × 80 mm	80 × 80 mm
Actuating force	approx. 11 N	approx. 11 N
Momentary position	To left and right of zero position	–
Latching position	–	To left and right of zero position
Resistance to shock	30 g/18 ms, no bouncing	30 g/18 ms, no bouncing
Resistance to vibration	> 20 g/10 ... 150 Hz	> 20 g/10 ... 150 Hz
Switching frequency	1,200 s/h	1,200 s/h
Switching principle	Creep circuit element	Creep circuit element
Execution of the electrical Connection	Screw terminals	Screw connection
Cable section	0.5 mm² ... 2.5 mm²	0.5 mm² ... 2.5 mm²
Electrical data		
Rated impulse withstand voltage U_{imp}	4 KV	4 KV
Rated insulation voltage U_i	400 V	400 V
Thermal test current I_{the}	10 A	10 A
Max. fuse rating	10 A gG	10 A gG
Utilisation category	AC-15: 250 VAC/8 A; DC-13: 24 VDC/5 A	AC-15: 250 VAC/8 A; DC-13: 24 VDC/5 A
Ambient conditions		
Ambient temperature	–25 °C ... +80 °C	–25 °C ... +80 °C
Degree of protection	IP65 / IP67	IP65 / IP67
Safety classification		
Standards	IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
Mechanical life	1,000,000	1,000,000
B_{10D} value	100,000	100,000

To get detailed information about the products, visit **products.schmersal.com**

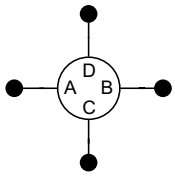
■ WKT	■ WKS
▪ Mounting hole Ø 30.5 mm ▪ Spring-return joystick switch	▪ Mounting hole Ø 30.5 mm ▪ Maintained joystick switch
90 mm	90 mm
Al anodised	Al anodised
Mounting flange	Mounting flange
30.5 mm	30.5 mm
Depending on contact type	Depending on contact type
1.5 mm ... 10 mm	1.5 mm ... 10 mm
80 × 80 mm	80 × 80 mm
approx. 11 N	approx. 11 N
To left and right of zero position	–
-	To left and right of zero position
30 g/18 ms, no bouncing	30 g/18 ms, no bouncing
> 20 g/10 ... 150 Hz	> 20 g/10 ... 150 Hz
1,200 s/h	1,200 s/h
Creep circuit element	Creep circuit element
Screw connection	Screw terminals
0.5 mm² ... 2.5 mm²	0.5 mm² ... 2.5 mm²
4 KV	4 KV
400 V	400 V
10 A	10 A
10 A gG	10 A gG
AC-15: 250 VAC/8 A; DC-13: 24 VDC/5 A	AC-15: 250 VAC/8 A; DC-13: 24 VDC/5 A
–25 °C ... +80 °C	–25 °C ... +80 °C
IP65 / IP67	IP65 / IP67
IEC 60947-5-1, IEC 60947-1	IEC 60947-5-1, IEC 60947-1
1,000,000	1,000,000
100,000	100,000

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES

SELECTION AID – RANGE MK/WK

1ST STEP: SELECTION OF THE DEVICE DESIGN

Choice of device



Contact options				Spring-return joystick switch			
				Range MKT Mounting Ø 22.3 mm		Range WKT Mounting Ø 30.5 mm	
Position A	Position B	Position C	Position D	without locking sleeve	with locking sleeve	without locking sleeve	with locking sleeve
1 NO	1 NO			MKTA32	MKTA321	WKTA32	WKTA321
1 NC	1 NC			MKTA32/401	MKTA321/401	WKTA32/401	WKTA321/401
2 NO	2 NO			MKTB32	MKTB321	WKTB32	WKTB321
1NC/1NO	1NC/1NO			MKTB32/1x401	MKTB321/1x401	WKTB32/1x401	WKTB321/1x401
2 NO	2 NO			MKTC32	MKTC321	WKTC32	WKTC321
1 NO	1 NO	1 NO		MKTC42	MKTC421	WKTC42	WKTC421
1 NO	1 NO	1 NO	1 NO	MKTC52	MKTC521	WKTC52	WKTC521
1 NC	1 NC	1 NC	1 NC	MKTC52/2x401	MKTC521/2x401	WKTC52/2x401	WKTC521/2x401
4 NO	4 NO			MKTE32	MKTE321	WKTE32	WKTE321
4 NC	4 NO			MKTE32/404	MKTE321/404	WKTE32/404	WKTE321/404
4 NC	4 NC			MKTE32/800	MKTE321/800	WKTE32/800	WKTE321/800
2 NO	2 NO	2 NO	2 NO	MKTE52	MKTE521	WKTE52	WKTE521
1NC/1NO	1NC/1NO	2 NO	2 NO	MKTE52/206	MKTE521/206	WKTE52/206	WKTE521/206
2 NC	2 NO	2 NO	2 NO	MKTE52/206.1	MKTE521/206.1	WKTE52/206.1	WKTE521/206.1
1NC/1NO	1NC/1NO	1NC/1NO	1NC/1NO	MKTE52/2x401	MKTE521/2x401	WKTE52/2x401	WKTE521/2x401

2ND STEP: SELECTION OF THE BELLOWS

Bellows

	Included in standard version	/WKT-19.4	/WKT-19.3	/WKT-26
Description	Bellows rubber	Bellows rubber, suitable for outdoor usage	Silicone bellows, UV-resistant up to –40°C	Silicone bellows, UV-resistant up to –40°C thick-walled / tear-proof IP69K
Material thickness	approx. 1 mm			approx. 2 mm
Material features	tear-proof		partly tear-proof	tear-proof
Degree of protection (frontside)	IP65 / IP67			IP67 / IP69K
Ambient temperature	–25 ... +80 °C		–40 ... +80 °C	
Mechanical life	1,000,000	500,000	300,000	500,000
Notes	–	–	–	Only usable in combination with spring-return joystick switches without locking sleeve
Material resistance	Rubber		Silicone	
- UV/ozone	not suitable	suitable	particularly suitable	
- Outdoor usage	not suitable	suitable	particularly suitable	
- Fuel, oil	partly suitable		not suitable	
- Solvents	partly suitable		partly suitable	
- Acids	partly suitable		not suitable	
- Chemicals	not suitable		partly suitable	

Optional bellows

To order, the order code of the bellows is added to the order code of the switch.

Maintained joystick switch				Maintained/spring-return joystick switch	
Range MKS Mounting Ø 22.3 mm		Range WKS Mounting Ø 30.5 mm		Range WKTS Mounting Ø 30.5 mm	
without locking sleeve	with locking sleeve	without locking sleeve	with locking sleeve	without locking sleeve	with locking sleeve
MKSA32	MKSA321	WKSA32	WKSA321	WKTSA32[1)]	WKTSA321[1)]
MKSA32/401	MKSA321/401	WKSA32/401	WKSA321/401		
MKSB32	MKSB321	WKSB32	WKSB321		
MKSB32/1x401	MKSB321/1x401	WKSB32/1x401	WKSB321/1x401		
MKSC32	MKSC321	WKSC32	WKSC321		
MKSC42	MKSC421	WKSC42	WKSC421		
MKSC52	MKSC521	WKSC52	WKSC521	WKTSC52[2)]	WKTSC521[2)]
MKSC52/2x401	MKSC521/2x401	WKSC52/2x401	WKSC521/2x401		
MKSE32	MKSE321	WKSE32	WKSE321		
MKSE32/404	MKSE321/404	WKSE32/404	WKSE321/404		
MKSE32/800	MKSE321/800	WKSE32/800	WKSE321/800		
MKSE52	MKSE521	WKSE52	WKSE521		
MKSE52/206	MKSE521/206	WKSE52/206	WKSE521/206		
MKSE52/206.1	MKSE521/206.1	WKSE52/206.1	WKSE521/206.1		
MKSE52/2x401	MKSE521/2x401	WKSE52/2x401	WKSE521/2x401		

[1)] Position A spring-return (touch position) and Position B maintained (latched position)
[2)] Position C/D spring-return (touch position) and Position A/B maintained (latched position)

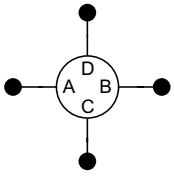
3RD STEP: YOUR PRODUCT

	Type					
Ordering example						
Mounting hole 22,3 mm	M					
Spring-return joystick switch		KT				
Contacts 4 NO contacts Position A 4 NO contacts Position B			E32			
With locking sleeve				1		
Bellows suitable for outdoor usage					/WKT-19.4	
	MKTE321/WKT-19.4					

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES
PREFERRED TYPES[1)] – RANGE MK/WK

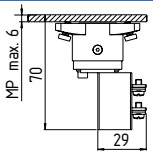
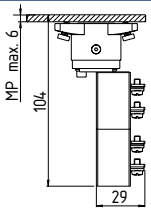
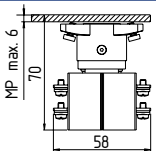
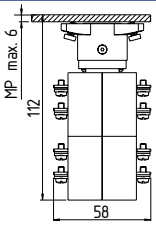
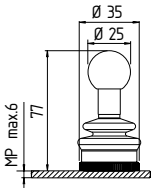
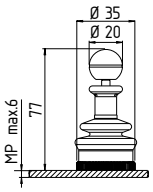
Mounting Ø	Type	With locking sleeve	Installation depth	Contact options Position A	Position B	Position C	Position D	Type designation	Material number
22.3 mm	Maintained joystick switches	–	70 mm	1 NO	1 NO	–	–	MKSA32	101005813
		■						MKSA321	101005816
		–	104 mm	2 NO	2 NO	–	–	MKSB32	101203907
		■						MKSB321/WKT-19.3	101191939
		–	70 mm					MKSC32	101005817
		■						MKSC321	101005818
		–		1 NO	1 NO	1 NO	1 NO	MKSC52	101005821
		■						MKSC521	101005822
		–	112 mm	2 NO	2 NO	2 NO	2 NO	MKSE52/WKT-19.4	101190916
		■						MKSE521	101005826
	Spring-return joystick switches	–	70 mm	1 NO	1 NO	–	–	MKTA32	101005827
		■						MKTA321	101005829
		–	104 mm	2 NO	2 NO	–	–	MKTB32	101005828
		■						MKTB321	101194681
		–	70 mm					MKTC32	101005832
		■						MKTC321	101005835
		–		1 NO	1 NO	1 NO	1 NO	MKTC52	101005837
		■						MKTC521	101005844
		■	112 mm	4 NO	4 NO	–	–	MKTE321	101190067
		–		2 NO	2 NO	2 NO	2 NO	MKTE52	101005842
		■						MKTE521	101005845
30.5 mm	Maintained joystick switches	–	57 mm	1 NO	1 NO	–	–	WKSA32	101019540
		■						WKSA321	101019545
		–		2 NO	2 NO	–	–	WKSC32	101019465
		■						WKSC321	101019493
		–		1 NO	1 NO	1 NO	1 NO	WKSC52	101019467
		■						WKSC521	101019473
		–	91 mm	2 NO	2 NO	2 NO	2 NO	WKSE52	101019489
		■						WKSE521	101019492
	Spring-return joystick switches	–	57 mm	1 NO	1 NO	–	–	WKTA32	101007593
		■						WKTA321	101019509
		–	91 mm	2 NO	2 NO	–	–	WKTB32	101019514
		■						WKTB321	101019539
		–	57 mm					WKTC32	101007594
		■						WKTC321	101007595
		–		1 NO	1 NO	1 NO	1 NO	WKTC52	101007597
		■						WKTC521	101019447
		–	91 mm	2 NO	2 NO	2 NO	2 NO	WKTE52	101019461
		■						WKTE521	101019464

Schematic representation of positions A-D

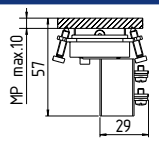
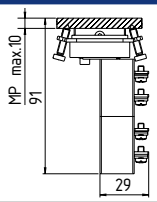
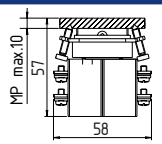
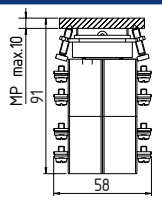
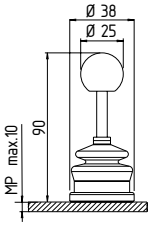
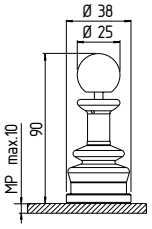


[1)] Preferred types are devices with faster delivery times.
To see a wide range of other types, visit **products.schmersal.com.**

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES
DIMENSIONS – RANGE MK/WK

Range MK... Mounting-Ø 22.3 mm		2 contacts	4 contacts	4 contacts	8 contacts
					
without locking sleeve		MKTA32...	MKTB32...	MKTC32...	MKTE32...
		MKSA32...	MKSB32...	MKSC32...	MKSE32...
				MKTC42...	MKTE52...
				MKSC42...	MKSE52...
				MKTC52...	
				MKSC52...	
with locking sleeve		MKTA321...	MKTB321...	MKTC321...	MKTE321...
		MKSA321...	MKSB321...	MKSC321...	MKSE321...
				MKTC421...	MKTE521...
				MKSC421...	MKSE521...
				MKTC521...	
				MKSC521...	

MP = Mounting plate (series MK... thickness max. 6 mm)

Range WK... Mounting-Ø 30.5 mm		2 contacts	4 contacts	4 contacts	8 contacts
					
without locking sleeve		WKTA32...	WKTB32...	WKTC32...	WKTE32...
		WKSA32...	WKSB32...	WKSC32...	WKSE32...
		WKTSA32...		WKTC42...	WKTE52...
				WKSC42...	WKSE52...
				WKTC52...	
				WKSC52...	
				WKTSC52...	
with locking sleeve		WKTA321...	WKTB321...	WKTC321...	WKTE321...
		WKSA321...	WKSB321...	WKSC321...	WKSE321...
		WKTSA321...		WKTC421...	WKTE521...
				WKSC421...	WKSE521...
				WKTC521...	
				WKSC521...	
				WKTSC521...	

MP = Mounting plate (series WK... thickness max. 10 mm)

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES
DESCRIPTION – NK/RK RANGE

AREA OF APPLICATION

The joystick switches of the RK/NK series are distinguished in particular by fast installation with central nut attachment and connection with M12 connector. The M12 connector is not just fast to install but it also prevents devices from being connected incorrectly.

The RK series is ideally suited for use in outside areas thanks to the special sealing boot and the new sealing concept. The silicon sealing boot is very capable even with high UV radiation.

The joystick switches of the NK series follow the principles of "hygienic design" thanks to their tried-and-tested construction without corners and edges and are particularly suitable for hygienic applications.

DESIGN AND WAY OF FUNCTIONING

The use of food-safe and largely chemically resistant materials ensures that daily cleaning with aggressive cleaning agents has little effect on the appliances.

The new sealing concept with up to three barriers prevents the ingress of fluid even if the sealing boot should become damaged. This provides enough time to renew the defective boot assembly without causing any damage to the machine during cleaning from the ingress of fluid.

OPERATING PRINCIPLE

Spring-return joystick switch
Spring-return switching position (touch position). Reset by spring force

Joystick switch
Maintained switching positions (latched position). Reset by touch and spring force

Maintained/spring-return joystick switch
Maintained and spring-return switching positions. Reset by touch and spring force

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES
TECHNICAL DATA – RANGE NK/RK

	■ NK	■ RK
Key Features		
	▪ Mounting hole Ø 22,3 mm ▪ Up to 6 mm front plate thickness ▪ Suitable for food processing industry	▪ Mounting hole Ø 22,3 mm ▪ Up to 6 mm front plate thickness ▪ For rough ambient conditions
Technical features		
Mechanical data		
Length of actuator	85 mm	85 mm
Material of the front ring	Thermoplastic	Thermoplastic
Mounting ramp edge	Central nut SW41	Central nut SW41
Mounting hole	22.3 mm + 0.4 mm	22.3 mm + 0.4 mm
Mounting depth	30 mm	30 mm
Mounting position	Arbitrarily	Arbitrarily
Front plate thickness	1.5 mm ... 6 mm	1.5 mm ... 6 mm
Spacing	90 × 90 mm	90 × 90 mm
Actuating force	approx. 11 N	approx. 11 N
Resistance to shock	30 g / 11 ms	30 g / 11 ms
Continuous shock	10 g / 16 ms	10 g / 16 ms
Switching frequency	1,200/h	1,200/h
Switching principle	Reed contacts, non-contact principle	Reed contacts, non-contact principle
Switching capacity	max. 7.2 W	max. 7.2 W
Contacts per switch direction	Up to 2 NC contacts	Up to 2 NC contacts
Execution of the electrical connection	Connector M12, 5 or 8 pole	Connector M12, 5 or 8 pole
Cable section		
Electrical data		
Rated impulse withstand voltage U_{imp}	0.5 kV	0.5 kV
Rated insulation voltage U_i	30 V	30 V
Rated operating voltage Ue	max. 30 VDC	max. 30 VDC
Operating current I_e	max. 0.3 A	max. 0.3 A
Max. fuse rating	0.5 A FF	0.5 A FF
Utilisation category	DC-12	DC-12
Ambient conditions		
Ambient temperature	–40 °C ... +80 °C	–40 °C ... +80 °C
Degree of protection (frontside)	IP65, IP67, IP69	IP65, IP67, IP69
Degree of protection of contact chamber	IP67	IP67
Safety classification		
Standards	IEC 60947-1, IEC 60947-5-1	IEC 60947-1, IEC 60947-5-1
Mechanical life	1,000,000 operations	1,000,000 operations

To get detailed information about the products, visit **products.schmersal.com**

MAINTAINED JOYSTICK SWITCHES AND SPRING-RETURN JOYSTICK SWITCHES
PREFERRED TYPES

	Range	Switch position	Termination	Additional sealing element	Type designation	Material number
	NK	2 switch positions with 1 NO contact each	1 connector, M12, 8 pole	■	**NK-T-21-1ST8-2**	**103012433**
		4 switch positions with 1 NO contact each	1 connector, M12, 8 pole	■	**NK-T-41-1ST8-2**	**103012431**
		2 switch positions with 2 NO contacts each	2 connectors, M12, 8 pole	■	**NK-T-22-2ST8-2**	**103012434**
		4 switch positions with 2 NO contacts each	2 connectors, M12, 8 pole	■	**NK-T-42-2ST8-2**	**103012432**
	RK	2 switch positions with 1 NO contact each	1 connector, M12, 8 pole	■	**RK-T-21-1ST8-2**	**103012429**
		4 switch positions with 1 NO contact each	1 connector, M12, 8 pole	■	**RK-T-41-1ST8-2**	**103012427**
		2 switch positions with 2 NO contacts each	2 connectors, M12, 8 pole	■	**RK-T-22-2ST8-2**	**103012430**
		4 switch positions with 2 NO contacts each	2 connectors, M12, 8 pole	■	**RK-T-42-2ST8-2**	**103012428**

ENABLING SWITCHES
DESCRIPTION

AREA OF APPLICATION

When carrying out set-up, refitting or service work on plant or machinery, it can be beneficial to partially or completely deactivate guard systems. Typically, this includes setting up a machine (set-up mode) and monitoring machining procedures (process monitoring).

One example: The operator of a machine tool is able to check format settings better and program movements exactly if the safety door is open. The better view of the process makes operation more convenient and reduces set-up and refitting times.

Special safety measures are needed for this case and similar ones; these measures are referred to as special operating modes and are specified in the machine directive and in some type C standards.

The measures that are required in this case include enabling devices that operators must actuate to start up the respective machine functions. In many cases, this is a slowed-down machine movement. The effect of the guard system is only partially or entirely suspended for the time in which the operator presses the enabling device.

DESIGN AND WAY OF FUNCTIONING

Operators must put the enabling device into the centre position and hold it in this position. As soon as they release the button or press it all the way down, the system interrupts the control command on a safety-related basis.

Series ZSD5 and ZSD6 enabling devices are of ergonomic design; with series ZSD6, an additional pushbutton is integrated in the device head. Operators can select the optimum position to the machine or the process; the connection to the machine controller is guaranteed by a signal line.

Both series are suitable for robot applications in accordance with ANSI standards.
There are of course suitable safety relay modules available for signal evaluation.

PERMISSIBLE SPEEDS IN ENABLING MODE

It is controversial and standards deal differently with the question of what "reduced" speeds are justifiable in enabling mode to comply with the further condition of the machine directive (see Machine Directive Appendix I, Clause 1.2.5) that the operation of dangerous functions is only possible under minor risk conditions (= reduced speed, reduced power, step mode, etc.)

Consideration should be given to specific C-standard specifications for the individual application.

Otherwise, it is advisable to differentiate between crushing and shearing hazards on the one hand and "just" collision hazards on the other. In this connection, people frequently quote values of 33 mm/sec. (2 m/min.) max. in the case of crushing and shearing hazards and 250 mm/sec. (15 m/min.) max. in the case of collision hazards. [1] MRL 2006/42/EG, however, "permits" higher values if absolutely technically necessary and execution is integrated into a considered and coherent safety concept. [2] [3]

A reduction in speed (performance, movement etc.) can be controlled either via the operating controller or via a safety-related controller or monitoring system, e.g. Safety Limited Speed (SLS) and the like as per EN/IEC 61800-5-2.
In this case too, we refer you to the "responsible standards": to some extent, it is adequate to use just enabling devices for minor risks with a safe controller or monitoring system only being required above and beyond this, to some extent there is, however, a general requirement for "enabling devices + e.g. SLS".

Technology is developing in the direction of "+ e.g. "SLS" (i.e. "safe controllers or monitoring systems"). Drives and drive controllers with integrated safety functions of this kind are being found far more frequently on the market. Where these possibilities cannot be implemented owing to reasons of technology and/or costs, consideration should be given to whether pressing the enabling device from stage 2 to stage 3 leads to an acceptably safe operating condition for the user or not, while also taking account of the machine's reaction time (delay from signaling to stationary or uncritical speed) as well as an additional human response time, such as 1 second.

[1] You can find an overview of the maximum speeds that there are for manual intervention on running machines in the IFA Manual (loose leaf collection – Lfg. 2/11 – XII/2011 – Clause 330 216).

[2] See Machine Directive Appendix I, Clause 1.2.5: If these four conditions cannot be fulfilled simultaneously, the ... operating mode selector must activate other protective measures designed and constructed to ensure a safe intervention zone.

[3] See also the "Fachbereich AKTUELL: Prozessbeobachtung in der Fertigung" of the DGUV's Woodworking and Metalworking Division.

ENABLING SWITCHES
TECHNICAL DATA

	■ ZSD5CC	■ ZSD6CC
Key Features		
	▪ 3-stage grip switch OFF-ON-OFF ▪ Contacts do not close on resetting from stage 3 → stage 1	▪ 3-stage grip switch OFF-ON-OFF ▪ Contacts do not close on resetting from stage 3 → stage 1 ▪ With additional pushbutton
Technical features		
Mechanical data		
Housing material	Plastic, thermoplastic, self-extinguishing	Plastic, thermoplastic, self-extinguishing
Additional pushbutton in device head	No	YES
Number of NO contacts	2	3
Of which automatic openers (stages 2-3)	2	2
Number of NC contacts	1	1
Switching frequency	max. 1200/h	max. 1200/h
Cable section	0.2 mm² ... 1.5 mm²	0.2 mm² ... 1.5 mm²
Termination	Cage clamps	Cage clamps
Electrical data		
Rated operating voltage Ue	250 V	250 V
Operating current I_e	2.5 A	2.5 A
Utilisation category		
NO contacts		
- Ohmic load (AC-12)	30 V: –; 125 V: 3,0 A; 250 V: 1,5 A	30 V: –; 125 V: 3,0 A; 250 V: 1,5 A
- Inductive load (AC-15)	30 V: –; 125 V: 1,5 A; 250 V: 0,75 A	30 V: –; 125 V: 1,5 A; 250 V: 0,75 A
- Ohmic load (DC-12)	30 V: 2,0 A; 125 V: 0,4 A; 250 V: 0,2 A	30 V: 2,0 A; 125 V: 0,4 A; 250 V: 0,2 A
- Inductive load (DC-13)	30 V: 1,0 A; 125 V: 0,22 A; 250 V: 0,1 A	30 V: 1,0 A; 125 V: 0,22 A; 250 V: 0,1 A
- Contact configuration	2 NO	2 NO
Auxiliary contacts		
- Ohmic load (AC-12)	30 V: –; 125 V: 2,0 A; 250 V: 1,0 A	30 V: –; 125 V: 2,0 A; 250 V: 1,0 A
- Inductive load (AC-15)	30 V: –; 125 V: 1.0 A; 250 V: 0.75 A	30 V: –; 125 V: 1.0 A; 250 V: 0.75 A
- Ohmic load (DC-12)	30 V: 2,0 A; 125 V: 0,4 A; 250 V: 0,2 A	30 V: 2,0 A; 125 V: 0,4 A; 250 V: 0,2 A
- Inductive load (DC-13)	30 V: 2.3 A; 125 V: 0.22 A; 250 V: 0.1 A	30 V: 2.3 A; 125 V: 0.22 A; 250 V: 0.1 A
- Contact configuration	1 NC	1 NC
Additional push-button		
- Ohmic load (AC-12)	–	30 V: –; 125 V: 0.5 A; 250 V: –
- Inductive load (AC-15)		30 V: –; 125 V: 0.3 A; 250 V: –
- Ohmic load (DC-12)		30 V: 1,0 A; 125 V: 0,2 A; 250 V: –
- Inductive load (DC-13)		30 V: 0,7 A; 125 V: 0,1 A; 250 V: –
Ambient conditions		
Ambient temperature	–10 °C ... +60 °C	–10 °C ... +60 °C
Degree of protection IP	IP66	IP66

Safety classification

Standards	EN 60947-5-1, EN 60947-5-8, EN ISO 13849-1
Mechanical life	Stage 1-2-1: min. 1,000,000; Stage 1-2-3-1: min. 100,000
B_{10D} value	100,000
Certificates	TÜV, cULus

ENABLING SWITCHES
ORDERING DETAILS AND RECOMMENDED EVALUATIONS

Type	Description	Pre-wired cable	Type	Material number
Enabling switches	3-stage grip switch	Without	ZSD5CC	103043703
		5 m	ZSD5CC-5M	103043683
	3-stage grip switch with additional pushbutton in device head	Without	ZSD6CC	103043704
		5 m	ZSD6CC-5M	103043685
Accessories	Mounting angle made of metal		ZSD-H	101163725

RECOMMENDED EVALUATIONS

PROTECT- SELECT	SRB-E-301ST	SRB-E-201LC
		
■ Evaluation of enabling devices ■ STOP 0 or STOP 1, depending on the setting values in the application program ■ For further information please visit **products.schmersal.com**	■ Function STOP 0 ■ 1- or 2-channel control ■ Start button / autostart ■ 3 safe relay outputs 6 A ■ 1 signalling output ■ For further information please visit **products.schmersal.com**	■ Function STOP 0 ■ 1- or 2-channel control ■ Start button / autostart ■ 2 safety outputs 2 A ■ 1 signalling output ■ For further information please visit **products.schmersal.com**

Addresses

Hauptsitz – Headquarters

K.A. Schmersal GmbH & Co. KG
42232 Wuppertal
Möddinghofe 30
42279 Wuppertal
Phone: +49 202 6474-0
Fax: +49 202 6474-100
info@schmersal.com
www.schmersal.com

GERMANY

Berlin
KSA Komponenten der Steuerungs- und Automatisierungstechnik GmbH
Pankstraße 8-10 / Aufg. L
13127 Berlin
Phone: +49 30 474824-00
Fax: +49 30 474824-05
info@ksa-gmbh.de
www.ksa-gmbh.de

Hannover
ELTOP GmbH
Robert-Bosch-Straße 8
30989 Gehrden
Phone: +49 51 089273-20
Fax: +49 51 089273-21
eltop@eltop.de
www.eltop.de

Köln
Stollenwerk
Technisches Büro GmbH
Scheuermühlenstraße 40
51147 Köln
Phone: +49 2203 96620-0
Fax: +49 2203 96620-30
info@stollenwerk.de
www.stollenwerk.de

Siegen
Siegfried Klein
Elektro-Industrie-Vertretungen
In der Steinwiese 46
57074 Siegen
Phone: +49 271 6778
Fax: +49 271 6770
info@sk-elektrotechnik.de
www.sk-elektrotechnik.de

Saarland
Herbert Neundörfer Werks-vertretungen GmbH & Co. KG
Am Campus 5
66287 Göttelborn
Phone: +49 6825 9545-0
Fax: +49 6825 9545-99
info@herbert-neundoerfer.de
www.herbert-neundoerfer.de

Bayern Süd
INGAM Ing. Adolf Müller GmbH
Industrievertretungen
Elly-Staegmeyr-Straße 15
80999 München
Phone: +49 89 8126044
Fax: +49 89 8126925
info@ingam.de
www.ingam.de

EUROPE

Austria – Österreich
AVS-Schmersal Vertriebs GmbH
Biróstraße 17
1232 Wien
Phone: +43 1 61028-0
Fax: +43 1 61028-130
info@avs-schmersal.at
www.avs-schmersal.at

Belgium – Belgien
Schmersal Belgium NV/SA
Nieuwlandlaan 73
Industriezone B 413
3200 Aarschot
Phone: +32 16 5716-18
Fax: +32 16 5716-20
info@schmersal.be
www.schmersal.be

Bosnia and Herzegovina
Tipteh d.o.o. Sarajevo
Ramiza Salčina 246
71000 Sarajevo
Phone: +387 33 452427
info@tipteh.ba
www.tipteh.com/ba

Bulgaria – Bulgarien
STRATONS
Han Omurtag 33 str. Office 2
7002 Ruse
Phone: +359 879 060788
Phone: +359 883 474148
office@stratons.bg
www.stratons.bg

Croatia – Kroatien
Tipteh Zagreb d.o.o.
Štrokinec 7
10000 Zagreb
Phone: +385 1 3141550
tipteh@tipteh.hr
www.tipteh.com/hr

Czech Republic – Tschech. Republik
Mercom Componenta spol. s.r.o.
Bechyňská 640
199 00 Praha 9 – Letňany
Phone: +420 267 314640
mercom@mercom.cz
www.mercom.cz
www.schmersal.cz

Denmark – Dänemark
Schmersal Danmark A/S
Arnold Nielsens Boulevard 72
2650 Hvidovre
Phone: +45 702090-27
Fax: +45 702090-37
info-dk@schmersal.com
www.schmersal.dk

Estonia – Estland
Schmersal Finland Oy
Äyritie 12 B
01510 Vantaa
Phone: +358 207199430
Fax: +358 935052660
info@schmersal.fi
www.schmersal.fi

Finland: Schmersal Finland Oy
Äyritie 12 B
01510 Vantaa
Phone: +3 58 207199430
Fax: +3 58 935052660
advancetec@advancetec.fi
www.schmersal.fi

France – Frankreich
Schmersal France
BP 18, 38181 Seyssins cedex
8 Rue Raoul Follereau
38180 Seyssins
Phone: +33 4 76842320
technique@schmersal.com
info-fr@schmersal.com
www.schmersal.fr

Greece – Griechenland
Kalamarakis Automation SA
PO Box 46566 Athens
13671 Chamomilos Acharnes Athens
Phone: +30 210 2406000-6
Fax: +30 210 2406007
info@ksa.gr
www.ksa.gr

Hungary – Ungarn
NTK Ipari-Elektronikai és Kereskedelmi Kft.
Gesztenyefa u. 4.
9027 Győr
Phone: +36 96 523268
Fax: +36 96 430011
info@ntk-kft.hu
www.ntk-kft.hu

Iceland – Island
Reykjafell Ltd.
Skipholti 35
125 Reykjavik
Phone: +354 5 8860-10
Fax: +354 5 8860-88
reykjafell@reykjafell.is
www.reykjafell.is

Italy – Italien
SCHMERSAL ITALIA S.r.l.
Via Molino Vecchio, 206
25010 Borgosatollo (BS)
Phone: +39 030 25074-11
Fax: +39 030 25074-31
info-it@schmersal.com
www.schmersal.it

Latvia – Lettland
BOPLALIT
145 Baltų pr., Kaunas
LT-47125 Lietuva
Phone: +370 37 298989
info@boplalit.lt
www.boplalit.lt

Lithuania – Litauen
BOPLALIT
145 Baltų pr., Kaunas
LT-47125 Lietuva
Phone: +370 37 298989
info@boplalit.lt
www.boplalit.lt

Luxembourg – Luxemburg
Schmersal Belgium NV/SA
info@schmersal.be
www.schmersal.be

Macedonia – Mazedonien
Tipteh d.o.o. Skopje
Bul. Partizanski odredi 80
lok.5, 1000 Skopje
Phone: +389 23 174197
info@tipteh.mk
www.tipteh.com/mk

Netherlands – Niederlande
Schmersal Nederland B.V.
Lorentzstraat 31
3846 AV Harderwijk
Phone: +31 341 432525
Fax: +31 341 425257
info-nl@schmersal.com
www.schmersal.nl

Norway – Norwegen
Schmersal Norge
Gråterudveien 1
3036 Drammen
Phone: +47 220600-70
Fax: +47 220600-80
info-no@schmersal.com
www.schmersal.no

Poland – Polen
Schmersal-Polska Sp.j.
ul. Baletowa 29
02-867 Warszawa
Phone: +48 22 2508800
Fax: +48 22 8168580
info@schmersal.pl
www.schmersal.pl

Portugal – Portugal
Schmersal Ibérica, S.L.
Apartado 30
2626-909 Póvoa de Sta. Iria
Phone: +351 308 800933
info-pt@schmersal.com
www.schmersal.pt

Romania – Rumänien
SC SENSODATA SRL
Autogarii 16
550135 Sibiu
Phone: +4 0770 796640
office@sensodata.ro
www.sensodata.ro

Serbia – Serbien
Tipteh d.o.o. Serbia
Ulica Moše Pijade 17A,
Vrčin, Beograd 11224
Phone: +3 11 8053-628
Fax: +3 11 8053-045
office@tipteh.rs
www.tipteh.rs

Slovakia – Slowakei
Mercom Componenta spol. s.r.o.
Bechyňská 640
199 00 Praha 9 – Letňany
Phone: +420 267 314640
mercom@mercom.cz
www.mercom.cz
www.schmersal.cz

Slovenia – Slowenien
Tipteh d.o.o.
Ulica Ivana Roba 23
1000 Ljubljana
Phone: +386 1 20051-50
info@tipteh.si
tipteh.com/si

Spain – Spanien
Schmersal Ibérica, S.L.
Rambla P. Catalanes, Nº 12
08800 Vilanova i la Geltrú
Phone: +34 938 970906
info-es@schmersal.com
www.schmersal.es

Sweden – Schweden
Schmersal Nordiska AB
F O Petersons gata 28
421 31 Västra Frölunda
Phone: +46 31 33835-00
Fax: +46 31 33835-39
info-se@schmersal.com
www.schmersal.se

Switzerland – Schweiz
Schmersal Schweiz AG
Moosmattstraße 3
8905 Arni
Phone: +41 43 31122-33
Fax: +41 43 31122-44
info-ch@schmersal.com
www.schmersal.ch

Turkey – Türkei
Schmersal Turkey Otomasyon Ürünleri ve Hizmetleri Ltd. Şti.
Atatürk Mah. Ataşehir Bulvarı No:5
Gardenya Plaza 5 Kat:2 Daire:2
34758 Ataşehir / İstanbul
Phone: +90 532 111 27 16
info-tr@schmersal.com
www.schmersal.com.tr

Ukraine – Ukraine
VBR Ltd.
41, Demiyivska Str.
03040 Kyiv Ukraine
Phone: +38 044 2590955
Fax: +38 044 2590955
office@vbr.com.ua
www.vbr-electric.com.ua/schmersal

United Kingdom – Großbritannien
Schmersal Ltd.
Sparrowhawk Close
Unit 1, Beauchamp Business Centre
Enigma Business Park
Malvern, Worcestershire WR14 1GL
Phone: +44 1684 571980
Fax: +44 1684 560273
uksupport@schmersal.com
www.schmersal.co.uk

Addresses

WORLDWIDE

- **Argentina – Argentinien**
  Condelectric S.A.
  info@condelectric.com.ar
  www.condelectric.com.ar
  Dinatecnica SA
  electrica@dinatecnica.com.ar
  www.dinatecnica.com.ar
  Electro Dos Materiales Electricos S.A.
  ventas@electro-dos.com.ar
  www.electro-dos.com.ar

- **Australia – Australien**
  IPD Group Ltd.
  43 Newton Road
  Wetherill Park, NSW 2164
  Phone: +61 1300 556 601
  Fax: +61 1300 550 187
  customerservice@ipd.com.au
  www.ipdgroup.com.au

- **Belarus – Weißrussland**
  ZAO Eximelektro
  Ul. Churlionisa, 26-169
  Minskaja Woblasz 220045
  Phone: +375 17 37344-11
  Fax: +375 17 37344-22
  info@exim.by
  www.exim.by

- **Bolivia – Bolivien**
  International Fil-Parts
  3er. Anillo, 1040, Frente al Zoo
  Santa Cruz de la Sierra
  Phone: +591 3 342-9900
  Fax: +591 3 342-3637
  presidente@filparts.com.bo
  www.filparts.com.bo

- **Brazil – Brasilien**
  ACE Schmersal
  Eletroeletrônica Industrial Ltda.
  Av. Brasil, 815 – Jardim Esplanada
  CEP: 18557-646, Boituva / SP
  Phone: +55 15 3263-9800
  Fax: +55 15 3263-9899
  export@schmersal.com.br
  www.schmersal.com.br

- **Canada – Kanada**
  Schmersal Canada, LTD
  29 Centennial Road, Unit 1
  Orangeville ON L9W 1R1
  Phone: +1 519 307-7540
  Fax: +1 519 307-7543
  salescanada@schmersal.com

- **Chile – Chile**
  Vitel S.A.
  francisco@vitel.cl
  www.vitel.cl
  Electric Parts
  asepulveda@eparts.cl
  www.eparts.cl
  Instrutec Ltda.
  gcaceres@instrutec.cl
  www.instrutec.cl
  Soltex Chile S.A.
  central@soltex.cl
  www.soltex.com.cl

- **PR China – VR China**
  Schmersal Industrial
  Switchgear (Shanghai) Co. Ltd.
  Cao Ying Road 3336, Qingpu
  201712 Shanghai
  Phone: +86 21 637582-87
  Fax: +86 21 637582-97
  sales@schmersal.com.cn
  www.schmersal.com.cn

- **Colombia – Kolumbien**
  Cimpex Ltda.
  jjaramillo@cimpex.co
  www.cimpex.co
  Dempro S.A.S.
  info@dempro.co
  www.dempro.co
  SAMCO Ingeniería S.A.S.
  jkemmerer@samcoingenieria.com
  www.samcoingenieria.com
  Potencia y Tecnología
  ventas@potenciaytecnologia.com
  www.potenciaytecnologia.com

- **Costa Rica – Costa Rica**
  Euro-Automation-Tec, S.A.
  eurotec.jhtg@yahoo.com

- **Ecuador – Ecuador**
  SENSORTEC S.A.
  Phone: +593 02 604-3230
  ventas@sensortecsa.com
  www.sensortecsa.com

- **Egypt – Ägypten**
  Schmersal Middle East Industrial
  Equipment Trading LLC
  ssambandan@schmersal.com
  www.schmersal.ae
  Nile for Engineering and Trading
  m.alkady@nile-egy.com

- **El Salvador – El Salvador**
  PRESTELECTRO
  david.palacios@prestelectro.com
  www.prestelectro.com

- **Guatemala – Guatemala**
  PRESTELECTRO
  david.palacios@prestelectro.com
  www.prestelectro.com

- **India – Indien**
  Schmersal India Pvt. Ltd.
  Plot No-G, 7/1, Ranjangaon MIDC,
  Taluka Shirur, District Pune 412220
  Phone: +91 21 38614700
  Fax: +91 20 66861114
  info-in@schmersal.com
  www.schmersal.in

- **Indonesia – Indonesien**
  Schmersal (Thailand) Co. Ltd.
  info@schmersal.co.th
  www.schmersal.co.th

- **Israel – Israel**
  A.U. Shay Ltd.
  P.O. Box 10049
  Imber St 23
  Petach Tikva, 49222 Israel
  Phone: +9 72 3923-3601
  Fax: +9 72 3923-4601
  shay@uriel-shay.com
  www.uriel-shay.com

- **Japan – Japan**
  Schmersal Japan KK
  Shin-yokohama Dai 3 Tosho Bldg.
  3-9-5 Shin-yokohama, Kohoku-ku,
  Yokohama 222-0033
  Phone: +81 45 476-5777
  Fax: +81 45 476-5778
  info@schmersal.co.jp
  www.schmersal.co.jp

- **Korea – Korea**
  Mahani Electric Co. Ltd.
  20, Gungmal-ro, Gwacheon-si,
  Gyeonggi-do 427-060
  Phone: +82 2 2194-3300
  Fax: +82 2 2194-3397
  yskim@mec.co.kr
  www.mec.co.kr

- **Malaysia – Malaysien**
  Schmersal (Thailand) Co. Ltd.
  71, Sukhumvit 52
  Bang Chak Sub District
  Phra Khanong District
  Bangkok 10260
  Phone: +66 2 1171723
  info@schmersal.co.th
  www.schmersal.co.th

- **Mexico – Mexiko**
  Controles Industriales Mecatronica
  cimsa1@mecathronica.com
  www.mecathronica.com
  EACSA, S.A de C.V.
  ruben_angeles@eacsamexico.mx
  www.eacsamexico.mx
  Electroconstructora del Golfo S.A.
  ventas.di@electro.mx
  www.electro.mx
  INNOVATIVE AUTOMOTION SOLUTIONS
  schmersal@iasmx.com
  www.iasautomation.com.mx
  ISEL
  ventas@isel.com.mx
  www.isel.com.mx
  REINSEL
  reinsel-ventas@hotmail.com
  SACCSA, S.A. de C.V.
  ventas.tecnicas@saccsa.mx
  www.saccsa.mx
  SEA INDUSTRIAL
  operaciones@sea-industrial.com
  www.sea-industrial.com
  SEPIA, S.A de C.V.
  alazcano@sepia.mx
  www.sepia.mx
  SMART CONTROL, S.A. de C.V.
  info@smartcontrol.com
  www.smartcontrolsa.com
  VGR TECHNOLOGIES
  alfredo@vgr.com.mx
  www.vgr.com.mx

- **New Zealand – Neuseeland**
  Hamer Automation
  85A Falsgrave Street
  Philipstown
  Christchurch
  Phone: +64 3 3662483
  Fax: +64 3 3791379
  sales@hamer.co.nz
  www.hamer.co.nz

- **Pakistan – Pakistan**
  Schmersal Middle East Industrial
  Equipment Trading LLC
  ssambandan@schmersal.com
  www.schmersal.ae

- **Paraguay – Paraguay**
  Brasguay S.R.L.
  brasguay@brasguay.com.py
  www.brasguay.com.py

- **Peru – Peru**
  ACE Schmersal
  Eletroeletrônica Industrial Ltda.
  Av. Brasil, 815 – Jardim Esplanada
  CEP: 18557-646, Boituva / SP
  Phone: +55 15 3263-9800
  Fax: +55 15 3263-9899
  export@schmersal.com.br
  www.schmersal.com.br

- **Philippines – Philippinen**
  Schmersal (Thailand) Co. Ltd.
  info@schmersal.co.th
  www.schmersal.co.th
  Active Control Automation and
  Industrial Sales Corporation
  sales@activecontrol.com.ph
  www.activecontrolautomation.com

- **Saudi Arabia – Saudi-Arabien**
  Schmersal Middle East Industrial
  Equipment Trading LLC
  ssambandan@schmersal.com
  www.schmersal.co.th

- **Singapore – Singapur**
  Schmersal (Thailand) Co. Ltd.
  info@schmersal.co.th
  www.schmersal.co.th

- **South Africa – Südafrika**
  A and A Dynamic Distributors (Pty) Ltd.
  18 to 24 Augusta Road
  Regents Park Estate
  Johannesburg, 2197
  Phone: +27 11 6815900
  sales@aadynamic.co.za
  www.aadynamic.co.za

- **Taiwan – Taiwan**
  Golden Leader Camel Ent. Co. Ltd.
  No. 453-7, Pei Tun Rd.
  Taichung City 40648, Taiwan
  Phone: +886 4 22412989
  Fax: +886 4 22412923
  service@leadercamel.com.tw
  www.leadercamel.com.tw

- **Thailand – Thailand**
  Schmersal (Thailand) Co. Ltd.
  71, Sukhumvit 52
  Bang Chak Sub District
  Phra Khanong District
  Bangkok 10260
  Phone: +66 2 1171723
  info@schmersal.co.th
  www.schmersal.co.th

- **United Arab Emirates –**
  Vereinigte Arabische Emirate
  Schmersal Middle East Industrial
  Equipment Trading LLC
  Post Box No. 410580
  Suntech Tower No. 308, 3rd Floor
  Dubai Silicon Oasis, Dubai
  Phone: +971 4 5775657
  +971 4 5775658
  ssambandan@schmersal.com
  www.schmersal.ae

- **Uruguay – Uruguay**
  Eneka S.A.
  info@eneka.com.uy
  www.eneka.com.uy
  Gliston S.A.
  colmedo@gliston.com.uy
  www.gliston.com.uy

- **USA – USA**
  Schmersal, Inc.
  115 E Stevens Avenue
  Suite 208
  Valhalla, NY 10595
  Phone: +1 914 347-4775
  Fax: +1 914 347-1567
  infousa@schmersal.com
  www.schmersalusa.com

- **Venezuela – Venezuela**
  EMI Equipos y Sistemas C.A.
  ventas@emi-ve.com
  www.emi-ve.com

- **Vietnam – Vietnam**
  Schmersal (Thailand) Co. Ltd.
  info@schmersal.co.th
  www.schmersal.co.th

THE SCHMERSAL GROUP
PROTECTION FOR MAN AND MACHINE

In the demanding field of machine safety, the owner-managed Schmersal Group is one of the international market leaders. The company, which was founded in 1945, has a workforce of about 2,000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 nations.

Customers of the Schmersal Group include “Global Players” in mechanical engineering and plant manufacturing and operators of machinery. They benefit from the company’s extensive expertise as a provider of systems and solutions for machine safety. In addition, Schmersal specialises in various areas including intralogistics, foodstuff production, the packaging industry, machine tool industry, lift switchgear, heavy industry and the automotive industry.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: Certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality. Furthermore, they design and realise complex solutions for safety around the world in close collaboration with the clients.

SAFETY PRODUCTS

- Safety switches and sensors, solenoid interlocks
- Safety controllers and safety relay modules, safety bus systems
- Optoelectronic and tactile safety devices
- Automation technology: position switches, proximity switches

SAFETY SYSTEMS

- Complete solutions for safeguarding hazard areas
- Individual parametrisation and programming of safety controllers
- Tailor-made safety technology – be it for individual machines or a complex production line
- Industry-specific safety solutions

SAFETY SERVICES

- tec.nicum academy – Seminars and training
- tec.nicum consulting – Consultancy services
- tec.nicum engineering – Design and technical planning
- tec.nicum integration – Execution and installation

x.000 / L+W / 04.2024 / Teile-Nr. 103007854 / EN / Ausgabe 04

SCHMERSAL
THE DNA OF SAFETY

www.schmersal.com