

# Series 09

*Rugged. Modular. Reliable.*

<https://eao.com/09>



# 09 Information about the Series

## Rugged Keypads

### Advantages

- Individual 4-segment and RGB halo ring illumination
- Designed for functional safety: ISO 26262 & ISO 13849
- Intelligent HMIs with CAN bus integration
- Robust, innovative, ergonomic design sealed up to IP6K9K protection
- Interchangeable ISO 7000 range of symbols or customised symbols

### Typical application areas

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- Roadmaking vehicles and roller compactors
- Loaders, dozers and excavators
- Cranes, dump trucks and crawler drills
- Fire-fighting and rescue vehicles
- Road sweepers, cleaning vehicles and refuse trucks
- Snow removers and groomers
- Agricultural vehicles and equipment

### HMI Functions

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- Rugged Keypad

### Degree of protection

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- Up to IP6K9K
- IP20 (rear side) according to ISO 20653
- Up to IP6K9K (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

### Operating voltage

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- 8-32 VDC

### Standards

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- E1 ECE R10/ECE R118
- CE

## Joysticks

### Advantages

- Mechanical and electrical customisation is possible
- Front protection to IP65 or IP67
- Standard joysticks available from stock
- Low back panel depth for hall effect and conductive plastic sensors

### Typical application areas

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- Commercial vehicles
- Special vehicles
- Marine, rail and electric vehicles
- Machinery
- Medical technology
- Numerous other applications

### Functions

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- Joystick
- Koordinatenschalter

### Design

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- Flush
- Raised

### Front protection

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- IP40
- IP65
- IP67

### Operating voltage

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- 5 VDC
- 8 ... 36 VDC
- 30 VDC
- 250 VAC
- 500 VAC

### Terminal

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- Screw terminal
- Soldering terminal
- Minitec plug
- Dubox plug
- Molex micro
- Cable

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# 09 Overview of Modules

## Rugged Keypads. Optimal for your application.

### Series 09 variants




The Series 09 Rugged Keypads are available with 6 and 8 pushbuttons and also in a range of different variants. All these have the flexibility of interchangeable legends, but come with a choice of different illumination features and connector types for example. Depending on the variant, the Rugged Keypads are also suitable for safety-relevant applications.

This wide choice allows designers to specify only the HMI features they actually need for their vehicle or machine application, therefore minimising hardware costs and optimising the scope of their software development – optimal for your application.

Variants	Halo ring illumination	Communication protocol	Switching element	IP protection	Connector	Switching function/s	Functional safety standard
<b>PREMIUM</b> 	4-segment RGB, freely configurable	CANopen Safety	Electro-mechanical switching element	IP6K7 frontside and rear-side	Deutsch DT04-6P	Pushbutton	CANopen safety protocol and functional safety, developed according to ISO 26262 ASIL B and ISO 13849 PL d *
<b>SUPER</b> 	4-segment RGB, freely configurable	CANopen, J1939	Electro-mechanical switching element	IP6K7 frontside and rear-side	Deutsch DT04-6P	Pushbutton	Suitable for functional safety applications according to EN ISO 13849
<b>PLUS</b> 	Red LED (other colours on request)	CANopen, J1939	Electro-mechanical switching element	IP6K7 frontside and rear-side	Deutsch DT04-6P	Pushbutton	Suitable for functional safety applications according to EN ISO 13849
<b>BASIC</b> 	Red LED	N.A. (hardwired)	Electro-mechanical switching element	IP6K7 frontside	Würth Elektronik WR-MPC3, 16 pins	Pushbutton	Suitable for functional safety applications due to diagnosable switching function for applications according to ISO 26262 and EN ISO 13849

\* available at a later date.



Variants	Halo ring illumination	Communication protocol	Switching element	IP protection	Connector	Switching function/s	Functional safety standard
<b>SUPER</b> 	4-segment RGB, freely configurable	CANopen, J1939	Electro-mechanical switching element	IP6K9K frontside and rear-side	Deutsch DT04-6P	Pushbutton	Suitable for functional safety applications according to EN ISO 13849
<b>PLUS</b> 	Red LED (other colours on request)	CANopen, J1939	Electro-mechanical switching element	IP6K9K frontside and rear-side	Deutsch DT04-6P	Pushbutton	Suitable for functional safety applications according to EN ISO 13849
<b>BASIC</b> 	Red LED	N.A. (hardwired)	Electro-mechanical switching element	IP6K9K frontside	Würth Elektronik WR-MPC3, 20 pins	Pushbutton	Suitable for functional safety applications due to diagnosable switching function for applications according to ISO 26262 and EN ISO 13849

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- 92
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# 09 Overview of Modules

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- 84
- 92
- 96



## Rugged Keypads with 8 pushbuttons. *EAO Series 09.*

Ideally suited for operation in outdoor applications, also under extreme conditions.

- Robust, ergonomic and innovative design sealed up to IP6K9K protection
- Suitable for functional safety applications according to EN ISO 13849
- Intelligent HMIs with CAN bus integration
- Programmable 4-segment RGB halo ring illumination
- Interchangeable ISO 7000 or customised symbols



[www.eao.com/09](http://www.eao.com/09)







Your Expert Partner for Human Machine Interfaces

## Customer-specific product diversity.

Series 09 In-Cabin Keypads with 6 pushbuttons are available in SUPER, PLUS and BASIC variants. These differ in terms of illumination options and the communication interface. The hard-wired BASIC product variant is available, as an additional option, in a 2-pushbutton version.

With this wide range of variants, customers can choose between a CAN bus connection or hard-wired version depending on their application, and they can further customise their keypad thanks to a variety of illumination options and interchangeable custom or ISO 7000 symbols – for optimal integration of the HMI in the vehicle interior.

Product	Variant	Symbol illumination	Halo-ring illumination	Communication protocol	IP protection class	Plug	Switching action	Safety
Keypad 6PB 	SUPER	White LED	RGB, freely configurable	CANopen, J1939	IP5K4	TYCO 1745000-3	Pushbutton	Diagnostic switching action for ASIL QM (B) in accordance with ISO 26262
Keypad 6PB 	PLUS	White LED	Red LED (other colours on request)	CANopen, J1939	IP5K4	TYCO 1745000-3	Pushbutton	Diagnostic switching action for ASIL QM (B) in accordance with ISO 26262
Keypad 6PB 	BASIC	White LED	Red LED	n/a (hard-wired)	IP5K4	TYCO 1745000-3/ 1745000-4	Pushbutton	Diagnostic switching action for ASIL QM (B) in accordance with ISO 26262 (with NAMUR)
Keypad 2PB 	BASIC	White LED	Red LED	n/a (hard-wired)	IP5K4	TYCO 1745000-3	Pushbutton	Diagnostic switching action for ASIL QM (B) in accordance with ISO 26262 (with NAMUR)

# 09 Numbering structure

## Part number structure Rugged Keypads Modules

Part No. module (12 digits)



Series number  
09

Module number  
00- Rugged Keypad  
10- Rugged Rotary Cursor Controller \*

Communication protocols  
1- J1939  
2- CANopen  
3- CANopenSafety (Button-Stuck 10 Seconds)  
4- CANopenSafety (Button-Stuck 5 Seconds)  
5- CANopenSafety (Button-Stuck 3 Seconds)  
6- CANopenSafety (Button-Stuck 1 Second)  
7- I/O

Mounting type  
1- Clip-in (1 mm panel)  
2- Clip-in (2 mm panel)  
3- Clip-in (3 mm panel)  
4- Clip-in (4 mm panel)  
5- Screw-in

Halo ring illumination  
1- RGB  
2- LED red

CAN  
1- LoadDump B  
2- LoadDump A  
Hardwired  
3- 12V  
4- 24V  
5- 12V diagnosable switching contact  
6- 24V diagnosable switching contact

Type of module  
1- 6 Pushbuttons  
2- 2 Pushbuttons + RCC \*  
(rotation + push + proportional Joystick)  
3- 8 Pushbuttons

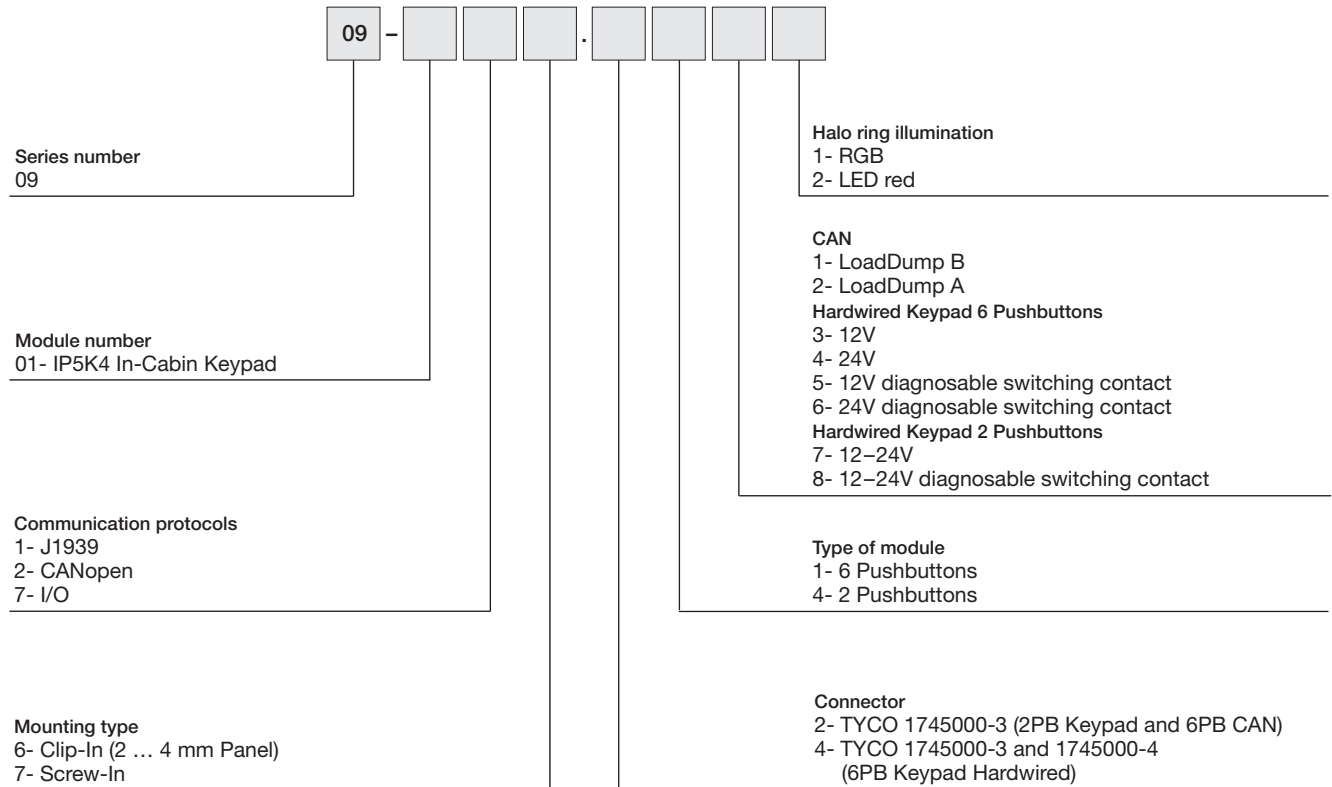
Connector  
1- DT04 - 6P  
3- Würth Elektronik  
WR-MPC3 16 pins  
(for BASIC only)

\* available at a later date



## Part number structure In-Cabin Keypads Modules

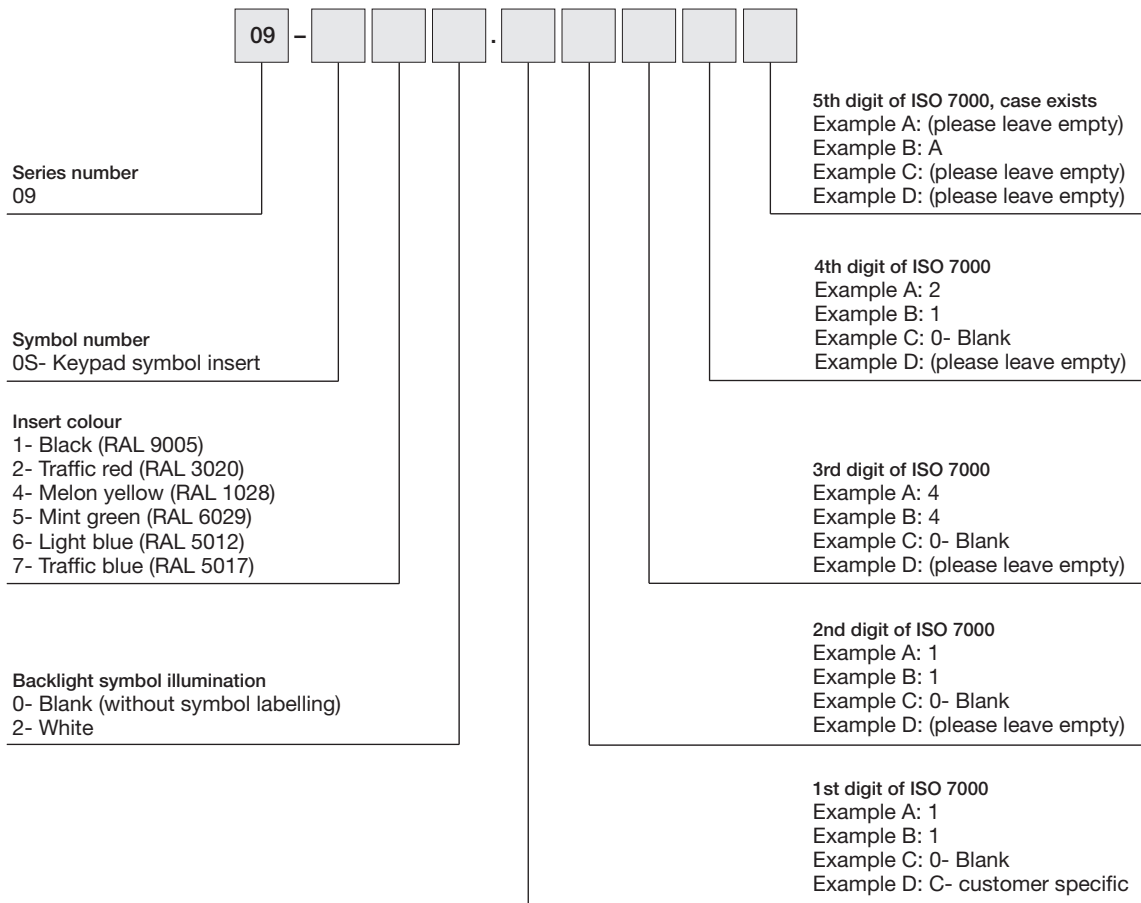
Part No. module (12 digits)



- 01
- 02
- 03
- 04
- 09**
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- 96

# 09 Numbering structure

## Part No. symbols



## Keypad PREMIUM\*



### Mechanical characteristics

- Actuation force: approx. 6.5 N
- Overload: 250 N
- Mechanical lifetime: up to 2 million cycles of operation
- Impact resistance: IK07 according to IEC 62262

### Electrical characteristics

- Operating voltage range 8–32 VDC

### Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup> (dimnable)
- LED halo ring illumination with four freely configurable segments
  - Multi-colour: RGB LED
  - Luminance: approx. 1500 cd/m<sup>2</sup> (dimnable)
- Illumination functions: steady lighting, flashing, pulses, rotations, colour changes
  - Halo and symbol illumination can be configured individually

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Interfaces

- CAN interface (ISO 11898)
- CANopen Safety (EN 50325-5)
- Baud rate 250 kBd and 500 kBd (software configurable)

- Connector Deutsch DT04-6P
- Designed in accordance with the safety requirements of vehicles as per ISO 26262 ASIL B and EN ISO 13849 PL d

### Ambient conditions

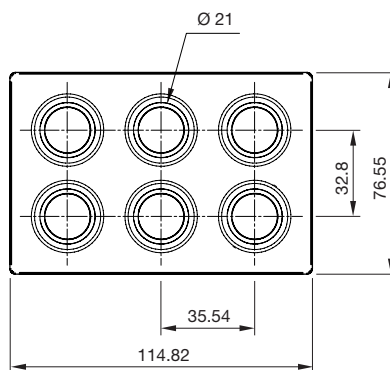
- Operating temperature: –40°C ... +85°C
- Storage temperature: –40°C ... +85°C

### Protection degree

- IP6K7 according to ISO 20653
- Up to IP6K7 (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

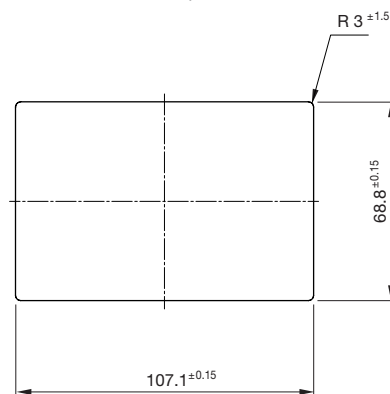
### Dimensions

(All dimensions in mm)



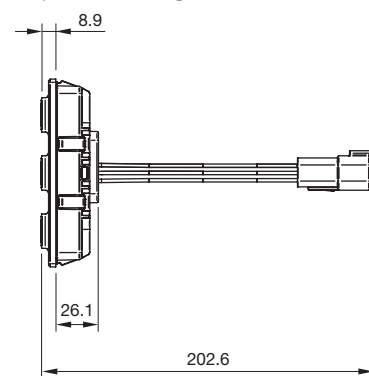
### Mounting cut-out

(Front plate thickness 1.0 mm ... 4.0 mm) \*2

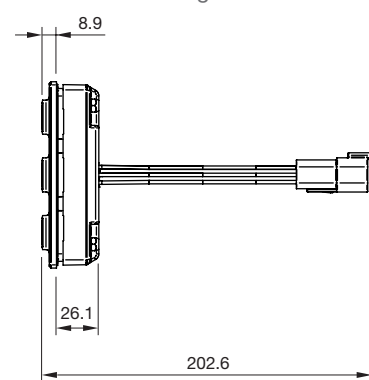


### Mounting

Clip-in mounting



Screw-in mounting



\*1 Availability of the PREMIUM variant for functional safety on request.

\*2 For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.

# 09 Rugged Keypad Modules

## Keypad SUPER



### Mechanical characteristics

- Actuation force: approx. 6.5 N
- Overload: 250 N
- Mechanical lifetime: up to 2 million cycles of operation
- Impact resistance: IK07 according to IEC 62262

### Electrical characteristics

- Operating voltage range: 8–32 VDC

### Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup>, dimmable
- LED halo ring illumination with four freely configurable segments
  - Multi-colour: RGB
  - Luminance: approx. 1500 cd/m<sup>2</sup> dimmable
- Illumination functions: steady lighting, flashing, pulses, rotations, colour changes
  - Halo and symbol illumination can be configured individually

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939

- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

### Ambient conditions

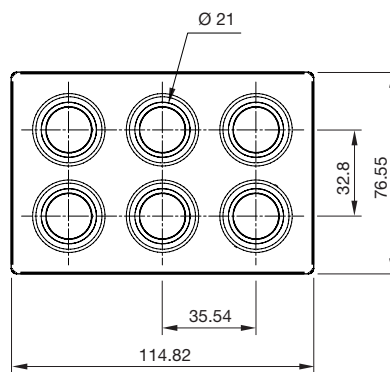
- Operating temperature: –40°C ... +85°C
- Storage temperature: –40°C ... +85°C

### Protection degree

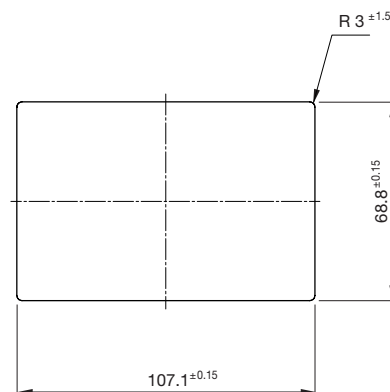
- IP6K7 according to ISO 20653
- Up to IP6K7 (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

### Dimensions

(All dimensions in mm)

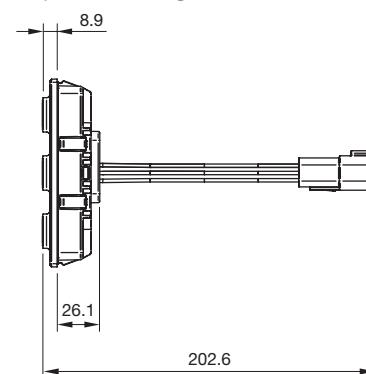


**Mounting cut-out**  
(Front plate thickness 1.0 mm ... 4.0 mm) \*

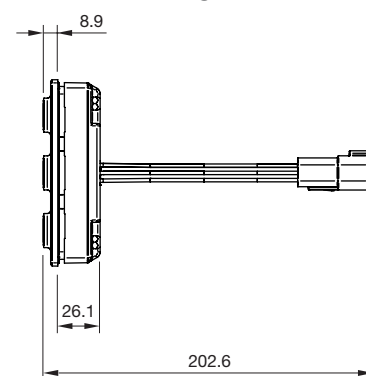


### Mounting

Clip-in mounting



Screw-in mounting



\* For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.

## Keypad PLUS



### Mechanical characteristics

- Actuation force: approx. 6.5 N
- Overload: 250 N
- Mechanical lifetime: up to 2 million cycles of operation
- Impact resistance: IK07 according to IEC 62262

### Electrical characteristics

- Operating voltage range: 8–32 VDC

### Illumination

- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup>, (dimnable)
- LED halo ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 750 cd/m<sup>2</sup> (dimnable)
- Illumination functions: lighting, flashing, pulses
  - Halo and symbol illumination can be configured individually

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939
- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

### Ambient conditions

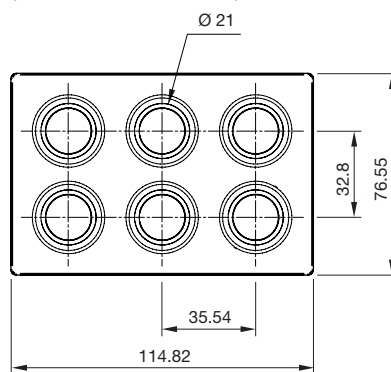
- Operating temperature: –40°C ... +85°C
- Storage temperature: –40°C ... +85°C

### Protection degree

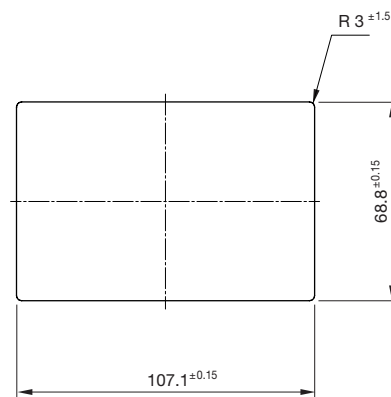
- IP6K7 according to ISO 20653
- Up to IP6K7 (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

### Dimensions

(All dimensions in mm)

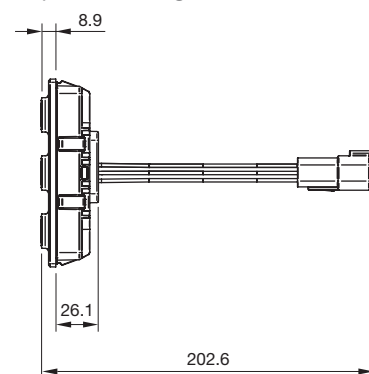


**Mounting cut-out**  
(Front plate thickness 1.0 mm ... 4.0 mm) \*

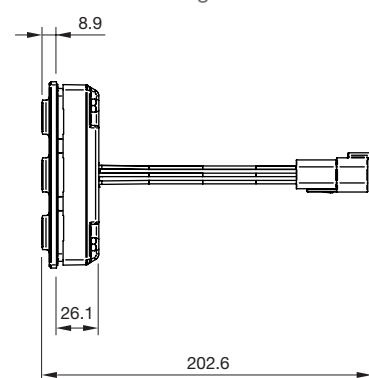


### Mounting

#### Clip-in mounting



#### Screw-in mounting



\* For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.

# 09 Rugged Keypad Modules

## Keypad BASIC



### Mechanical characteristics

- Actuation force: approx. 6.5 N
- Overload: 250 N
- Mechanical lifetime: up to 2 million cycles of operation
- Impact resistance: IK07 according to IEC 62262

### Electrical characteristics

- 8–18 VDC or 18–32 VDC for operating voltage of the illumination for use in 12 V or 24 V applications. Optionally available with switch contacts with diagnostic capability

### Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup>, (dimnable)
- LED halo ring illumination
  - Colour: red
  - (other colours on request)
  - Luminance: approx. 750 cd/m<sup>2</sup>
- Illumination functions
  - Halo and symbol illumination can be configured individually

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Interfaces

- Connector: Würth Elektronik WR-MPC3, 16 Pins

### Ambient conditions

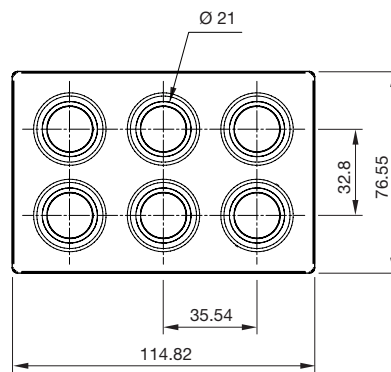
- Operating temperature: –40 °C ... +85 °C
- Storage temperature: –40 °C ... +85 °C

### Protection degree

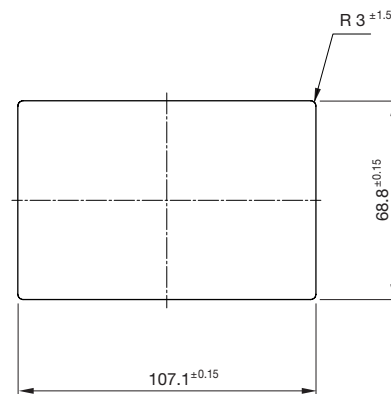
- IP6K7 (front side)
- IP20 (rear side) according to ISO 20653
- Up to IP6K7 (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

### Dimensions

(All dimensions in mm)

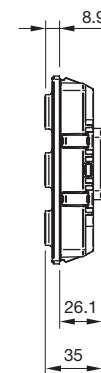


**Mounting cut-out**  
(Front plate thickness 1.0 mm ... 4.0 mm) \*

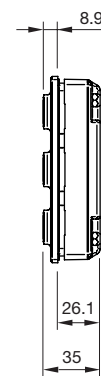


### Mounting

Clip-in mounting



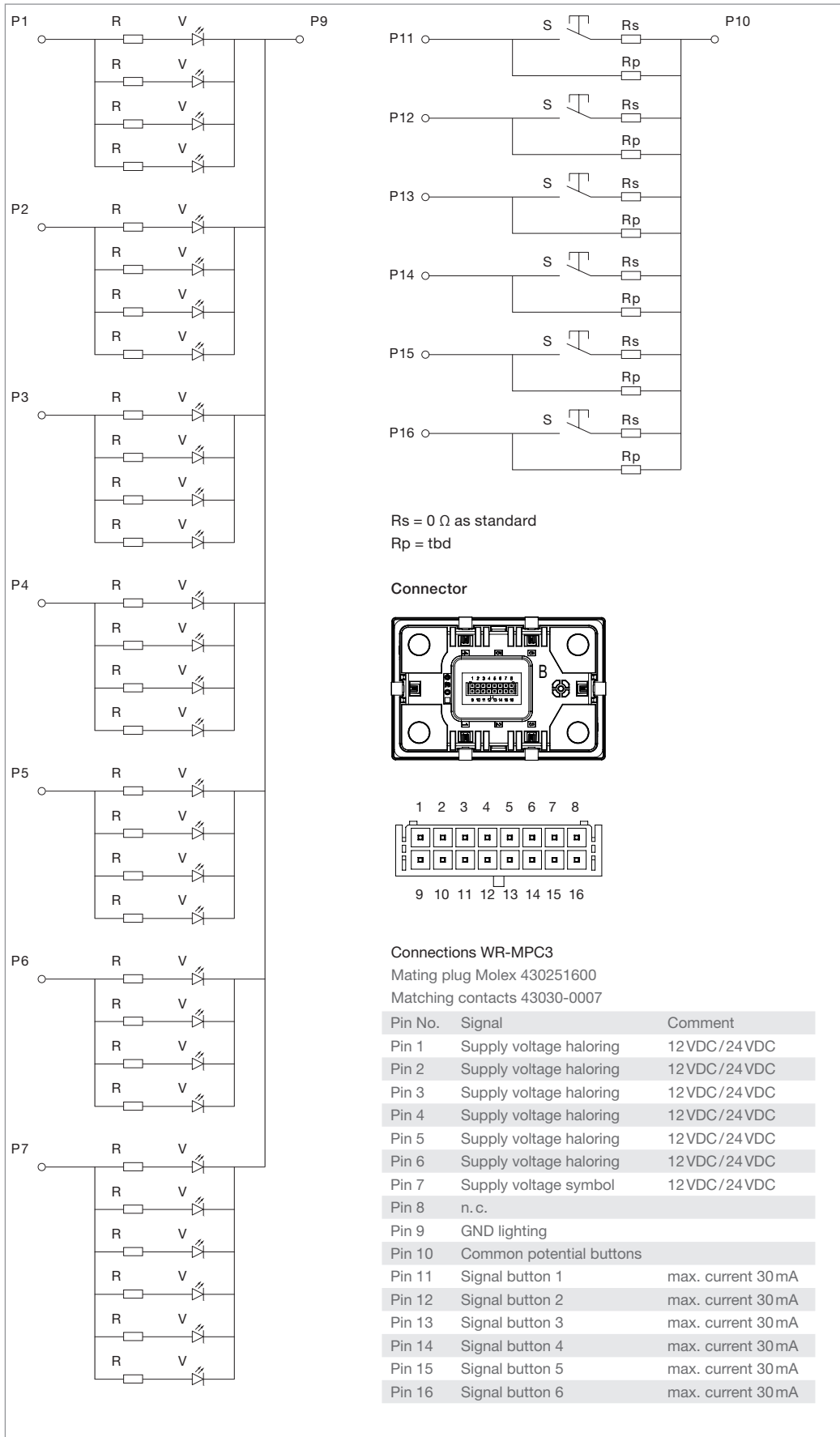
Screw-in mounting



\* For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.

## Wiring diagram, connector

### Wiring diagram



# 09 Rugged Keypad Modules

## Keypad SUPER



### Mechanical characteristics

- Actuation force: approx. 11 N
- Overload: 250 N
- Mechanical lifetime: up to 2 million cycles of operation
- Impact resistance: IK07 according to IEC 62262

### Electrical characteristics

- Operating voltage range: 8–32 VDC

### Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup> (dimnable)
- LED halo ring illumination with four freely configurable segments
  - Multi-colour: RGB
  - Luminance: approx. 1500 cd/m<sup>2</sup> (dimnable)
- Illumination functions: steady lighting, flashing, pulses, rotations, colour changes
  - Halo and symbol illumination can be configured individually

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939
- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

### Ambient conditions

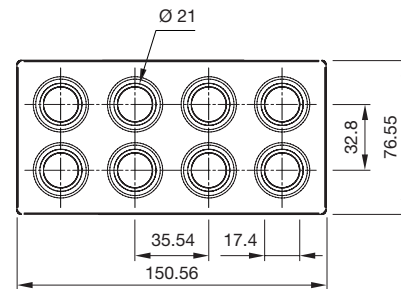
- Operating temperature: –40 °C ... +85 °C
- Storage temperature: –40 °C ... +85 °C

### Protection degree

- IP6K9K according to ISO 20653 <sup>\*1</sup>
- Up to IP6K9 (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

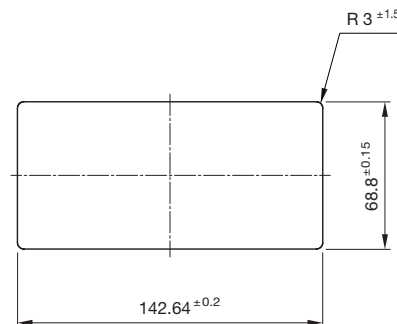
### Dimensions

(All dimensions in mm)



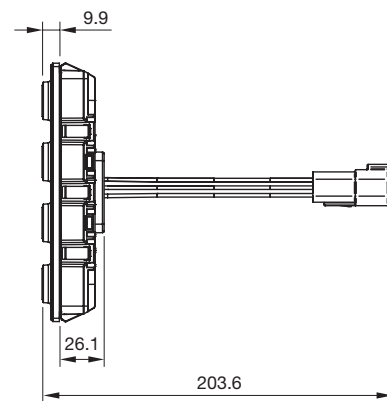
### Mounting cut-out

(Front plate thickness 1.0 mm ... 4.0 mm) <sup>\*2</sup>

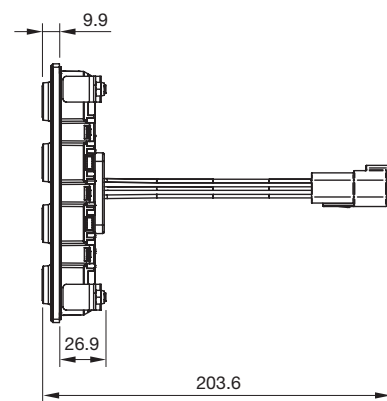


### Mounting

Clip-in mounting



Screw-in mounting



<sup>\*1</sup> Under extreme conditions, the symbol inserts may detach. These can be easily reinserted in the keypad. For further information, please refer to the operating instructions.

<sup>\*2</sup> For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.



## Keypad PLUS



### Mechanical characteristics

- Actuation force: approx. 11 N
- Overload: 250 N
- Mechanical lifetime: up to 2 million cycles of operation
- Impact resistance: IK07 according to IEC 62262

### Electrical characteristics

- Operating voltage range: 8–32 VDC

### Illumination

- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup>, (dimnable)
- LED halo ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 750 cd/m<sup>2</sup> (dimnable)
- Illumination functions: lighting, flashing, pulses
  - Halo and symbol illumination can be configured individually

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANopen (CiA 401), CAN J1939
- Baud rate 250 kBd and 500 kBd (software configurable)
- Connector Deutsch DT04-6P

### Ambient conditions

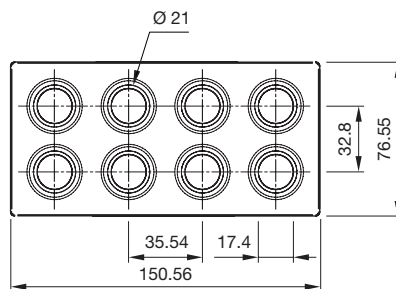
- Operating temperature: –40°C ... +85°C
- Storage temperature: –40°C ... +85°C

### Protection degree

- IP6K9K according to ISO 20653 \*1
- Up to IP6K7 (panel/screw-in version) \*1
- Up to IP5K4 (panel/clip-in version)

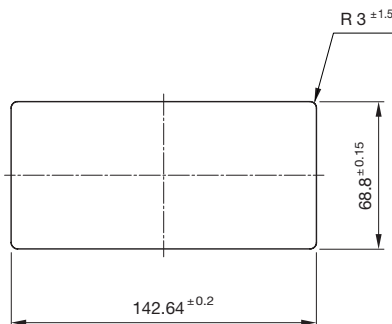
### Dimensions

(All dimensions in mm)



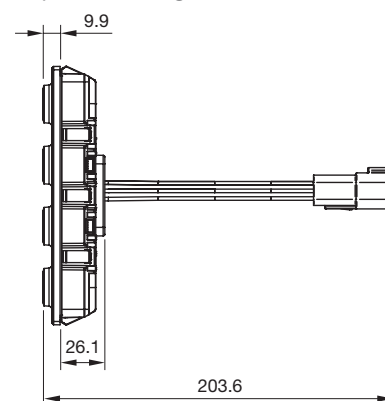
### Mounting cut-out

(Front plate thickness 1.0 mm ... 4.0 mm) \*2

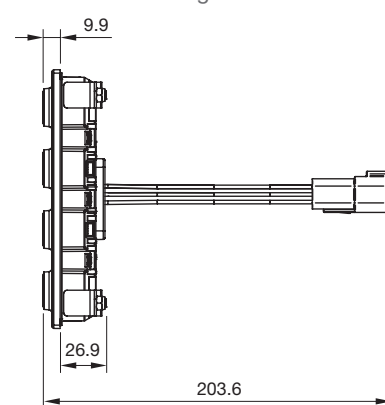


### Mounting

Clip-in mounting



Screw-in mounting



\*1 Under extreme conditions, the symbol inserts may detach. These can be easily reinserted in the keypad. For further information, please refer to the operating instructions.

\*2 For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.

# 09 Rugged Keypad Modules

## Keypad BASIC



### Mechanical characteristics

- Actuation force: approx. 11 N
- Overload: 250 N
- Mechanical lifetime: up to 2 million cycles of operation
- Impact resistance: IK07 according to IEC 62262

### Electrical characteristics

- 8–18VDC or 18–32VDC for operating voltage of the illumination for use in 12V or 24V applications. Optionally available with switch contacts with diagnostic capability

### Illumination

- Halo ring and symbol illumination can be configured independently
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20cd/m<sup>2</sup>, (dimnable)
- LED halo ring illumination
  - Colour: red
  - (other colours on request)
  - Luminance: approx. 750cd/m<sup>2</sup>
- Illumination functions
  - Halo and symbol illumination can be configured individually

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Interfaces

- Connector: Würth Elektronik WR-MPC3, 20 Pins

### Ambient conditions

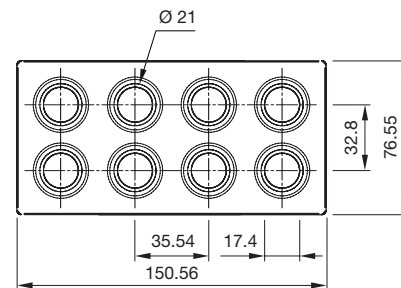
- Operating temperature: –40°C ... +85°C
- Storage temperature: –40°C ... +85°C

### Protection degree

- IP6K9K (front side)
- IP20 (rear side) according to ISO 20653 \*1
- Up to IP6K9K (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

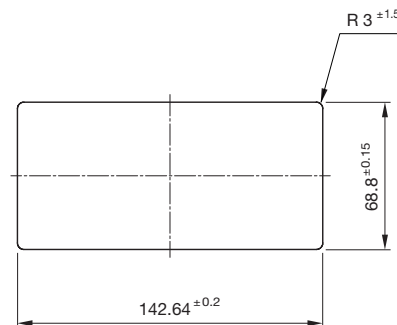
### Dimensions

(All dimensions in mm)



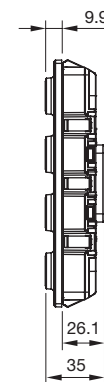
### Mounting cut-out

(Front plate thickness 1.0 mm ... 4.0 mm) \*

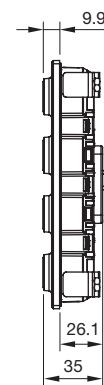


### Mounting

Clip-in mounting



Screw-in mounting



\*1 Under extreme conditions, the symbol inserts may detach. These can be easily reinserted in the keypad. For further information, please refer to the operating instructions.

\*2 For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.

## 6-pushbutton Keypad SUPER



### Mechanical characteristics

- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 250 000 cycles of operation
- Impact resistance: IEC 62262 IK07

### Electrical characteristics

- Operating voltage range 8-32 VDC
- LoadDump A or B

### Illumination

- Halo-ring and symbol illumination can be configured independently of one another
- Halo-ring effects: flashing, pulsing, colour change
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup> (dimnable)
- LED halo-ring illumination
  - Colour: multi-colour RGB
  - Luminance: approx. 500 cd/m<sup>2</sup> (dimnable\*)

\*depending on the respective colour

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Connections/interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANOpen (CiA 401), CAN J1939
- Baud rate 125, 250, 500, 1000 kBit/s (configurable through software)
- Integrated plug recess, compatible with TE 8P-1745000-3

### Protection degree

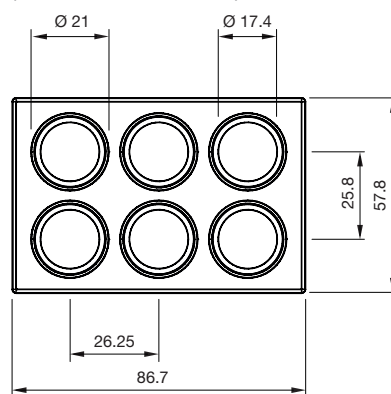
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

### Ambient conditions

- Operating temperature -40°C ... +85°C
- Storage temperature -40°C ... +85°C

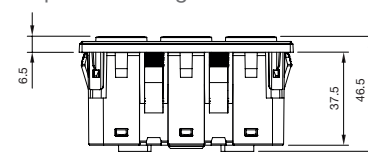
### Dimensions

(All dimensions in mm)

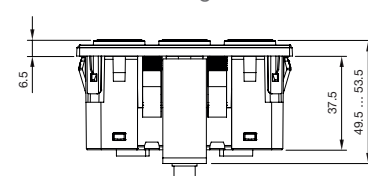


### Mounting

Clip-in mounting



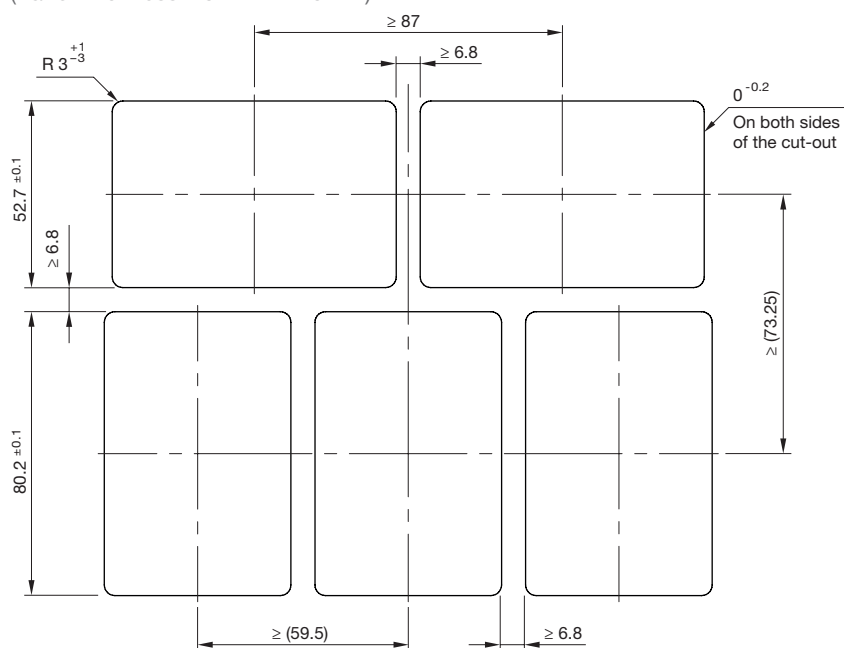
Screw-in mounting



The keypad can be mounted into front plate thicknesses between 1 and 4 mm. A front plate of at least 2 mm thickness is recommended. Non-compliance with these specifications may lead to damage to the locking tongue.

### Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)



01  
02  
03  
04  
09  
14  
17  
18  
19  
22  
31  
41  
45  
51  
56  
57  
61  
70  
71  
82  
84  
92  
96

# 09 In-Cabin Keypad Modules

## 6-pushbutton Keypad PLUS



### Mechanical characteristics

- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 250 000 cycles of operation
- Impact resistance: IEC 62262 IK07

### Electrical characteristics

- Operating voltage range 8-32 VDC LoadDump A or B

### Illumination

- Halo-ring and symbol illumination can be configured independently of one another  
Halo-ring effects: flashing, pulsing, colour change
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup> (dimnable)
- LED halo-ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 500 cd/m<sup>2</sup> (dimnable)

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Connections/interfaces

- CAN interface (ISO 11898)
- CAN protocols: CANOpen (CiA 401), CAN J1939
- Baud rate 125, 250, 500, 1000 kBit/s (configurable through software)
- Integrated plug recess, compatible with TE 8P-1745000-3

### Protection degree

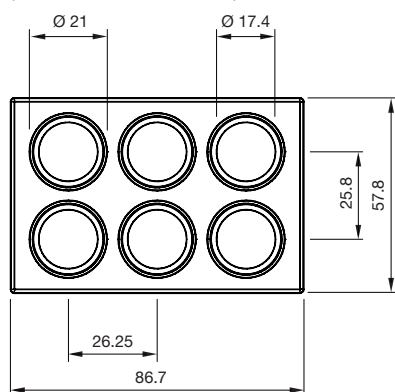
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

### Ambient conditions

- Operating temperature -40°C ... +85°C
- Storage temperature -40°C ... +85°C

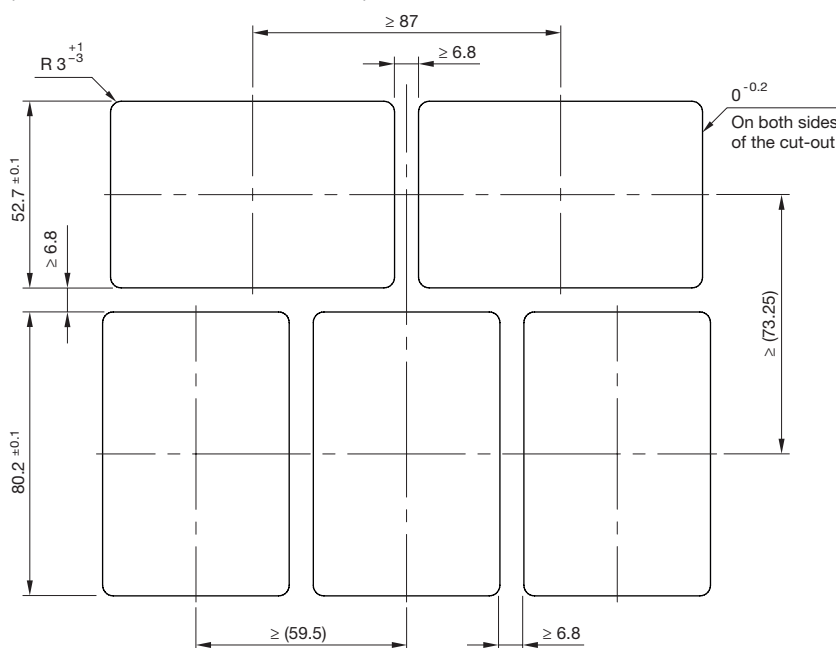
### Dimensions

(All dimensions in mm)



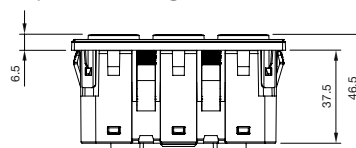
### Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

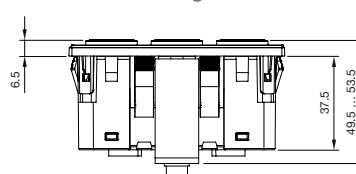


### Mounting

Clip-in mounting



Screw-in mounting



The keypad can be mounted into front plate thicknesses between 1 and 4 mm. A front plate of at least 2 mm thickness is recommended. Non-compliance with these specifications may lead to damage to the locking tongue.

## 6-pushbutton Keypad BASIC



### Mechanical characteristics

- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 250 000 cycles of operation
- Impact resistance: IEC 62262 IK07

### Electrical characteristics

- Operating voltage range: 8 – 18VDC or 18 – 32VDC  
Operating voltage of illumination for use in 12V or 24V applications. Available with the option of diagnostic switching contacts
- Max. power: 1 W (without NAMUR)  
0.25 W (with NAMUR)
- Max. current: 30 mA
- Min. current: 2 mA
- Max. voltage: 32 V
- Contact resistance (unactuated): > 2 M $\Omega$  (without NAMUR)  
1 k $\Omega$   $\pm$  4 % (with NAMUR)
- Contact resistance (actuated): < 10  $\Omega$  (without NAMUR)  
110  $\Omega$   $\pm$  10  $\Omega$  (with NAMUR)

### Illumination

- Halo-ring and symbol illumination can be configured independently of one another
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup> (dimnable)
- LED halo-ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 500 cd/m<sup>2</sup> (dimnable)

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Connections/interfaces

- Integrated plug recess, compatible with TE 8P-1745000-3/8P-1745000-4, 8-pin

### Protection degree

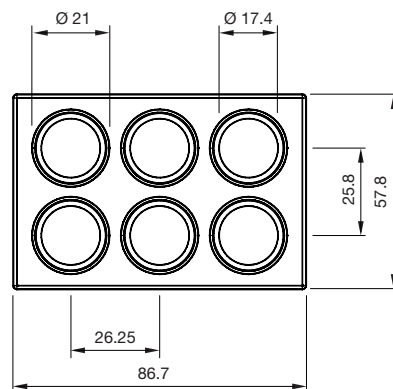
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

### Ambient conditions

- Operating temperature –40 °C ... +85 °C
- Storage temperature –40 °C ... +85 °C

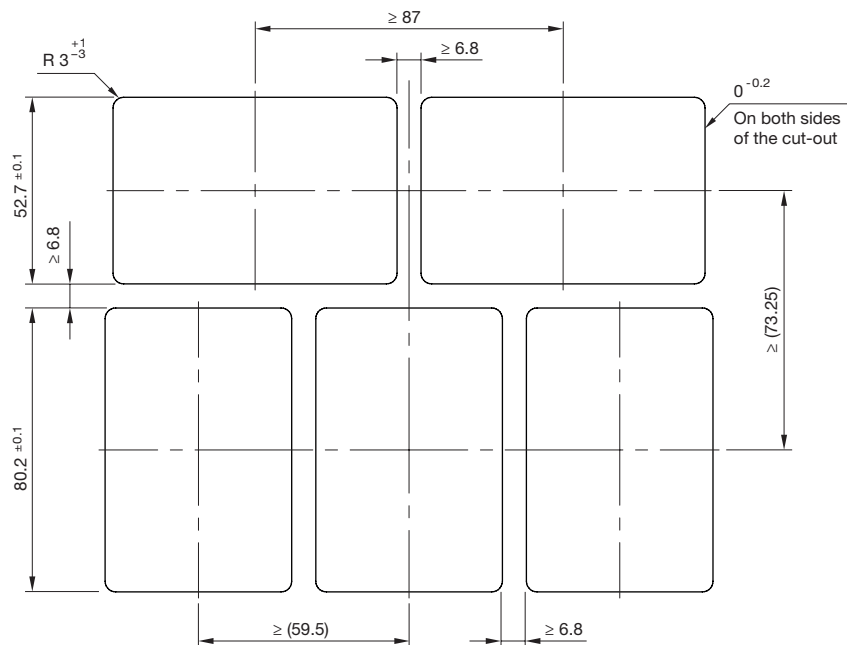
### Dimensions

(All dimensions in mm)



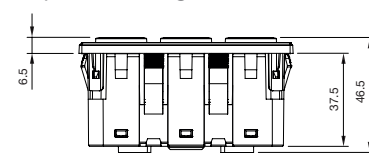
### Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

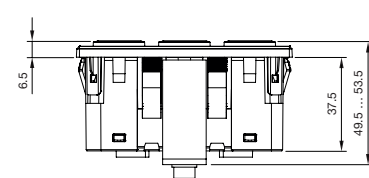


### Mounting

Clip-in mounting



Screw-in mounting



The keypad can be mounted into front plate thicknesses between 1 and 4 mm. A front plate of at least 2 mm thickness is recommended. Non-compliance with these specifications may lead to damage to the locking tongue.

# 09 In-Cabin Keypad Modules

## 2-pushbutton Keypad BASIC



### Mechanical characteristics

- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 250 000 cycles of operation
- Impact resistance: IEC 62262 IK07

### Electrical characteristics

- Operating voltage range 8 – 32 VDC  
Available with the option of diagnostic switching contacts (NAMUR)
- Max. power:  
1 W (without NAMUR)  
0.25 W (with NAMUR)
- Max. current:  
30 mA
- Min. current:  
2 mA
- Max. voltage:  
32 V
- Contact resistance (unactuated):  
> 2 M $\Omega$  (without NAMUR)  
1 k $\Omega$   $\pm$  4 % (with NAMUR)
- Contact resistance (actuated):  
< 10  $\Omega$  (without NAMUR)  
110  $\Omega$   $\pm$  10  $\Omega$  (with NAMUR)

### Illumination

- Halo-ring and symbol illumination can be configured independently of one another
- LED symbol illumination
  - Colour: white
  - Luminance: approx. 20 cd/m<sup>2</sup> (dimnable)
- LED halo-ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 500 cd/m<sup>2</sup> (dimnable)

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Connections/interfaces

- Integrated plug recess, compatible with TE 8P-1745000-3/8P-1745000-4, 8-pin

### Protection degree

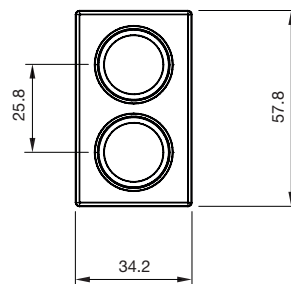
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

### Ambient conditions

- Operating temperature  
–40 °C ... +85 °C
- Storage temperature  
–40 °C ... +85 °C

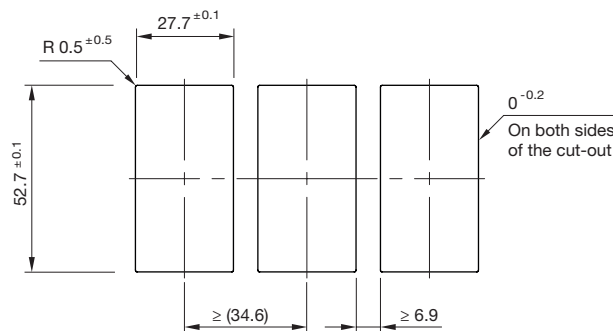
### Dimensions

(All dimensions in mm)



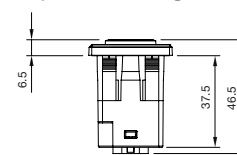
### Mounting cut-out

(Panel thickness 1.0 mm ... 4.0 mm)

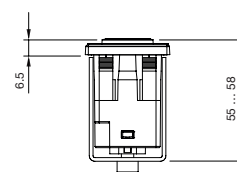


### Mounting

Clip-in mounting



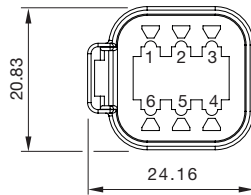
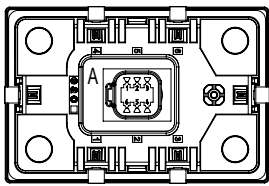
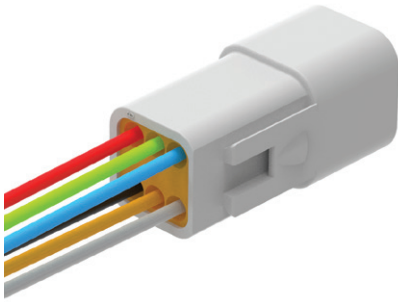
Screw-in mounting



The keypad can be mounted into front plate thicknesses between 1 and 4 mm. A front plate of at least 2 mm thickness is recommended. Non-compliance with these specifications may lead to damage to the locking tongue.

## Accessories

### Deutsch DT Series connector (DT04-6P)



#### Connector 6 – DT (DT04-6P)

Mating plug            Deutsch DT06-6S  
 Matching contacts    e.g. 1062-16-0122  
 Matching wedge      W6-S

Pin Nr.	Signal	Wire colour	Comment
Pin 1	GND	Black	
Pin 2	CAN High	Yellow	
Pin 3	WakeUp_Out	Grey	
Pin 4	WakeUp_In	Blue	
Pin 5	CAN Low	Green	
Pin 6	Vcc		8 – 32VDC

All dimensions in mm.

### Symbol inserts



The interchangeable symbol inserts are available with ISO 7000 or customer-specific symbols. In addition to the standard colour black, symbol inserts are also available in a variety of other colours.

### Tool for legends



The symbol insert tool with trendy design enables userfriendly fitting and removal of symbol inserts of the pushbuttons.

### Protective shroud



EAO offers protective shrouds as accessories for the Series 09 Rugged Keypads. These ensure that the 6 or 8 pushbuttons are protected against unintentional actuation, thus preventing safety-critical operating errors.











# 09 Universal Switch

## Product variants

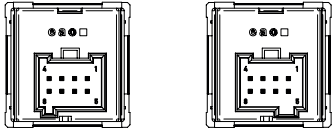





### Versatile product variants

The Series 09 universal switch is available in two variants – STANDARD and DUAL CONTACT – and offers universal configuration options. The product variants and their configurations mean the Series 09 universal switch can be used for a wide range of applications – including safety-relevant functions such as hazard light button or transmission control.

This configurability offers many possibilities for the type and number of switching contacts, vehicle voltage, and the option of diagnostic capability. Definitions of haptic feedback, two different connector codings, and a complete selection of ISO 7000 symbols – or custom symbols – complete the comprehensive options to choose from.

Product options, Series 09 universal switch					
Features		Product options	Variants		
			STANDARD	DUAL CONTACT	
				NO-NO	NO/NC-NO
Electrical properties		12V	✓	✓	✓
		24V	✓	✓	✓
		12V Namur $R_s=120\Omega/R_p=1K\Omega$	✓	✓	✓
		24V Namur $R_s=120\Omega/R_p=1K\Omega$	✓	✓	✓
Haptics		Firm haptics (short travel)	✓	✗	✓
		Soft haptics (long travel)	✓	✓	✗
		Without haptics	✓	✗	✗
Symbol illumination	   White      Red      Without	White	✓	✓	✓
		Red	✓	✓	✓
		Without symbol illumination	✓	✗	✗
Status indicator	   Without      One LED      Three LEDs	Without status indicator	✓	✓	✓
		One red status indicator	✓	✓	✓
		Three red status indicators	✓	✗	✗



Features		Product options		Variants		
				STANDARD	DUAL CONTACT	
					NO-NO	NO/ NC-NO
TYCO Connector		Tyco 8P-1745000-3 (black)	✓	✓	✓	
		Tyco 8P-1745000-4 (grey)	✓	✓	✓	
		Without connector	✓	✗	✗	
Symbol	ISO 7000	 Customized	ISO 7000- XXXX			
			Customized symbol*			
Symbol direction	 0°	 90°	0°			
			90°			
	 180°	 270°	180°			
			270°			

### Notes

- ✗ For this variant the option is not available
- \* For customized symbols, please send us the corresponding file

# 09 Universal Switch

## Universal Switch STANDARD



### Product options

- 12V or 24V (optionally available as diagnosis-capable version with Namur contact)

### Mechanical characteristics

- Actuation force:  
approx. 4.5N (soft (long travel) haptics)  
approx. 6.5N (firm (short travel) haptics)
- Overload: 250N
- Mechanical lifetime: up to 250 000 cycles of operation

### Electrical characteristics

- Operating voltage range:  
8–18VDC (12V product option)  
18–32VDC (24V product option)
- Max. current: 50mA
- Min. current: 1mA
- Max. power: 1VA (without Namur)  
0.25VA (with Namur)
- Max. switching voltage: 32VDC
- Contact resistance:  
< 10Ω (without Namur)  
106Ω–118Ω (with Namur)

### Illumination

- LED symbol illumination
  - Colour white, luminance:  
approx. 20 cd/m<sup>2</sup>  
(conditions: 28VDC or 14VDC,  
23°C ±2K)
  - Colour red (for hazard warning light),  
luminance: approx. 90 cd/m<sup>2</sup>  
(conditions: 28VDC or 14VDC,  
23°C ±2K)
- LED status indicator
  - Colour red, luminance:  
approx. 200 cd/m<sup>2</sup>  
(28VDC or 14VDC and 23°C ±2K)

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Connections/interfaces

- Integrated plug recess,  
suitable for TE 8P-1745000-3 or  
8P-1745000-4, 8-pin

### Ambient conditions

- Operating temperature  
–40°C ... +85°C
- Storage temperature  
–40°C ... +85°C

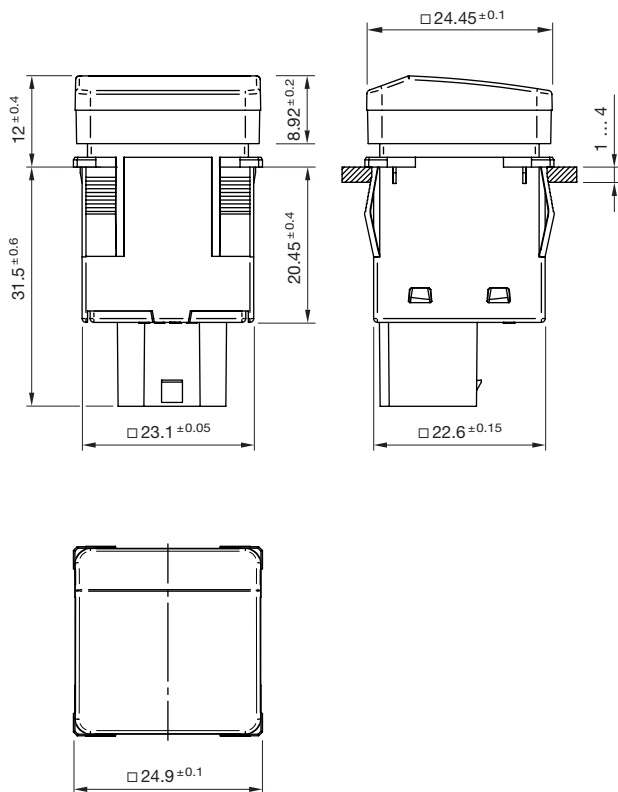
### Protection degree

- up to IP5K4 front side  
(built into a panel)
- IP20 rear side



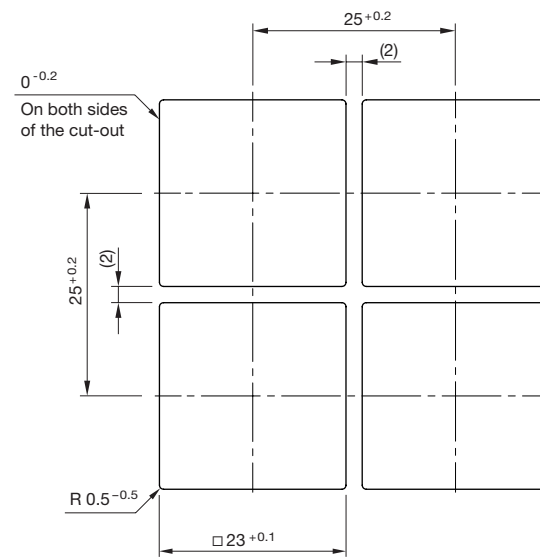
## Dimensions

(All dimensions in mm)



## Mounting cut-outs

(All dimensions in mm)



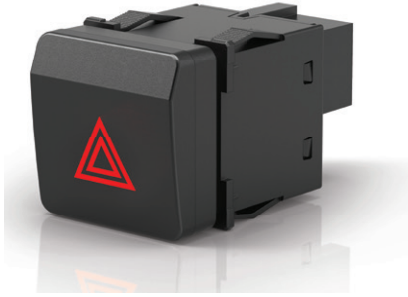
The switch can be mounted in front panel thicknesses between 2 and 4 mm. To guarantee stability and density, a plastic front panel with a material thickness of 3 mm is recommended.

Further information is provided in the corresponding operating instructions at [www.eao.com/09-universal-switch](http://www.eao.com/09-universal-switch).



# 09 Universal Switch

## Universal Switch DUAL CONTACT



### Product options

- NO/NO or NO/NC-NO (optionally available as diagnosis-capable version with Namur contact)
- 12V or 24V (optionally available as diagnosis-capable version with Namur contact)

### Mechanical characteristics

- Actuation force:  
approx. 4.5N (soft (long travel) haptics) NO/NO  
approx. 6.5N (firm (short travel) haptics) NO/NC-NO
- Overload: 250N
- Mechanical lifetime: up to 250000 cycles of operation

### Electrical characteristics

- Operating voltage range:  
8–18VDC (12V product option)  
18–32VDC (24V product option)
- Max. current: 50mA
- Min. current: 1mA
- Max. power: 1VA (without Namur)  
0.25VA (with Namur)
- Max. switching voltage: 32VDC
- Contact resistance:  
< 10Ω (without Namur)  
106Ω–118Ω (with Namur)

### Illumination

- LED symbol illumination
  - Colour white, luminance: approx. 20 cd/m<sup>2</sup> (conditions: 28VDC or 14VDC, 23°C ±2K)
  - Colour red (for hazard warning light), luminance: approx. 90 cd/m<sup>2</sup> (conditions: 28VDC or 14VDC, 23°C ±2K)
- LED status indicator
  - Colour red, luminance: approx. 200 cd/m<sup>2</sup> (28VDC or 14VDC and 23°C ±2K)

### Symbols

- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

### Connections/interfaces

- Integrated plug recess, suitable for TE 8P-1745000-3 or 8P-1745000-4, 8-pin

### Ambient conditions

- Operating temperature –40°C ... +85°C
- Storage temperature –40°C ... +85°C

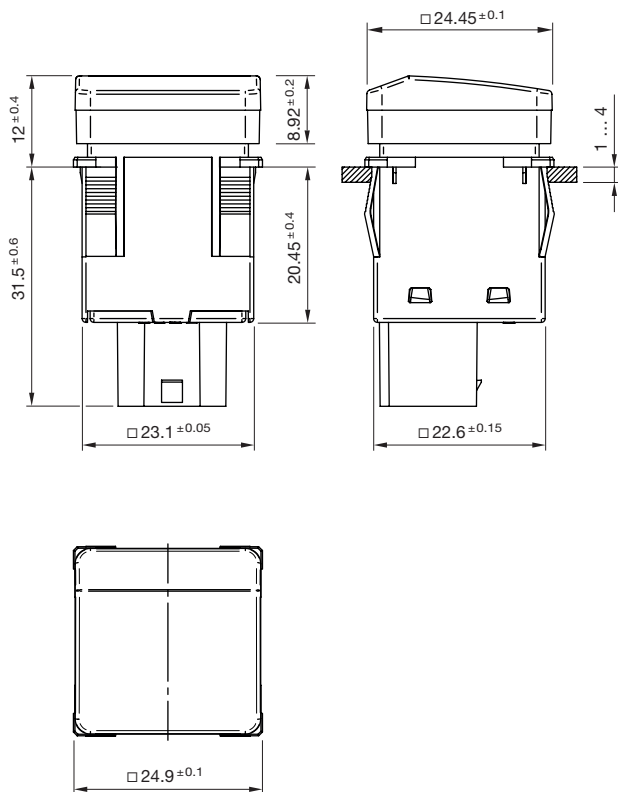
### Protection degree

- up to IP5K4 front side (built into a panel)
- IP20 rear side



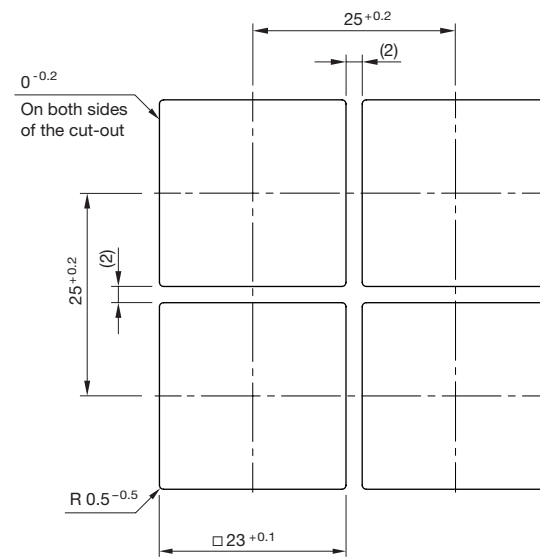
## Dimensions

(All dimensions in mm)



## Mounting cut-outs

(All dimensions in mm)



The switch can be mounted in front panel thicknesses between 2 and 4 mm. To guarantee stability and density, a plastic front panel with a material thickness of 3 mm is recommended.

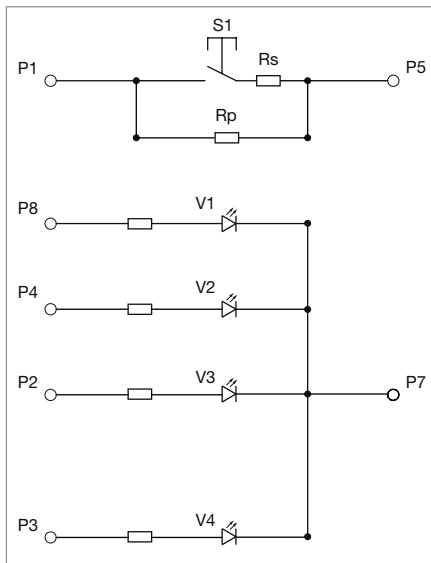
Further information is provided in the corresponding operating instructions at [www.eao.com/09-universal-switch](http://www.eao.com/09-universal-switch).



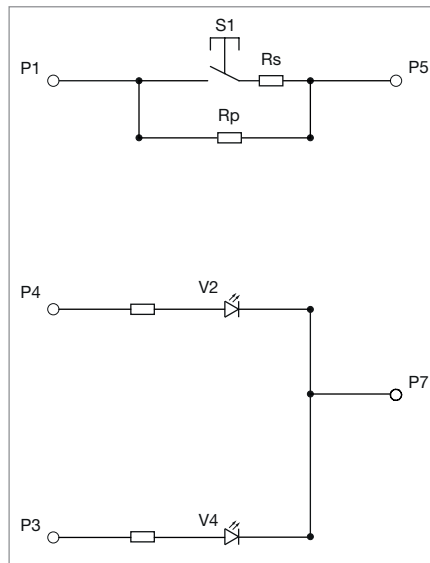
# 09 Universal Switch

## Wiring diagram

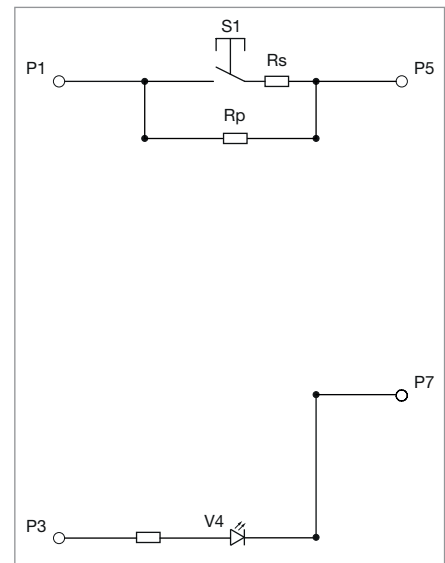
Standard (single contact) NO



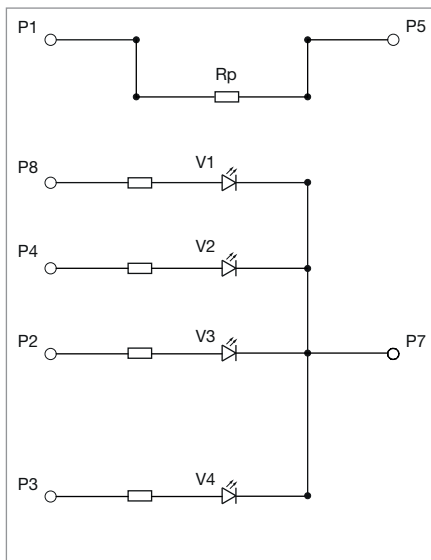
Three indicators,  
backlight and switching element  
with NAMUR circuit



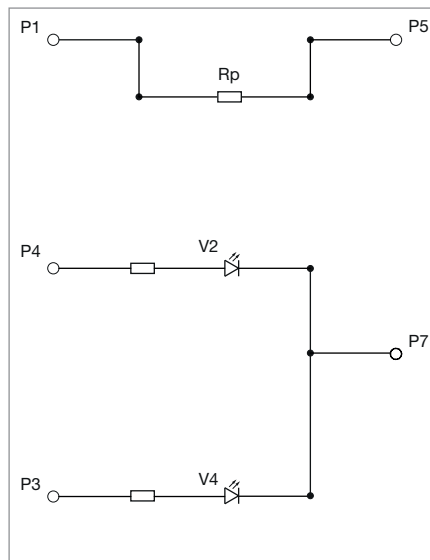
One indicator,  
backlight and switching element  
with NAMUR circuit



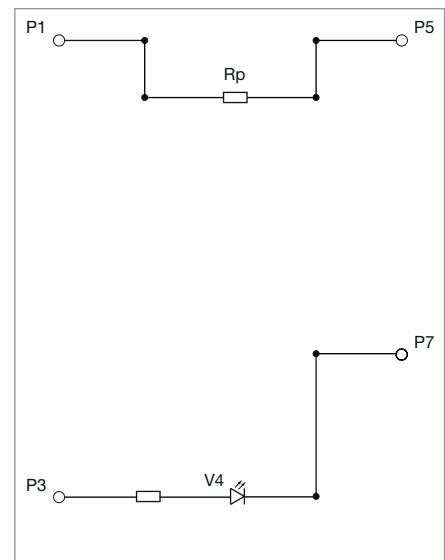
Backlight and switching element  
with NAMUR circuit



Three indicators,  
backlight with coding resistor



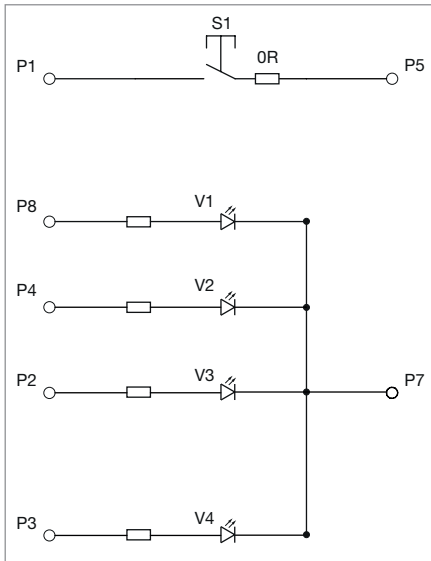
One indicator,  
backlight with coding resistor



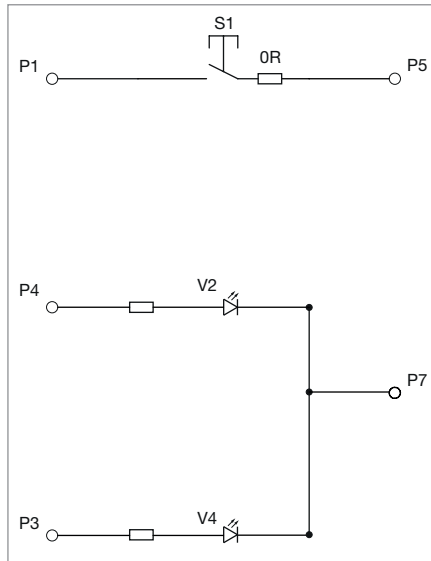
Backlight with coding resistor

## Wiring diagram

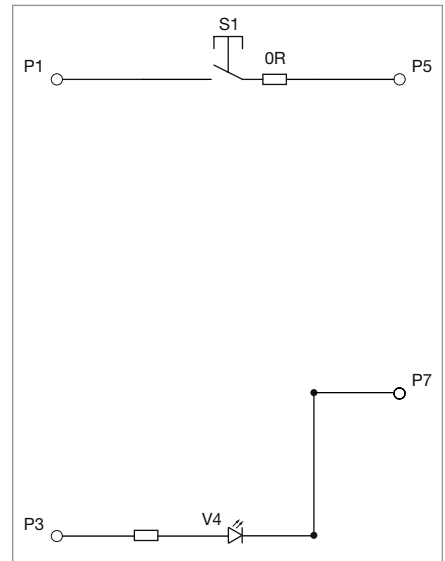
Standard (single contact) NO



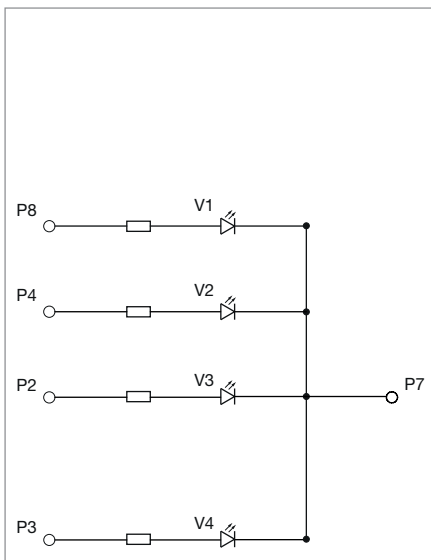
Three indicators, backlight and switching element standard



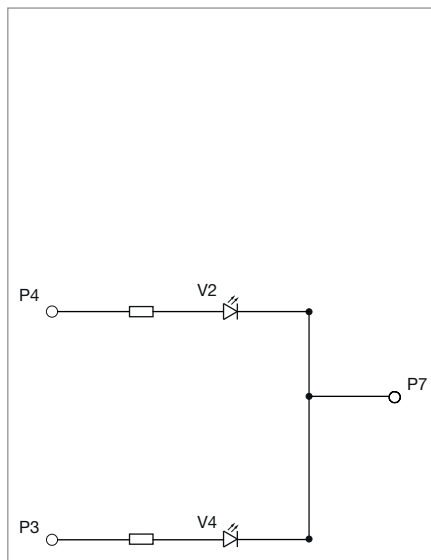
One indicator, backlight and switching element standard



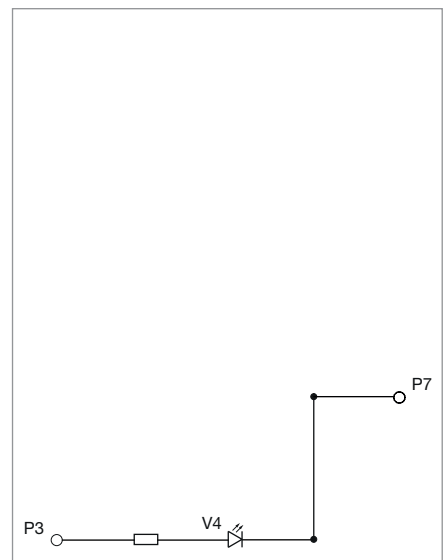
Backlight and switching element standard



Three indicators, backlight standard



One indicator, backlight standard



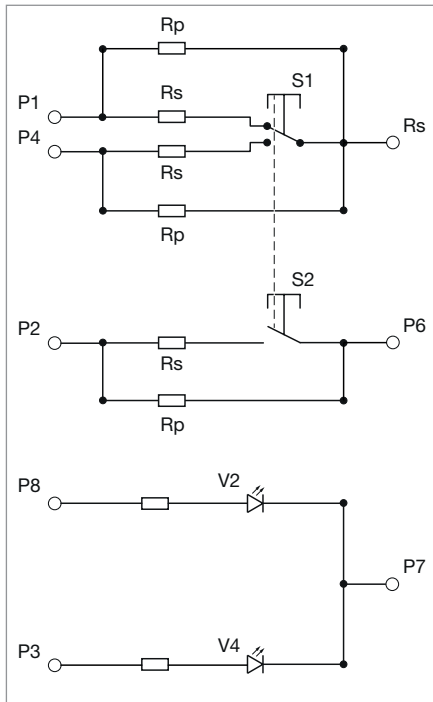
Backlight standard

- 01
- 02
- 03
- 04
- 09
- 14
- 17
- 18
- 19
- 22
- 31
- 41
- 45
- 51
- 56
- 57
- 61
- 70
- 71
- 82
- 84
- 92
- 96

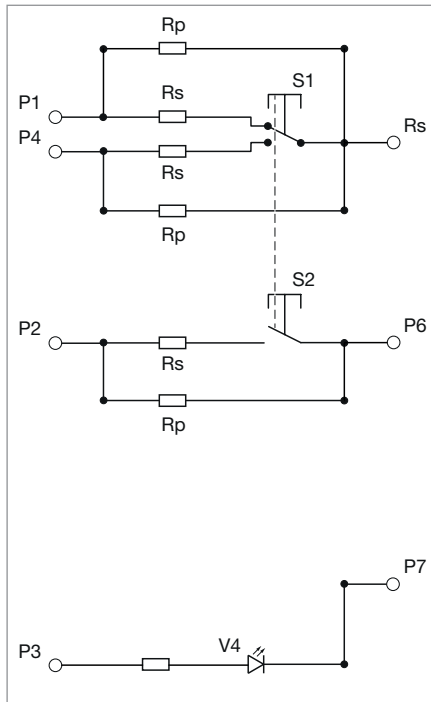
# 09 Universal Switch

## Wiring diagram

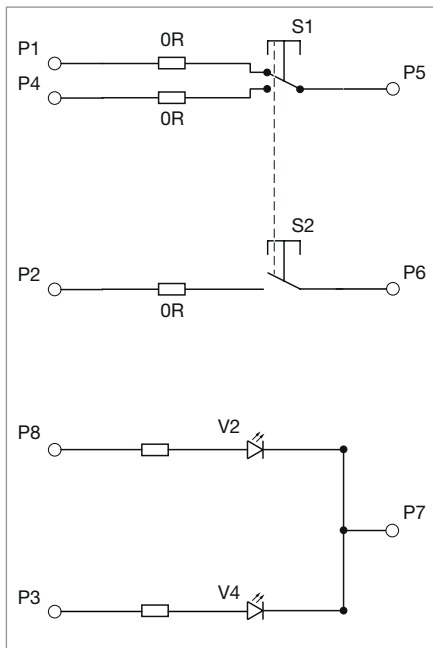
Dual contact NO/NC-NO



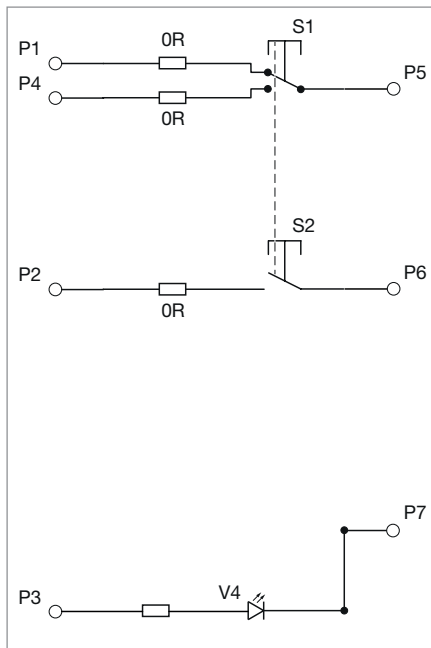
One indicator, backlight and switching elements with NAMUR circuit



Backlight and switching elements with NAMUR circuit



One indicator, backlight and switching elements without NAMUR circuit

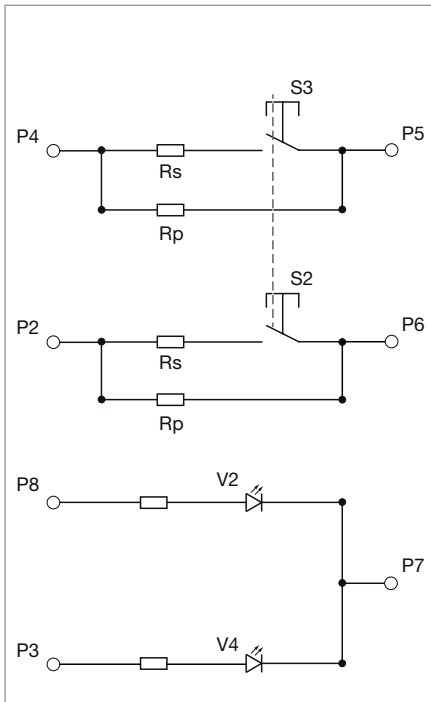


Backlight and switching elements without NAMUR circuit

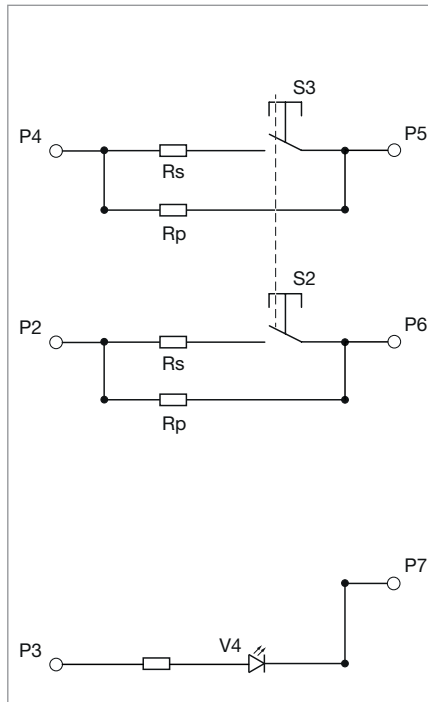


## Wiring diagram

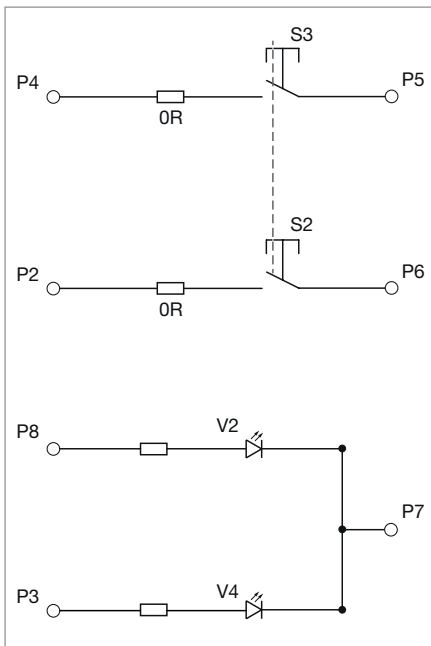
Dual contact NO/NO



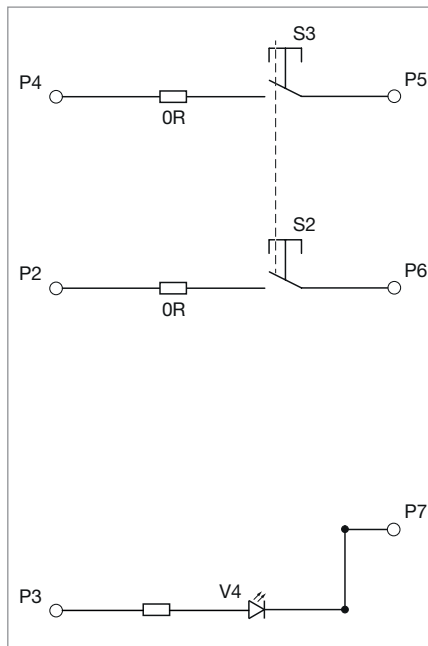
One indicator,  
backlight and switching elements  
with NAMUR circuit



Backlight and switching elements  
with NAMUR circuit



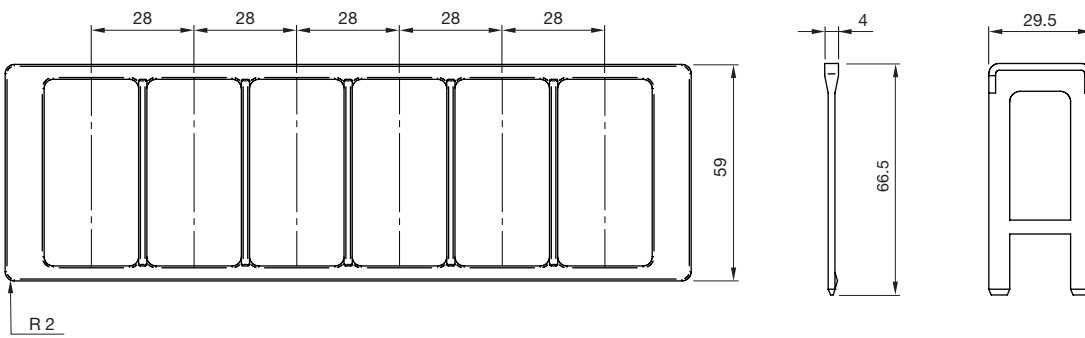
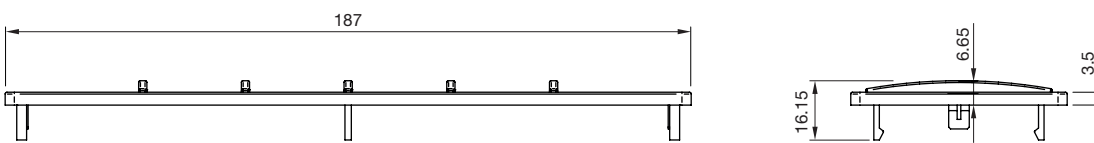
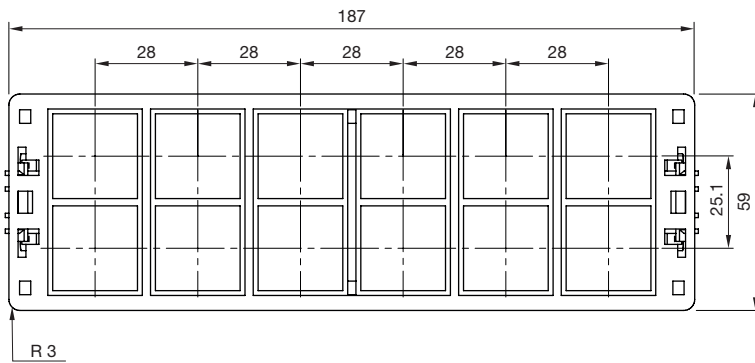
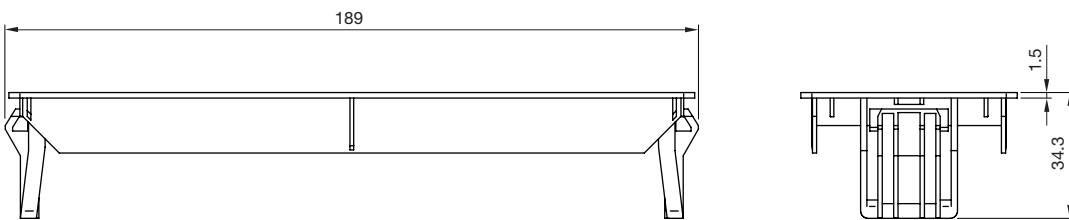
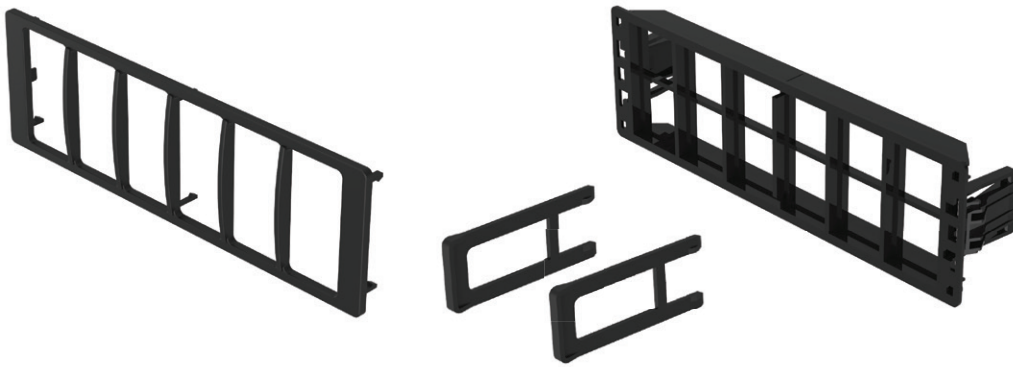
One indicator,  
backlight and switching elements  
without NAMUR circuit



Backlight and switching elements  
without NAMUR circuit

# 09 Universal Switch

## Radio slot frame



## Joystick, 1 axis with square flange

**Part No.**  
09-01.18214.0107

**Mechanical characteristics**

- Mounting  
from front of panel, 4 screws  
( $\varnothing 3.5\text{mm}$ )
- 1 axis
- No cross guidance
- No gate shape
- $20^\circ$  deflection angle
- Handle "Winter"
- Resetting  
self-resetting (medium resetting force)
- Breakout torque  
Y-axis 0.18 Nm
- Operating torque  
Y-axis 0.42 Nm
- Max. allowable torque  
Y-axis 18 Nm

**Electrical characteristics**

- Operating voltage  
5VDC
- Output signal  
proportional ( $-y = 0.5\text{V}$ /  
Mid =  $2.5\text{V}$ / $+y = 4.5\text{V}$ )
- Redundancy  
yes

**Technology**

- Hall effect sensors

**Connections**

- Minitek plug (8-pole)

**Ambient conditions**

- Operating temperature  
 $-30^\circ\text{C}$  to  $+80^\circ\text{C}$
- Storage temperature  
 $-40^\circ\text{C}$  to  $+85^\circ\text{C}$

**Degree of protection**

- IP65 front protection
- IP40 rear protection



Gate



Dimensions

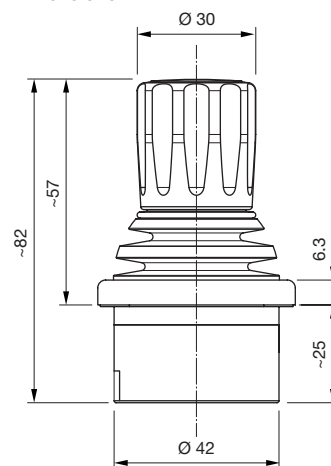
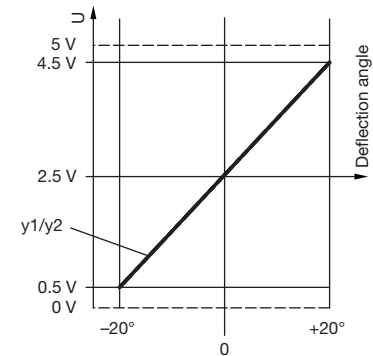
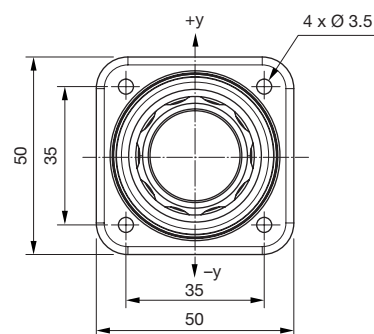


Diagram Y-axis



View from above



# 09 Joysticks

## Joystick, 3 axes with square flange.

### Part No.

09-01.32294.0109

### Mechanical characteristics

- Mounting from front of panel, four screws ( $\varnothing 3.5$  mm)
- 3 axes
- Soft cross guidance
- Gate shape square
- Deflection angle XY:  $\pm 20^\circ$  / Z:  $\pm 30^\circ$
- Handle "Winter twist"
- Resetting self-resetting (medium resetting force)
- Breakout torque X/Y-axis 0.18 Nm / Z-axis 0.075 Nm
- Operating torque X/Y-axis 0.42 Nm / Z-axis 0.18 Nm
- Max. allowable torque X/Y-axis 18 Nm / Z-axis 10 Nm

### Electrical characteristics

- Operating voltage 5 VDC
- Output signal proportional ( $-x/y/z = 0.5$  V / Mid = 2.5 V /  $+x/y/z = 4.5$  V)
- Redundancy all axes

### Technology

- Hall effect sensors

### Connections

- Minitek plug (8-pole)

### Ambient conditions

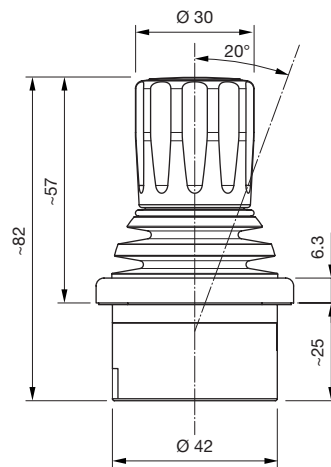
- Operating temperature  $-30^\circ\text{C}$  to  $+80^\circ\text{C}$
- Storage temperature  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$

### Degree of protection

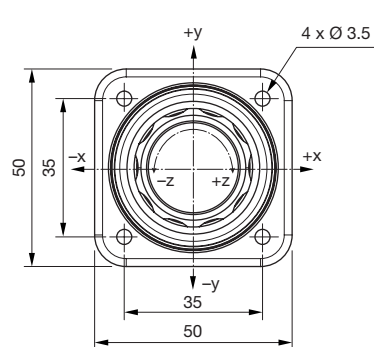
- IP65 front protection
- IP40 rear protection



Dimensions



View from above



Gate

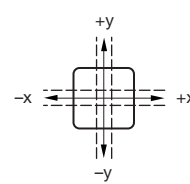


Diagram X-, Y-axis

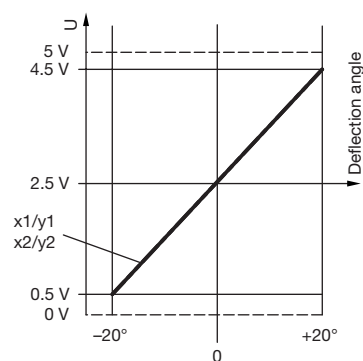
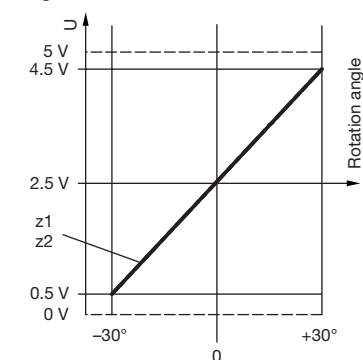


Diagram Z-axis



## Joystick, small and beautiful

### Part No.

09-01.22224.0128

### Mechanical characteristics

- Mounting  
from above, four screws ( $\varnothing$  3.5mm)
- 2 axes
- Light cross guidance
- Gate shape square
- 20° deflection angle
- Handle "Nupsi"
- Resetting  
self-resetting (medium resetting force)
- Breakout torque  
X/Y-axis 0.18Nm
- Operating torque  
X/Y-axis 0.42Nm
- Max. allowable torque  
X/Y-axis 10Nm

### Electrical characteristics

- Operating voltage  
5VDC
- Output signal  
proportional ( $-x1/y1 = 0.5V$ /average =  $2.5V$ / $+x1/y1 = 4.5V$ ) ( $-x2/y2 = 4.5V$ /average =  $2.5V$ / $+x2/y2 = 0.5V$ )
- Redundancy  
all axes

### Technology

- Hall effect sensors

### Connections

- Minitek plug (8-pole)

### Ambient conditions

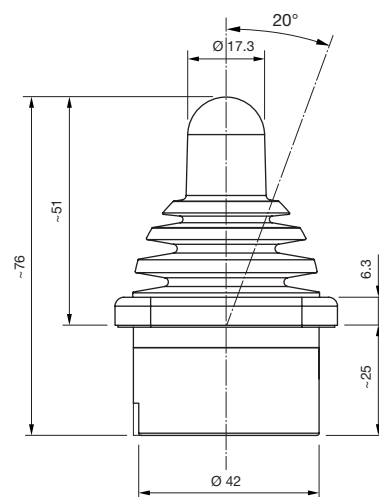
- Operating temperature  
 $-30^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$
- Storage temperature  
 $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

### Degree of protection

- IP67 front protection
- IP40 rear protection



Dimensions



Gate

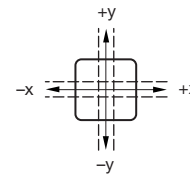
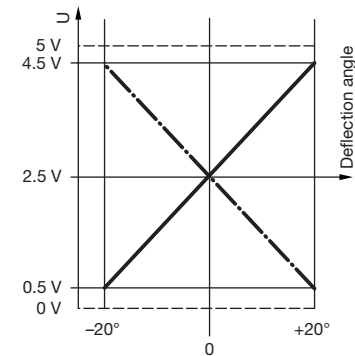
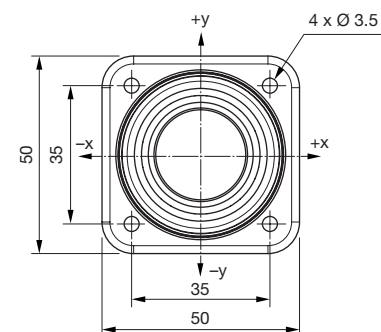


Diagram X-, Y-axis



View from above



# 09 Joysticks

## Joystick, standard with round flange

### Part No.

09-02.22244.1052

### Mechanical characteristics

- Mounting  
from rear of panel, 4 x M3 screws
- 2 axes
- Rigid cross guidance
- Gate shape square
- 20° deflection angle
- Handle "Standard"
- Resetting  
self-resetting (medium resetting force)
- Breakout torque  
X/Y-axis 0.16 Nm
- Operating torque  
X/Y-axis 0.5 Nm
- Max. allowable torque  
X/Y-axis 18 Nm

### Electrical characteristics

- Operating voltage  
max. 30VDC
- Output signal  
proportional with centre tab at  $\pm 1.75^\circ$ ,  
switch point at  $\pm 2.3^\circ$  (see diagram  
X-, Y-axis)

### Technology

- Conductive plastic with digital steps/  
control segment 1-0-1

### Connections

- Dubox plug (6- and 8-pole)

### Ambient conditions

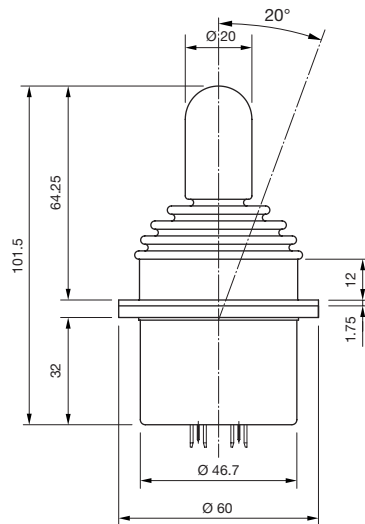
- Operating temperature  
 $-30^\circ\text{C}$  to  $+80^\circ\text{C}$
- Storage temperature  
 $-40^\circ\text{C}$  to  $+85^\circ\text{C}$

### Degree of protection

- IP67 front protection
- IP40 rear protection



Dimensions



Gate

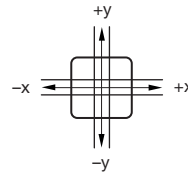
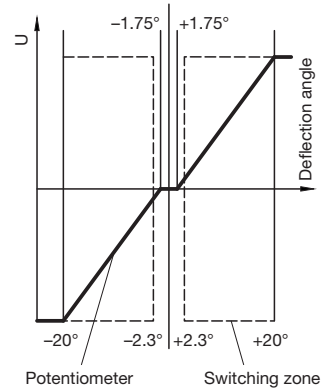
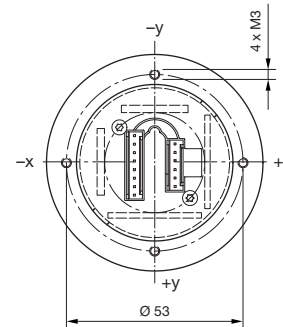


Diagram X-, Y-axis



Bottom view



## Joystick, CAN with round flange

### Part No.

09-03.23362.1051 (CANopen)

09-03.23363.1051 (J1939)

### Mechanical characteristics

- Mounting  
from rear of panel, 4 x M3 screws
- 2 axes
- Soft cross guidance
- Gate shape square
- 20° deflection angle
- Handle "Sleek"  
with two integrated buttons (red)
- Resetting  
self-resetting (strong resetting force)
- Breakout torque  
X/Y-axis 0.19 Nm
- Operating torque  
X/Y-axis 0.7 Nm
- Max. allowable torque  
X/Y-axis 18 Nm

### Electrical characteristics

- Operating voltage  
8 to 36 VDC

### Technology

- Hall effect sensors

### Connections

- Dubox plug (4-pole)

### Interfaces

- CANopen/J1939 interface

### Ambient conditions

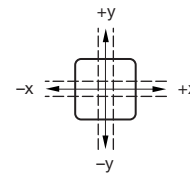
- Operating temperature  
-30 °C to +80 °C
- Storage temperature  
-40 °C to +85 °C

### Degree of protection

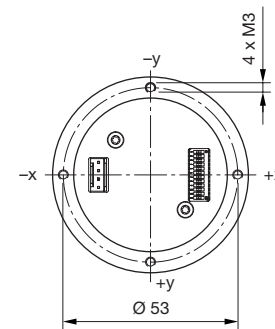
- IP64 front protection
- IP40 rear protection



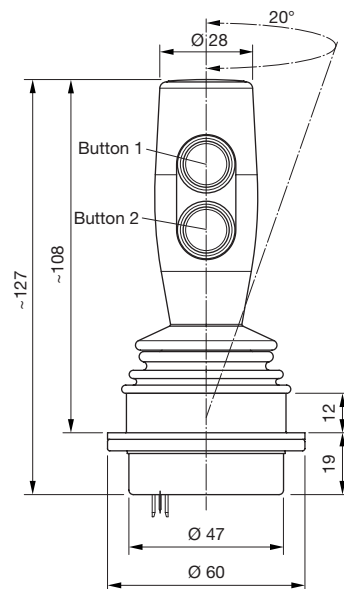
### Gate



### Bottom view



### Dimensions



# 09 Joysticks

## Joystick, CAN with 3 buttons and 1 cable

### Applications

Especially well-suited to heavy duty and special vehicles.

### Part No.

09-03.223A2.1114 (CANopen)  
09-03.223A3.1114 (J1939)

### Mechanical characteristics

- Mounting from below, 4 x M3 screws
- 2 axes
- Light cross guidance
- Gate shape square
- 15° deflection angle
- Handle "Kermit" with 3 integrated buttons (black)
- Resetting self-resetting (strong resetting force)
- Breakout torque X/Y-axis 0.63 Nm
- Operating torque X/Y-axis 1.16 Nm
- Max. allowable torque X/Y-axis 18 Nm

### Electrical characteristics

- Operating voltage 8 to 36 VDC

### Technology

- Hall effect sensors

### Connections

- PVC cable, 4 x 0.34 mm<sup>2</sup> Molex Micro-Fit (4-pole)

### Interfaces

- CANopen/ J1939 interface

### Ambient conditions

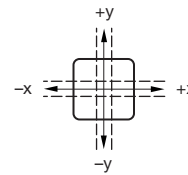
- Operating temperature -30 °C to +80 °C
- Storage temperature -40 °C to +85 °C

### Degree of protection

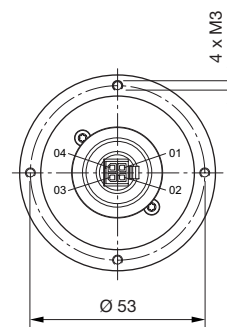
- IP65 front protection
- IP40 rear protection



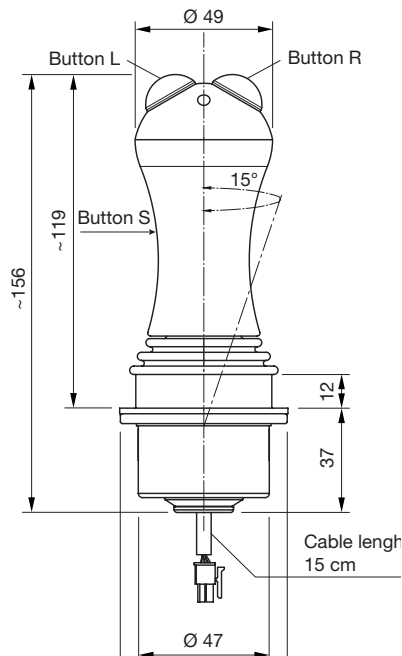
### Gate



### Bottom view



### Dimensions





## Joystick, 2 axes with 6 momentary positions each

### Applications

Especially well-suited to wireless remote control systems.

### Part No.

09-04.223E4.1112

### Mechanical characteristics

- Mounting  
from below, 4 x M3 screws
- 2 axes
- Soft cross guidance
- Gate shape square
- 20° deflection angle
- 6 momentary positions per axis
- Handle "Goblet Top" with button
- Resetting  
self-resetting (strong resetting force)
- Breakout torque  
X/Y-axis 0.19 Nm
- Operating torque  
X/Y-axis 0.7 Nm
- Max. allowable torque  
X/Y-axis 18 Nm

### Electrical characteristics

- Operating voltage  
max. 5 VDC/5 mA
- Output signal  
switching point at  $\pm 3.33^\circ$

### Technology

- Digital grid/switching segment 3-1-3

### Connections

- Dubox plug (2 and 8-pole)

### Ambient conditions

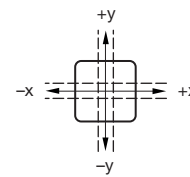
- Operating temperature  
-30 °C to +80 °C
- Storage temperature  
-40 °C to +85 °C

### Degree of protection

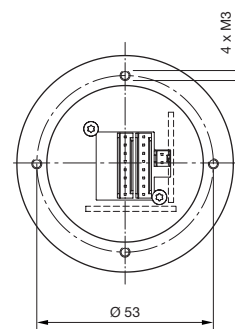
- IP65 front protection
- IP40 rear protection



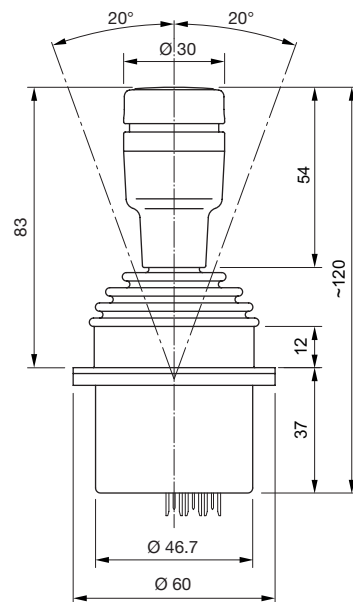
### Gate



### Bottom view



### Dimensions



# 09 Joysticks

## Joystick, drive lever with mechanical interlocking

### Part No.

09-02.174C4.1113

### Mechanical characteristics

- Mounting  
from below, 4 x M3 screws
- 1 axis
- No cross guidance
- No gate shape
- 20° deflection angle
- Handle "Central Lock"
- Resetting  
friction brake
- Unlocking force  
22 N
- Breakout torque  
0.456 Nm
- Operating torque  
0.456 Nm
- Max. allowable torque  
18 Nm

### Electrical characteristics

- Operating voltage  
max. 30VDC
- Output signal  
proportional without centre tab

### Technology

- Conductive plastic

### Connection

- Dubox plug (3-pole)

### Ambient conditions

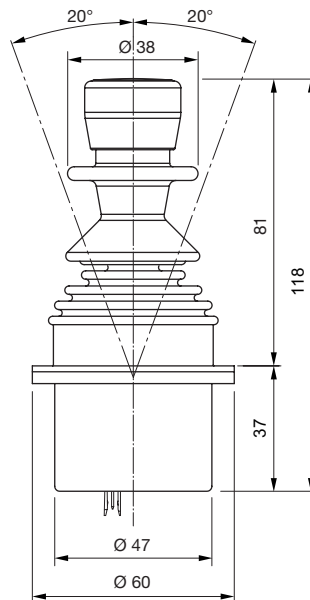
- Operating temperature  
-30 °C to +80 °C
- Storage temperature  
-40 °C to +85 °C

### Degree of protection

- IP65 front protection
- IP40 rear protection



Dimensions



Gate

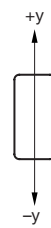
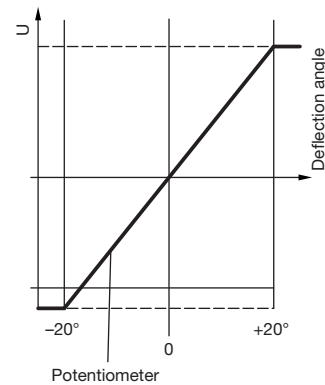
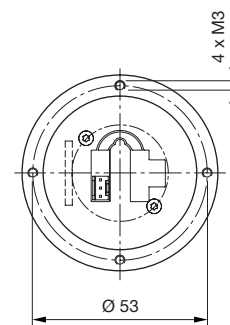


Diagram Y-axis



Bottom view



## Joystick with handle and additional buttons.

### Part No.

09-01.222Y2.0009

09-01.222Y3.0009

### Mechanical characteristics

- Mounting  
from below, 4 x  $\varnothing$  5.5 screws
- 1 or 2 axes
- Soft cross guidance
- Gate shape round
- 24° deflection angle
- Multifunction handle with 3 buttons
- Resetting  
self-resetting (strong resetting force)
- Breakout torque  
0.5 Nm
- Max. allowable torque  
60 Nm

### Electrical characteristics

- Operating voltage  
8 – 36 V
- Output signal  
CANopen/J1939

### Technology

- Hall effect sensors

### Connections

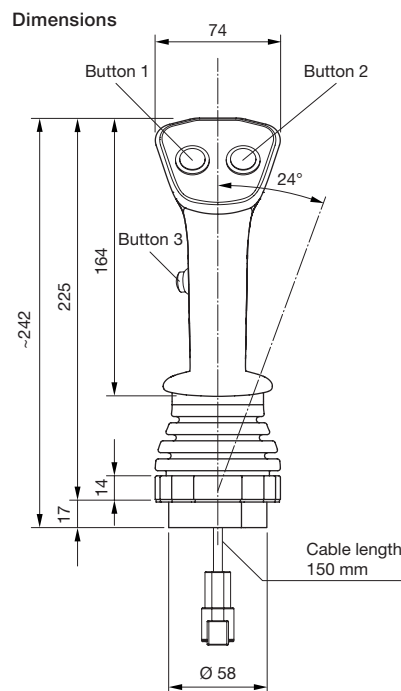
- Deutsch DTM04-4P (4-pole)

### Ambient conditions

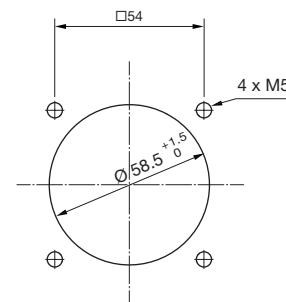
- Operating temperature  
-30 °C to +80 °C
- Storage temperature  
-40 °C to +85 °C

### Protection degree

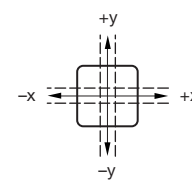
- IP65 front side



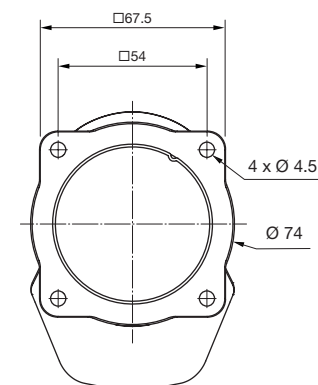
### Mounting cut-out



### Gate



### View from bottom



All dimensions in mm.

## Fingertip joystick

### Part No.

09-03.22204.0010

### Mechanical characteristics

- Mounting  
from below, 4 x Ø 2.7 screws
- 1 or 2 axes
- Soft or rigid guidance
- Gate shape round
- 25° deflection angle
- Handle "thumb tower"
- Resetting  
self-resetting (medium resetting force)
- Operating torque  
0.026 Nm
- Max. allowable torque  
4 Nm

### Electrical characteristics

- Operating voltage  
5 VDC
- Output signal  
0.5–4.5 V linear, redundant

### Technology

- Hall effect sensors

### Connections

- Connector JST EHR (6-Pol)  
length 80 mm

### Ambient conditions

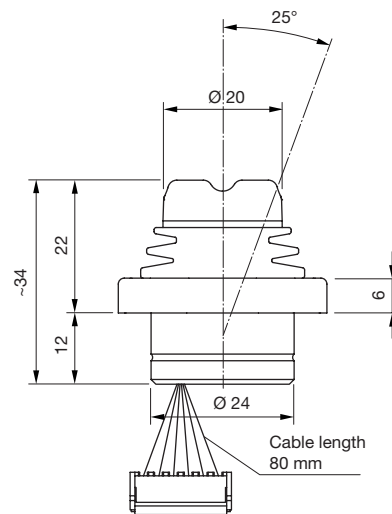
- Operating temperature  
–30 °C to +80 °C
- Storage temperature  
–40 °C to +85 °C

### Protection degree

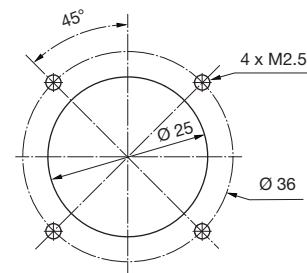
- IP65 front side



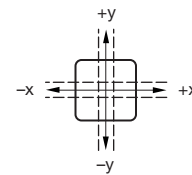
### Dimensions



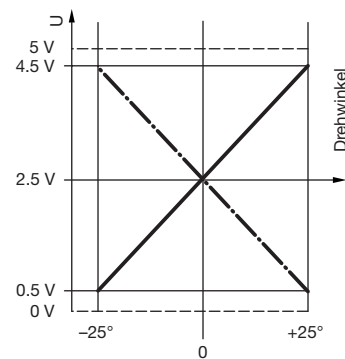
### Mounting cut-out



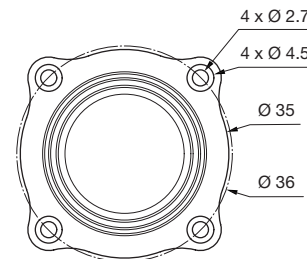
### Gate



### Diagram X-, Y-axis



### View from bottom



All dimensions in mm.

## Toggle stick, 4 directions with momentary position

### Applications

The toggle stick (4 directions with momentary position, lock-able) is suitable for various applications.

### Part No.

Please see Series 45

### Mechanical characteristics

- Mounting  
Ø 22.3 mm, raised
- 2 axes
- Rigid cross guidance
- 35° deflection angle
- Mechanical service life  
up to 250 000 switching cycles
- Connection  
screw terminal

### Electrical characteristics

- Operating voltage  
5 to 500 V
- Output signal  
AC15: 6A/24 V to 1.4A/500 V
- Contact material  
silver

### Ambient conditions

- Operating temperature  
-25 °C to +70 °C
- Storage temperature  
-40 °C to +85 °C

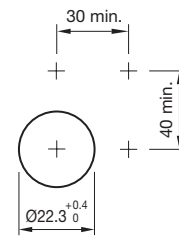
### Degree of protection

- IP65, IP67 front protection
- IP20 or IP40 rear protection

Configure your product in a few steps at [eao.com/products](http://eao.com/products).

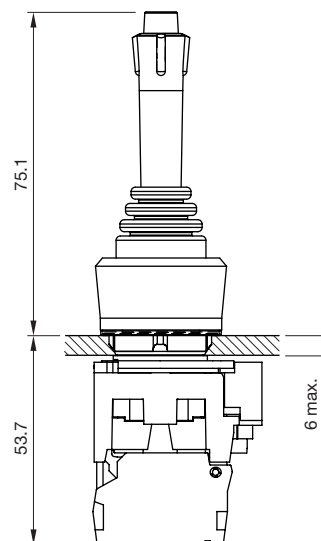


### Mounting cut-outs



All dimensions in mm.

### Dimensions



# 09 Joysticks

## Lever switch, 8 positions

### Applications

The lever switch (2, 4 or 8 positions) is suitable for various applications.

### Part No.

44-800.2  
44-800.4  
44-800.8

### Mechanical characteristics

- Mounting  
Ø 22.3 mm, raised
- 2 axes
- Soft cross guidance, pulse
- 12° deflection angle
- Mechanical service life  
up to 1.2 million switching cycles
- Connection  
soldering terminal

### Electrical characteristics

- Operating voltage  
250 VAC
- Output signal  
5A/4 NC + 4 NO
- Contact material  
gold-plated silver alloy

### Ambient conditions

- Operating temperature  
-30 °C to +80 °C
- Storage temperature  
-40 °C to +85 °C

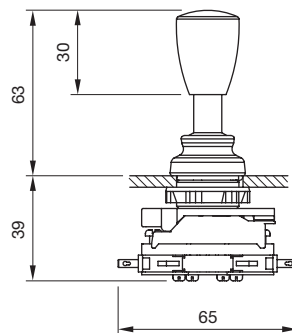
### Degree of protection

- IP65 front protection
- IP20, IP40 rear protection

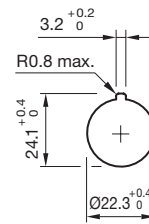
A choice of three lever switches can be found at [eao.com/products](http://eao.com/products).



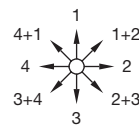
### Dimensions



### Mounting cut-outs



### Wiring diagram



All dimensions in mm.



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