

# Control devices and indicator lights for 22.3 mm installed diameter

⊠ Ex Explosion protection for ATEX zones 2 and 22

Catalogue D-22 Ex-R





### Caution!

The devices in this delivery range are not intended for the private consumer, i.e. they are not consumer products in the sense of the European Directives (in Germany in the Sense of § 5 GPSG, the Equipment and Product Safety Act) or other national statutory regulations.

The assembly and commissioning of the devices require personnel who have appropriate knowledge of basic electronics or have been instructed accordingly.

Technical modifications and errors reserved. The data quoted in this list are carefully checked typical series values.

Or as the old Greeks knew already:

*By no means did the gods reveal all things to mortals from the beginning, but in time, by searching, we discover better.*

Xenophanes  
(Greek philosopher, born 580/577 B.C.)

Descriptions of the control contexts, details on external controls, installation and operating information or suchlike are given to the best of our knowledge. This does not mean however that any assured properties or other claims under liability law that extend beyond the "General Delivery Conditions for Products and Services in the Electrical Industry" may be derived.

The user is not absolved of his obligation to examine our information and recommendations before using them for his own purposes. We trust you understand and will heed this information.

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## ATEX directives

Two directives basically govern the explosion prediction of machinery and plants within the European member states:

- Directive 94/9/EC of the European Parliament and of the Council of 23 March 1994
- Directive 1999/92/EC of the Europe and of the Council of 16 December 1999.

Both directives are also called the ATEX directives (ATEX= Atmosphère Explosible).

Whereas the “Manufacturer’s Directive” 94/9/EC lays down the essential requirements for improving the safety and health prediction of workers potentially at risk from explosive atmosphere, the industrial safety regulation or Operator’s Directive 1999/92/EC divides the equipment and predictive systems which it covers into equipment groups and categories; this directive provides for a classification by the employer of the places where explosive atmo-

spheres may occur in terms of zones and determines which equipment groups and categories should be used in each zone.

These zones, equipment categories and groups are basically determined as shown in the table.

In zones 0, 1, 20 and 21 only electrical equipment with an approval in the form of an EC-type examination certificate may be used; in zone 0 however only those products that are explicitly approved for this zone. For electrical equipment intended for use in zones 2 and 22, compliance with all the essential safety requirements of Directive 94/9/EC as well as a written declaration of conformity from the manufacturer is required.

As one of the largest industrial switchgear manufacturers in the world, the Schmersal group offers a comprehensive range of safety devices for any application in equipment categories 2GD and 3GD from non-contact position switches (magnetic switches) up to safety switches with and without interlocking device for the prediction of men.

The product range includes products for equipment categories 3G and 3D. They are suitable for zones 2 and 22.



Flammable material	Zone (99/92/EG)	Group (94/9/EG)	Category (94/9/EG)
Methane, dust	Mining	I	M1
	Mining	I	M2 or M1
Gases, vapours	Zone 0: The explosive atmosphere is present continuously or for long periods or frequently	II	1G
	Zone 1: The explosive atmosphere is likely to occur in normal operation occasionally	II	2G or 1G
	Zone 2: The explosive atmosphere is unlikely to occur in normal operation but, if it does occur, will persist for a short period only	II	3G or 2G or 1G
Dusts	Zone 20: The explosive atmosphere is present continuously or for long periods or frequently	II	1D
	Zone 21: The explosive atmosphere is likely to occur in normal operation occasionally	II	2D or 1D
	Zone 22: The explosive atmosphere is unlikely to occur in normal operation but, if it does occur, will persist for a short period only	II	3D or 2D or 1D

## ATEX marking

Zone 2		Zone 22	
⊕ II 3G	Ex nL IIC T4 X	⊕ II 3D	Ex tD A22 IP65 T110°C X
⊕	ATEX – specific marking of explosive prediction	⊕	ATEX – specific marking of explosive prediction
II	Equipment group	II	Equipment group
3G	Equipment category – zone 2 (gases and vapours) to IEC 60079-0	3D	Equipment category – zone 22 (dust) to IEC 61241-0
Ex nL	Predaction type to IEC 60079-15	Ex tD	Predaction by enclosure (type of predaction) to IEC 61241-1
IIC	Explosion prediction group	A	Test method to IEC 61241-1
		22	Equipment for zone 22
		IP65	Predaction type to IEC 60529
T4	Temperature class: max. ambient temperature of the equipment permitted to.	T110°C	Temperature in degree Celsius: max. ambient temperature of the equipment permitted to.
X	Attention should be paid to specific conditions of use.	X	Attention should be paid to specific conditions of use.

### Grading of the max. ambient temperatures of electrical equipment of group II in classes (IEC 60079-0)

T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

The Schmersal Group can even offer a comprehensive programme of safety switches and solenoid interlocks of type 2 (with separate actuator) to predict operators against hazardous machine movements in potentially explosive atmospheres. The large variety of useful accessories allows for a flexible application of these switches under all circumstances.



# Flammable gases, vapours or mists

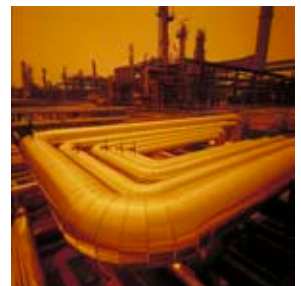
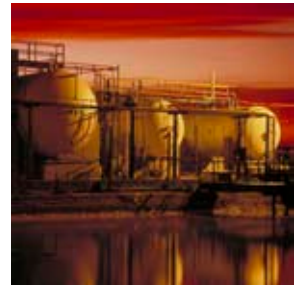
## Zone 2

This may apply, amongst other things, to the following applications:

- Printing machines
- Paint-spraying plants
- Fuel stations (areas accessible to customers)
- Weaving/Dyeing factories
- Chemical industry
- Waste processing plants
- Petrochemical industry
- Pharmaceutical industry
- Plastics manufacturers
- Furniture plants

In directive 1999/92/EG, zone 2 is defined in the following way:

“A place, in which an explosive atmosphere consisting of a mixture with air or flammable substances in the form of gas, vapour or mist is not likely to occur in **normal operation** but, if it does occur, will **persist for a short period only.**”



# Flammable dusts

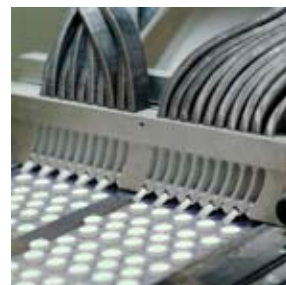
## Zone 22

This may apply, amongst other things, to the following applications:

- Grain and corn mills
- Powder coating
- Textile industry
- Chemical industry
- Waste processing plants
- Pharmaceutical industry
- Woodworking machines
- Grain, beans and coffee warehouses

In directive 1999/92/EG, zone 22 is defined in the following way:

“A place, in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in **normal operation** but, **if it does occur, will persist for a short period only.**”



# Control devices and indicator lights for 22.3 mm installed diameter


Equipment category  II 3GD

## General description

### Design

With the new development of this 22 mm control device and indicator light range, Elan provides a switching device concept to provide the user with additional device functionality, reliability and spatial use beyond the usual standard. The RF/RL contact and light element system makes a special contribution here. Traditionally tried-and-tested features in earlier Elan designs (metal bezels, glass lens covers, knobs of selector switches/push-buttons made of impact-resistant plastic) have been improved.

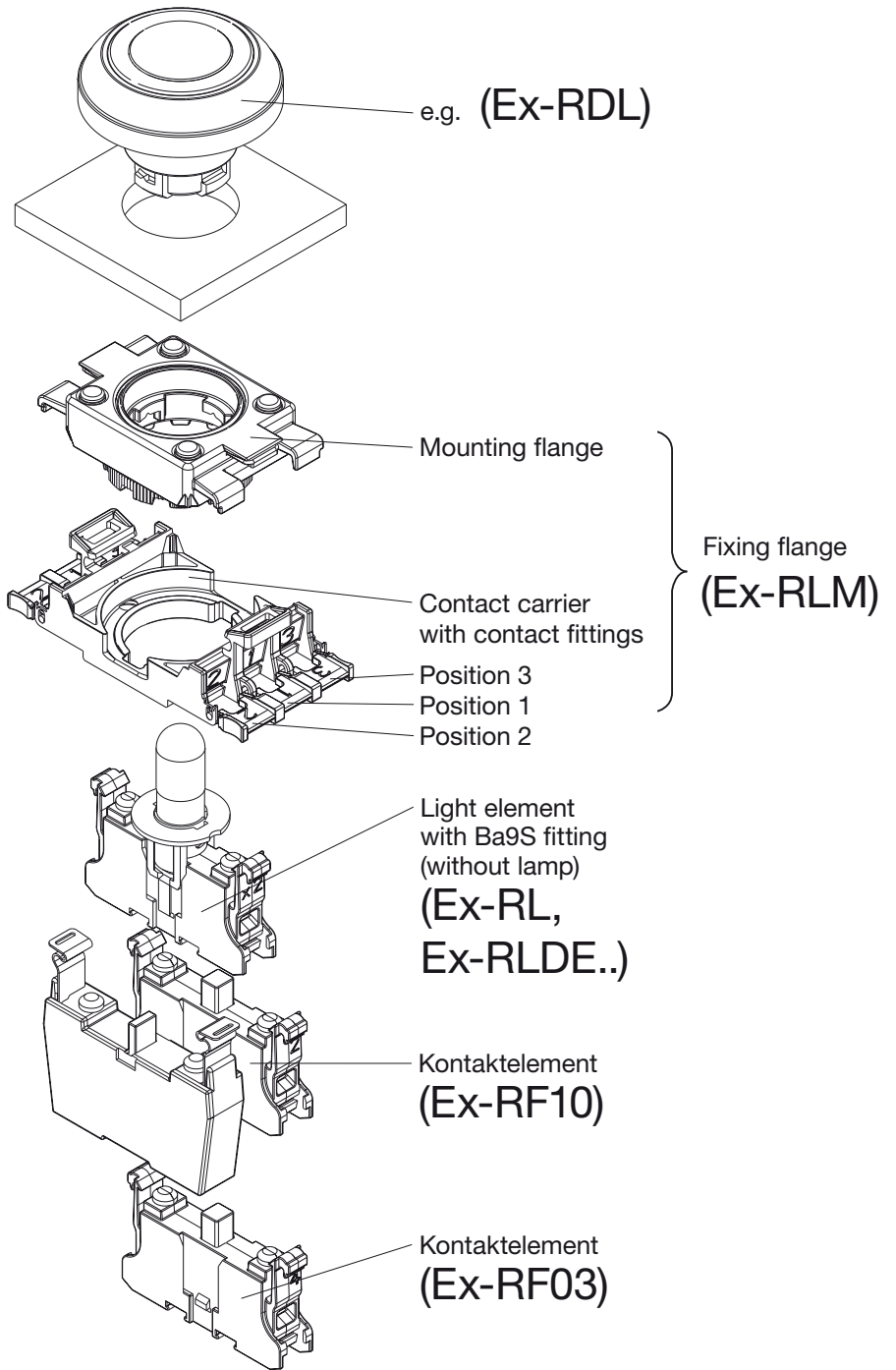


The devices are applicable for the Ex-category  II 3GD. The prediction against explosion of the devices respectively the type of prediction complies:

- Ex nL IIC T4 X
- Ex tD A22 IP65 T110°C X

### Control devices and indicator light actuators

A variety of fully insulated pushbuttons/slam buttons/illuminated pushbuttons/selector switches/key-operated switches etc. is offered. The actuators are made of anodised aluminium with a large actuating diameter of 28 mm for pushbuttons and illuminated pushbuttons. The pushbuttons are made of anodised aluminium. The lens covers of the illuminated pushbuttons and indicator lights are made of glass. In addition to the high mechanical strength, this material selection permits an above-average degree of resistance to heat and chemical effects (such as from cleaning, lubricating and cooling agents).





### **Type of pretection**

The front seal of these devices corresponds to type of pretection IP 65 in accordance with EN DIN 60 529. The design features of the device sealing guarantee the high type of pretection over a long period of time, also under extreme conditions, e.g. through oil, organic and inorganic grease residue, grinding dust and high switching frequency.

### **Structure of range**

A control and indicator device consists of actuator, mounting flange and contact or light element. The type designation for this type series starts with Ex-R..., e.g. Ex-RDT for a pushbutton. The mounting flange (divided into two, type Ex-RLM) is not part of the scope of delivery of the actuators, the same applies to contact and light elements.

Per control device are max. 2 contact elements designated.

### **One-hole fixing**

The devices are designed in accordance with DIN EN 50047 for single bore holes of a  $22.3 + 0.4$  mm diameter. An additional cut-out to prevent redation is not required.

### **Grid dimensions**

It is possible to install several devices with minimum dimensions as follows:

Minimum distance between fixing holes to DIN EN 50047:

- Horizontal: 40 mm
- Vertical: 50 mm

**Exceptions:** selector switches/pushbuttons with long knob, EMERGENCY STOP-buttons Ex-RDR50...

### **Device installation**

The actuator is accurately aligned and firmly plugged into the bore hole. The retention lugs have a self-holding function so that the mounting flange can be pushed up from the rear of the front panel and then redated into locked position using the supplied fixing tool. The contact bracket serves to preassemble the contact elements Ex-RF or the light element Ex-RL.

The fixing flange includes mounting flange, contact bracket and the two plunger segments. In the case of two or three contact elements arranged beside each other, the plunger segments attached by simply pushing them onto the middle contact element (Position 1) serve to actuate the contact elements located in Positions 2 and 3. No plunger segments are required for contact elements arranged beneath each other. After snapping on the elements to the contact brackets, they are pushed onto the mounting flange.

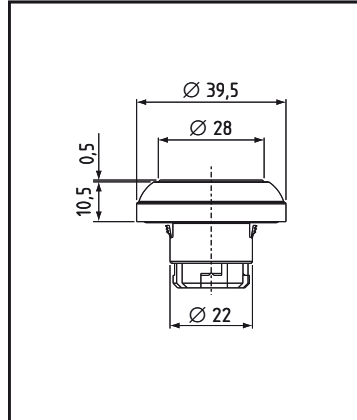
Using the contact lugs attached to the right and the left-hand side, the contact elements are additionally fixed so that incorrect assembly or detachment in the case of strong vibrations is not possible. With contact multiplication (starting from the 4th contact) the NC contact elements should be fitted to the uppermost row, i.e. next to the bezel so that the above described mechanical securing is effective (particularly for EMERGENCY STOP devices).



## Pushbuttons and pushbuttons with diaphragm Type series Ex-RDT .. and Ex-RDM ..



Pushbutton Ex-RDT ..

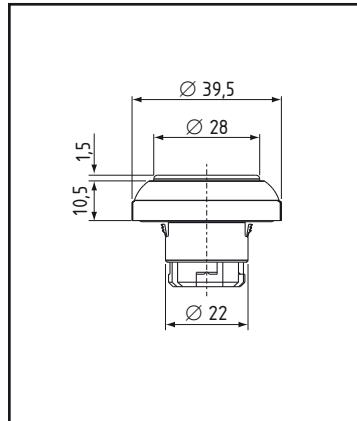


Pushbutton Ex-RDT ..

The mounting flange Ex-RLM consisting of mounting flange, contact bracket, contact lug and two contact links, do not belong to the scope of delivery of the device heads (refer to page 18).



Pushbutton with diaphragm  
Ex-RDM ..



Pushbutton with diaphragm  
Ex-RDM ..

Pushbuttons			
Brief description	Colour	Type	Order no.
Pushbuttons, button of Ms, Ø 28 mm	black	Ex-RDT sw	084 0010
	yellow	Ex-RDT gb	084 0015
	red	Ex-RDT rt	084 0020
	green	Ex-RDT gn	084 0025
	white	Ex-RDT ws	084 0030
	blue	Ex-RDT bl	084 0035

Pushbuttons with diaphragm			
Brief description	Colour	Type	Order no.
Pushbuttons with diaphragm, button of Ms, Ø 28 mm. The diaphragm protects the button from grinding dust or other pasty, viscous media. Symbols are still easily legible.	black	Ex-RDM sw	084 0410
	yellow	Ex-RDM gb	084 0415
	red	Ex-RDM rt	084 0420
	green	Ex-RDM gn	084 0425
	white	Ex-RDM ws	084 0430
	blue	Ex-RDM bl	084 0435

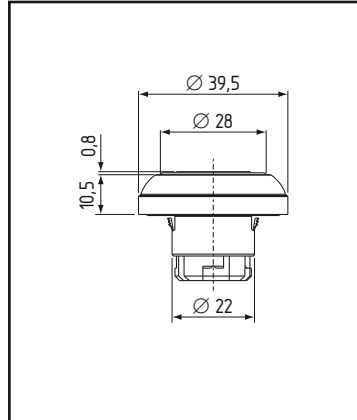
Contact elements: See page 16

Technical data: See page 26

## Illuminated pushbuttons and illuminated pushbuttons with diaphragm Type series Ex-RDL .. and Ex-RDLM ..



Illuminated pushbuttons Ex-RDL ..

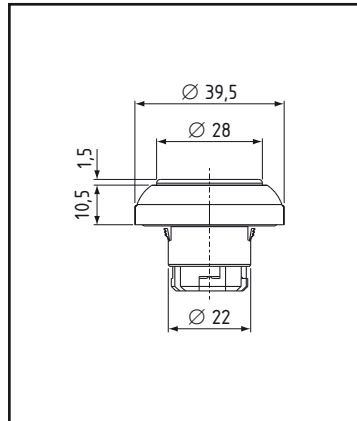


Illuminated pushbuttons Ex-RDL ..

The mounting flange Ex-RLM consisting of mounting flange, contact bracket, contact lug and two contact links, do not belong to the scope of delivery of the device heads (refer to page 18).



Illuminated pushbuttons with diaphragm Ex-RDLM ..



Illuminated pushbuttons with diaphragm Ex-RDLM ..

Illuminated pushbuttons			
Brief description	Colour	Type	Order no.
Illuminated pushbuttons <sup>1</sup> , swivel of impact-proof plastics, Ø 28 mm	yellow	Ex-RDL gb	084 5015
	red	Ex-RDL rt	084 5020
	green	Ex-RDL gn	084 5025
	white	Ex-RDL ws	084 5030
	blue	Ex-RDL bl	084 5035

Illuminated pushbuttons with diaphragm			
Brief description	Colour	Type	Order no.
Illuminated pushbuttons with diaphragm <sup>1</sup> , swivel of impact-proof plastics, Ø 28 mm. The diaphragm protects the buttons from grinding dust or other pasty, viscous media. Symbols are still easily legible.	yellow	Ex-RDLM gb	084 5215
	red	Ex-RDLM rt	084 5220
	green	Ex-RDLM gn	084 5225
	white	Ex-RDLM ws	084 5230
	blue	Ex-RDLM bl	084 5235
Membran als Einzelteil		R-M	084 9350

Ba9S-LEDs: See page 17

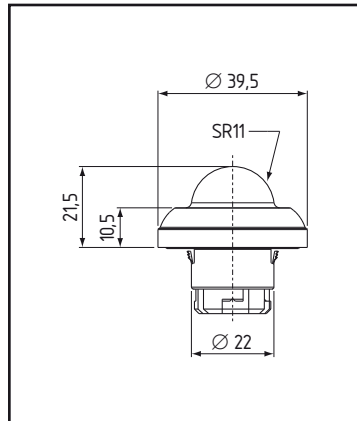
Technical data: See page 26

1) Only in conjunction with Ex-RLDE .. 24 applicable, see page 17

## Pilot lights with protruding swivel Type series Ex-RMLH ../RMEH



Pilot light Ex-RMLH ..



Pilot light Ex-RMLH ..

The mounting flange Ex-RMLM consisting of mounting flange, contact bracket, contact lug and two contact links, do not belong to the scope of delivery of the device heads (refer to page 18).

Pilot lights with protruding swivel			
Brief description	Colour	Type	Order no.
Pilot lights for Ba9S-LED's <sup>1,3</sup> , protruding swivel of impact-resistant plastics <sup>1</sup>	yellow	Ex-RMLH gb	0846115
	red	Ex-RMLH rt	0846120
	green	Ex-RMLH gn	0846125
	white	Ex-RMLH ws	0846130
	blue	Ex-RMLH bl	0846135

Ba9S-LEDs: See page 17

Technical data: See page 26

1) Only in conjunction with Ex-RLDE .. 24 applicable, see page 17

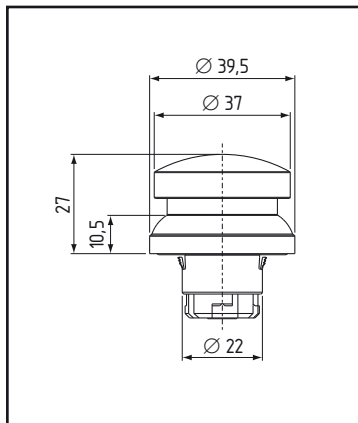
2) In conjunction with Ex-RL applicable, see page 17

3) Swivel of plastics limited chemical-resistant (refer to resistance table at page 28)

## Mushroom-head impact buttons without latching Type series Ex-RDP40 ..



Mushroom-head impact button without latching Ex-RDP40 ..



Mushroom-head impact button without latching Ex-RDP40 ..

The mounting flange Ex-RLM consisting of mounting flange, contact bracket, contact lug and two contact links, do not belong to the scope of delivery of the device heads (refer to page 18).

Mushroom-head impact button			
Brief description	Colour	Type	Order no.
Mushroom-head impact button without latching, mushroom-Ø 37 mm, made of Ms powder-coated	black	Ex-RDP40 sw	0840810
	yellow	Ex-RDP40 gb	0840815
	red	Ex-RDP40 rt	0840820
	green	Ex-RDP40 gn	0840825
	white	Ex-RDP40 ws	0840840
	blue	Ex-RDP40 bl	0840845

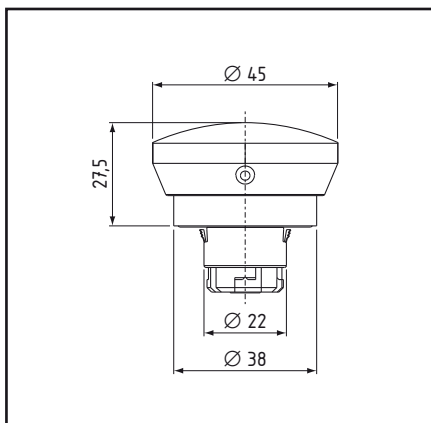
Contact elements: See page 16

Technical data: See page 26

## Mushroom-head impact buttons with latching Type series Ex-RDRZ45 ..



Mushroom-head impact button with latching Ex-RDRZ45 ..



Mushroom-head impact button with latching Ex-RDRZ45 ..

The mounting flange Ex-RLM consisting of mounting flange, contact bracket, contact lug and two contact links, do not belong to the scope of delivery of the device heads (refer to page 18).

Mushroom-head impact button			
Brief description	Colour	Type	Order no.
Mushroom-head impact button with latching, mushroom-head made of Ms powder-coated, released by pulling	black	Ex-RDRZ45 sw	084 1210
	yellow	Ex-RDRZ45 gb	084 1315
	green	Ex-RDRZ45 gn	084 1325

Other colours: On request.

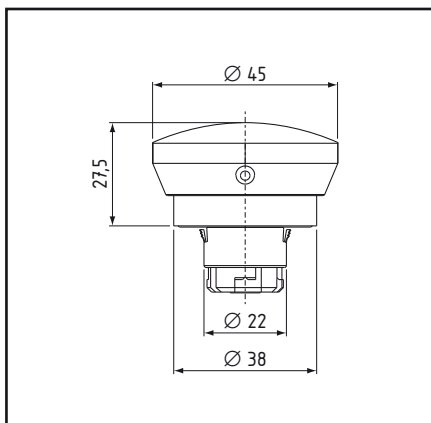
Contact elements: See page 16

Technical data: See page 26

## EMERGENCY STOP mushroom-head impact button according to EN ISO 13850: 2006 Type Ex-RDRZ45 rt



EMERGENCY STOP mushroom-head button  
Ex-RDRZ45 rt



EMERGENCY STOP mushroom-head button  
Ex-RDRZ45 rt

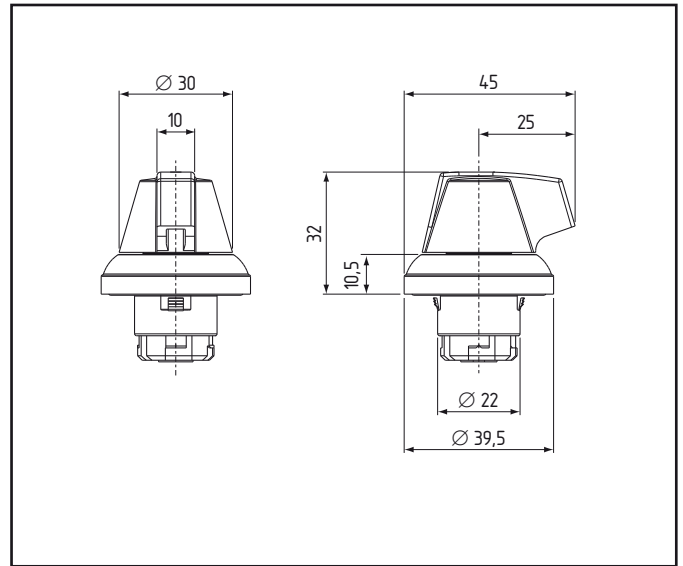
The mounting flange Ex-RLM consisting of mounting flange, contact bracket, contact lug and two contact links, do not belong to the scope of delivery of the device heads (refer to page 18).

EMERGENCY STOP mushroom-head impact button			
Brief description	Colour	Type	Order no.
Emergency stop mushroom-head impact button with latching, made of Ms powder-coated, released by pulling	red	Ex-RDRZ45 rt	0841350

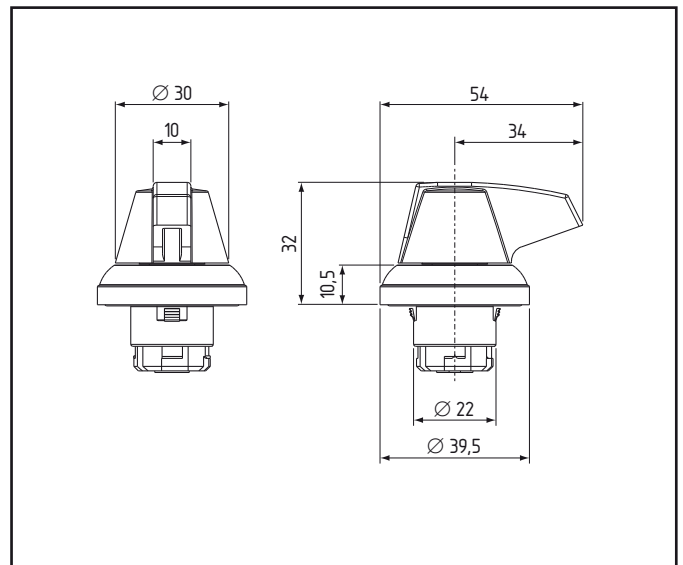
Technical data: See page 26

Contact elements: See page 16

**Selector switches/spring-return rotary selector switch/maintained spring-return rotary selector switch with short or long toggle**  
**Type series RW.. ..**



Spring-return rotary selector switch Ex-RWT 21/32 and selector switch Ex-RWS 21/32 with standard toggle (short)



Selector switch Ex-RWS 21.1/32.1 and maintained spring-return rotary selector switch Ex-RWT 21.1/32.1 with long toggle

The mounting flange Ex-RLM consisting of mounting flange, contact bracket, contact lug and two contact links, do not belong to the scope of delivery of the device heads (refer to page 18).



**Selector switches/spring-return rotary selector switches/Maintained spring-return rotary selector switches**

Brief description	Switching angle		Type	Order no.
Spring-return rotary selector switch with 2 positions	1 × 55°		Ex-RWT 21	084 2000
			Ex-RWT 21.1	084 2010
Selector switch with 2 latched positions	1 × 70°		Ex-RWS 21	084 2060
			Ex-RWS 21.1	084 2070
Maintained spring-return rotary selector switch with 3 positions	2 × 35°		Ex-RWT 32	084 2020
			Ex-RWT 32.1	084 2030
Selector switch with 3 positions; right: latching, left: switching	right 35° left 55°		Ex-RWST 32	084 2035
			Ex-RWST 32.1	084 2040
Selector switch with 3 positions	2 × 55°		Ex-RWS 32	084 2080
			Ex-RWS 32.1	084 2090
Maintained spring-return rotary selector switch with 3 positions, right: switching, left: latching	right 55° left 35°		Ex-RWTS 32	084 2045
			Ex-RWTS 32.1	084 2050

.1-versions with long toogle (54 mm)

Selector switches/maintained spring-return rotary selector switches with long toogle need a grid dimension of 50 × 60 mm.

Contact elements: See page 16

Technical data: See page 26

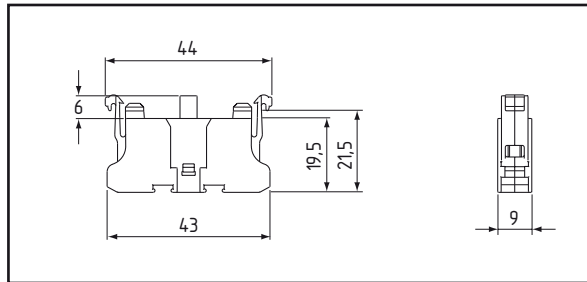
## Contact terminal blocks System Ex-RF.../Ex-RL...



Contact element Ex-RF 10...



Contact element Ex-RF 03...



Contact element Ex-RF ...

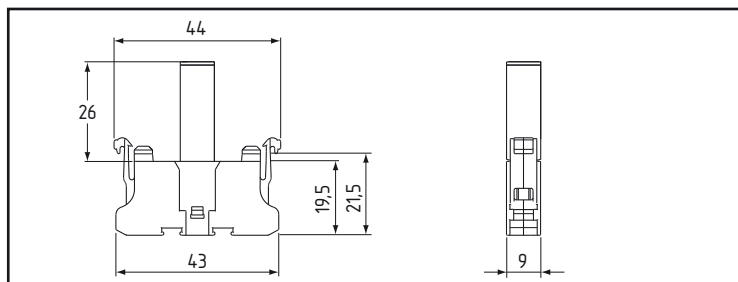
Contact blocks with screw connection terminal				
Function/contact path diagram	Contact label	Type	Order no.	
1 NC	■ □ □ □	1, 2	Ex-RF 10	
		11, 12	Ex-RF 10.1	
1 NO	□ □ ■	3, 4	Ex-RF 03	
		13, 14	Ex-RF 03.1	

Contacts with other connections: On request.  
Max. 2 contact elements per head.

## Light terminal block System Ex-RLDE



Light terminal block  
Ex-RLDE .. 24



Light terminal block Ex-RLDE .. 24

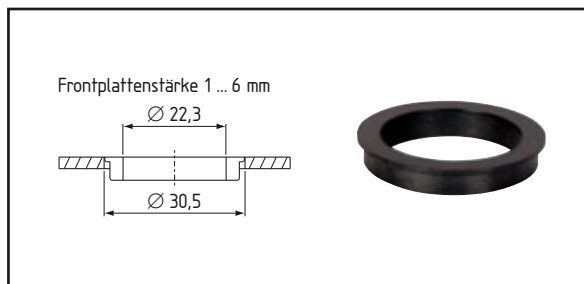
### Light terminal blocks with integrated Multi-LEDs for pilot lights Ex-RMLH and illuminated pushbuttons Ex-RDL ../Ex-RDLM ..

Function/voltage	Colour	Type	Order no.
	white	Ex-RLDE ws 24	0846614
24 VDC/AC			

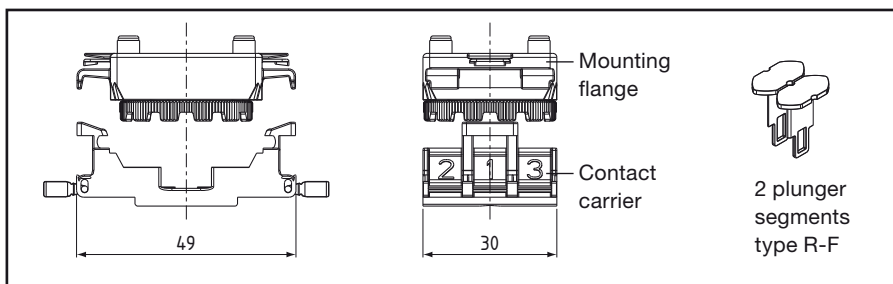
## Accessories for type series Ex-R



Mounting tool RMW



Adapter ring RUE (30.5 mm to 22.3 mm)



Mounting flange Ex-RLM

Accessories		
Brief description	Type	Order no.
Mounting tool for mounting the flange	RMW	0839005
Adapter ring of POM for use of Ø 22 mm operations heads with 30.5 mm control devices	RUE	0839010
Mounting flange, consisting of mounting flange, contact carrier with contact lug and 2 plunger segments	Ex-RLM	0839016
1 plunger segment for "take-along" the contacts on pos. 2 and 3	R-F	0839020

## Housings (mounting boxes)

### ATEX types

#### Design

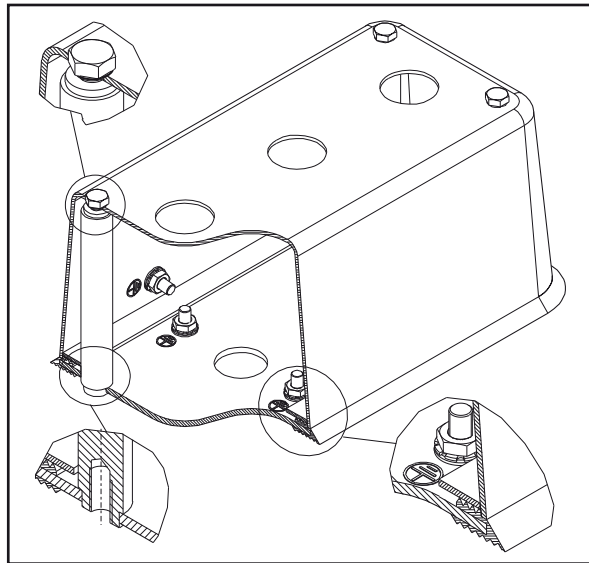
The mounting boxes (control boxes) of the type series Ex-EBG consist of a housing top part made of V4A material produced using a special deep-drawing process and a bottom part. Versions are available as empty housing with bore holes for 1, 3 and 5 control points (installation diameter: 22.3 mm).

The bottom part of the housing (with 2 earthing screws) has a special seal which covers the edges of the top part of the housing (with 1 earthing screw) and all sides of the bottom part of the housing.

The top and bottom parts of the housing are connected by means of V4A hexagonal screws M 5 × 10 (to ISO 4017 or DIN 933). With respect to tightness, the screw bushing is additionally protected with special washers (PA) and with an inner O ring.

The housing is fixed via 4 or 6 threaded boreholes – depending on version – M 6/12 deep. The corresponding screws (M 6) are not supplied.

The protection class is IP 67.



#### Option (on request)

- Mounting box equipped with control and indicator devices

#### Assembly instructions

The assembly (with screws M 6) is provided via the bottom part (see figure “fixing holes” at pages 20 and 21).

The cable entries are provided as follows:

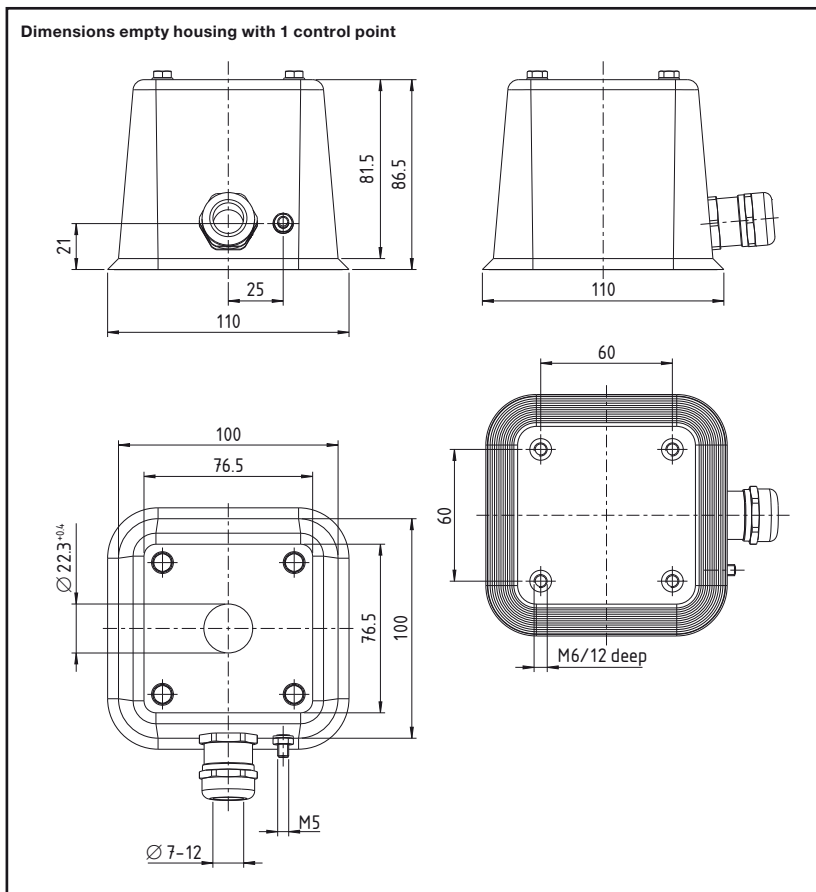
- Housing Ex-EBG 311.O  
1 × M 20 –  
for cable-Ø 7–12 mm
- Housing Ex-EBG 633.O  
1 × M 25 –  
for cable-Ø 13–18 mm
- Housing Ex-EBG 665.O  
2 × M 25 –  
for cable-Ø 13–18 mm



## Housings (mounting boxes) (continued)

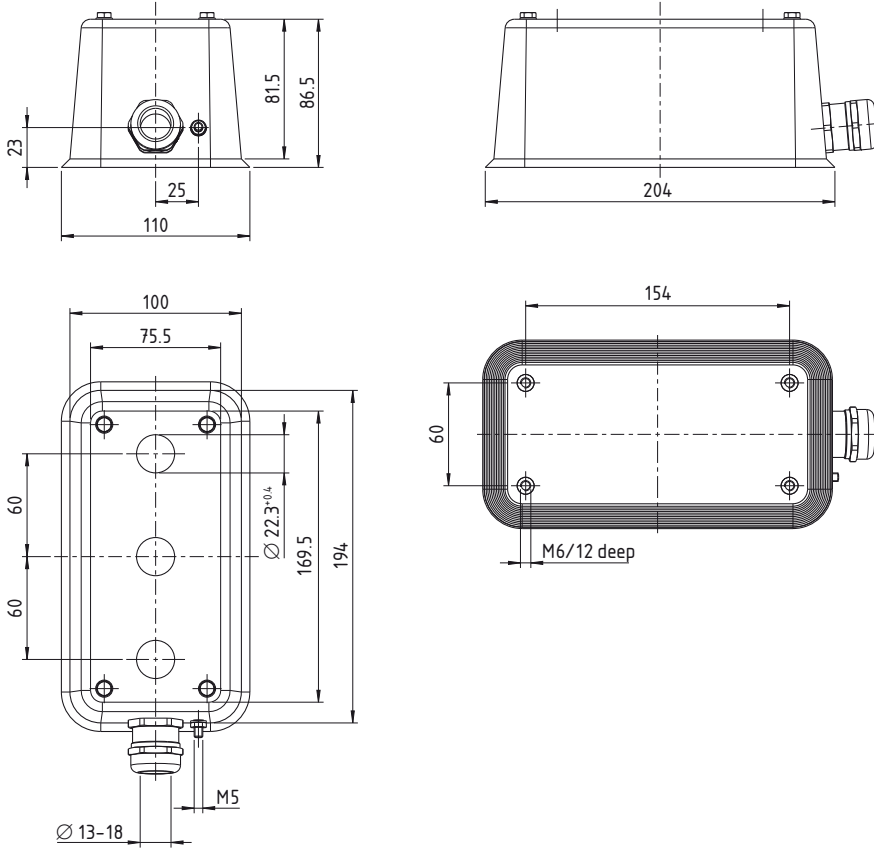


- Empty housing made of V4A
- Versions for 1, 3 and 5 control points for installation- $\varnothing$  22.3 mm
- Equipped versions: On request



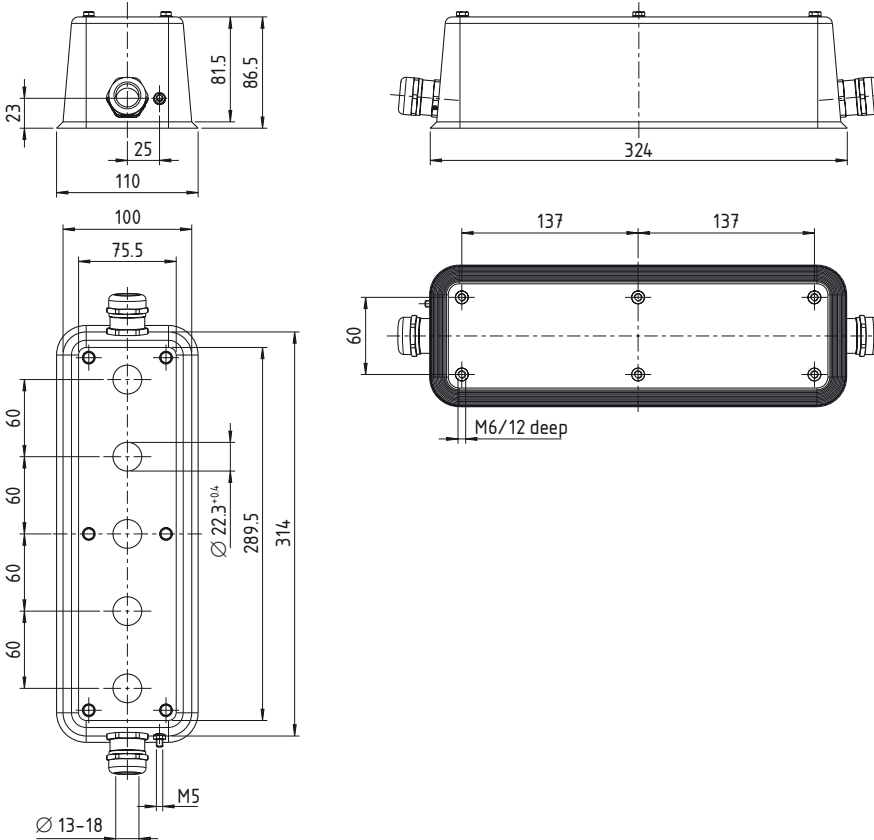
Housing type Ex-EBG 311.0

Dimensions empty housing with 3 control points



Housing type Ex-EBG 633.O

Dimensions empty housing with 5 control points



Housing type Ex-EBG 665.O

## Housings (mounting boxes) (continued)

Product range housings		
Brief description	Type	Order no.
Housings (mounting boxes) with UV- and Ozone-resistant seals incl. cable glands	Ex-EBG 311.O	0849500
	Ex-EBG 633.O	0849510
	Ex-EBG 665.O	0849520









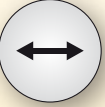
Technical data	
Version	Under consideration of EN 1672-2 and ISO 14 159 largely avoiding corners and edges with radiuses >6 mm
Type of protection	IP 67
Material	NIROSTA 1.4571 (AiSi 316Ti)
Use of the material	Apparatus and components of the chemicals industry, textiles industry, cellulose manufacture, dye works as well as in the photo, paint, artificial resin and rubber industry
Corrosion resistance class	III medium (structures with moderate chloride and sulphur dioxide exposure from industry, traffic and sea water atmosphere; a concentration of pollutants must be avoided)















## Notes

# Symbols







## Linear motion

	101 Working motion feed		102 Rapid motion or idling		103 Rapid motion		104 Feed
	105 Interrupted motion jogging		106 Reciprocating motion				
	107 Limited motion		108 Indexing		109 Motion in 2 directions		







## Rotary motion

	201 Continuous clockwise rotation		202 Anti-clockwise rotation		203 Clockwise rotation STOP		204 Anti-clockwise rotation STOP
	205 1 revolution clockwise		206 Anti-clockwise		207 Rotary indexing		208 Interrupted rotary motion
	209 Clockwise motion restricted		210 Anti-clockwise motion restricted		211 Clockwise motion from a restriction		211 Anti-clockwise motion from a restriction

## Additional options












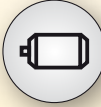
	301 Clamping, chucking		302 Release		303 Braking		304 Release brake
	305 Unlock		306 Lock				

## Arabic numerals<sup>1</sup>













	700		701		702		
	801		802		803		

<sup>1</sup> Other numerals available, e.g. part no. 709 for number 9













## Drives

	401 Electric motor		402 Pump general		403 Gear pump		405 Coolant
	406 Oil lubrication		407 Rotary indexing table		408 Shuttle table forward		409 Backwards
	410 Brake fan		411 Caution - live		412 Clamp table rectangular		413 Electrical machine





## Signals

	501 On		502 Jog		503 Automatic		504 Off
	505 Everything off		506 On - off		507 Increase of a variable		508 Decrease of a variable
	509 Pause (time elapse)		510 Manual operation		511 Visual		512 Hydraulics

## Words

	513		514		515		516
	517		518		519		520
	521		522		523		524

## Letters<sup>1</sup>

	901		902		903		904
---	-----	---	-----	---	-----	---	-----

<sup>1</sup> Further letters available

## Technical data

Control elements	
Regulations	<ul style="list-style-type: none"> <li>• IEC/EN 60947-5-1</li> <li>• IEC/EN 60947-5-5</li> <li>• IEC 60947-1</li> <li>• IEC 61241-1</li> <li>• EN 60079-15</li> </ul>
Equipment category	⊕ II 3GD
Protection against explosion	<ul style="list-style-type: none"> <li>• Ex nL IIC T4 X</li> <li>• Ex tD A22 IP65 T110°C X</li> </ul> (in combination mit contact/illuminated element(s) and Ex-EBG ... housings)
Design	round
Installation-∅	22.3 mm
Grid dimension	<ul style="list-style-type: none"> <li>• 40 × 50 mm</li> <li>• 50 × 60 mm (selector switches, mushroom-head impact button with latching)</li> </ul>
Front plate thickness	1 ... 6 mm
Installation position	any
Designation	Identification plates, symbols
Climatic resistance to DIN EN 60068	Part 2-30
Ambient temperature	<ul style="list-style-type: none"> <li>• Pushbuttons: -25 °C ... +75 °C</li> <li>• Illuminated pushbuttons: -25 °C ... +75 °C</li> <li>• Pilot lights: -25 °C ... +75 °C</li> <li>• Mushroom-head impact buttons: -25 °C ... +75 °C</li> <li>• Key-operated switches: 0 °C ... +75 °C</li> </ul>
Switching frequency	1,000 s/h (except mushroom-head impact button with latching)
Protection type to IEC 60529	IP 65
Full insulation	yes
Materials	<ul style="list-style-type: none"> <li>• Swivels: PC (chemical-resistance see page 28)</li> <li>• Front rings/buttons: Ms chromated, Ms powder-coated</li> </ul>
Type of fixing	with mounting flange
Max. torque for mounting	2 Nm
Shock resistance to IEC 60068-2-27	<50 g
Vibration resistance to IEC 60068-2-6	5 g
Actuating stroke	4 mm
Actuating force	<ul style="list-style-type: none"> <li>• Pushbuttons: approx. 1.5 N</li> <li>• Pushbuttons with diaphragm: approx. 2 N</li> <li>• Illuminated pushbuttons: approx. 1.5 N</li> <li>• Selector switches: approx. 0.2 Nm</li> <li>• Mushroom-head impact buttons: approx. 2 N</li> </ul>
Mechanical life	<ul style="list-style-type: none"> <li>• Pushbuttons: 10 × 10<sup>6</sup> switching cycles</li> <li>• Illuminated pushbuttons: 5 × 10<sup>6</sup> switching cycles</li> <li>• Key-operated switches: 3 × 10<sup>5</sup> switching cycles</li> </ul>
Rohs-conformity	yes

X) The temperature informations corresponds the installation in reference mounting boxes Ex-EBG 665.O (see page 21).

In combination with control devices and contact/illuminated contact elements the housing fulfills the requirements tD (protection by housing).

Contact/illuminated contact elements	
Regulations	<ul style="list-style-type: none"> <li>• IEC/EN 60947-5-1</li> <li>• IEC/EN 60947-5-5</li> <li>• IEC 61241-1</li> <li>• EN 60079-15</li> </ul>
Equipment category	⊕ II 3GD
Protection against explosion	<ul style="list-style-type: none"> <li>• Ex nL IIC T4 X</li> <li>• Ex tD A22 IP65 T110°C X</li> </ul> (in combination with control device(s) and Ex-EBG housings)
$U_i$	<ul style="list-style-type: none"> <li>• Contact element: 250 V</li> <li>• Illuminated contact element: 24 V</li> </ul>
$I_i$	<ul style="list-style-type: none"> <li>• Contact element: 6 A</li> <li>• Illuminated contact element: 0.8 A</li> </ul>
$P_i$	<ul style="list-style-type: none"> <li>• Contact element: max. 1,500 W</li> <li>• Illuminated contact element: max. 2 W</li> </ul>
$C_i$	~ 0
$L_i$	~ 0
Rated operating voltage $U_e$ max.	<ul style="list-style-type: none"> <li>• Contact element: 400 V</li> <li>• Illuminated contact element: 24 V</li> </ul>
Rated insulation voltage $U_i$ at pollution degree 3 to IEC 60947-1	400 V
Rated impulse withstand voltage	$U_{imp}$ 4 kV
Thermal rated current $I_{th}$ (in air)	6 A
Rated operating voltage $I_e$ as dependent on the utilisation category and test voltage $U_e$	<ul style="list-style-type: none"> <li>• 6 A, AC-15, 250 VAC</li> <li>• 3 A, DC-13, 24 VDC</li> </ul>
Contact safety	5 VDC/1 mA
Short-circuit protection	gG 6 A
Proof of positive opening	2.5 kV impulse voltage
Positive opening path	approx. 2 mm after achieving opening point
LED	max. 24 V/2 W
Air clearance and creeping distance to DIN EN 60664-1	4 kV/3
Switching frequency	1,200 s/h
Switching points	<ul style="list-style-type: none"> <li>• NC: approx. 1 mm</li> <li>• NO: ca. 2.5 mm</li> </ul>
Temperature range	<ul style="list-style-type: none"> <li>• Contact elements: -25°C ... +75°C</li> <li>• Illuminated contact element with LED (made by Elan): -25°C ... +75°C</li> </ul>
Climatic resistance to DIN EN 60068	Part 2-20
Installation position	any
Mechanical life to IEC 60947-5-1	$10 \times 10^6$ switching cycles
Actuating force at stroke end	approx. 4.5 N
Terminal designations	to IEC 60947-1
Type of connection	Screwed connection
Mounting diameter	<ul style="list-style-type: none"> <li>• Single-core: <math>2 \times (0.5 \dots 2.5 \text{ mm}^2)</math></li> <li>• Dual-core with wire-end ferrule: <math>2 \times (0.5 \dots 1.5 \text{ mm}^2)</math></li> </ul>
Max. torque of the mounting screw	max. 1 Nm
Electric shock protection	present (to EN 50274 and BGV A2)
Protection class	<ul style="list-style-type: none"> <li>• Connections: IP 20 (finger-safe)</li> <li>• Switching elements: IP 40</li> </ul>
Approvals	cULus (in preparation)

X) The temperature informations corresponds the installation in reference mounting boxes Ex-EBG 665.0 (see page 21).

In combination with control devices and contact/illuminated contact elements the housing fulfills the requirements tD (protection by housing).

# Chemikalienbeständigkeit Polycarbonat

Die nachfolgenden Angaben beruhen auf Informationen unserer Zulieferanten und verstehen sich lediglich als Orientierung ohne Gewähr, da die jeweilige Beständigkeit in der Regel von mehreren Einflussgrößen abhängt (Menge, Einwirkungsdauer, Temperatur etc.).

Der Einfluss der Chemikalien auf das aus Polycarbonat geformte Teil ist abhängig von der Konzentration und der Temperatur.

Die Chemikalienbeständigkeit eines Produkts aus Polycarbonat muss im Einzelfall dann untersucht werden, wenn eine Exposition gegenüber Chemikalien (auch Haushaltschemikalien oder Lebensmitteln) durch den vorgesehenen Gebrauch zu erwarten ist.

## Testmethode

Der Typekörper wird einer Lösung aus einer bestimmten Chemikalie bei 23 °C und 70 °C für 28 Tage ausgesetzt. Danach wurden eventuelle Veränderungen der physikalischen Eigenschaften getestet.

Chemikalie	Max. Konzentration	Immersionstemperatur		
		23 °C	70 °C	
Anorganische Säuren	Destilliertes Wasser		O	A
	Salzsäure	-10%	O	A
		-20%	O	A
	Schwefelsäure	-10%	O	A
		-30%	O	A
	Salpetersäure	-10%	A	A
	-30%		X	
Alkalien	Natriumhydroxid	-1%	A	X
	Ammoniumhydroxid		X	X
	Kalziumhydroxid	-10%		
	Kochsalz	-10%	O	A
	Kaliumchlorid	-10%	O	A
	Kaliumnitrat	-10%	O	A
	Kaliumdichromat	-10%	A	A
Anorganische Salze	Natriumsulfid	-10%	O	A
	Ammoniumchlorid	-10%	O	A
	Kalziumchlorid	-10%	O	A
	Natriumcarbonat	-10%		
Alkohole	Methanol		A	
	Ethanol	-50%	O	A
	i-Propanol		O	A
	n-Butanol		O	A-O
	Ethylenglycol		O	O
	Glycerin		O	O
Organische Säuren	Ameisensäure	-10%	O	
	Essigsäure (Essig)	-10%	O	A-X
	Oxalsäure	-10%	O	O
	Oleinsäure		O	O
Organische Lösungsmittel	n-Hexan		O	
	n-Heptan		O	O-A
	Cyclohexan		A	X
	Benzol		X	X
	Toluol		X	X
	Azeton		X	
	Methyl-ethyl-keton		X	
	Butylacetat		X	
	Methylenchlorid		X	
	Tetrachlorkohlenstoff		X	X
	Benzin		A	X
	Kerosin		O	
	Paraffinöl		O	

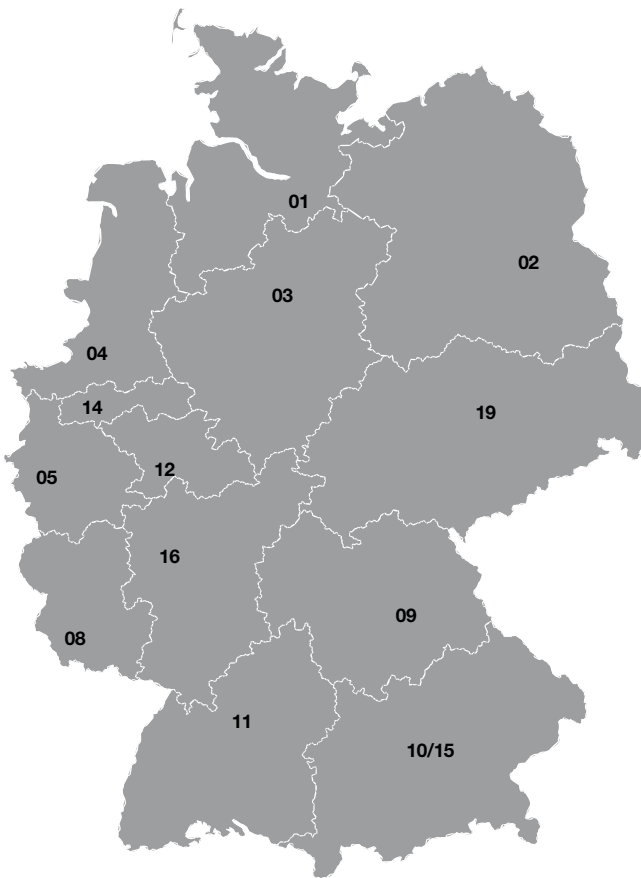
O Nur geringe Veränderung bei beiden Tests der physikalischen Eigenschaften

A Nur kurzzeitig einsetzbar

X Kein Einsatz möglich, Aufquellen und Auflösung

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