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

- 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

- Rugged Keypad

Degree of protection

- 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

- 8-32 VDC

Standards

- 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

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

Functions

- Joystick
- Koordinatenschalter

Design

- Flush
- Raised

Degree of protection

- IP40 (rear side)
- IP65 (front side)
- IP67 (front side)

Operating voltage

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

Terminal

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

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
PREMIUM 	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 *
SUPER 	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
PLUS 	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
BASIC 	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
SUPER 	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
PLUS 	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
BASIC 	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

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 vechicle 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)

Rotary Cursor Controller and Rotary Push Button

Depending on the intended use, the Series 09 Rotary Pushbuttons are divided into two product lines. While the RPB (Rotary pushbutton) product offers the functions of rotary selection and pushbutton selection, the RCC (Rotary Cursor Controller) is also equipped with a tilting function in the X/Y direction.

This enables full control over the cursor, which is ideal for use as a display controller or for navigation in user menus. Both the RPB and RCC are available in the SUPER version with RGB illumination and the PLUS version with Red illumination.

Product	Variant	Symbol illumination	Halo-ring illumination	Communication protocol	Switching element	IP protection class	Plug	Switching function
RCC 2PB 	SUPER	White LED	RGB	CANopen, J1939	Electrical mechanical switching element	IP5K4	TYCO 1745000-3/ 1745000-4	Pushbutton: Push RCC: Rotate/ Push/Tilt
RCC 2PB 	PLUS	White LED	Red LED (other colours on request)	CANopen, J1939	Electrical mechanical switching element	IP5K4	TYCO 1745000-3/ 1745000-4	Pushbutton: Push RCC: Rotate/ Push/Tilt
RPB 2PB 	SUPER	White LED	RGB	CANopen, J1939	Electrical mechanical switching element	IP5K4	TYCO 1745000-3/ 1745000-4	Pushbutton: Push RPB: Rotate/ Push
RPB 2PB 	PLUS	White LED	Red LED (other colours on request)	CANopen, J1939	Electrical mechanical switching element	IP5K4	TYCO 1745000-3/ 1745000-4	Pushbutton: Push RPB: Rotate/ Push

09 Numbering structure

Part number structure Rugged Keypads Modules

Part No. module (12 digits)

09 – □ □ □ . □ □ □ □

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

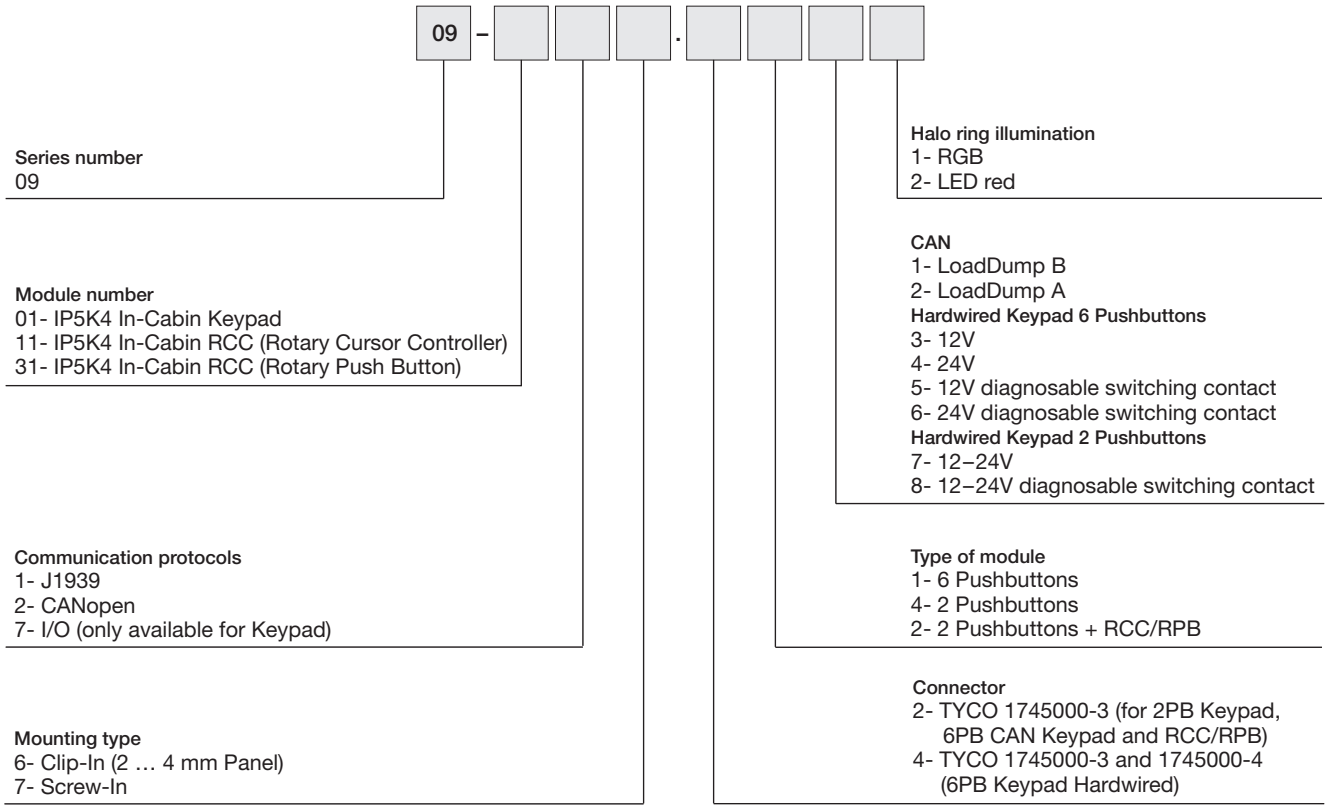
Type of module
1- 6 Pushbuttons
2- 2 Pushbuttons + RCC *
(rotation + push + proportional Joystick)
3- 8 Pushbuttons

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

* available at a later date

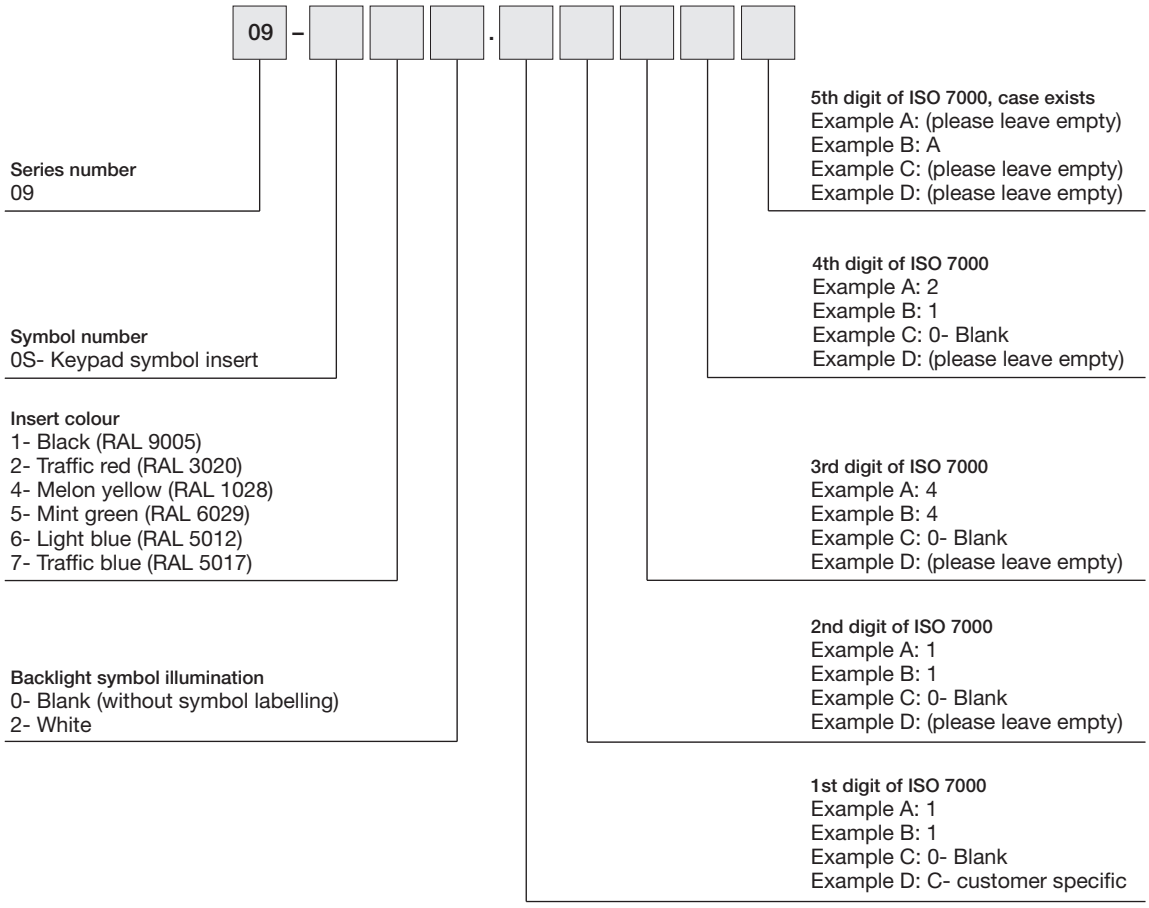
Part number structure In-Cabin Keypads Modules

Part No. module (12 digits)



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/m² (dimmable)
- LED halo ring illumination with four freely configurable segments
  – Multi-colour: RGB LED
  – Luminance: approx. 1 500 cd/m² (dimmable)
- Illumination functions: steady lighting, flashing, pulses, rotations, colour changes
  – Halo and symbol illumination can be configured individually

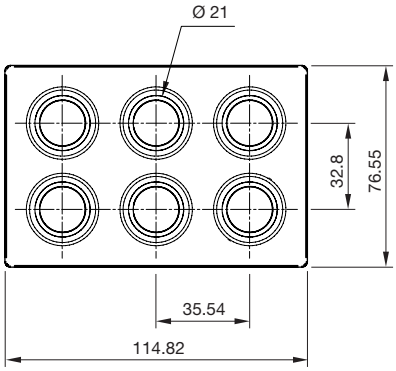
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Interfaces
- CAN interface (ISO 11898)
- 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

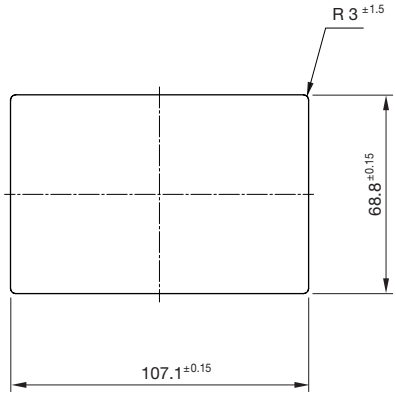
Ambient conditions
- Operating temperature –40 °C … +85 °C
- Storage temperature: –40 °C … +85 °C

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

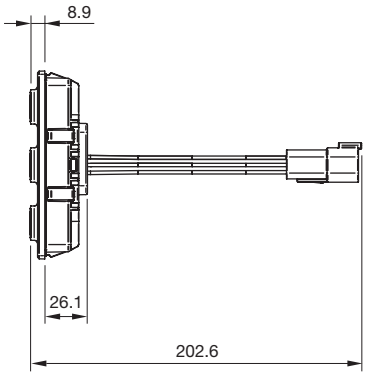
Dimensions
(All dimensions in mm)



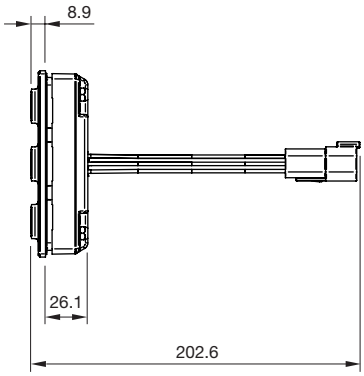
Mounting cut-out
(Front plate thickness 1.0 mm … 4.0 mm) *2



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.

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/m², dimmable
- LED halo ring illumination with four freely configurable segments
  – Multi-colour: RGB
  – Luminance: approx. 1 500 cd/m² dimmable
- Illumination functions: steady lighting, flashing, pulses, rotations, colour changes
  – Halo and symbol illumination can be configured individually

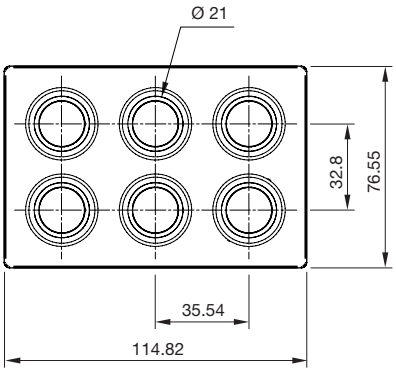
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

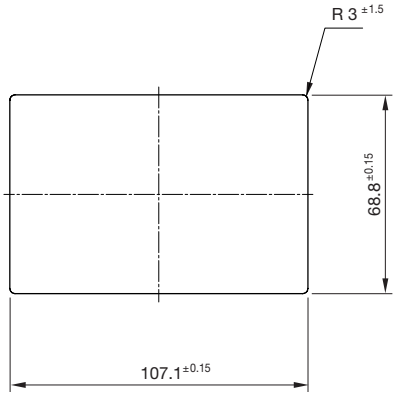
Ambient conditions
- Operating temperature: –40 °C … +85 °C
- Storage temperature: –40 °C … +85 °C

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

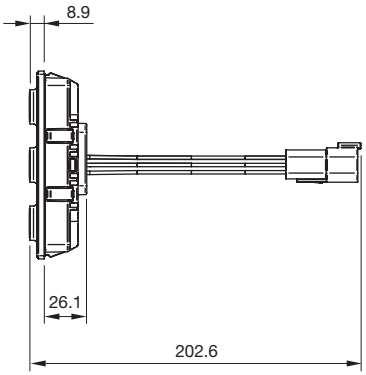
Dimensions
(All dimensions in mm)



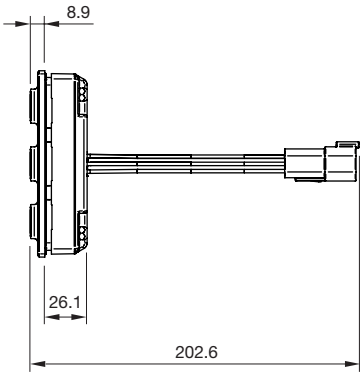
Mounting cut-out
(Front plate thickness 1.0 mm … 4.0 mm) *



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/m², (dimmable)
- LED halo ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 750 cd/m² (dimmable)
- Illumination functions: lighting, flashing, pulses
  - Halo and symbol illumination can be configured individually

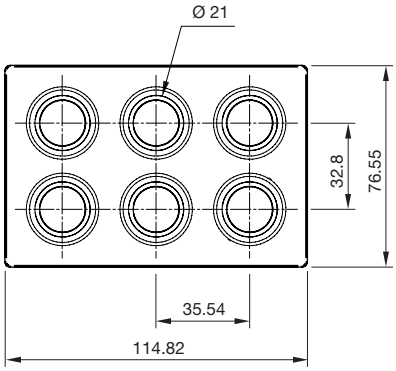
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

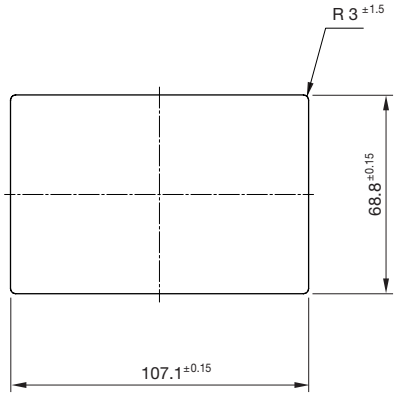
Ambient conditions
- Operating temperature: –40 °C … +85 °C
- Storage temperature: –40 °C … +85 °C

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

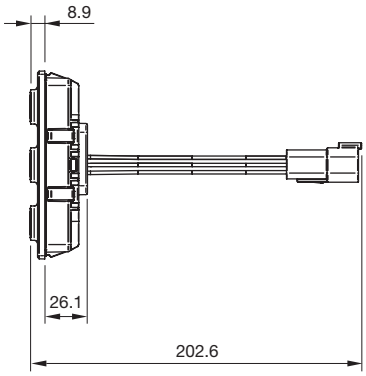
Dimensions
(All dimensions in mm)



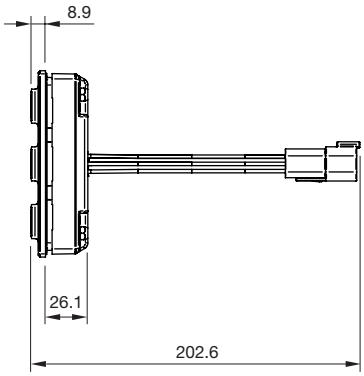
Mounting cut-out
(Front plate thickness 1.0 mm … 4.0 mm) *



Mounting
Clip-in mounting



Screw-in mounting



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

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/m², (dimmable)
- LED halo ring illumination
  - – Colour: red (other colours on request)
  - – Luminance: approx. 750 cd/m²
- Illumination functions
  - – Halo and symbol illumination can be configured individually

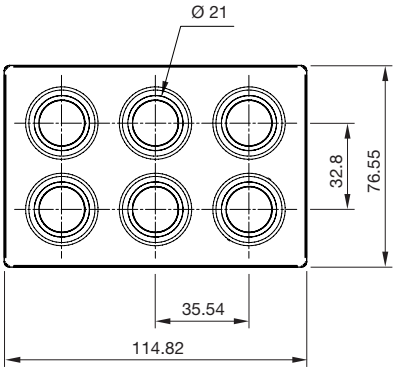
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Interfaces
- Connector: Würth Elektronik WR-MPC3, 16 Pins

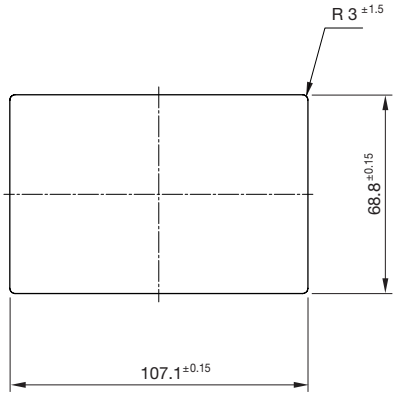
Ambient conditions
- Operating temperature: –40 °C … +85 °C
- Storage temperature: –40 °C … +85 °C

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)

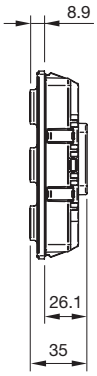
Dimensions
(All dimensions in mm)



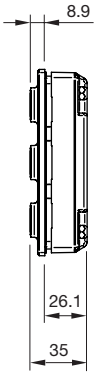
Mounting cut-out
(Front plate thickness 1.0 mm … 4.0 mm) *



Mounting
Clip-in mounting



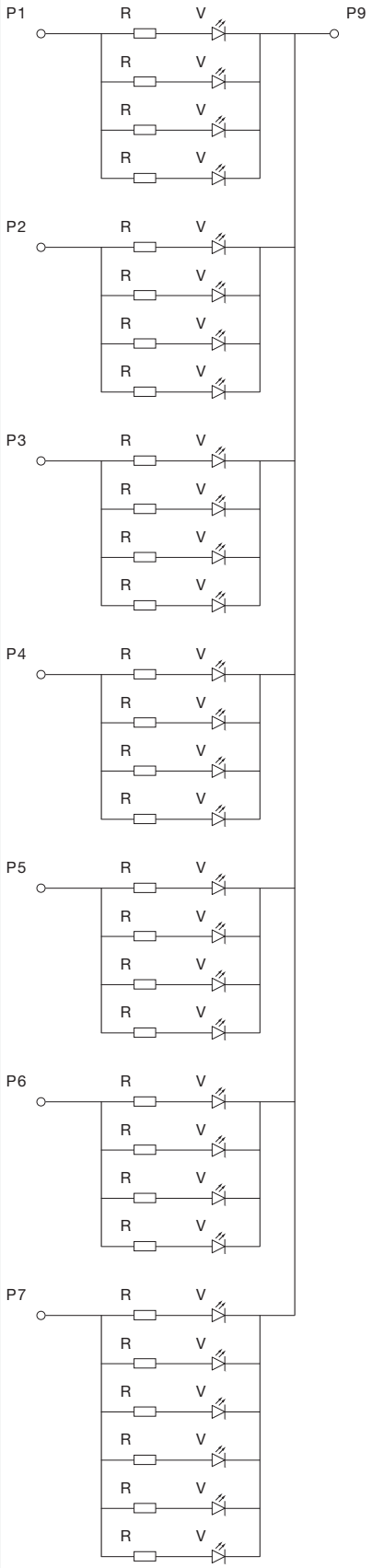
Screw-in mounting

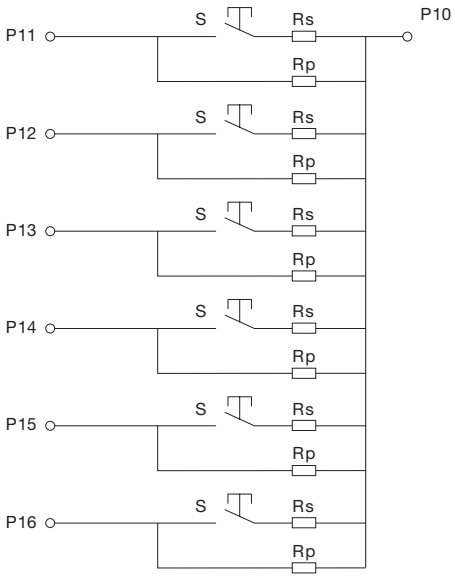


* For vibration-proof mounting, a front plate of at least 2 mm thickness is recommended.

Wiring diagram, connector

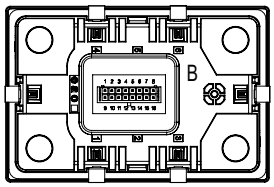
Wiring diagram

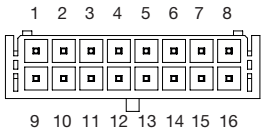




Rs = 0 Ω as standard
Rp = tbd

Connector





Connections WR-MPC3
Mating plug Molex 430251600
Matching contacts 43030-0007

Pin No.	Signal	Comment
Pin 1	Supply voltage haloring	12 VDC / 24 VDC
Pin 2	Supply voltage haloring	12 VDC / 24 VDC
Pin 3	Supply voltage haloring	12 VDC / 24 VDC
Pin 4	Supply voltage haloring	12 VDC / 24 VDC
Pin 5	Supply voltage haloring	12 VDC / 24 VDC
Pin 6	Supply voltage haloring	12 VDC / 24 VDC
Pin 7	Supply voltage symbol	12 VDC / 24 VDC
Pin 8	n. c.	
Pin 9	GND lighting	
Pin 10	Common potential buttons	
Pin 11	Signal button 1	max. current 30 mA
Pin 12	Signal button 2	max. current 30 mA
Pin 13	Signal button 3	max. current 30 mA
Pin 14	Signal button 4	max. current 30 mA
Pin 15	Signal button 5	max. current 30 mA
Pin 16	Signal button 6	max. current 30 mA

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/m² (dimmable)
- LED halo ring illumination with four freely configurable segments
  – Multi-colour: RGB
  – Luminance: approx. 1 500 cd/m² (dimmable)
- Illumination functions: steady lighting, flashing, pulses, rotations, colour changes
  – Halo and symbol illumination can be configured individually

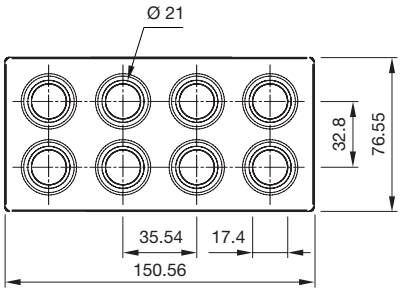
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

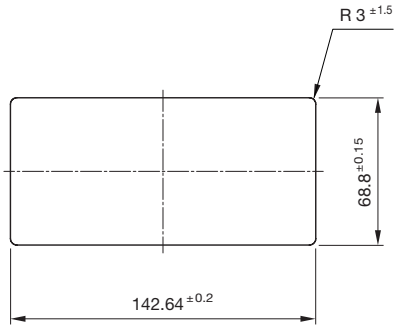
Ambient conditions
- Operating temperature: –40 °C … +85 °C
- Storage temperature: –40 °C … +85 °C

Protection degree
- IP6K9K according to ISO 20653 *1
- Up to IP6K9 (panel/screw-in version)
- Up to IP5K4 (panel/clip-in version)

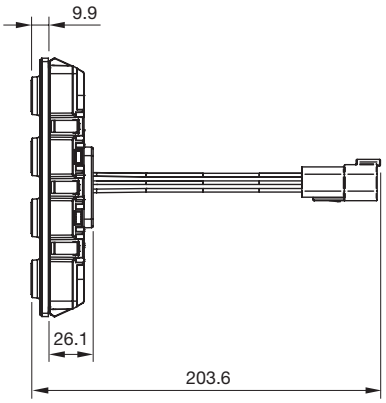
Dimensions
(All dimensions in mm)



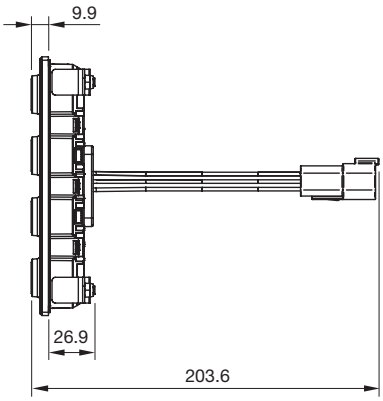
Mounting cut-out
(Front plate thickness 1.0 mm … 4.0 mm) *2



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.

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/m², (dimmable)
- LED halo ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 750 cd/m² (dimmable)
- Illumination functions: lighting, flashing, pulses
  - Halo and symbol illumination can be configured individually

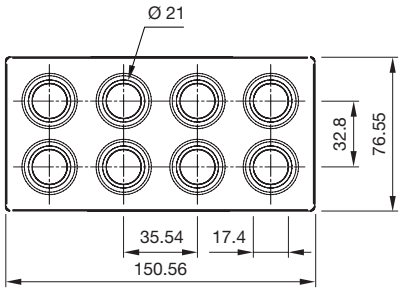
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

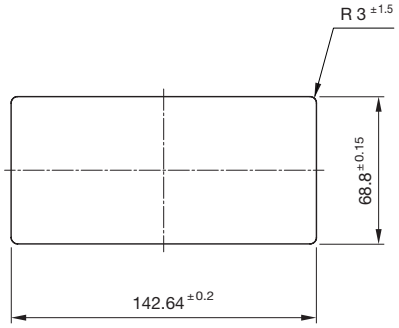
Ambient conditions
- Operating temperature: –40 °C … +85 °C
- Storage temperature: –40 °C … +85 °C

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

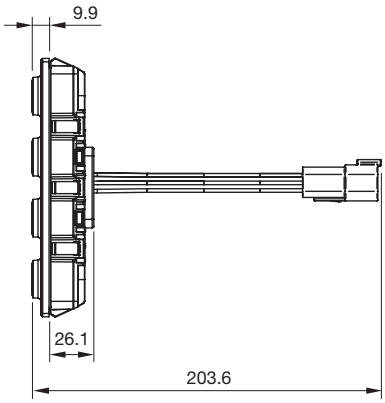
Dimensions
(All dimensions in mm)



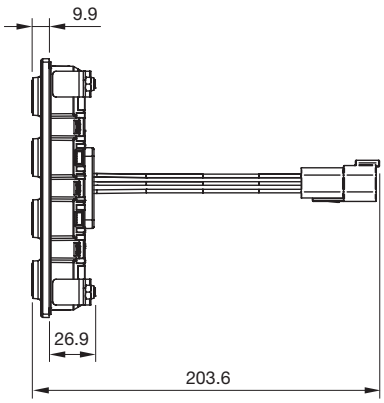
Mounting cut-out
(Front plate thickness 1.0 mm … 4.0 mm) *2



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.

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
- 8–18 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/m², (dimmable)
- LED halo ring illumination
  - Colour: red (other colours on request)
  - Luminance: approx. 750 cd/m²
- Illumination functions
  - Halo and symbol illumination can be configured individually

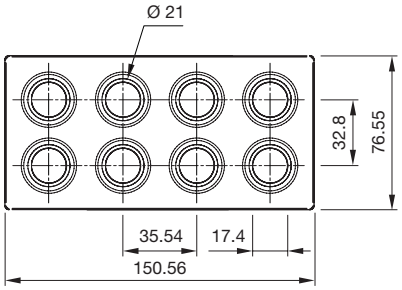
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

Interfaces
- Connector: Würth Elektronik WR-MPC3, 20 Pins

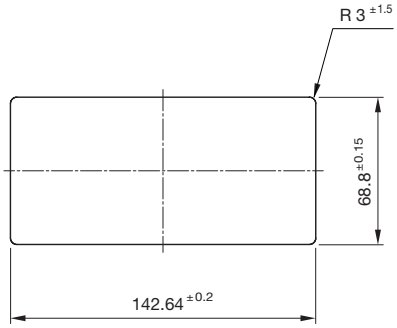
Ambient conditions
- Operating temperature: –40 °C … +85 °C
- Storage temperature: –40 °C … +85 °C

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)

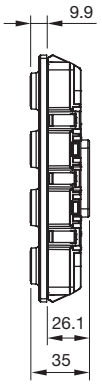
Dimensions
(All dimensions in mm)



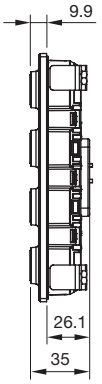
Mounting cut-out
(Front plate thickness 1.0 mm … 4.0 mm) *



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.

Accessories

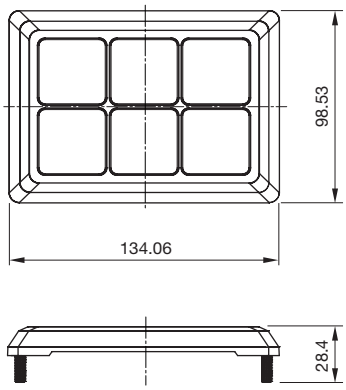
Protective shroud

Part No.

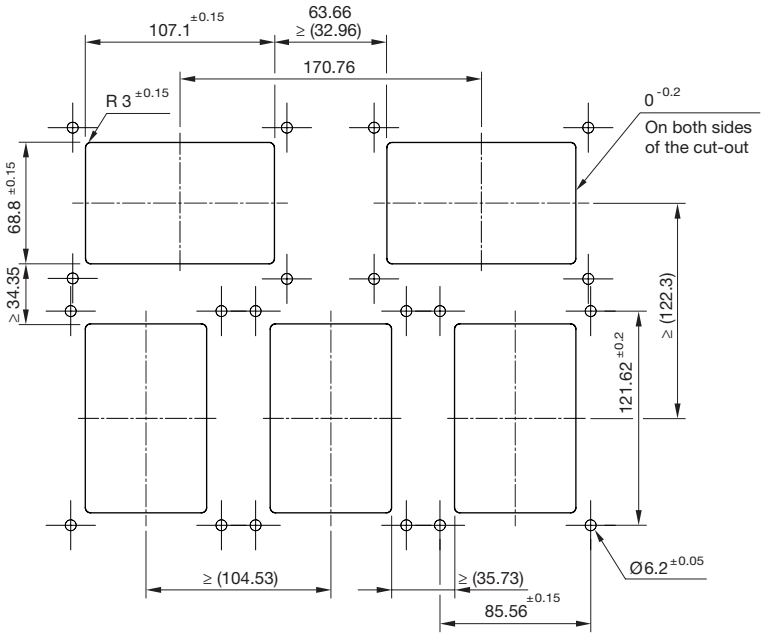
09-0A00.0100	Protective shroud for Rugged Keypad 6PB
09-0A00.0300	Protective shroud for Rugged Keypad 8PB

Dimensions Keypad 6PB

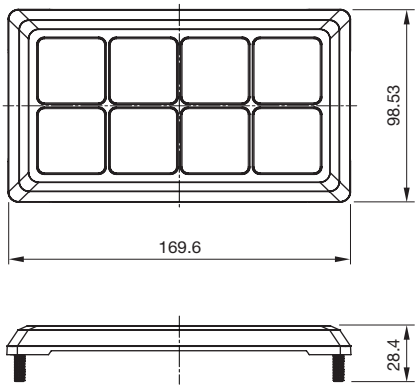
(All dimensions in mm)



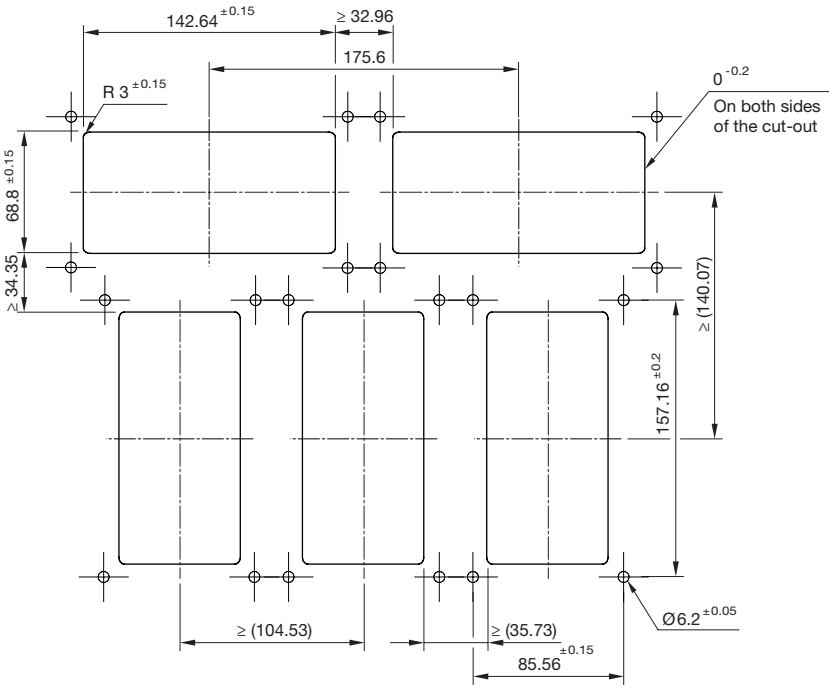
Mounting cut-out Keypad 6PB



Dimensions Keypad 8 PB
(All dimensions in mm)



Mounting cut-out Keypad 8 PB



6-pushbutton Keypad SUPER

Mechanical characteristics
- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 1 million 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/m² (dimmable)
- LED halo-ring illumination
  – Colour: multi-colour RGB
  – Luminance: approx. 500 cd/m² (dimmable*)

*depending on the respective colour

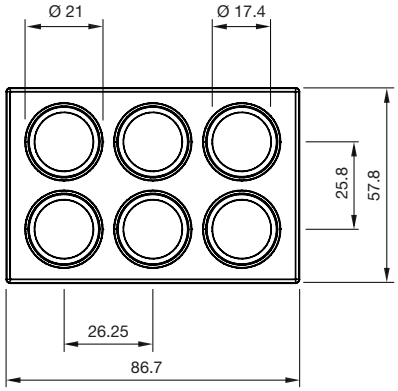
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

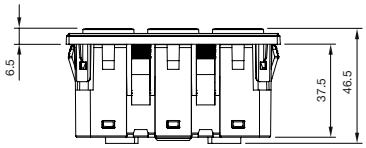
Protection degree
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

Ambient conditions
- Operating temperature –40 °C … +85 °C
- Storage temperature –40 °C … +85 °C

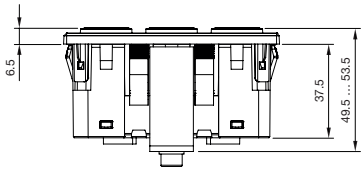
Dimensions
(All dimensions in mm)



Mounting
Clip-in mounting

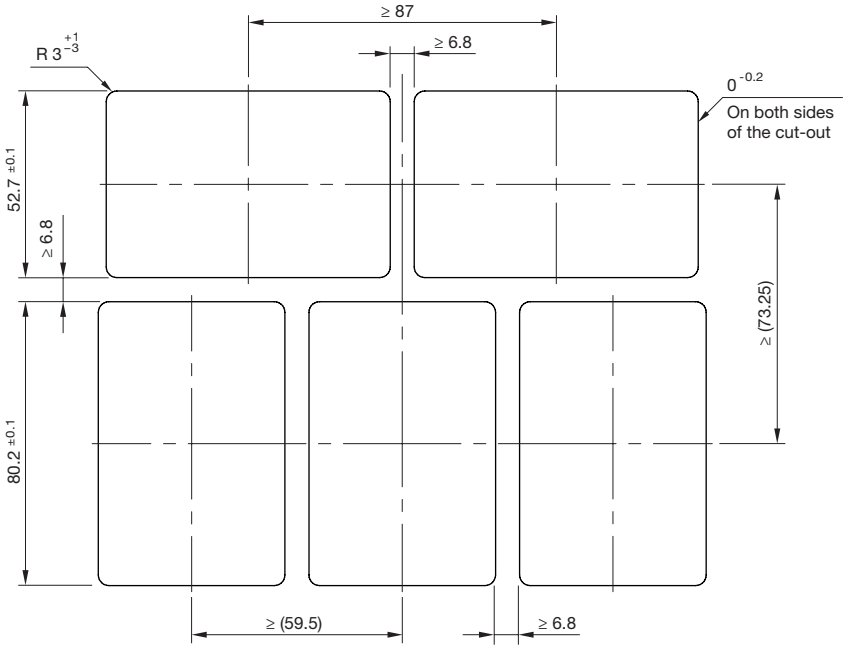


Screw-in mounting



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)



6-pushbutton Keypad PLUS

Mechanical characteristics
- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 1 million 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/m² (dimmable)
- LED halo-ring illumination
  – Colour: red (other colours on request)
  – Luminance: approx. 500 cd/m² (dimmable)

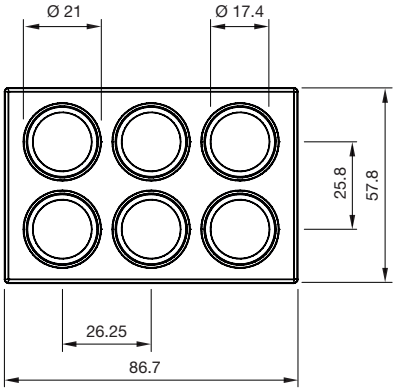
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

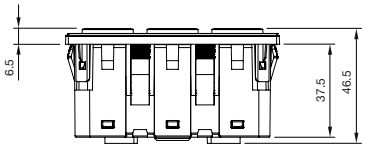
Protection degree
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

Ambient conditions
- Operating temperature –40 °C … +85 °C
- Storage temperature –40 °C … +85 °C

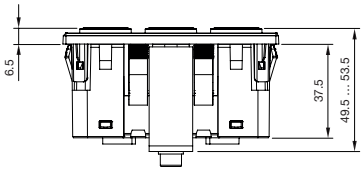
Dimensions
(All dimensions in mm)



Mounting
Clip-in mounting

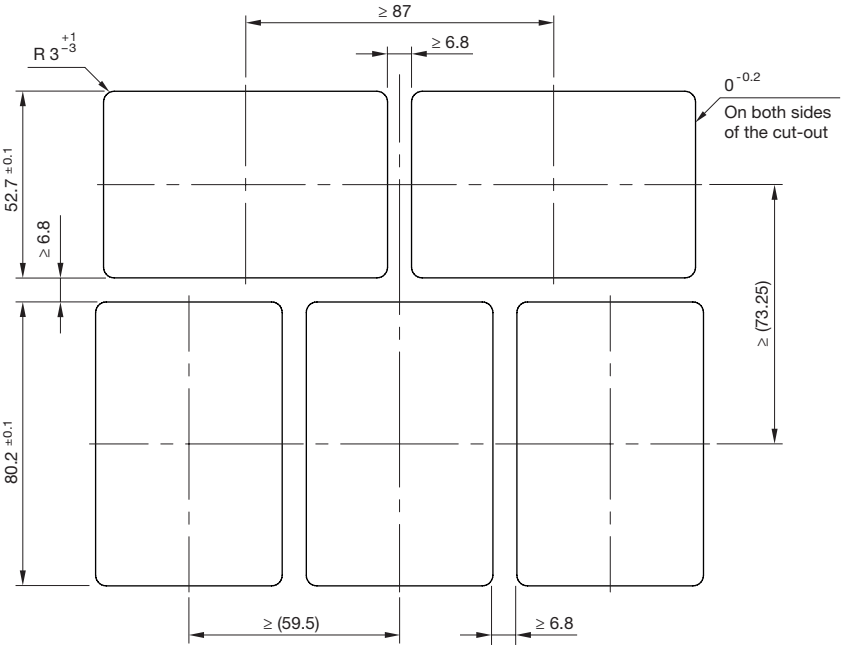


Screw-in mounting



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)



6-pushbutton Keypad BASIC

Mechanical characteristics
- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 1 million cycles of operation
- Impact resistance: IEC 62262 IK07

Electrical characteristics
- Operating voltage range:
  8 – 18 VDC or 18 – 32 VDC
  Operating voltage of illumination for use in 12 V or 24 V 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 MΩ (without NAMUR)
  1 kΩ ± 4 % (with NAMUR)
- Contact resistance (actuated):
  < 10 Ω (without NAMUR)
  110 Ω ± 10 Ω (with NAMUR)

Illumination
- Halo-ring and symbol illumination can be configured independently of one another

LED symbol illumination
- – Colour: white
- – Luminance: approx. 20 cd/m² (dimmable)

- LED halo-ring illumination
- – Colour: red (other colours on request)
- – Luminance: approx. 500 cd/m² (dimmable)

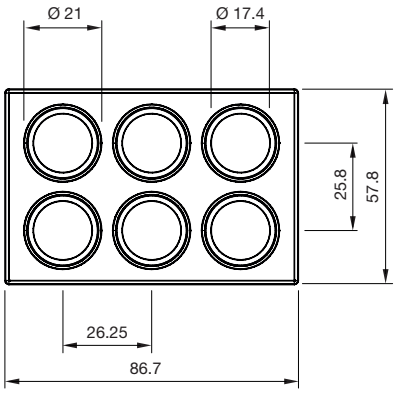
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

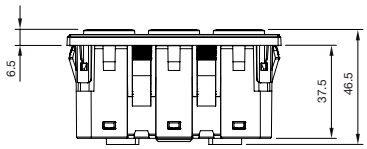
Protection degree
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

Ambient conditions
- Operating temperature
  –40 °C … +85 °C
- Storage temperature
  –40 °C … +85 °C

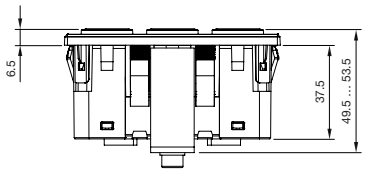
Dimensions
(All dimensions in mm)



Mounting
Clip-in mounting

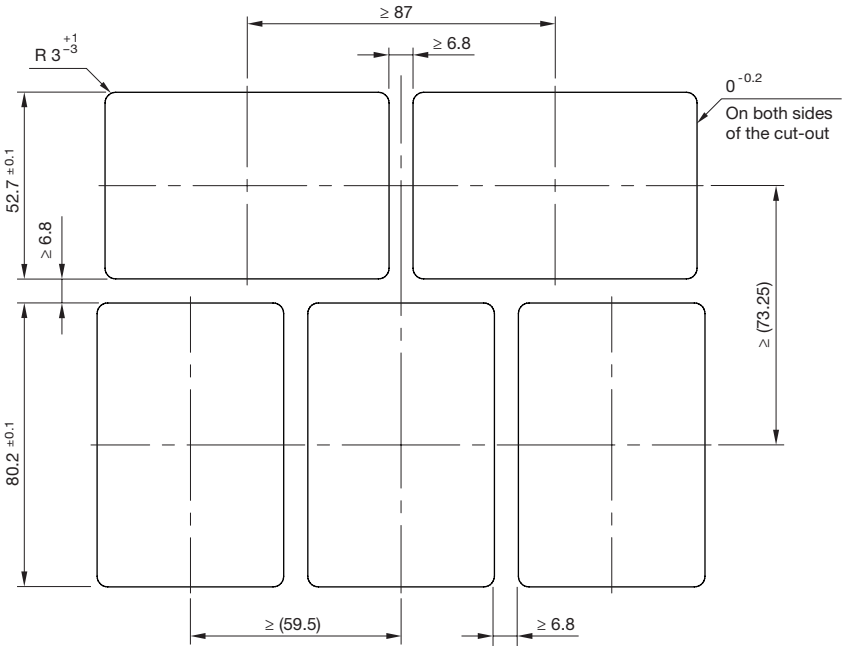


Screw-in mounting



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)



Rugged. Modular. Reliable.
New Series 09 Rugged CAN Keypads.

Designed for E1 applications with functional safety and CAN bus integration.

- Individual 4-segment and RGB halo ring illumination
- Designed for functional safety: ISO 26262 & ISO 13849
- Intelligent HMIs with CAN bus integration
- Robust design sealed up to IP67 protection
- Interchangeable ISO 7000 or customised symbols

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2-pushbutton Keypad BASIC

Mechanical characteristics
- Actuating force: approx. 6 N
- Overload force: 250 N
- Lifecycle: up to 1 million 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 MΩ (without NAMUR)
  1 kΩ ± 4 % (with NAMUR)
- Contact resistance (actuated):
  < 10 Ω (without NAMUR)
  110 Ω ± 10 Ω (with NAMUR)

Illumination
- Halo-ring and symbol illumination can be configured independently of one another

LED symbol illumination
  – Colour: white
  – Luminance: approx. 20 cd/m² (dimmable)
- LED halo-ring illumination
  – Colour: red (other colours on request)
  – Luminance: approx. 500 cd/m² (dimmable)

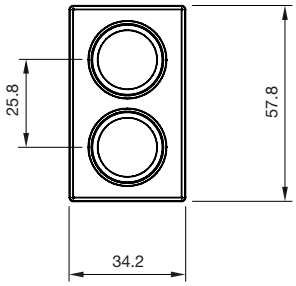
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

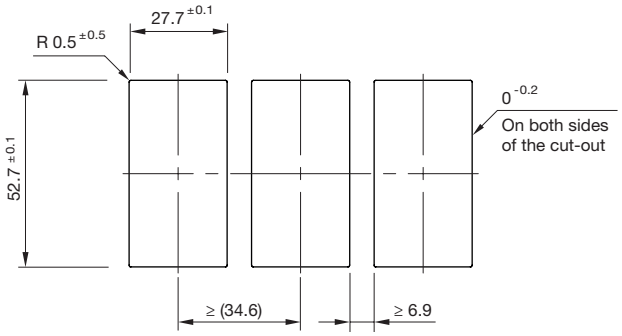
Protection degree
- IP5K4 in accordance with ISO 20653 (front side in installed state)
- IP20 in accordance with ISO 20653 (rear side)

Ambient conditions
- Operating temperature
  –40 °C … +85 °C
- Storage temperature
  –40 °C … +85 °C

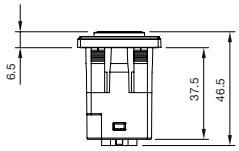
Dimensions
(All dimensions in mm)



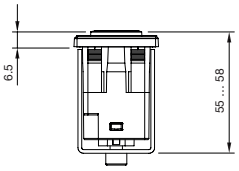
Mounting cut-out
(Panel thickness 1.0 mm … 4.0 mm)



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.

In-Cabin Rotary Cursor Controller SUPER

Mechanical characteristics
- Actuating force:
  – Buttons approx. 6.5 N
  – Rotary Switch approx. 12 N
- Overload force: 250 N
- Mechanical lifetime:
  – Buttons 1 million cycles of operation (B10)
  – Rotary Switch 500 000 cycles
- Impact resistance: IEC 62262 IK07

Rotary pushbutton
- Rotation function: 360°, 20 detents, continuous rotation
- Tilt function: X/Y, digital with micro switch

Electrical characteristics
- Operating voltage 8-32 VDC LoadDump A or B

Illumination (Buttons)
- 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/m² (dimmable)
- LED halo-ring illumination
  – Colour: multi-colour RGB
  – Luminance: approx. 500 cd/m² (dimmable*)

*depending on the respective colour

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

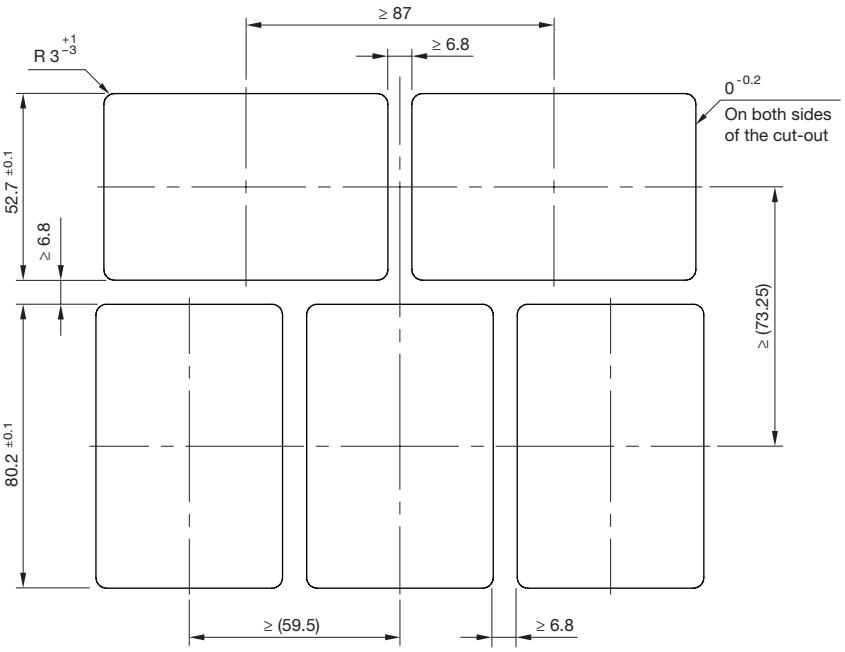
Connections/interfaces
- CAN interface (ISO 11898)
- CAN protocols: CANOpen (CiA 401), CAN J1939
- Baud rate 125, 250, 500, 1000 kBit/s (configurable through software)
- Integrated plug recess, compatible with TE 8P-1745000-3

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

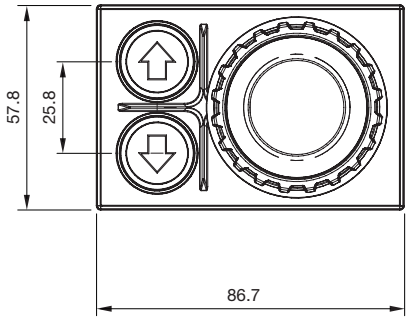
Ambient conditions
- Operating temperature
  –40 °C … +85 °C
- Storage temperature
  –40 °C … +85 °C

Standards and certifications
- Developed and produced according to IATF 16949
- CE

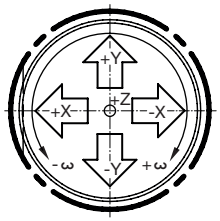
Mounting cut-out
(Panel thickness 1.0 mm … 4.0 mm)



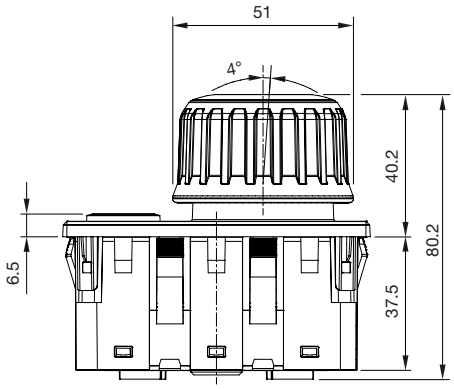
Dimensions
(All dimensions in mm)



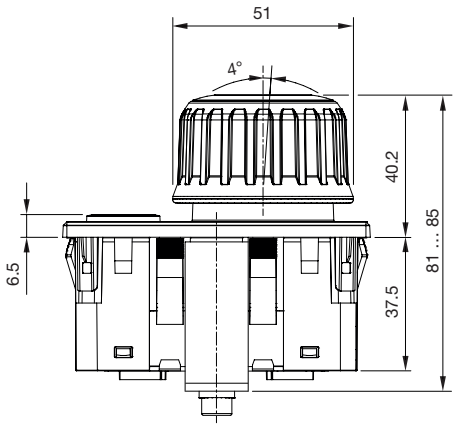
Orientation



Mounting
Clip-in mounting



Screw-in mounting



The RCC can be mounted into front plate thicknesses between 1 – 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

In-Cabin Rotary Cursor Controller PLUS

Mechanical characteristics
- Actuating force:
  – Buttons approx. 6.5 N
  – Rotary Switch approx. 12 N
- Overload force: 250 N
- Mechanical lifetime:
  – Buttons 1 million cycles of operation (B10)
  – Rotary Switch 500 000 cycles
- Impact resistance: IEC 62262 IK07

Rotary push-button
- Rotation function: 360°, 20 detents, continuous rotation
- Tilt function: X/Y, digital with micro switch

Electrical characteristics
- Operating voltage 8-32 VDC LoadDump A or B

Illumination (Buttons)
- 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/m² (dimmable)
- LED halo-ring illumination
  – Colour: red (other colours on request)
  – Luminance: approx. 500 cd/m² (dimmable*)

*depending on the respective colour

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

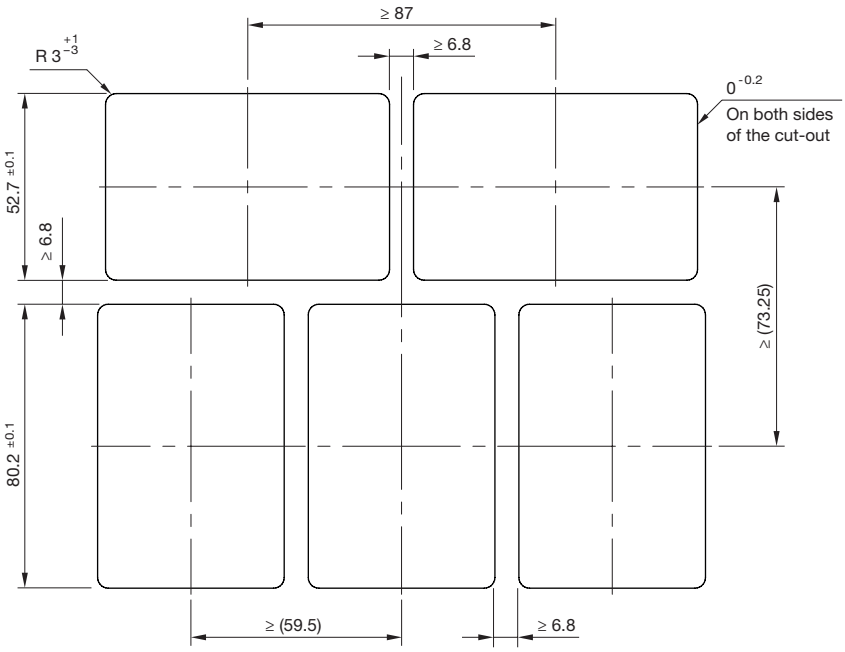
Connections/interfaces
- CAN interface (ISO 11898)
- CAN protocols: CANOpen (CiA 401), CAN J1939
- Baud rate 125, 250, 500, 1000 kBit/s (configurable through software)
- Integrated plug recess, compatible with TE 8P-1745000-3

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

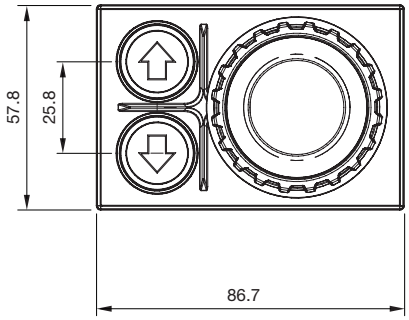
Ambient conditions
- Operating temperature
  –40 °C … +85 °C
- Storage temperature
  –40 °C … +85 °C

Standards and certifications
- Developed and produced according to IATF 16949
- CE

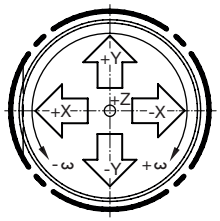
Mounting cut-out
(Panel thickness 1.0 mm … 4.0 mm)



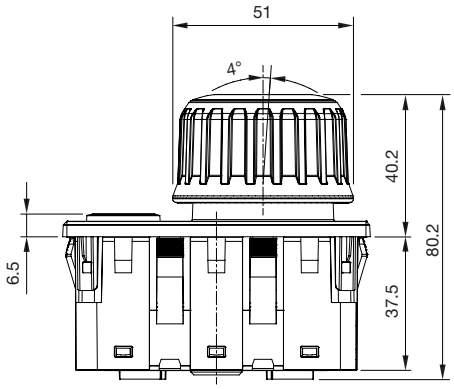
Dimensions
(All dimensions in mm)



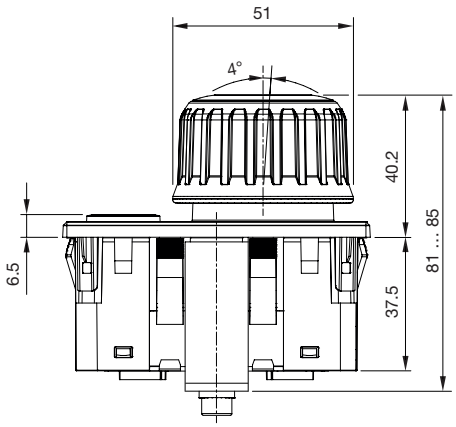
Orientation



Mounting
Clip-in mounting



Screw-in mounting



The RCC can be mounted into front plate thicknesses between 1 – 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

In-Cabin Rotary Push Button SUPER

Mechanical characteristics
- Actuating force:
  – Buttons approx. 6.5 N
  – Rotary Switch approx. 12 N
- Overload force: 250 N
- Mechanical lifetime:
  – Buttons 1 million cycles of operation (B10)
  – Rotary Switch 500 000 cycles
- Impact resistance: IEC 62262 IK07

Rotary pushbutton
- Rotation function: 360°, 20 detents, continuous rotation

Electrical characteristics
- Operating voltage 8-32 VDC LoadDump A or B

Illumination (Buttons)
- 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/m² (dimmable)
- LED halo-ring illumination
  – Colour: multi-colour RGB
  – Luminance: approx. 500 cd/m² (dimmable*)

*depending on the respective colour

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

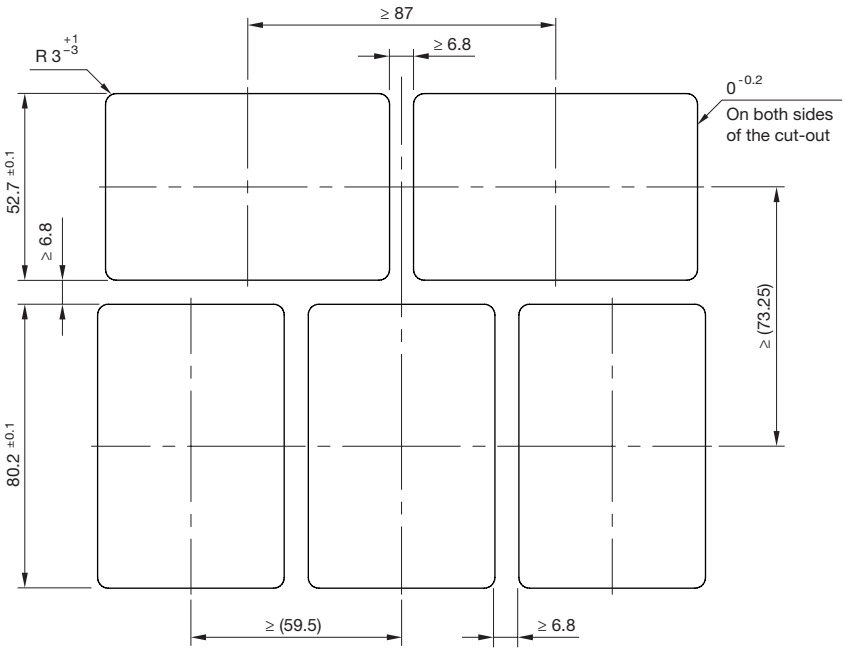
Connections/interfaces
- CAN interface (ISO 11898)
- CAN protocols: CANOpen (CiA 401), CAN J1939
- Baud rate 125, 250, 500, 1000 kBit/s (configurable through software)
- Integrated plug recess, compatible with TE 8P-1745000-3

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

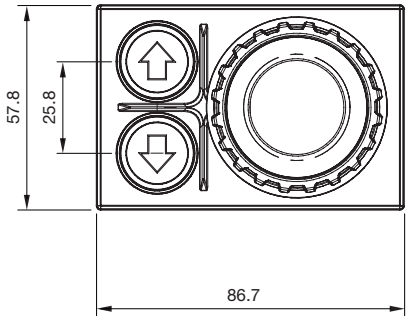
Ambient conditions
- Operating temperature
  –40 °C … +85 °C
- Storage temperature
  –40 °C … +85 °C

Standards and certifications
- Developed and produced according to IATF 16949
- CE

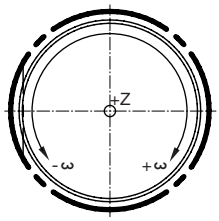
Mounting cut-out
(Panel thickness 1.0 mm … 4.0 mm)



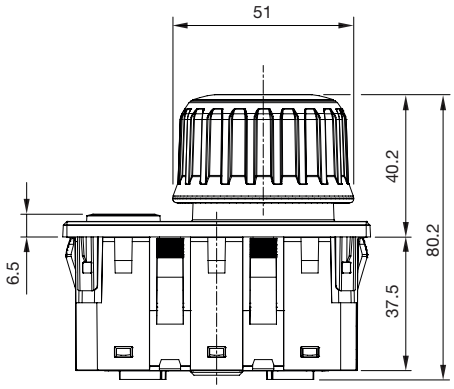
Dimensions
(All dimensions in mm)



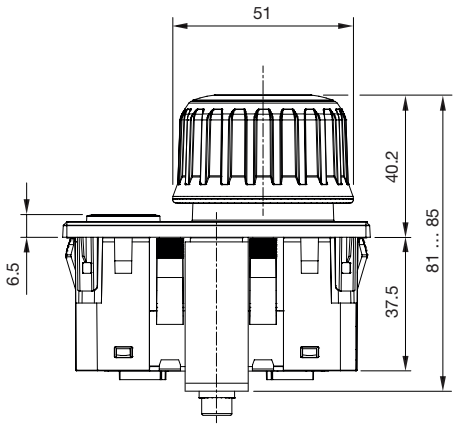
Orientation



Mounting
Clip-in mounting



Screw-in mounting



The RPB can be mounted into front plate thicknesses between 1–4 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.

In-Cabin Rotary Push Button PLUS

Mechanical characteristics
- Actuating force:
  – Buttons approx. 6.5 N
  – Rotary Switch approx. 12 N
- Overload force: 250 N
- Mechanical lifetime:
  – Buttons 1 million cycles of operation (B10)
  – Rotary Switch 500 000 cycles
- Impact resistance: IEC 62262 IK07

Rotary pushbutton
- Rotation function: 360°, 20 detents, continuous rotation

Electrical characteristics
- Operating voltage 8-32 VDC LoadDump A or B

Illumination (Buttons)
- 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/m² (dimmable)
- LED halo-ring illumination
  – Colour: red (other colours on request)
  – Luminance: approx. 500 cd/m² (dimmable*)

*depending on the respective colour

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

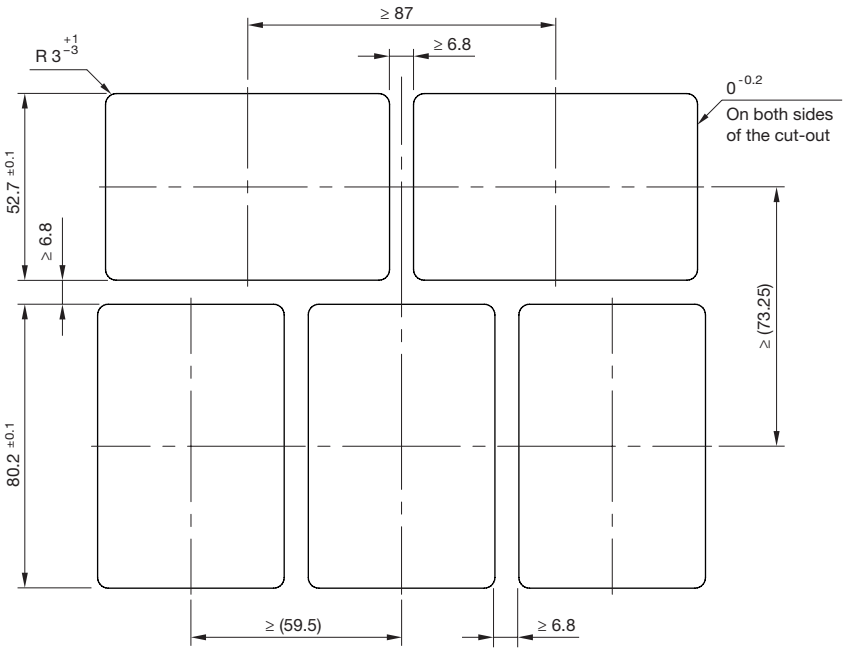
Connections/interfaces
- CAN interface (ISO 11898)
- CAN protocols: CANOpen (CiA 401), CAN J1939
- Baud rate 125, 250, 500, 1000 kBit/s (configurable through software)
- Integrated plug recess, compatible with TE 8P-1745000-3

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

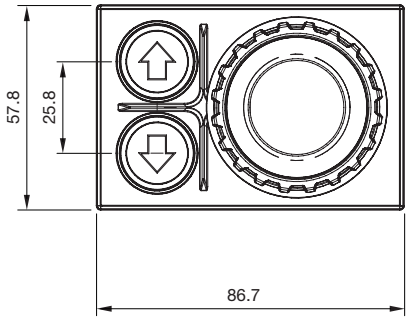
Ambient conditions
- Operating temperature
  –40 °C … +85 °C
- Storage temperature
  –40 °C … +85 °C

Standards and certifications
- Developed and produced according to IATF 16949
- CE

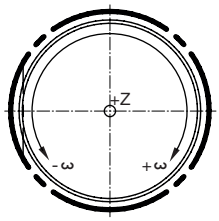
Mounting cut-out
(Panel thickness 1.0 mm … 4.0 mm)



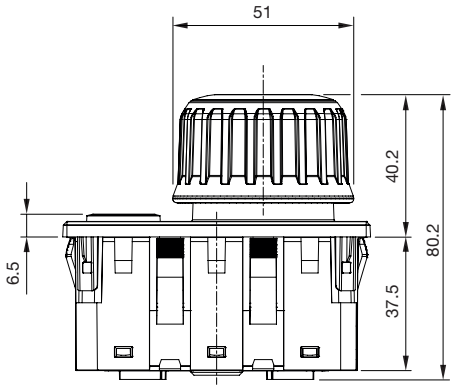
Dimensions
(All dimensions in mm)



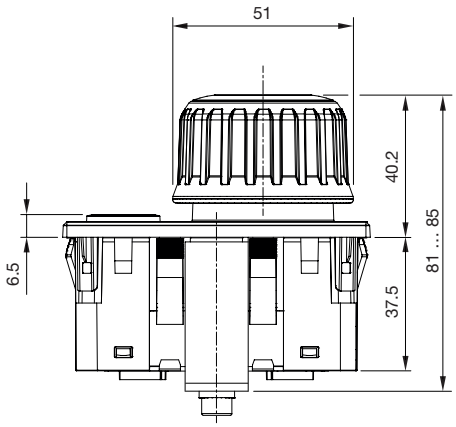
Orientation



Mounting
Clip-in mounting



Screw-in mounting



The RPB can be mounted into front plate thicknesses between 1–4 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.

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

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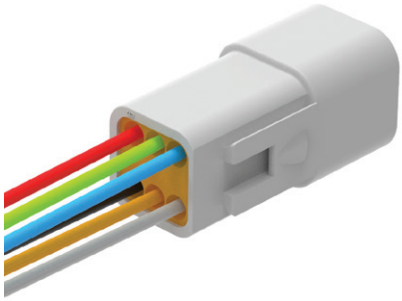
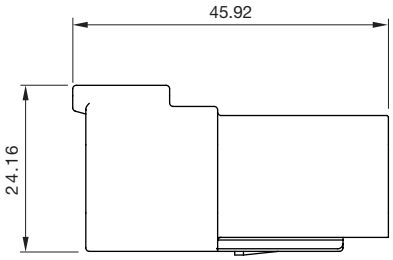
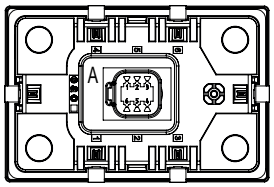
Your Expert Partner for **Human Machine Interfaces**

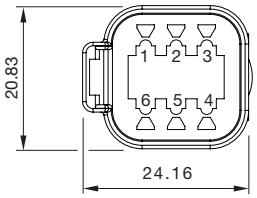
Accessories

Deutsch DT Series connector (DT04-6P)









All dimensions in mm.

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 – 32 VDC

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.

09 Universal Switch

Product variants

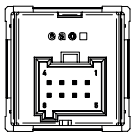
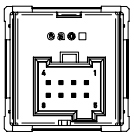
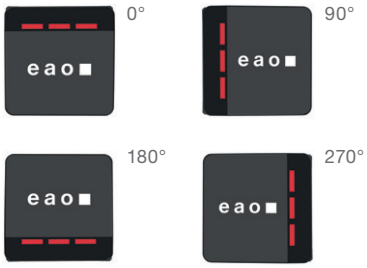
Versatile product variants

The Series 09 universal switch is available in variants STANDARD, DUAL CONTACT and LIN – 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		12 V	✓	✓	✓
		24 V	✓	✓	✓
		12 V Namur R_s=120 Ω / Rp = 1 KΩ	✓	✓	✓
		24 V Namur R_s=120 Ω / Rp = 1 KΩ	✓	✓	✓
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°			
		180°			
		270°			

Notes

✗ For this variant the option is not available
* For customized symbols, please send us the corresponding file
** Other configuration options on request

Universal Switch STANDARD

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

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

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

Illumination
- LED symbol illumination
  – Colour white, luminance:
    approx. 25 cd / m²
    (conditions: 28 VDC or 14 VDC, 23 °C ± 2 K)
  – Colour red (for hazard warning light), luminance: approx. 90 cd / m²
    (conditions: 28 VDC or 14 VDC, 23 °C ± 2 K)
- LED status indicator
  – Colour red, luminance:
    approx. 200 cd/m²
    (28 VDC or 14 VDC and 23 °C ± 2K)

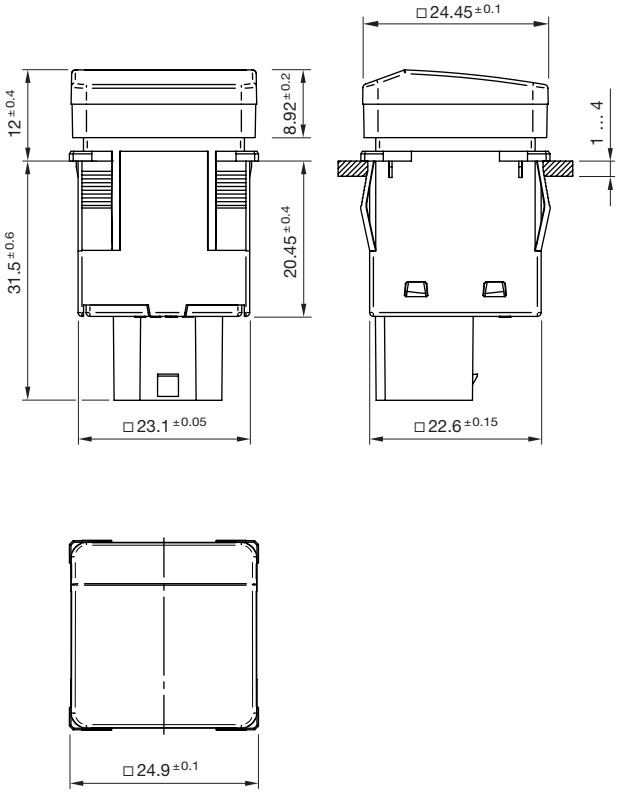
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

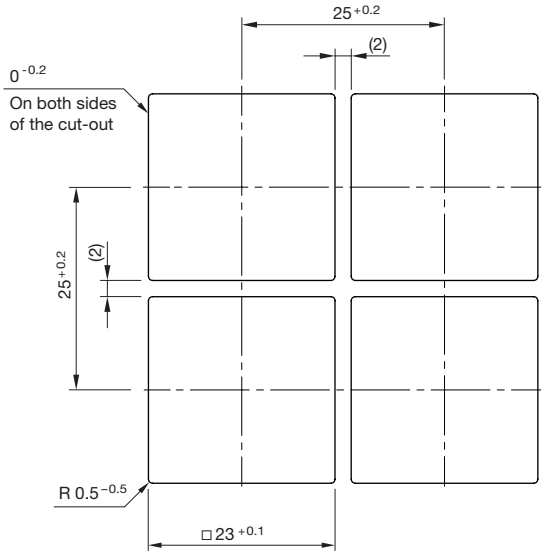
Ambient conditions
- Operating temperature
  –40 °C … +85 °C
- Storage temperature
  –40 °C … +85 °C

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 DUAL CONTACT

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

Mechanical characteristics
- Actuation force: approx. 4.5 N (soft (long travel) haptics) NO/NO approx. 6.5 N (firm (short travel) haptics) NO/NC-NO
- Overload: 250 N
- Mechanical lifetime: up to 250 000 cycles of operation

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

Illumination
- LED symbol illumination
  - Colour white, luminance: approx. 25 cd/m² (conditions: 28 VDC or 14 VDC, 23 °C ±2 K)
  - Colour red (for hazard warning light), luminance: approx. 90 cd/m² (conditions: 28 VDC or 14 VDC, 23 °C ±2 K)
- LED status indicator
  - Colour red, luminance: approx. 200 cd/m² (28 VDC or 14 VDC and 23 °C ±2K)

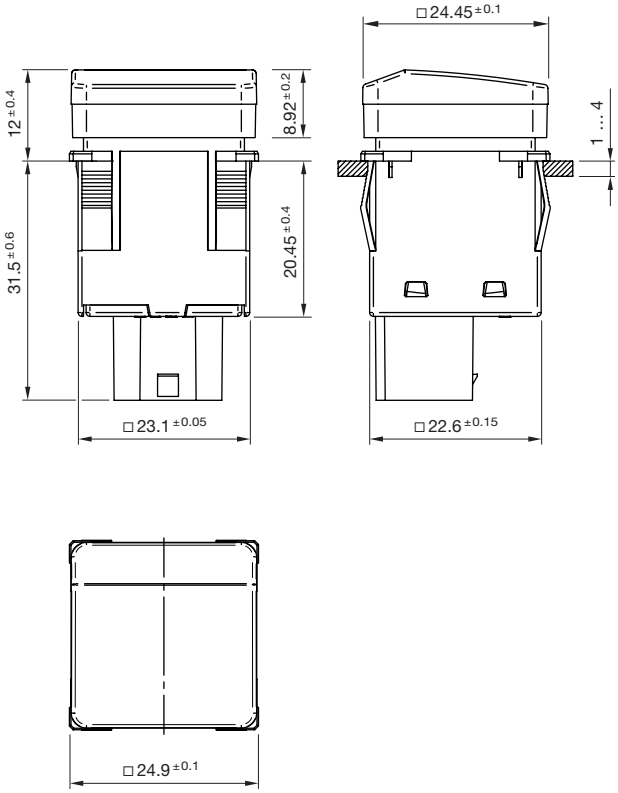
Symbols
- Symbols in accordance with ISO 7000
- Customer-specific symbols on request

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

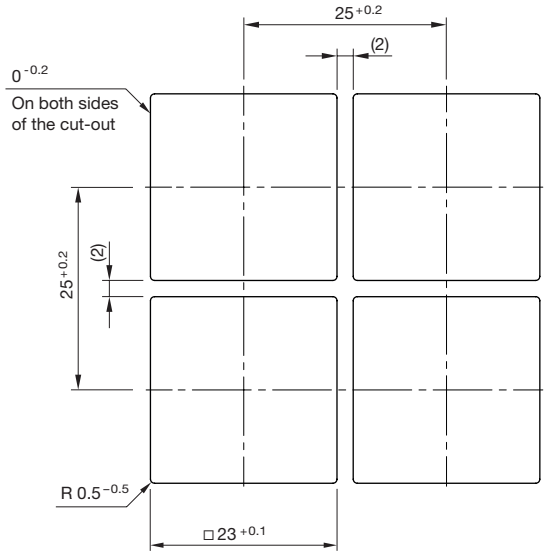
Ambient conditions
- Operating temperature –40 °C … +85 °C
- Storage temperature –40 °C … +85 °C

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 LIN

Product options
- 12 V

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

Electrical characteristics
- Operating voltage range: 8 – 18 VDC
- Max. current: 80 mA
- Min. current: 8 mA
- Max. power: 1.5 VA
- Max. switching voltage: 32 VDC
- Idle state: < 20 µ A at 12 VDC

Illumination
- LED symbol illumination
  – Colour white, luminance: approx. 25 cd / m² (conditions: 14 VDC, 23 °C ± 2 K)
  – Colour red (for hazard warning light), luminance: approx. 90 cd / m² (conditions: 14 VDC, 23 °C ± 2 K)
- LED status indicator
  – Colour red, luminance: approx. 200 cd/m² (14 VDC and 23 °C ± 2K)
  – Luminance: approx. 500 cd / m² (dimmable)*

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

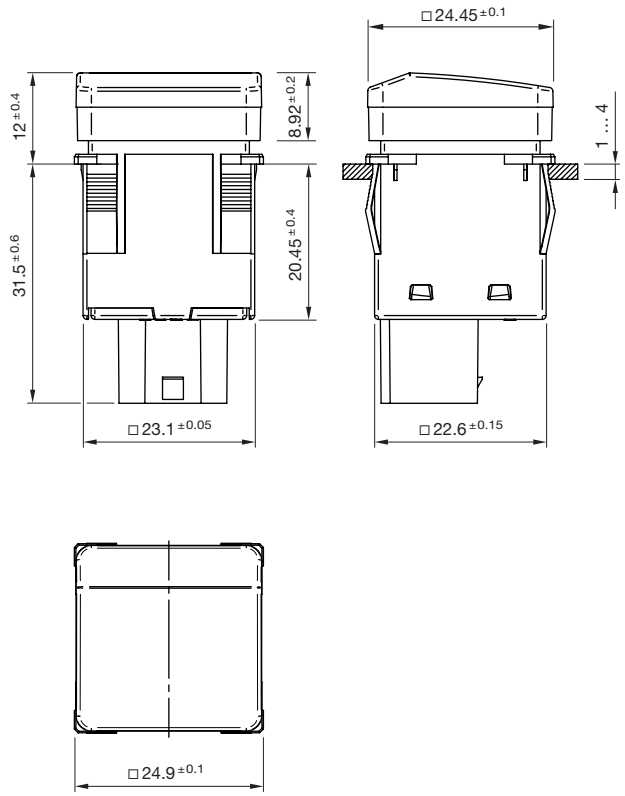
LIN-BUS Interface
- LIN signal looped through optionally (1 in / out) or (1 in, 2 out)
- 3-wire-BUS: LIN, GND, Ubatt
  Speed: 19.2 kbit / sek
  Up to 16 participants in the network

Ambient conditions
- Operating temperature –40 °C … +85 °C
- Storage temperature –40 °C … +85 °C

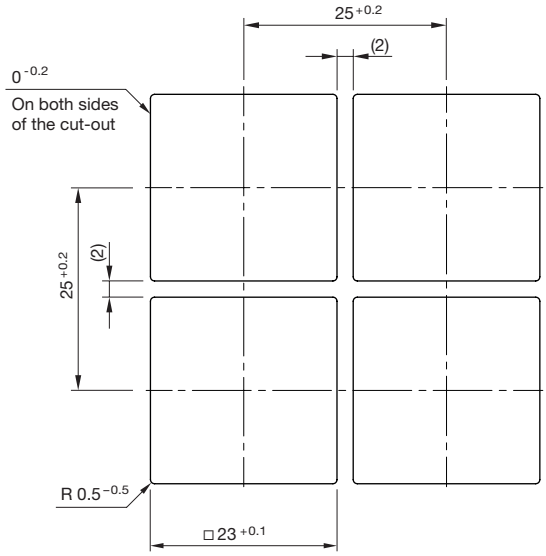
Protection degree
- up to IP5K4 front side (built into a panel)
- IP20 rear side

Approvals and conformities
- E1 (ECE R10, ECE R118) (pending)
- CE
- Developed and manufactured in accordance with IATF 16949

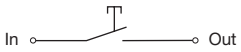
Dimensions
(All dimensions in mm)



Mounting cut-outs
(All dimensions in mm)



Wiring diagram
Standard (NO)



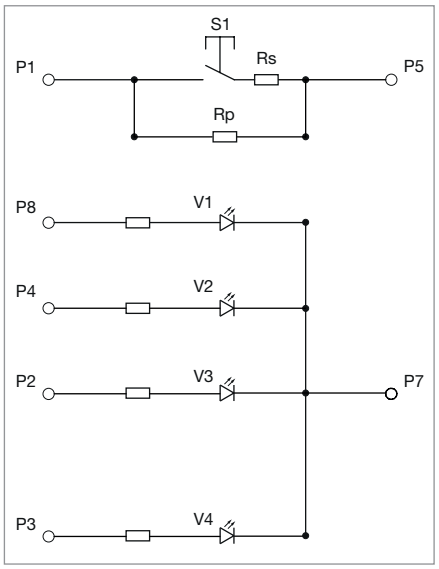
The switch can be mounted in front panel thicknesses between 2 and 4 mm. To guarantee stability and density, a plastic front panel with a material thickness of 3 mm is recommended.

Further information is provided in the corresponding operating instructions at www.eao.com/09.

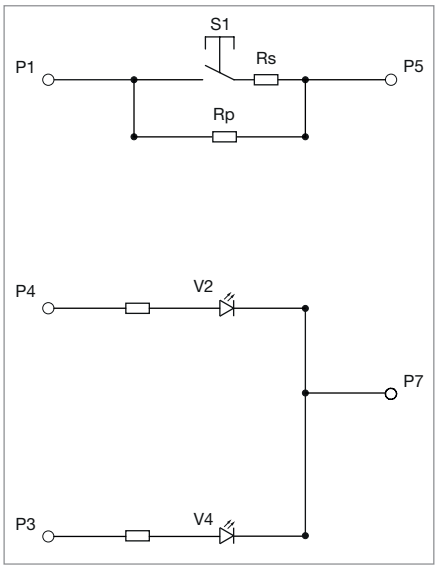
09 Universal Switch

Wiring diagram

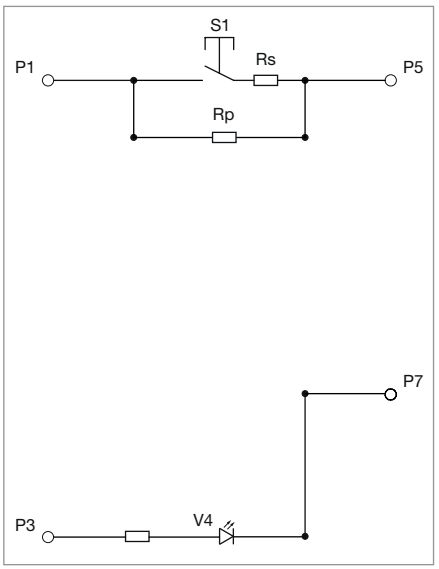
Standard (single contact) NO



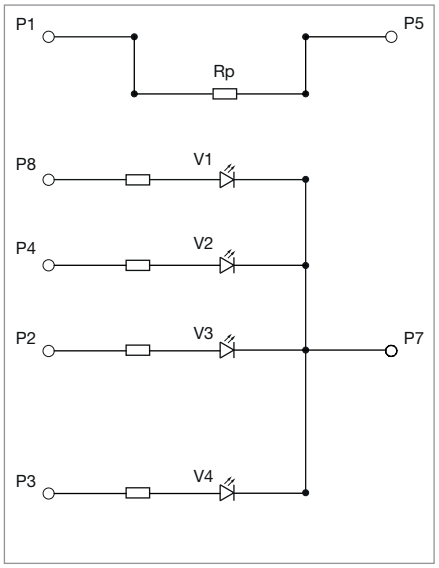
Three indicators,
backlight and switching element
with NAMUR circuit



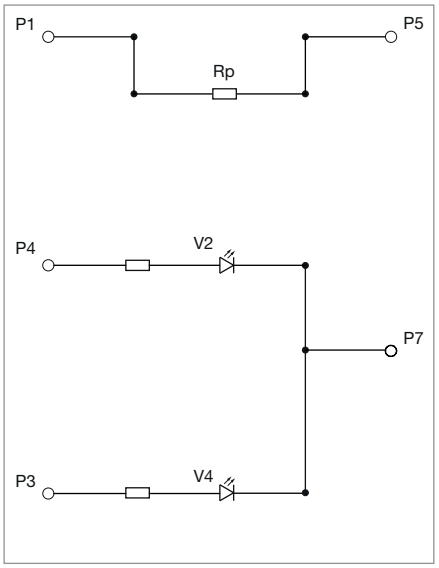
One indicator,
backlight and switching element
with NAMUR circuit



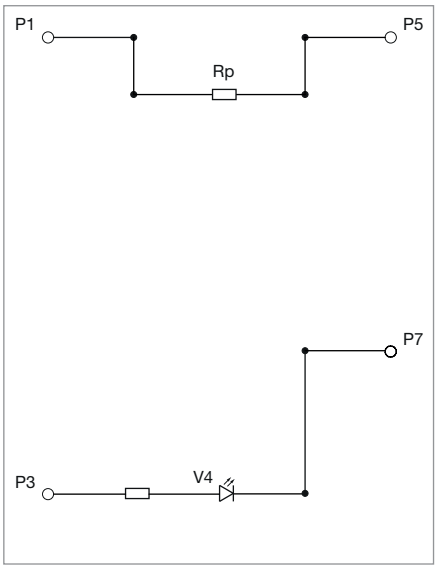
Backlight and switching element
with NAMUR circuit



Three indicators,
backlight with coding resistor



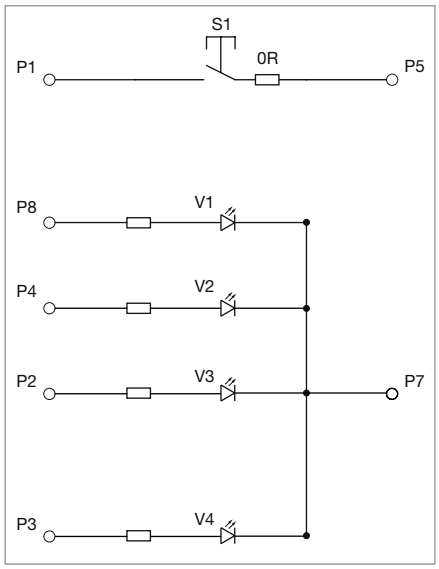
One indicator,
backlight with coding resistor



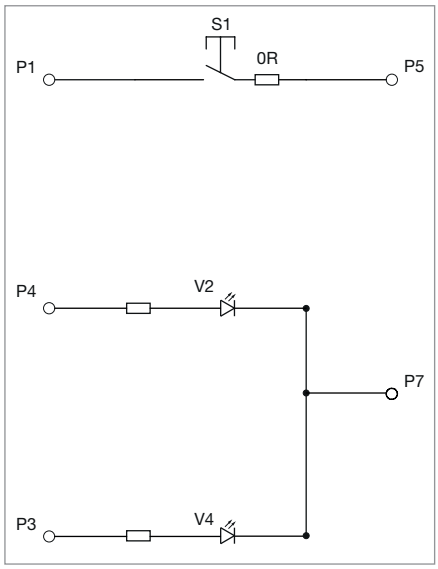
Backlight with coding resistor

Wiring diagram

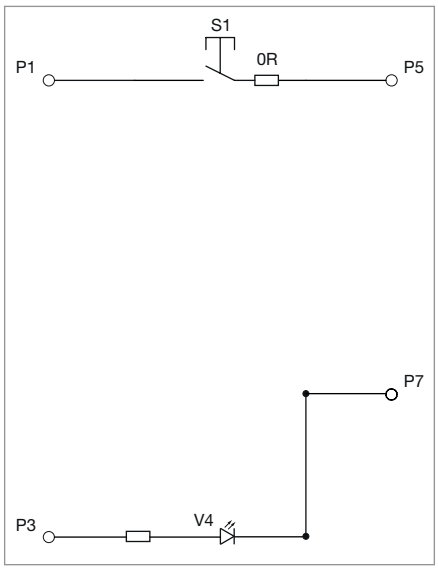
Standard (single contact) NO



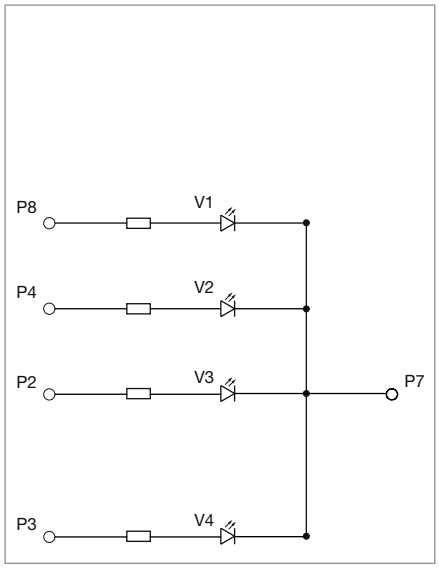
Three indicators,
backlight and switching element standard



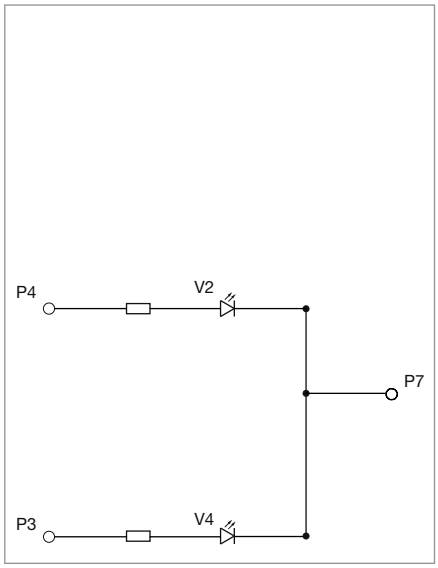
One indicator,
backlight and switching element standard



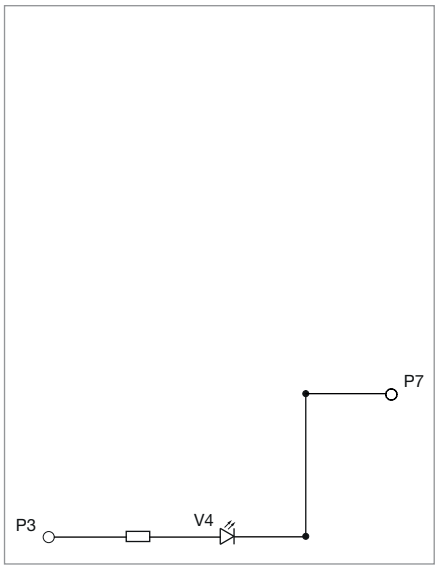
Backlight and switching element standard



Three indicators, backlight standard



One indicator, backlight standard

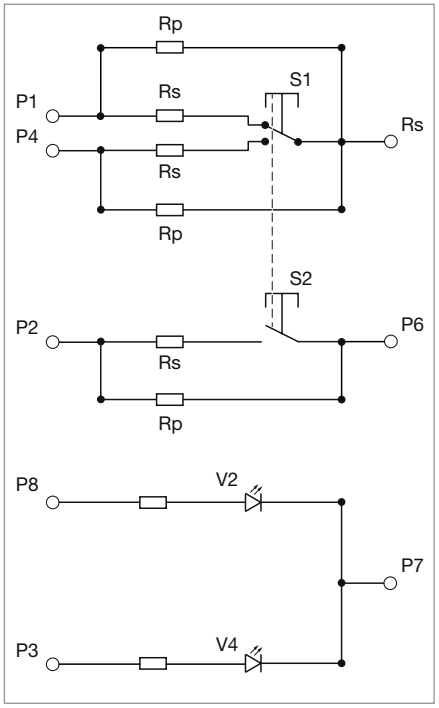


Backlight standard

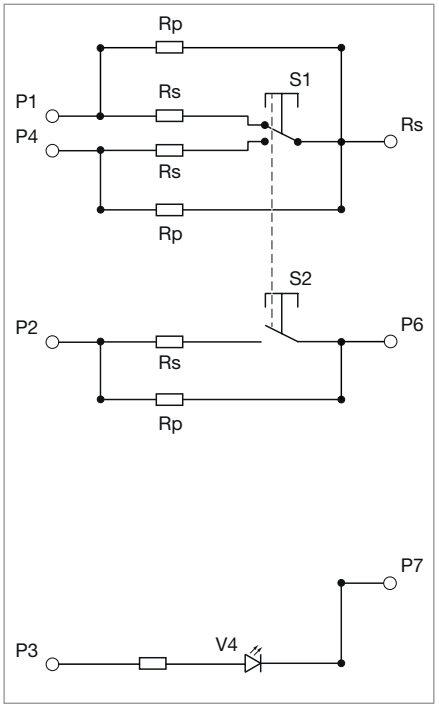
09 Universal Switch

Wiring diagram

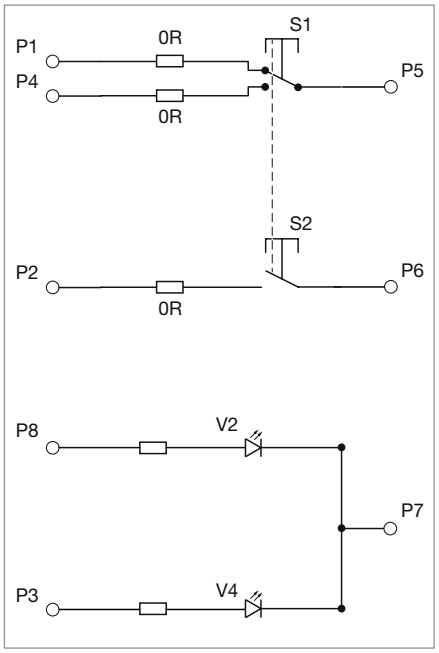
Dual contact NO/NC-NO



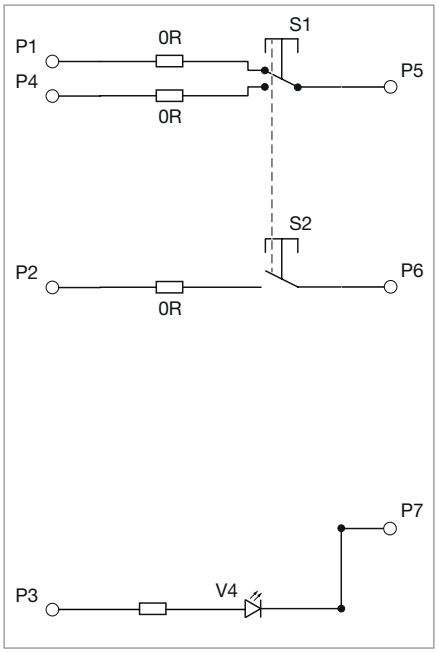
One indicator,
backlight and switching elements
with NAMUR circuit



Backlight and switching elements
with NAMUR circuit



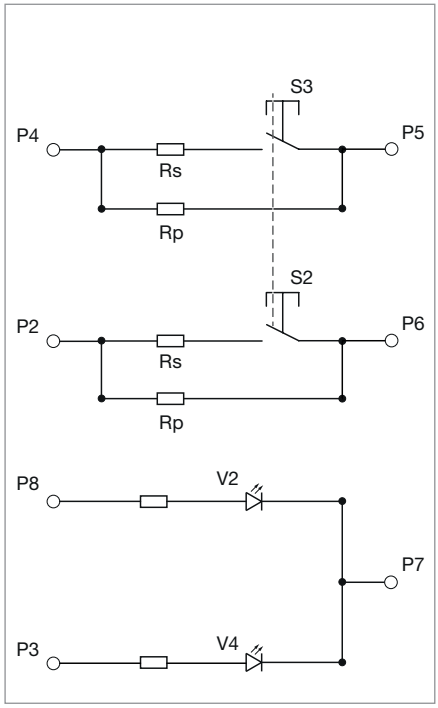
One indicator,
backlight and switching elements
without NAMUR circuit



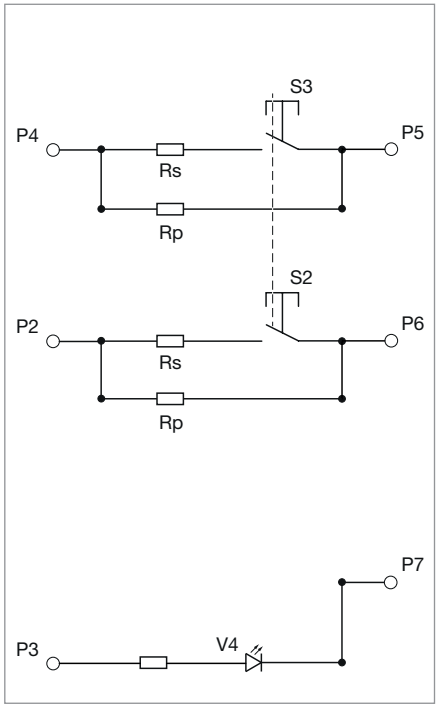
Backlight and switching elements
without NAMUR circuit

Wiring diagram

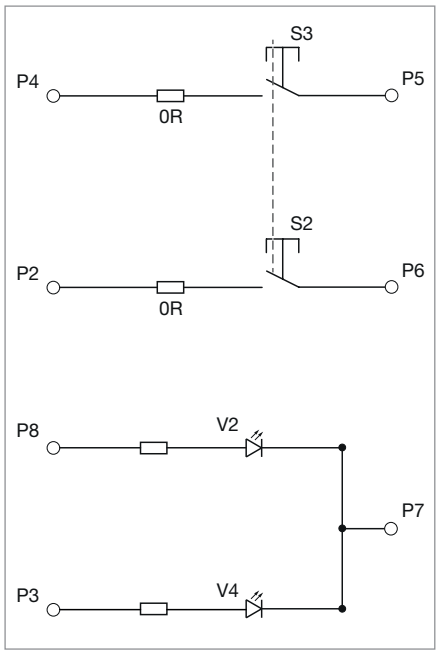
Dual contact NO/NO



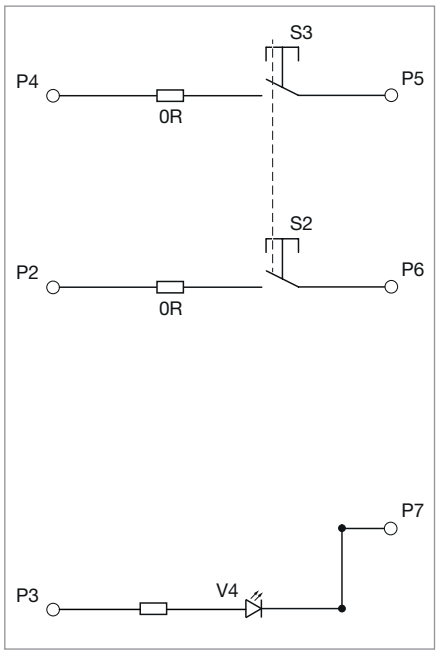
One indicator,
backlight and switching elements
with NAMUR circuit



Backlight and switching elements
with NAMUR circuit

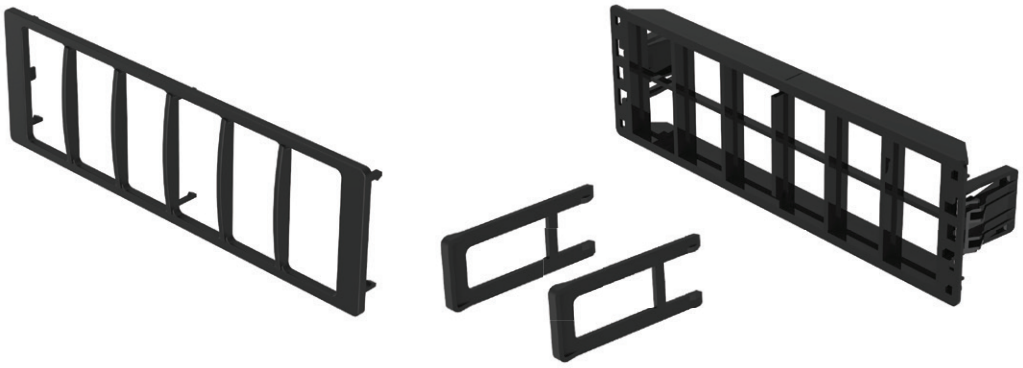


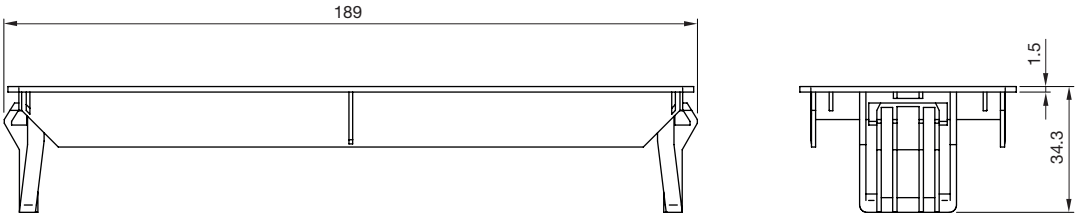
One indicator,
backlight and switching elements
without NAMUR circuit

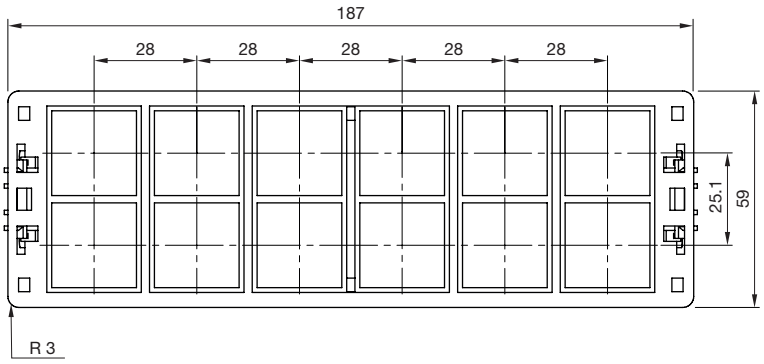


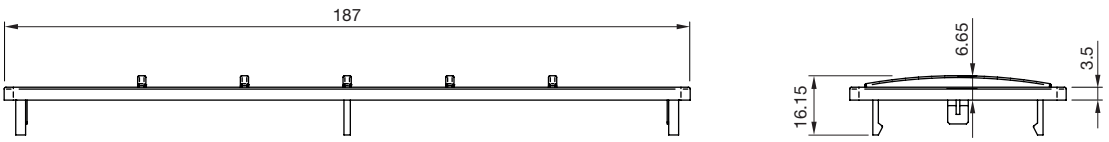
Backlight and switching elements
without NAMUR circuit

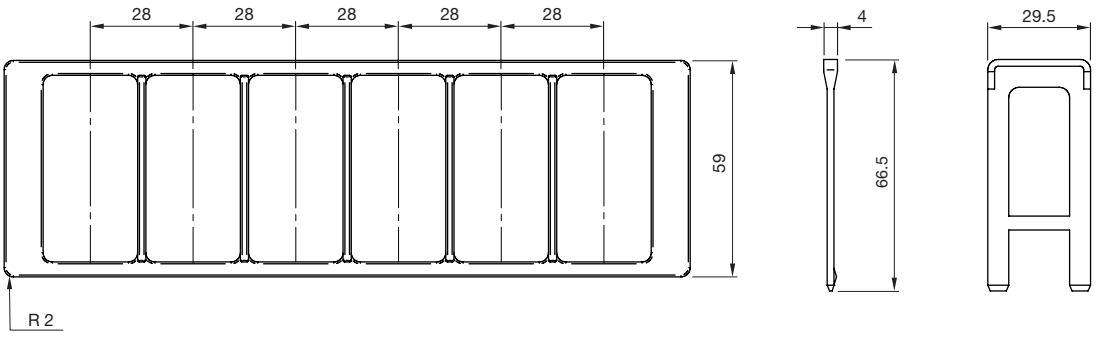
Radio slot frame











Joystick, 1 axis with square flange

Part No.
09-01.18214.0107

Gate

Mechanical characteristics
- Mounting
  from front of panel, 4 screws
  (Ø3.5 mm)
- 1 axis
- No cross guidance
- No gate shape
- 20° 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

Dimensions

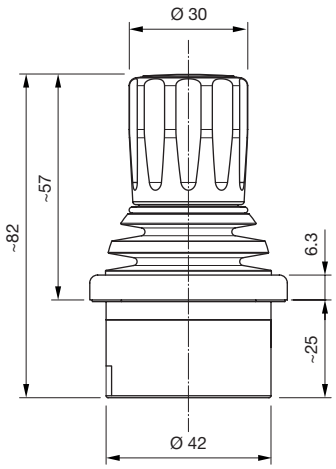
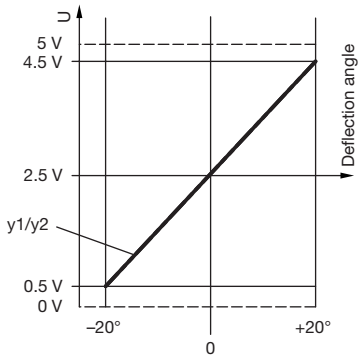


Diagram Y-axis

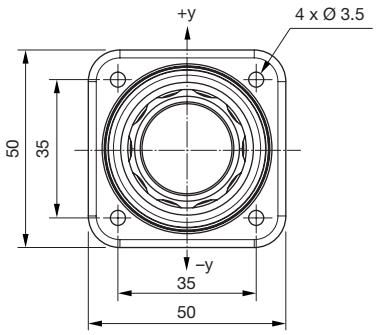


Electrical characteristics
- Operating voltage
  5 VDC
- Output signal
  proportional (–y = 0.5 V/
  Mid = 2.5 V/+y = 4.5 V)
- Redundancy
  yes

Technology
- Hall effect sensors

Connections
- Minitek plug (8-pole)

View from above



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

Joystick, 3 axes with square flange.

Part No.
09-01.32294.0109

Mechanical characteristics
- Mounting
  from front of panel, four screws
  (Ø3.5 mm)
- 3 axes
- Soft cross guidance
- Gate shape square
- Deflection angle XY: ±20° / Z: ±30°
- 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

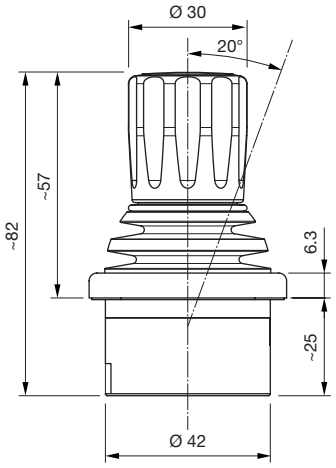
Technology
- Hall effect sensors

Connections
- Minitek plug (8-pole)

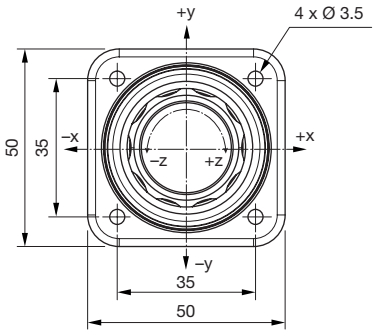
Ambient conditions
- Operating temperature
  –30 °C to +80 °C
- Storage temperature
  –40 °C to +85 °C

Degree of protection
- IP65 front protection
- IP40 rear protection

Dimensions



View from above



Gate

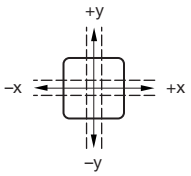


Diagram X-, Y-axis

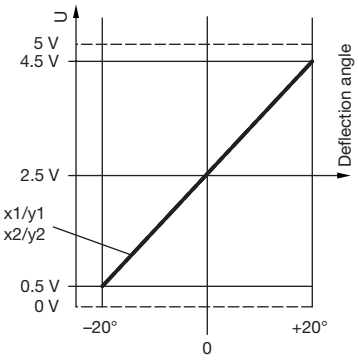
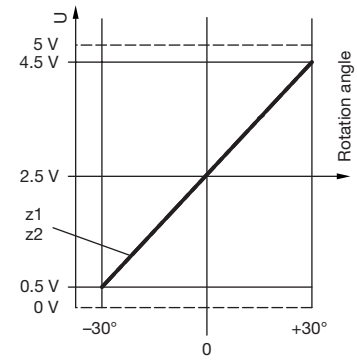


Diagram Z-axis



Joystick, small and beautiful

Part No.
09-01.22224.0128

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

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

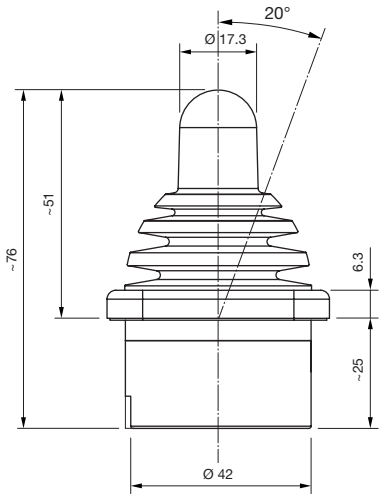
Technology
- Hall effect sensors

Connections
- Minitek plug (8-pole)

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

Degree of protection
- IP67 front protection
- IP40 rear protection

Dimensions



Gate

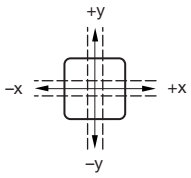
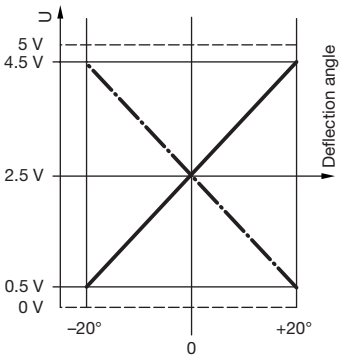
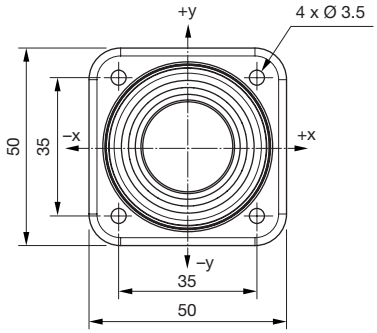


Diagram X-, Y-axis



View from above



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. 30 VDC
- Output signal
  proportional with centre tab at ±1.75°, switch point at ±2.3° (see diagram X-, Y-axis)

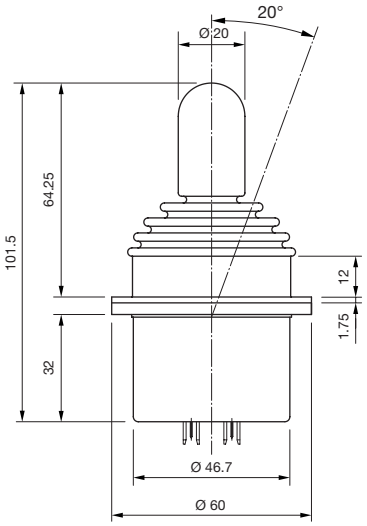
Technology
- Conductive plastic with digital steps/ control segment 1-0-1

Connections
- Dubox plug (6- and 8-pole)

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

Degree of protection
- IP67 front protection
- IP40 rear protection

Dimensions



Gate

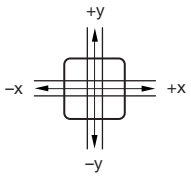
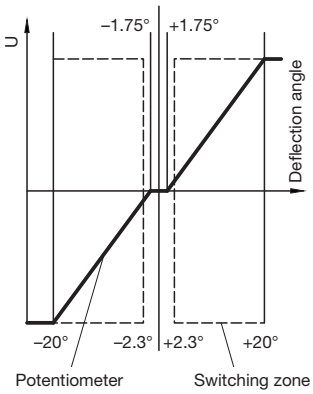
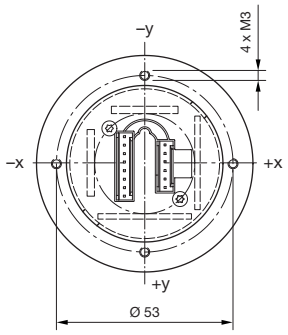


Diagram X-, Y-axis



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

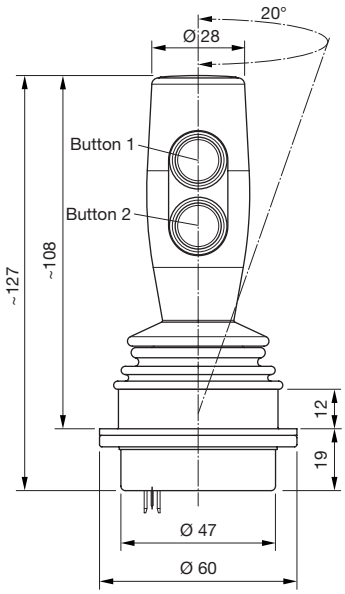
Connections
- Dubox plug (4-pole)

Interfaces
- CANopen/J1939 interface

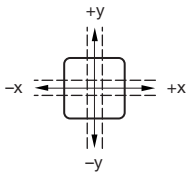
Ambient conditions
- Operating temperature
  –30 °C to +80 °C
- Storage temperature
  –40 °C to +85 °C

Degree of protection
- IP64 front protection
- IP40 rear protection

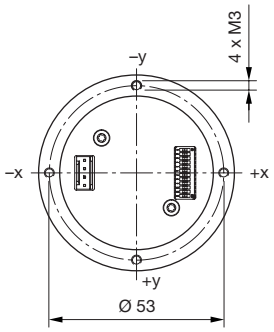
Dimensions



Gate



Bottom view



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

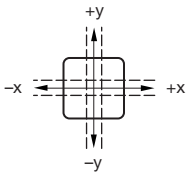
Connections
- PVC cable, 4 x 0.34 mm²
  Molex Micro-Fit (4-pole)

Interfaces
- CANopen/J1939 interface

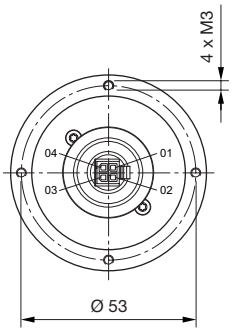
Ambient conditions
- Operating temperature
  −30 °C to +80 °C
- Storage temperature
  −40 °C to +85 °C

Degree of protection
- IP65 front protection
- IP40 rear protection

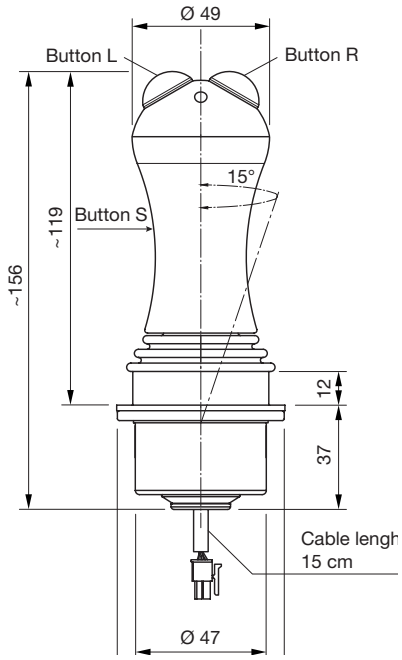
Gate



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 ±3.33°

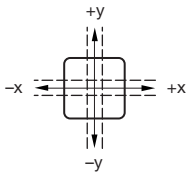
Technology
- Digital grid/switching segment 3-1-3

Connections
- Dubox plug (2 and 8-pole)

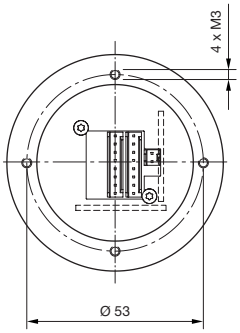
Ambient conditions
- Operating temperature
  –30 °C to +80 °C
- Storage temperature
  –40 °C to +85 °C

Degree of protection
- IP65 front protection
- IP40 rear protection

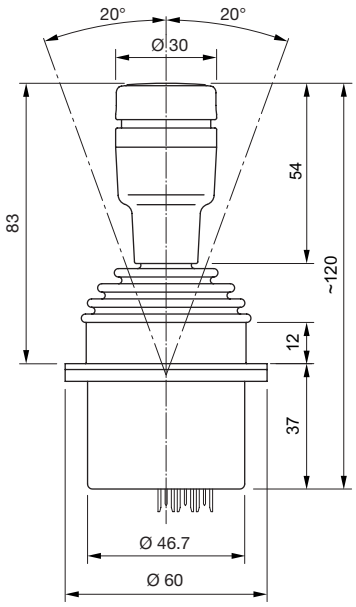
Gate



Bottom view



Dimensions



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. 30 VDC
- Output signal
  proportional without centre tab

Technology
- Conductive plastic

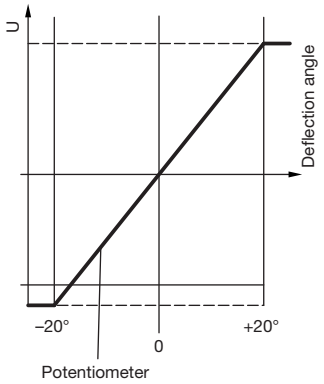
Connection
- Dubox plug (3-pole)

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

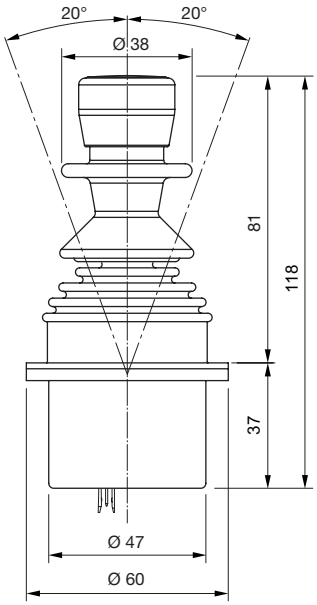
Degree of protection
- IP65 front protection
- IP40 rear protection

Gate

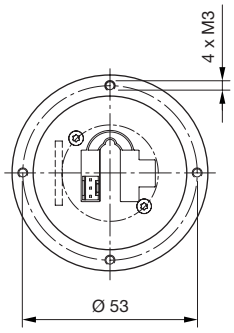
Diagram Y-axis



Dimensions



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 Ø 5.5 screws
- 1 or 2 axes
- Soft cross guidance
- Gate shape round
- 24° deflection angle
- Multifunction handlewith 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

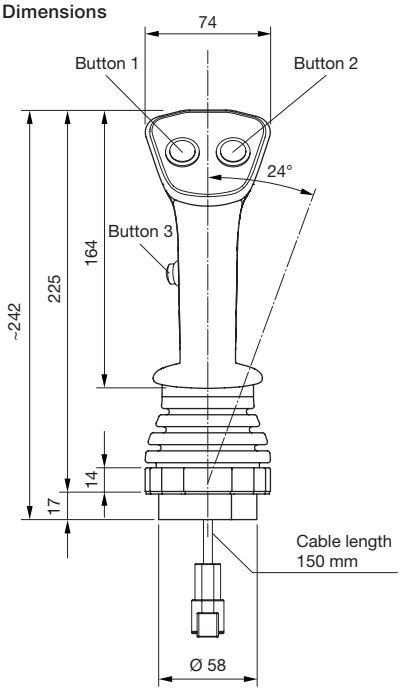
Technology
- Hall effect sensors

Connections
- Deutsch DTM04-4P (4-pole)

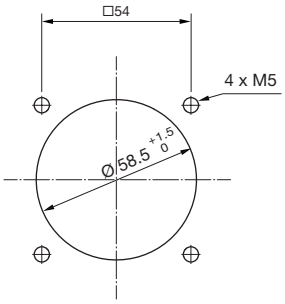
Ambient conditions
- Operating temperature
  –30 °C to +80 °C
- Storage temperature
  –40 °C to +85 °C

Protection degree
- IP65 front side

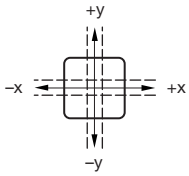
Dimensions



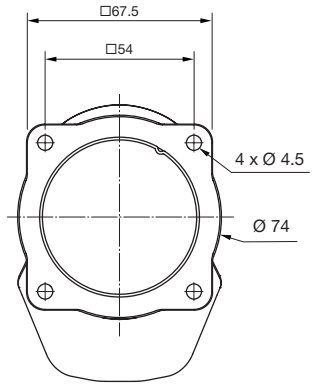
Mounting cut-out



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

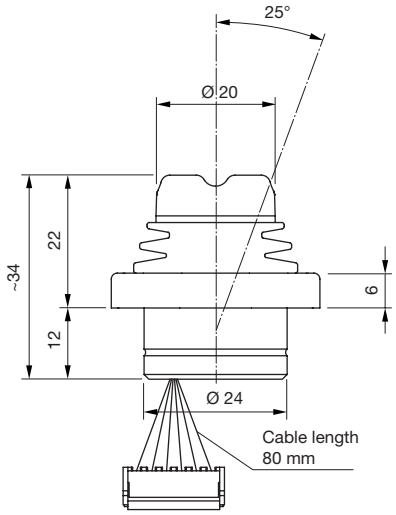
Technology
- Hall effect sensors

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

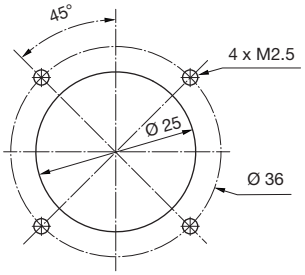
Ambient conditions
- Operating temperature
  –30 °C to +80 °C
- Storage temperature
  –40 °C to +85 °C

Protection degree
- IP65 front side

Dimensions



Mounting cut-out



Gate

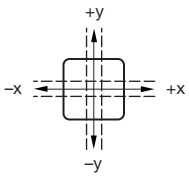
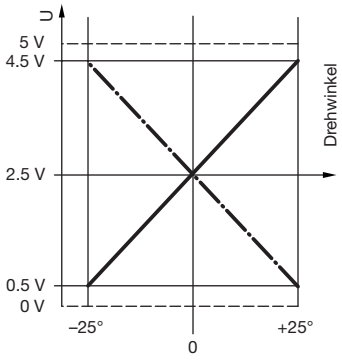
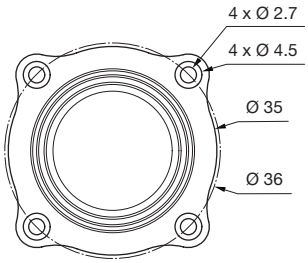


Diagram X-, Y-axis



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

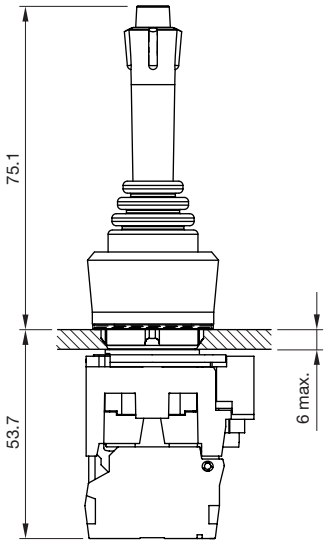
Electrical characteristics
- Operating voltage
  5 to 500 V
- Output signal
  AC15: 6A/24 V to 1.4A/500V
- Contact material
  silver

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

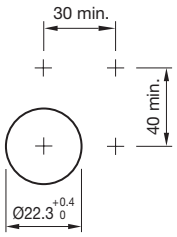
Degree of protection
- IP65, IP67 front protection
- IP20 or IP40 rear protection

Configure your product in a few steps at eao.com/products.

Dimensions



Mounting cut-outs



All dimensions in mm.

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

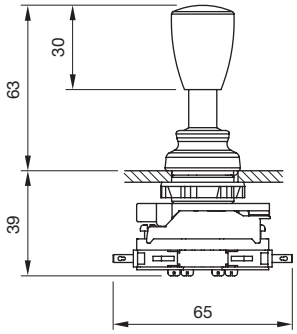
Electrical characteristics
- Operating voltage
  250 VAC
- Output signal
  5 A / 4 NC + 4 NO
- Contact material
  gold-plated silver alloy

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

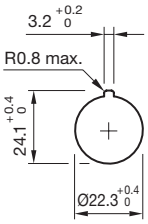
Degree of protection
- IP65 front protection
- IP20, IP40 rear protection

A choice of three lever switches can be found at eao.com/products.

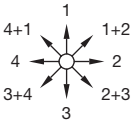
Dimensions



Mounting cut-outs



Wiring diagram



All dimensions in mm.

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