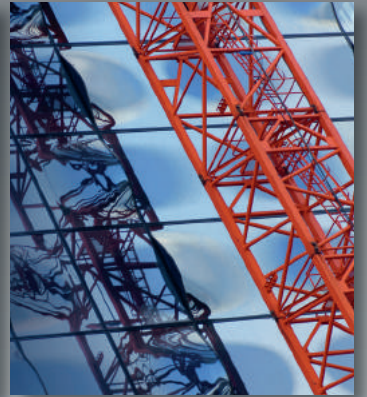


Industrial Controllers Catalog





Product range

Joysticks with
hallsensor-technology

Joysticks with
contacts and potentiometer

Control-Switches

Steering Column Switch

Opto-Electronic Encoders

Control Elements

Palm Grips

Control Console

Foot Pedals

Crane Control Units

Driver's Seats

Portable Control Units

Industrial Controllers

Gear Limit Switches

Naval Cruise Controller

Control Pedestals for offshore

Tool for Designers, Engineers and Purchasing Agents

Your tool for finding industrial controllers for cranes, electro-hydraulic systems, floor conveyors, industrial applications, ships, rail vehicles, and construction machinery of any kind, joysticks and masterswitches with electronic interface adjustment for all machines matching our product portfolio. Take advantage of our fold-out order tool on this page and the detailed tables of contents at the beginning of each position.

As of
2021



GESSMANN®

Product Portfolio

Gessmann is an international market leader. Our success in the market is based upon our decisive focus on innovative product development and the highest possible standards when it comes to quality. Our product range includes:

- Joysticks (Multi-Axis Controller, Double-Handle Controller, Control Switch), Gear Limit Switch for hoisting, Electro-hydraulic Application, Material-handling technology and Remote Control
- Gear limit switch for joisting equipment
- Complete Crane Control Unit, Portable Control Unit, Pendant Control Unit, including wiring for all types of cranes, vehicles and industrial applications
- Operating Panels for construction machinery, industrial applications, vehicles and harvesting machines
- Control Pedestals, ship-operating transmitters, sensor units and actual-value transmitters for ship drives
- Pedal Controllers for welding machines, road and rail vehicles
- Master Controllers, panels and control stations for rail vehicles
- Displays for forklifts and construction machinery
- Proportional control electronics for solenoid valves
- Interface electronics with digital and analog outputs matching our controllers
- Interface electronics with Profibus interface or CAN-bus interface matching our controllers (input/output cards)
- DC controllers, selector switches (signal controllers) for high-voltage systems
- Customized solutions for operating devices and electronic units for any type of machinery and vehicles

Management certification:

Industrial Joysticks

Joysticks with hallsensor-technology

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Joysticks with contacts and potentiometer

| | | | |
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|--------------------|----|---------|
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|---------------------------|------------|
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Industrial Controllers

| | |
|---------------------------|------------|
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| | |
|-----------------------------|------------|
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|-----------------------------|------------|

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| | |
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For our general conditions for sale and delivery please refer to our website at www.gessmann.com

Please also note:

The prices are ex-works in Leingarten excluding packaging. Packaging is charged at cost and cannot be returned. For orders below EURO 150.00 our gross prices are applicable. The minimum invoice amount is EURO 80.00, regardless of the value of the delivered goods. Therefore, we recommend combining small orders.

We are entitled to pass on any additional handling and production costs resulting from modifications to the order caused or requested by the customer (both technical modifications and non-compliance with deadlines).

Our periods of payment are: 30 days without a discount.
These conditions of payment shall be deemed agreed and accepted upon receipt of our written confirmation of order.

All delivered goods shall remain our sole and absolute property until full payment is received.

The delivery period only commences upon clarification of all technical details. Unforeseen circumstances justify an appropriate extension of the delivery period. All documents, such as drawings, dimensional drawings, circuit diagrams, etc., are non-binding. We reserve the right to make any changes necessary, in particular changes which serve the technical advancement.

The exclusive place of jurisdiction is 74072 Heilbronn, Germany.

Warning

Certain parts of this electrical device carry hazardous voltages when in operation.

Installation, maintenance, modification or retrofitting may only be carried out by qualified personnel in consideration of the appropriate safety precautions.

Non-compliance may result in death, severe injuries or substantial property damage.

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Managing Director:

Alwin Ehrensperger

Multi-Axis Controller

V85 / VV85



The V85/VV85 is a robust joystick commonly used in electro-hydraulic applications. Long life and high reliability is ensured by the latest contactless hall-technology. With many outputs and grip options the V85/VV85 series is flexible and customisable.

Technical data

| | |
|-----------------------|--|
| Mechanical life V85 | 10 million operating cycles |
| Mechanical life VV85 | 20 million operating cycles |
| Supply voltage | See interface |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | | VV85 | S8 | P | T | -Z80 | +R11 | -B | -E... | -S... | -X |
|---|---|------|----|---|---|------|------|----|-------|-------|----|
| Basic unit | | | | | | | | | | | |
| V85.1 | 1-axis | | | | | | | | | | |
| V85 | 2-axis | | | | | | | | | | |
| Reinforced version | | | | | | | | | | | |
| VV85.1 | 1-axis | | | | | | | | | | |
| VV85 | 2-axis | | | | | | | | | | |
| Control-handle extended | | | | | | | | | | | |
| | Standard 160 mm* | | | | | | | | | | |
| S5 | -20 mm | | | | | | | | | | |
| S8 | +20 mm | | | | | | | | | | |
| *Only available in combination with a handle! | | | | | | | | | | | |
| Gate | | | | | | | | | | | |
| P | Cross gate | | | | | | | | | | |
| P X | Special gate | | | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | | | |
| | Knob (included in basic unit!) | | | | | | | | | | |
| M | Knob with mechanical zero interlock | | | | | | | | | | |
| T | Dead man | | | | | | | | | | |
| H | Signal button | | | | | | | | | | |
| D | Push button | | | | | | | | | | |
| B... | Palm Grip B... (see page Palm Grip 154) | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

VV85 S8 P T -Z80 +R11 -B -E... -S... -X

Axis 1 / Axis 2 (not applied for V/VV85.1)

| | |
|----|--|
| Z | Spring return |
| R | Friction brake* |
| | Latching:* |
| 11 | 1-0-1 |
| 22 | 2-0-2 |
| 33 | 3-0-3 |
| 44 | 4-0-4 |
| 55 | 5-0-5 |
| 08 | end-position latching SR2 or SR4 |
| 19 | 1-0-1 + end-position latching SR2 or SR4 |
| 80 | end-position latching SR1 or SR3 |
| 91 | 1-0-1 + end-position latching SR1 or SR3 |
| 88 | end-position latching SR1 + SR2 or SR3 + SR4 |
| 99 | 1-0-1 + end-position latching SR1 + SR2 or SR3 + SR4 |

*Maximum deflection angle +/- 25°!

Degree of protection

| | |
|-----|--|
| B | Cover housing (included in basic unit!) |
| B10 | Joystick-main board sealed (IP67) |
| B11 | Joystick-main board sealed (IP67) and grip function sealed, grip with drain hole |

For a schematic description of the protection class, see page 121

Interface (description see on the following pages)

| | |
|------|--------------------------|
| E0xx | Switching output |
| E1xx | Voltage output |
| E2xx | Current output |
| E3xx | CAN-interface |
| E4xx | CANopen Safety interface |
| E5xx | Profibus DP-interface |
| E6xx | Profinet |
| E7xx | PROFIsafe |
| E8xx | PWM - Output |
| E9xx | Other outputs |

Plug connectors

| | |
|------|---|
| S... | Standard plug connectors (see page 120) |
|------|---|

Special model

| | |
|---|------------------------------|
| X | Special / customer specified |
|---|------------------------------|

Combination possibilities with our grips



| Digital output | |
|---|--|
| Supply voltage | 9-32 V DC |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA |
| Mounting depth A | 72 mm (reduced mounting depth on request!) |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 2 Direction signals + 1 zero position signal (galvanically isolated) per axis | |
| | 1 axis |
| | 2 axis |
| | E001 1 |
| | 2 |

| Voltage output (not stabilized) | |
|--|--|
| Supply voltage | 4,75-5,25 V DC |
| Current carrying capacity | Direction signal 8 mA |
| Mounting depth A | 72 mm (reduced mounting depth on request!) |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 0,5...2,5...4,5 V redundant + 2 direction signals per axis | |
| | 1 axis |
| | 2 axis |
| | E104 1 |
| | 2 |
| Output options | |
| Characteristic: | |
| Inverse dual | 1 |
| Dual | 2 |
| Inverse dual with dead zone +/- 3° (standard) | 3 |
| Dual with dead zone +/- 3° | 4 |

Voltage output

| | |
|---|--|
| Supply voltage | 9-32 V DC (*11,5-32) |
| Current carrying capacity | Direction signal 150 mA |
| | Zero position signal 500 mA |
| Mounting depth A | 72 mm (reduced mounting depth on request!) |
| Option | Input for capacitive sensor |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector |
| | 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector |
| Optional with plug connector (<i>standard plug connectors see page 120</i>) | |

| | | | |
|---|---------|------|---|
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis | | | |
| | 1 axis | E112 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC | | | |
| | 1 axis | E132 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E136 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| +10...0...-10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, redundant sensor with error monitoring | | | |
| | 1 axis | E138 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |

Output options

| | |
|---|---|
| Characteristic: | |
| Inverse dual *1 | 1 |
| Dual *1 | 2 |
| Inverse dual with dead zone +/- 3° *1 (standard) | 3 |
| Dual with dead zone +/- 3° *1 | 4 |
| *1 not combinable with output E136X + E138X | |
| Single *2 | 5 |
| Single with dead zone *2 (standard) | 6 |
| *2 not combinable with output E112X and E132X | |
| Digital output signals: | |
| Output signals standard: | |
| Direction signals and zero position signals 1,5A 24V DC | 1 |

*Axis for grip functions, interface can vary depending upon actuation element!

Voltage output with other value on request!

| Current output | | | |
|---|--|--|--------|
| Supply voltage | 9-32 V DC | | |
| Current carrying capacity | Direction signal 150 mA | | |
| | Zero position signal 500 mA | | |
| Mounting depth A | 72 mm (reduced mounting depth on request!) | | |
| Option | Input for capacitive sensor | | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector | | |
| | 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| S | | | |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | | E206 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | | E208 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | | E214 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | | E216 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| +20...0...-20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring | | | |
| | 1 axis | | E226 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| Output options | | | |
| | Single | | 5 |
| | Single with dead zone +/- 3° (standard) | | 6 |
| Digital output signals: | | | |
| Output signals standard: | | | |
| | Direction signals and zero position signals 1,5A 24 V DC | | 1 |
| *Axis for grip functions, interface can vary depending upon actuation element! | | | |
| Current output with other value on request! | | | |

| CAN | | | |
|---|--|--------|---|
| Supply voltage | 9-32 V DC | | |
| Idle current consumption | 120 mA (24 V DC) | | |
| Current carrying capacity | Direction signal 100 mA | | |
| | Zero position signal 100 mA (potential-free) | | |
| | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) | | |
| | Digital switching output (potential-free) 100 mA | | |
| Mounting depth A | E3091: 72 mm | | |
| | E3091X: 85 mm | | |
| | E3101X - E3103X: 85 mm | | |
| | E3104X - E3105X: 105 mm | | |
| | (reduced mounting depth on request!) | | |
| Protocol | CANopen CiA DS 301 or SAE J1939 (based on) | | |
| Baud rate | 20 kBit/s to 1 Mbit/s (standard 250 kBit/s) | | |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) | | |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) | | |
| | External in-/outputs cable 300 mm long without plug connector | | |
| | External in-/outputs cable 300 mm long without plug connector (additionally from 32 in-/outputs) | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| CAN expansion stage 1 | | E309 1 | |
| - 7 analog joystick axis | | | |
| - 16 digital joystick functions | | | |
| - Input for capacitive sensor | | | |
| With additional external in-/outputs | | | |
| - 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 | |
| - 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs | | 3 | |
| *External LED-outputs can be used for LEDs in the grip | | | |
| *With the use of capacitive sensor, the external digital inputs are reduced by one input! | | | |
| CAN expansion stage 2 | | E310 1 | |
| - 10 analog joystick axis | | | |
| - 16 digital joystick functions | | | |
| - 2 inputs for capacitive sensors | | | |
| With additional external in-/outputs | | | |
| - 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 | |
| - 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs | | 3 | |
| - 24 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 24 external digital inputs | | 4 | |
| - 32 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 32* external digital inputs | | 5 | |
| *External LED-outputs can be used for LEDs in the grip | | | |
| *With the use of two capacitive sensors, the external digital inputs are reduced by one input! | | | |
| Main-axis with additional digital-/analog outputs separately wired (not via CAN) | | | |
| - 2 direction signals + 1 zero position signal (potential-free) per main-axis | | | 3 |
| Additional analog outputs on request! | | | |

| CANopen Safety | | |
|---|--|--------|
| Supply voltage | 9-32 V DC | |
| Idle current consumption | 120 mA (24 V DC) | |
| Current carrying capacity | Direction signal 100 mA | |
| | Zero position signal 100 mA (potential-free) | |
| | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) | |
| | Digital switching output (potential-free) 100 mA | |
| Mounting depth A | E4091: 72 mm | |
| | E4091X: 85 mm | |
| | E4101X - E4103X: 85 mm | |
| | E4104X - E4105X: 105 mm | |
| | (reduced mounting depth on request!) | |
| Protocol | CANopen Safety EN50325-5 | |
| Baud rate | 20 kBit/s to 1 MBit/s (standard 250 kBit/s) | |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) | |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) | |
| | External in-/outputs cable 300 mm long without plug connector | |
| | External in-/outputs cable 300 mm long without plug connector (additionally from 32 in-/outputs) | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| CANopen Safety expansion stage 1 | | E409 1 |
| - 7 analog joystick axis | | |
| - 16 digital joystick functions | | |
| - Input for capacitive sensor | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs | | 3 |
| *External LED-outputs can be used for LEDs in the grip | | |
| *With the use of capacitive sensor, the external digital inputs are reduced by one input! | | |
| CANopen Safety expansion stage 2 | | E410 1 |
| - 10 analog joystick axis | | |
| - 16 digital joystick functions | | |
| - 2 inputs for capacitive sensors | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs | | 3 |
| - 24 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 24 external digital inputs | | 4 |
| - 32 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 32* external digital inputs | | 5 |
| *External LED-outputs can be used for LEDs in the grip | | |
| *With the use of two capacitive sensors, the external digital inputs are reduced by one input! | | |
| Main-axis with additional digital outputs separately wired (not via CAN) | | |
| - 2 direction signals + 1 zero position signal (potential-free) per main-axis | | 3 |
| Additional analog outputs on request! | | |

| Profibus DP | | | |
|---|--|--------|---|
| Supply voltage | 18-30 V DC | | |
| Baud rate | to 12 MBit/s | | |
| Output value | 0...128...255 | | |
| Mounting depth A | 105 mm (reduced mounting depth on request!) | | |
| Wiring | Profibus, cable 100 mm with plug connector D-Sub 9 | | |
| | Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm ² 300 mm long without plug connector | | |
| | External in-/outputs, cable 300 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| Profibus DP | | E501 1 | |
| - 4 analog joystick axis | | | |
| - 16 digital joystick functions | | | |
| - Input for capacitive sensor | | | |
| With additional external in-/outputs | | | |
| - 8 external LED-outputs, 8 external digital inputs | | 2 | |
| - 16 external LED-outputs, 16 external digital inputs | | 3 | |
| *External LED-outputs can be used for LEDs in the grip | | | |
| Main-axis with additional contact equipment separately wired (not via profibus) | | | |
| - 2 direction contacts + 1 zero position contact (not potential-free) per main-axis | | | 1 |
| - 1 zero position contact (potential-free) per main-axis | | | 2 |

| Profinet | | | |
|---|--|--------|---|
| Supply voltage | 18-30 V DC | | |
| Baud rate | to 100 MBit/s | | |
| Output value | 0...512...1023 | | |
| Mounting depth A | 85 mm (reduced mounting depth on request!) | | |
| Wiring | Profinet (1), cable 300 mm with M12 plug connector (female) | | |
| | Profinet (2), cable 300 mm with M12 plug connector (female) | | |
| | Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm ² 300 mm long without plug connector | | |
| | External in-/outputs, cable 300 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| Profinet | | E601 1 | |
| - 4 analog joystick axis | | | |
| - 16 digital joystick functions | | | |
| - Input for capacitive sensor | | | |
| With with additional external in-/outputs | | | |
| - 8 external LED-outputs, 8 external digital inputs | | 2 | |
| - 16 external LED-outputs, 16 external digital inputs | | 3 | |
| *External LED-outputs can be used for LEDs in the grip | | | |
| Main-axis with additional signals separately wired (not via profinet) | | | |
| - 2 direction signals + zero position signal (potential-free) per main-axis | | | 3 |

| PROFIsafe | | |
|---|--|--------|
| Supply voltage | 18-30 V DC | |
| Baud rate | to 100 MBit/s | |
| Output value | 0...512...1023 | |
| Mounting depth A | 85 mm (reduced mounting depth on request!) | |
| Wiring | Profinet (IN), cable 300 mm with M12 plug connector (female) | |
| | Profinet (OUT), cable 300 mm with M12 plug connector (female) | |
| | Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm ² 300 mm long without plug connector | |
| | External in-/outputs, cable 300 mm long without plug connector | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| - 4 analog joystick axis | | E701 1 |
| - 16 digital joystick functions | | |
| - Input for capacitive sensor | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs, 8 external digital inputs | | 2 |
| - 16 external LED-outputs, 16 external digital inputs | | 3 |
| *External LED-outputs can be used for LEDs in the grip | | |
| Main-axis with additional signals separately wired (not via profinet safe) | | |
| - 2 direction signals + zero position signal (potential-free) per main-axis | | 3 |

| PWM Outputs | | |
|--|---|--------|
| Supply Voltage | 9-32V DC | |
| Valve control current | max. 3 A | |
| PWM-frequency | 1225 Hz | |
| Dither frequency | 1...250 Hz adjustable | |
| Mounting depth A | 85 mm (reduced mounting depth on request!) | |
| Other features | Creep speed per axis | |
| | 5 configurable switching outputs 2A | |
| | LED outputs for status indication | |
| | Input for redundant deadman | |
| Wiring: | Built-in socket Phoenix 2-pole (power supply) | |
| | Cable 1 (PWM) 12 x 1mm ² 300 mm long without plug | |
| | Cable 2 (switching output) 12 x 1mm ² 300 mm long without plug | |
| | Cable 3 (creep speed / dead man) 14x0,25mm ² 300mm long without plug | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| PWM Output 0-3 A for 2 proportional valve magnets per axis | 1 axis | E801 1 |
| | 2 axis | 2 |
| | 3 axis | 3 |
| | 4 axis | 4 |

Other outputs

Voltage output for PVG32 0,25...0,5...0,75Us, power supply 9-32 V DC

Mounting depth A 72 mm (reduced mounting depth on request!)

Option Input for capacitive sensor

Wiring
 1. cable 14 x 0,25 mm² 300 mm long without plug connector
 2. cable 14 x 0,25 mm² 300 mm long without plug connector (optional for grip function)
 Optional with plug connector (*standard plug connectors see page 120*)

| | |
|--------|--------|
| 1 axis | E907 1 |
| 2 axis | 2 |
| 3 axis | 3 |
| 4 axis | 4 |
| 5 axis | 5 |
| 6 axis | 6 |

S

Main-axis with additional direction signals and zero direction signals (potential-free) per main-axis

3

8 Bit Gray-Code with direction signals per main-axis, supply voltage 9-36 V DC

Wiring:
 1. cable 37 x 0,14 mm² 300 mm long without plug connector (axis 1+2)
 2. cable 37 x 0,14 mm² 300 mm long without plug connector (optional for axis 3+4)
 Optional with plug connector (*standard plug connectors see page 120*)

| | |
|--------|--------|
| 1 axis | E903 1 |
| 2 axis | 2 |
| 3 axis | 3 |
| 4 axis | 4 |

S

8 Bit binary-Code with direction signals per main-axis, supply voltage 9-36 V DC

Wiring:
 1. cable 37 x 0,14 mm² 300 mm long without plug connector (axis 1+2)
 2. cable 37 x 0,14 mm² 300 mm long without plug connector (optional for axis 3+4)
 Optional with plug connector (*standard plug connectors see page 120*)

| | |
|--------|--------|
| 1 axis | E904 1 |
| 2 axis | 2 |
| 3 axis | 3 |
| 4 axis | 4 |

S

Attachments

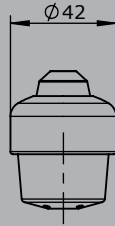
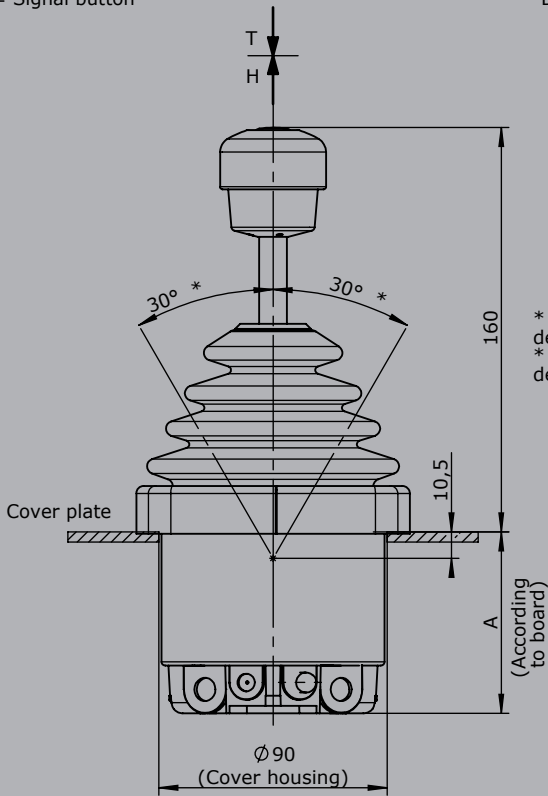
| | | |
|-----|--|------------|
| Z01 | Mating connector (CAN) M12 (male insert) with 2 m cable | 20201140 |
| Z02 | Mating connector (CAN) M12 (female contact) with 2 m cable | 20202298 |
| Z03 | Mating connector (Profibus) straight | 22201440 |
| Z04 | Mating connector (Profibus) 90° angled | 22201741 |
| Z05 | Mating connector (Profinet) M12 (male insert) with 2 m cable | 5300000222 |

T = Dead man's button
H = Signal button

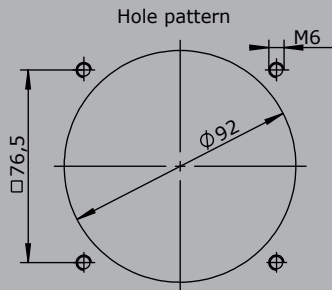
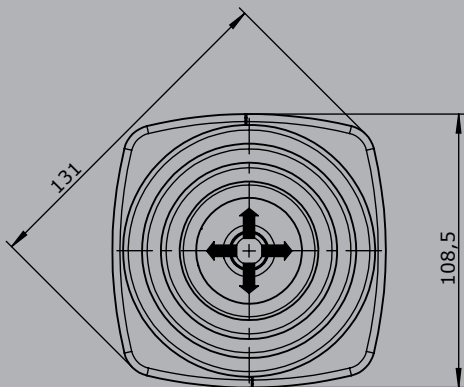
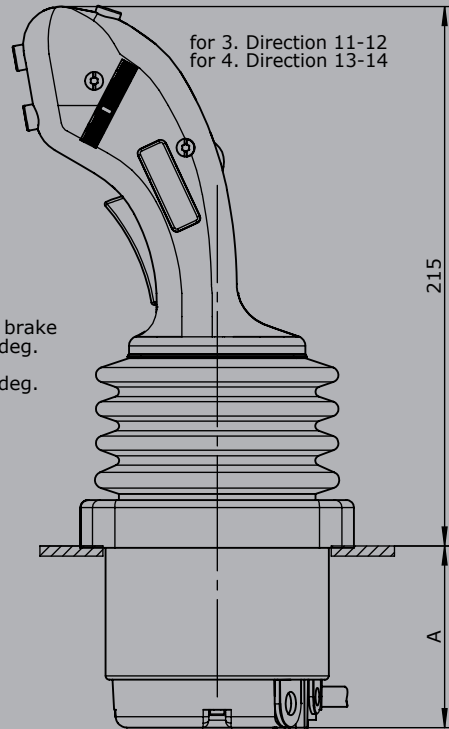
Knob solid
D= Push button

Palm grip B3

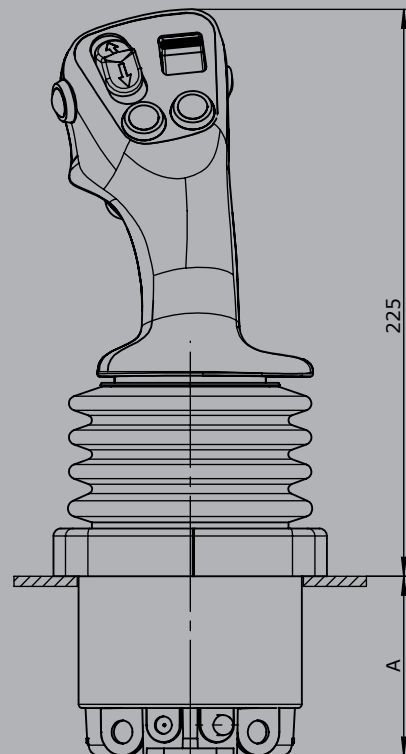
for 3. Direction 11-12
for 4. Direction 13-14



* Type with friction brake
deflection max. 25 deg.
* Type with detent
deflection max. 25 deg.



Palm grip B25



Multi-Axis Controller V27



The V27 is a robust joystick commonly used in electro-hydraulic applications. The compact design allows for use in smallest installation spaces. It can be integrated with detents and a very robust friction brake. Long life and high reliability is ensured by the latest contactless hall-technology. With many outputs and grip options the V27 series is flexible and customisable.

Technical data

| | |
|-----------------------|--|
| Mechanical life V27 | 10 million operating cycles |
| Supply voltage | See interface |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | | V27 | S8 | P | T | -R11 | +Z | -B10 | -E... | -S.. | -X |
|--|--|-----|----|---|---|------|----|------|-------|------|----|
| Basic unit | | | | | | | | | | | |
| V27.1 | 1-axis | | | | | | | | | | |
| V27 | 2-axis | | | | | | | | | | |
| Control-handle extended | | | | | | | | | | | |
| | Standard 95 mm* | | | | | | | | | | |
| S8 | +20 mm | | | | | | | | | | |
| *Only available in combination with a handle! | | | | | | | | | | | |
| Gate | | | | | | | | | | | |
| P | Cross gate | | | | | | | | | | |
| P X | Special gate | | | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | | | |
| | Knob (included in basic unit!) | | | | | | | | | | |
| M | Knob with mechanical zero interlock | | | | | | | | | | |
| T | Dead man | | | | | | | | | | |
| H | Signal button | | | | | | | | | | |
| D | Push button | | | | | | | | | | |
| B... | Palm Grip B... (see page Palm Grip 154) | | | | | | | | | | |
| Axis 1 / Axis 2 (not applied for V27.1) | | | | | | | | | | | |
| Z | Spring return | | | | | | | | | | |
| R | Friction brake (possible with one axis!) | | | | | | | | | | |
| | Latching: (possible with one axis!) | | | | | | | | | | |
| 11 | 1-0-1 | | | | | | | | | | |
| 22 | 2-0-2 | | | | | | | | | | |
| 33 | 3-0-3 | | | | | | | | | | |
| 44 | 4-0-4 | | | | | | | | | | |
| 08 | end-position latching SR2 or SR4 | | | | | | | | | | |
| 19 | 1-0-1 + end-position latching SR2 or SR4 | | | | | | | | | | |
| 80 | end-position latching SR1 or SR3 | | | | | | | | | | |
| 91 | 1-0-1 + end-position latching SR1 or SR3 | | | | | | | | | | |
| 88 | end-position latching SR1 + SR2 or SR3 + SR4 | | | | | | | | | | |
| 99 | 1-0-1 + end-position latching SR1 + SR2 or SR3 + SR4 | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

V27 S8 P T -R11 +Z -B10 -E... -S... -X

Degree of protection

B10 Joystick-main board sealed (IP67)
 B11 Joystick-main board sealed (IP67) and grip function sealed, grip with drain hole
 For a schematic description of the protection class, see page 121

Interface (description see on the following pages)

E0xx Switching output
 E1xx Voltage output
 E2xx Current output
 E3xx CAN-interface
 E4xx CANopen Safety interface
 E9xx Other outputs

Plug connectors

S... Standard plug connectors (see page 120)

Special model

X Special / customer specified

Combination possibilities with our grips



Digital output

Supply voltage 9-32 V DC
 Current carrying capacity Direction signal 150 mA
 Zero position signal 500 mA
 Mounting depth A 45 mm
 Wiring 1. cable 14 x 0,25 mm² 500 mm long without plug connector
 2. cable 14 x 0,25 mm² (optional for grip function) 500 mm long without plug connector
 Optional with plug connector (standard plug connectors see page 120)

2 Direction signals + 1 zero position signal (galvanically isolated) per axis

| | |
|--------|--------|
| 1 axis | E001 1 |
| 2 axis | 2 |

Voltage output (not stabilized)

| | | | |
|--|--|--------|---|
| Supply voltage | 4,75-5,25 V DC | | |
| Current carrying capacity | Direction signal 8 mA | | |
| Mounting depth A | 45 mm | | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (grip function) 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| 0,5...2,5...4,5 V redundant + 2 direction signals per axis | | | |
| | 1 axis | E104 1 | |
| | 2 axis | 2 | |
| | Output options | | |
| | Characteristic: | | |
| | Inverse dual | | 1 |
| | Dual | | 2 |
| | Inverse Dual with dead zone +/- 3° (standard) | | 3 |
| | Dual with dead zone +/- 3° | | 4 |

Voltage output

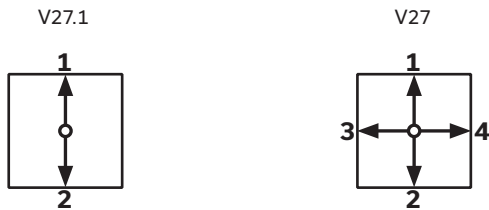
| | | | |
|---|---|--------|---|
| Supply voltage | 9-32 V DC (*11,5-32) | | |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA | | |
| Mounting depth A | 45 mm (60 mm from 3 axis) | | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis | | | |
| | 1 axis | E112 1 | |
| | 2 axis | 2 | |
| | 3 axis* | 3 | |
| | 4 axis* | 4 | |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC | | | |
| | 1 axis | E132 1 | |
| | 2 axis | 2 | |
| | 3 axis* | 3 | |
| | 4 axis* | 4 | |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E136 1 | |
| | 2 axis | 2 | |
| | 3 axis* | 3 | |
| | 4 axis* | 4 | |
| | Output options | | |
| | Characteristic: | | |
| | Inverse dual *1 | | 1 |
| | Dual *1 | | 2 |
| | Inverse dual with dead zone +/- 3° *1 (standard) | | 3 |
| | Dual with dead zone +/- 3° *1 | | 4 |
| | *1 not combinable with output E136X | | |
| | Single *2 | | 5 |
| | Single with dead zone *2 (standard) | | 6 |
| | *2 not combinable with output E112X and E132X | | |

*Axis for grip functions, interface can vary depending upon actuation element!

Voltage output with other value on request!

| Current output | |
|---|--|
| Supply voltage | 9-32 V DC |
| Current carrying capacity | Direction signal 150 mA |
| | Zero position signal 500 mA |
| Mounting depth A | 45 mm (60 mm from 3 axis) |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector |
| | 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector |
| Optional with plug connector (standard plug connectors see page 120) | |
| S | |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 1 axis E206 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 1 axis E208 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 1 axis E214 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 1 axis E216 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| | Output options |
| | Single 5 |
| | Single with dead zone +/- 3° (standard) 6 |
| *Axis for grip functions, interface can vary depending upon actuation element! | |
| Current output with other value on request! | |

Identification of the installation variants with switching directions:



| CAN | | | |
|--|---|--------|--------|
| Supply voltage | 9-32 V DC | | |
| Idle current consumption | 120 mA (24 V DC) | | |
| Current carrying capacity | Direction signal 100 mA Zero position signal 100 mA External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) Digital switching output (potential-free) 100 mA | | |
| Mounting depth A | 45 mm (expansion stage 1) 60 mm (expansion stage 2) 80 mm (expansion stage 3) | | |
| Protocol | CANopen CiA DS 301 or SAE J1939 (based on) | | |
| Baud rate | 20 kBit/s to 1 Mbit/s (standard 250 kBit/s) | | |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) CAN (OUT) cable 300 mm with plug connector M12 (female) External in-/outputs cable 300 mm long without plug connector External in-/outputs cable 300 mm long without plug connector (additional from 32 in-/outputs) Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| CAN expansion stage 1 | - 4 analog joystick axis - 15 digital joystick functions - Input for capacitive sensor | E304 1 | |
| Main-axis with additional digital outputs separately wired (not via CAN) | - 2 direction signals per main axis | | 1 |
| CAN expansion stage 2 | - 7 analog joystick axis - 15 digital joystick functions - 2 inputs for capacitive sensors | E305 1 | |
| With additional external in-/outputs | - 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs - 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs | | 2 3 |
| *External LED-outputs can be used for LEDs in the grip | | | |

| CAN expansion stage 3 | | E306 1 |
|---|--|--------|
| - 10 analog joystick axis | | |
| - 15 digital joystick functions | | |
| - 2 inputs for capacitive sensors | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs | | 3 |
| - 24 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs | | 4 |
| - 32 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 32 external digital inputs | | 5 |
| <i>*External LED-outputs can be used for LEDs in the grip</i> | | |
| Main-axis with additional digital outputs separately wired (not via CAN) | | |
| - 2 direction signals + 1 zero position signal (potential-free) per axis | | 3 |
| <i>With additional analog outputs on request!</i> | | |

| CANopen Safety | | |
|--|--|--------|
| Supply voltage | 9-32 V DC | |
| Idle current consumption | 120 mA (24 V DC) | |
| Current carrying capacity | Direction signal 100 mA | |
| | Zero position signal 100 mA (potential-free) | |
| | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) | |
| | Digital switching output (potential-free) 100 mA | |
| Baud rate | 20 kBit/s to 1 MBit/s (standard 250 kBit/s) | |
| Mounting depth | 45 mm (expansion stage 1) | |
| | 60 mm (expansion stage 2) | |
| | 80 mm (expansion stage 3) | |
| Protocol | CANopen Safety EN50325-5 | |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) | |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) | |
| | External in-/outputs cable 300 mm long without plug connector | |
| | External in-/outputs cable 300 mm long without plug connector (additional from 32 in-/outputs) | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| CANopen Safety expansion stage 1 | | E404 1 |
| - 4 analog joystick axis | | |
| - 15 digital joystick functions | | |
| - Input for capacitive sensor | | |
| Main-axis with additional digital outputs separately wired (not via CAN) | | |
| - 2 direction signals per main axis | | 1 |
| CANopen Safety expansion stage 2 | | E405 1 |
| - 7 analog joystick axis | | |
| - 15 digital joystick functions | | |
| - 2 inputs for capacitive sensors | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs | | 3 |
| <i>*External LED-outputs can be used for LEDs in the grip</i> | | |

CANopen Safety expansion stage 3

- 10 analog joystick axis
- 15 digital joystick functions
- 2 inputs for capacitive sensor

E406 1

With additional external in-/outputs

- 8 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 8 external digital inputs
- 16 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs
- 24 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs
- 32 external LED-outputs (dimmable), 2 switching outputs (potential-free, 100 mA), 32 external digital inputs

2
3
4
5

**External LED-outputs can be used for LEDs in the grip*

Main-axis with additional digital outputs separately wired (not via CAN)

- 2 direction signals + 1 zero position signal (potential-free) per axis

3

With additional analog outputs on request!

Other outputs

Voltage output for PVG32 0,25...0,5...0,75Us, power supply 9-32 V DC

Option Input for capacitive sensor

Mounting depth A 45 mm (60 mm from 3 axis)

- Wiring:
1. cable 14 x 0,25 mm² 300 mm long without plug connector
 2. cable 14 x 0,25 mm² 300 mm long without plug connector (optional for grip function)

Optional with plug connector (*standard plug connectors see page 120*)

S

| | |
|--------|--------|
| 1 axis | E907 1 |
| 2 axis | 2 |
| 3 axis | 3 |
| 4 axis | 4 |

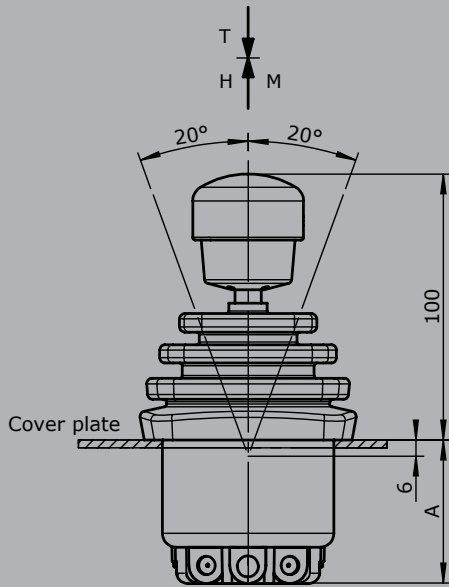
Main-axis with additional direction signals and zero direction signals (potential-free) per main-axis

3

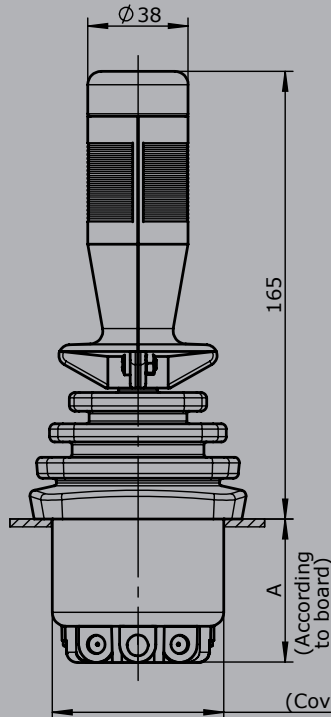
Attachments

| | |
|---|----------|
| Z01 Mating connector M12 male insert with 2 m cable | 20201140 |
| Z02 Mating connector M12 female insert with 2 m cable | 20202298 |

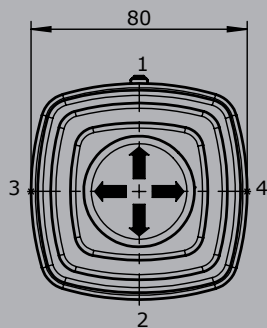
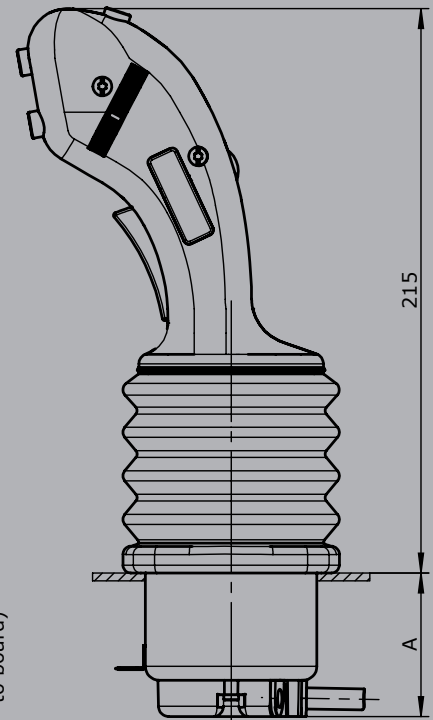
T = Dead man's button
H = Signal button
M = Latch for mechanical zero interlock



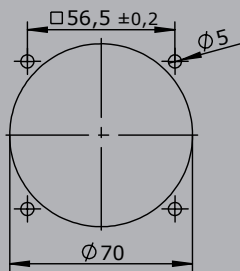
Palm grip B1



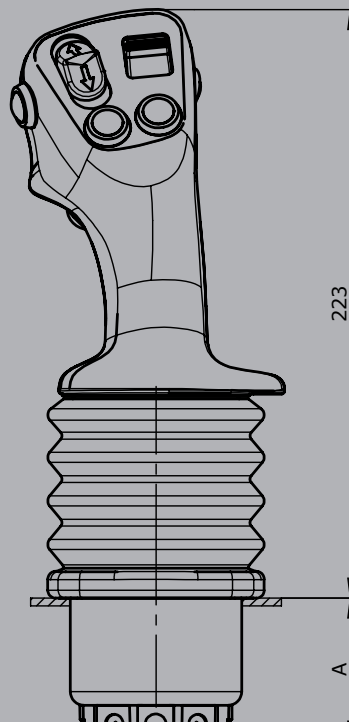
Palm grip B3



Hole pattern



Palm grip B25



Multi-Axis Controller V26



The V26 is a robust joystick commonly used in electro-hydraulic applications. Long life and high reliability is ensured by the latest contactless hall-technology. With many outputs and grip options the V26 series is hugely customisable.

Technical data

| | |
|-----------------------|--|
| Mechanical life V26 | 10 million operating cycles |
| Supply voltage | See interface |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP22 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | V26 | T | -R | +R | -B | -E... | -S... | -X |
|---|-----|---|----|----|----|-------|-------|----|
| Basic unit | | | | | | | | |
| V26 2-axis | | | | | | | | |
| Grip / Palm Grip | | | | | | | | |
| Knob (included in basic unit!) | | | | | | | | |
| T Dead man | | | | | | | | |
| H Signal button | | | | | | | | |
| D Push button | | | | | | | | |
| B... Palm Grip B... (see page Palm Grip 154) | | | | | | | | |
| Axis 1 | | | | | | | | |
| R Friction brake | | | | | | | | |
| Axis 2 | | | | | | | | |
| R Friction brake | | | | | | | | |
| Cover housing | | | | | | | | |
| B Cover housing (included in basic unit!) | | | | | | | | |
| Interface (description see on the following pages) | | | | | | | | |
| E0xx Switching output | | | | | | | | |
| E1xx Voltage output | | | | | | | | |
| E2xx Current output | | | | | | | | |
| E3xx CAN-interface | | | | | | | | |
| E4xx CANopen Safety interface | | | | | | | | |
| E9xx Other outputs | | | | | | | | |
| Plug connectors | | | | | | | | |
| S... Standard plug connectors (see page 120) | | | | | | | | |
| Special model | | | | | | | | |
| X Special / customer specified | | | | | | | | |

Digital output

| | | | |
|---|---|--|--------|
| Supply voltage | 9-32 V DC | | |
| Current carrying capacity | Direction signal 150 mA | | |
| | Zero position signal 500 mA | | |
| Mounting depth A | 105 mm | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| 2 direction signals + 1 zero position signal (galvanically isolated) per axis | | | |
| | 2 axis | | E002 2 |

Voltage output (not stabilized)

| | | | |
|--------------------------------------|---|--|--------|
| Supply voltage | 4,75-5,25 V DC | | |
| Mounting depth A | 105 mm | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| 0,5...2,5...4,5 V redundant per axis | | | |
| | 2 Achsen | | E103 2 |
| Output options | | | |
| Characteristic: | | | |
| | Inverse dual | | 1 |
| | Dual | | 2 |
| | Inverse dual with dead zone +/- 3° (standard) | | 3 |
| | Dual with dead zone +/- 3° | | 4 |

Voltage output

| | | | |
|--|---|--|--------|
| Supply voltage | 9-32 V DC (*11,5-32) | | |
| Mounting depth A | 105 mm | | |
| Option | Input for capacitive sensor | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| 0,5...2,5...4,5 V redundant per axis | | | |
| | 2 axis | | E111 2 |
| 0...5...10 V redundant per axis, supply voltage 11,5 - 32 V DC | | | |
| | 2 axis | | E131 2 |
| Output options | | | |
| Characteristic: | | | |
| | Inverse dual | | 1 |
| | Dual | | 2 |
| | Inverse dual with dead zone +/- 3° (standard) | | 3 |
| | Dual with dead zone +/- 3° | | 4 |
| <i>Voltage output with other value on request!</i> | | | |

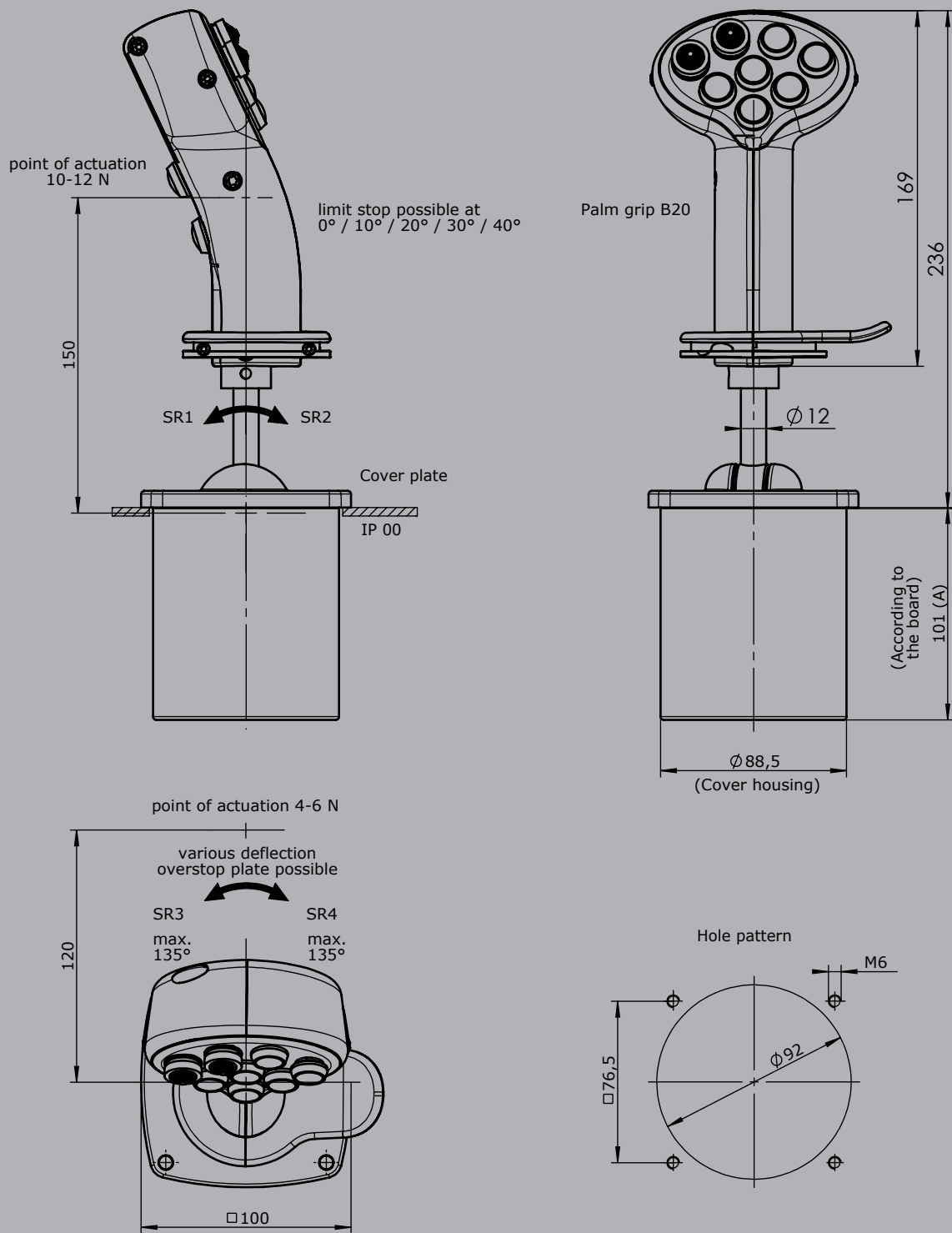
Current output

| | | | |
|--|---|--------|---|
| Supply voltage | 9-32 V DC | | |
| Mounting depth A | 105 mm | | |
| Option | Input for capacitive sensor | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| 0...10...20 mA per axis, sensor redundant with error monitoring and error signal | | | |
| | 2 axis | E203 2 | |
| 4...12...20 mA per axis, sensor redundant with error monitoring and error signal | | | |
| | 2 axis | E211 2 | |
| | Output options | | |
| | Single | | 5 |
| | Single with dead zone +/- 3° (standard) | | 6 |
| <i>Current output with other value on request!</i> | | | |

CAN

| | | | |
|---|---|------|---|
| Supply voltage | 9-36 V DC | | |
| Idle current consumption | 120 mA | | |
| | External digital output for LEDs 5-30 mA (dependent on the number of LEDs) | | |
| | Digital switching output (potential-free) 100 mA | | |
| Mounting depth A | E3091: 105 mm | | |
| | E3091X: 130 mm | | |
| | E3101X - E3103X: 130 mm | | |
| | E3104X - E3105X: 160 mm | | |
| Protocol | CANopen CiA DS 301 or SAE J 1939 (based on) | | |
| Baud rate | 125 kBit/s to 1 Mbit/s (standard 250 kBit/s) | | |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) | | |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) | | |
| | External in-/outputs cable 300 mm without plug connector | | |
| | External in-/outputs cable 300 mm without plug connector (additionally from 32 in-/outputs) | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| CAN expansion stage 1 | | E309 | 1 |
| - 7 analoge Joystickachsen | | | |
| - 16 digitale Joystickfunktionen | | | |
| - Input for capacitive sensor | | | |
| With additional external in-/outputs | | | |
| - 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | | 2 |
| - 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs | | | 3 |
| <i>*External LED-outputs can be used for LEDs in the grip</i> | | | |
| <i>*With the use of capacitive sensor, the external digital inputs are reduced by one input!</i> | | | |

| CANopen Safety | | |
|---|--|--------|
| Supply voltage | 9-36 V DC | |
| Idle current consumption | 120 mA | |
| | External digital output for LEDs 5-30 mA (depending on the number of LEDs) | |
| | Digital switching output (potential-free) 100 mA | |
| Mounting depth A | E4091: 105 mm | |
| | E4091X: 130 mm | |
| | E4101X - E4103X: 130 mm | |
| | E4104X - E4105X: 160 mm | |
| Protocol | CANopen Safety EN50325-5 | |
| Baud rate | 125 kBit/s to 1 MBit/s (Standard 250 kBits) | |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) | |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) | |
| | External in-/outputs cable 300 mm without plug connector | |
| | External in-/outputs cable 300 mm without plug connector (additionally from 32 in-/outputs) | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| CANopen Safety expansion stage 1 | | E409 1 |
| - 7 analog joystick axis | | |
| - 16 digital joystick functions | | |
| - Input for capacitive sensor | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs | | 3 |
| *External LED-outputs can be used for LEDs in the grip | | |
| *With the use of capacitive sensor, the external digital inputs are reduced by one input! | | |
| Other outputs | | |
| Voltage output for PVG32 | 0,25...0,5...0,75Us, power supply 9-32V DC | |
| Mounting depth A | 105 mm | |
| Option | Input for capacitive sensor | |
| Wiring: | 1. cable 14 x 0,25 mm ² 300 mm long without plug connector | |
| | 2. cable 14 x 0,25 mm ² 300 mm long without plug connector (optional for grip function) | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| | 2 axis | E907 2 |
| Attachments | | |
| Z01 Mating connector (CAN) M12 (male insert) with 2 m cable | 20201140 | |
| Z02 Mating connector (CAN) M12 (female contact) with 2 m cable | 20202298 | |



Multi-Axis Controller V25



The V25 is a compact and robust joystick commonly used in electro-hydraulic applications. Long life and high reliability is ensured by the latest contactless hall-technology. With many outputs and grip options the V25 series is hugely customisable.

Technical data

| | |
|-----------------------|--|
| Mechanical life V25 | 8 million operating cycles |
| Supply voltage | See interface |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | V25 | S8 | P | Example T | -Z | -B10 | -E... | -S... | -X |
|---|---|----|---|--------------|----|------|-------|-------|----|
| Basic unit | | | | | | | | | |
| V25.1 | 1-axis | | | | | | | | |
| V25 | 2-axis | | | | | | | | |
| Control-handle long | | | | | | | | | |
| | Standard 100 mm* | | | | | | | | |
| S8 | +20 mm | | | | | | | | |
| *Only available in combination with a handle! | | | | | | | | | |
| Gate | | | | | | | | | |
| P | Cross gate (deflection angle max. 15°) | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | |
| | Knob (included in basic unit!) | | | | | | | | |
| M | Mechanical zero interlock | | | | | | | | |
| T | Knob with dead man | | | | | | | | |
| H | Knob with signal button | | | | | | | | |
| D | Knob with push button KDA/70 | | | | | | | | |
| B ... | Palm Grip B... (see page Palm Grip 154) | | | | | | | | |
| Spring return (included in basic unit!) | | | | | | | | | |
| Z | Spring return | | | | | | | | |
| Degree of protection | | | | | | | | | |
| B | Cover housing | | | | | | | | |
| B10 | Joystick-main board sealed | | | | | | | | |
| B11 | Joystick-main board sealed and grip function sealed, grip with drain hole | | | | | | | | |
| For a schematic description of the protection class, see page 121 | | | | | | | | | |
| Interface (description see on the following page) | | | | | | | | | |
| E0xx | Switching output | | | | | | | | |
| E1xx | Voltage output | | | | | | | | |
| E2xx | Current output | | | | | | | | |
| E3xx | CAN-interface | | | | | | | | |
| E4xx | CANopen Safety interface | | | | | | | | |
| E9xx | Other outputs | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

V25 S8 P T -Z -B10 -E... -S... -X

Plug connectors

S... Standard plug connectors (see page 120)

Special model

X Special / customer specified

Combination possibilities with our grips



Digital output

| | | |
|---|---|--------|
| Supply voltage | 9-32 V DC | |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA | |
| Mounting depth A | 60 mm | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector Optional with plug connector (standard plug connectors see page 120) | |
| 2 Direction signals + 1 zero position signal (galvanically isolated) per axis | 1 axis | E001 1 |
| | 2 axis | 2 |

Voltage output (not stabilized)

| | | |
|--|---|--------|
| Supply voltage | 4,75-5,25 V DC | |
| Current carrying capacity | Direction signal 8 mA | |
| Mounting depth A | 60 mm | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector Optional with plug connector (standard plug connectors see page 120) | |
| 0,5...2,5...4,5 V redundant + 2 direction signals per axis | 1 axis | E104 1 |
| | 2 axis | 2 |
| Output options | | |
| Characteristic: | | |
| Inverse dual | | 1 |
| Dual | | 2 |
| Inverse Dual with dead zone +/- 3° (standard) | | 3 |
| Dual with dead zone +/- 3° | | 4 |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

| Voltage output | |
|---|--|
| Supply voltage | 9-32 V DC (*11,5-32) |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA |
| Mounting depth A | 60 mm |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis | |
| | 1 axis E112 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC | |
| | 1 axis E132 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | |
| | 1 axis E136 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| Output options | |
| Characteristic: | |
| Inverse dual *1 | 1 |
| Dual *1 | 2 |
| Inverse dual with dead zone +/- 3° *1 (standard) | 3 |
| Dual with dead zone +/- 3° *1 | 4 |
| *1 not combinable with output E136X | |
| Single *2 | 5 |
| Single with dead zone +/- 3° *2 (standard) | 6 |
| *2 not combinable with output E112X and E132X | |
| Digital output signals: | |
| Output signals standard: | |
| Direction signals and zero position signals 1,5A 24 V DC | 1 |

*Axis for grip functions, interface can vary depending upon actuation element!

Voltage output with other value on request!

Current output

| | | | |
|---|--|------|---|
| Supply voltage | 9-32 V DC | | |
| Current carrying capacity | Direction signal 150 mA | | |
| | Zero position signal 500 mA | | |
| Mounting depth A | 60 mm | | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector | | |
| | 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E206 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E208 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E214 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E216 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| | 4 axis* | | 4 |
| | Output options | | |
| | Single | | 5 |
| | Single with dead zone +/- 3° (standard) | | 6 |
| | Digital output signals: | | |
| | Output signals standard: | | |
| | Direction signals and zero position signals 1,5A 24 V DC | | 1 |

*Axis for grip functions, interface can vary depending upon actuation element!

Current output with other value on request!

Identification of the installation variants with switching directions:



| CAN | |
|--|---|
| Supply voltage | 9-32 V DC |
| Idle current consumption | 120 mA (24 V DC) |
| Current carrying capacity | Direction signal 100 mA Zero position signal 100 mA External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) Digital switching output (potential-free) 100 mA |
| Mounting depth A | 60 mm (expansion stage 1) 70 mm (expansion stage 2) 90 mm (expansion stage 3) |
| Protocol | CANopen CiA DS 301 or SAE J1939 (based on) |
| Baud rate | 20 kBit/s to 1 Mbit/s (standard 250 kBit/s) |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) CAN (OUT) cable 300 mm with plug connector M12 (female) External in-/outputs cable 300 mm long without plug connector External in-/outputs cable 300 mm long without plug connector (additional from 32 in-/outputs) Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| CAN expansion stage 1 | E304 1 |
| - 4 analog joystick axis | |
| - 15 digital joystick functions | |
| - Input for capacitive sensor | |
| Main-axis with additional digital outputs separately wired (not via CAN) | |
| - 2 direction signals per main axis | 1 |
| CAN expansion stage 2 | E305 1 |
| - 7 analog joystick axis | |
| - 15 digital joystick functions | |
| - 2 inputs for capacitive sensors | |
| With additional external in-/outputs | |
| - 8 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | 2 |
| - 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs | 3 |
| *External LED-outputs can be used for LEDs in the grip | |

| CAN expansion stage 3 | | E306 1 |
|---|--|--------|
| <ul style="list-style-type: none"> - 10 analog joystick axis - 15 digital joystick functions - 2 inputs for capacitive sensors | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs | | 3 |
| - 24 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs | | 4 |
| - 32 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 32 external digital inputs | | 5 |
| *External LED-outputs can be used for LEDs in the grip | | |
| Main-axis with additional digital outputs separately wired (not via CAN) | | |
| - 2 direction signals + 1 zero position signal (potential-free) per axis | | 3 |
| With additional analog outputs on request! | | |

| CANopen Safety | | |
|---------------------------|--|---|
| Supply voltage | 9-32 V DC | |
| Idle current consumption | 120 mA (24 V DC) | |
| Current carrying capacity | Direction signal 100 mA | |
| | Zero position signal 100 mA (potential-free) | |
| | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) | |
| | Digital switching output (potential-free) 100 mA | |
| Baud rate | 20 kBit/s to 1 MBit/s (standard 250 kBit/s) | |
| Mounting depth | 60 mm (expansion stage 1) | |
| | 70 mm (expansion stage 2) | |
| | 90 mm (expansion stage 3) | |
| Protocol | CANopen Safety EN50325-5 | |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) | |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) | |
| | External in-/outputs cable 300 mm long without plug connector | |
| | External in-/outputs cable 300 mm long without plug connector (additional from 32 in-/outputs) | |
| | Optional with plug connector (standard plug connectors see page 120) | S |

| CANopen Safety expansion stage 1 | | E404 1 |
|--|--|--------|
| <ul style="list-style-type: none"> - 4 analog joystick axis - 15 digital joystick functions - Input for capacitive sensor | | |
| Main-axis with additional digital outputs separately wired (not via CAN) | | |
| - 2 direction signals per main axis | | 1 |

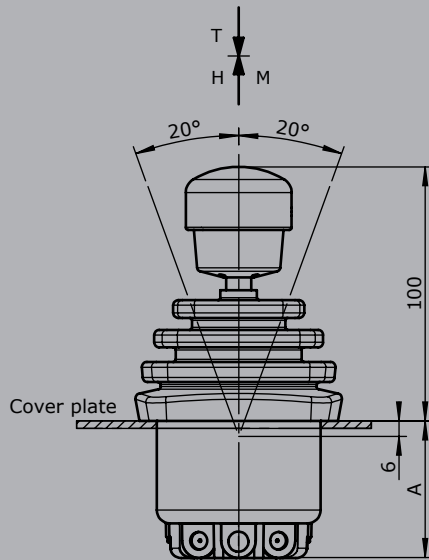
| CANopen Safety expansion stage 2 | | E405 1 |
|--|--|--------|
| <ul style="list-style-type: none"> - 7 analog joystick axis - 15 digital joystick functions - 2 inputs for capacitive sensors | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs | | 3 |
| *External LED-outputs can be used for LEDs in the grip | | |

| CANopen Safety expansion stage 3 | | E406 1 |
|--|--|--------|
| <ul style="list-style-type: none"> - 10 analog joystick axis - 15 digital joystick functions - 2 inputs for capacitive sensor | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs | | 3 |
| - 24 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs | | 4 |
| - 32 external LED-outputs (dimnable optional), 2 switching outputs (potential-free, 100 mA), 32 external digital inputs | | 5 |
| <i>*External LED-outputs can be used for LEDs in the grip</i> | | |
| Main-axis with additional digital outputs separately wired (not via CAN) | | |
| - 2 direction signals + 1 zero position signal (potential-free) per axis | | 3 |
| <i>With additional analog outputs on request!</i> | | |

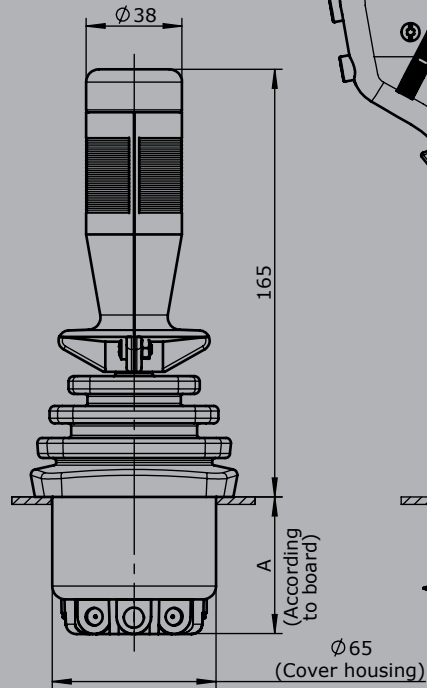
| Other outputs | | |
|--|---|--------|
| Voltage output for PVG32 0,25...0,5...0,75Us, power supply 9-32 V DC | | |
| Option | Input for capacitive sensor | |
| Mounting depth A | 60 mm | |
| Wiring: | <ol style="list-style-type: none"> 1. cable 14 x 0,25 mm² 300 mm long without plug connector 2. cable 14 x 0,25 mm² 300 mm long without plug connector (optional for grip function) | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| | 1 axis | E907 1 |
| | 2 axis | 2 |
| | 3 axis | 3 |
| | 4 axis | 4 |
| Main-axis with additional direction signals and zero direction signals (potential-free) per main-axis | | 3 |

| Attachments | | |
|---|----------|--|
| Z01 Mating connector M12 male insert with 2 m cable | 20201140 | |
| Z02 Mating connector M12 female insert with 2 m cable | 20202298 | |

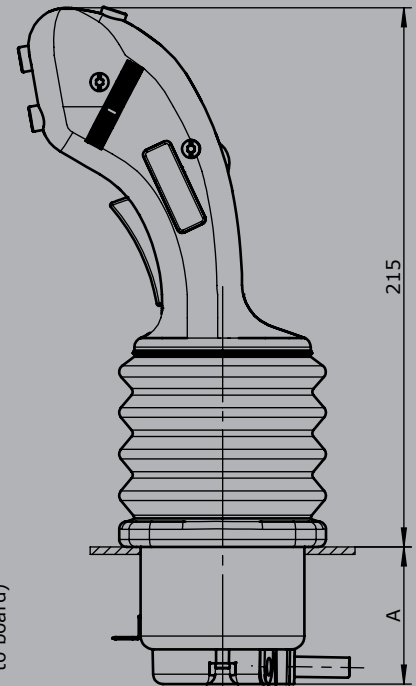
T = Dead man's button
H = Signal button
M = Latch for mechanical zero interlock



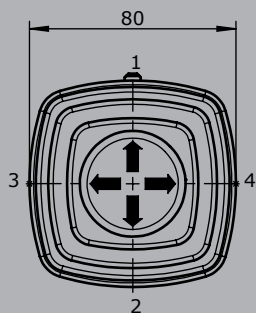
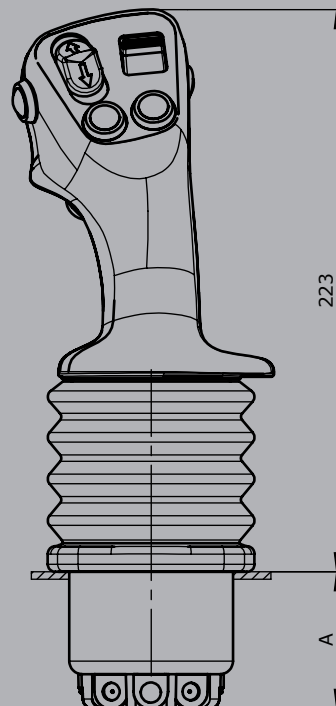
Palm grip B1



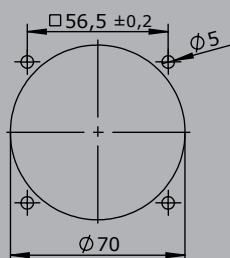
Palm grip B3



Palm grip B25



Hole pattern



Multi-Axis Controller V24



The Multi-Axis Controller V24 is designed as a driving joystick for construction and agricultural machinery. It has a parking position which can be inserted in the zero position. The V24 is characterized by its extremely rugged design. Long life and high reliability is ensured by the latest contactless hall-technology. Through its various interfaces and many possibilities of combination with our numerous ball grips the V24 is very flexible.



Technical data

| | |
|-----------------------|--|
| Mechanical life V24 | 20 million operating cycles |
| Supply voltage | See interface |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

| | V24 | P1 | Example T | -R | -B10 | -E... | -S... | -X |
|--|-----|----|--------------|----|------|-------|-------|----|
| Basic unit | | | | | | | | |
| V24.1 1-axis | | | | | | | | |
| V24L 1-axis with parking position left | | | | | | | | |
| V24R 1-axis parking position right | | | | | | | | |
| Gate | | | | | | | | |
| P1 T-gate main axis axial (included in basic unit!) | | | | | | | | |
| P2 T-gate main axis right outside | | | | | | | | |
| P3 T-gate main axis left outside | | | | | | | | |
| PX Special gate | | | | | | | | |
| Grip / Palm Grip | | | | | | | | |
| Knob (included in basic unit!) | | | | | | | | |
| T Dead man | | | | | | | | |
| H Signal button | | | | | | | | |
| D Push button | | | | | | | | |
| B... Palm Grip B... (see page Palm Grip 154) | | | | | | | | |
| Main axis | | | | | | | | |
| R Friction brake adjustable (included in basic unit!) | | | | | | | | |
| Degree of protection | | | | | | | | |
| B10 Joystick-main board sealed (IP67) | | | | | | | | |
| B11 Joystick-main board sealed (IP67) and grip function sealed, grip with drain hole | | | | | | | | |
| <i>For a schematic description of the protection class, see page 150</i> | | | | | | | | |
| Interface (description see on the following pages) | | | | | | | | |
| E1xx Voltage output | | | | | | | | |
| E2xx Current output | | | | | | | | |
| E3xx CAN-interface | | | | | | | | |
| E4xx CANopen Safety interface | | | | | | | | |
| E9xx Other outputs | | | | | | | | |
| Plug connectors | | | | | | | | |
| S... Standard plug connectors (see page 120) | | | | | | | | |
| Special model | | | | | | | | |
| X Special / customer specified | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Combination possibilities with our grips

| | | | | | | | | |
|--|--|--|--|--|---|--|--|--|
| B1  p. 199 | B2  p. 197 | B3  p. 194 | B5  p. 192 | B6  p. 188 | B7 B8  p. 188 | B9  p. 186 | B10  p. 184 | B14 B15  p. 182 |
| B20  p. 180 | B22  p. 178 | B23  p. 176 | B24  p. 174 | B25  p. 172 | B26  p. 170 | B28  p. 168 | B29  p. 166 | B30  p. 164 |
| B31  p. 162 | B32  p. 160 | B33  p. 158 | B34  p. 156 | B35  p. 154 | | | | |

Voltage output (not stabilized)

| | |
|-----------------------------|---|
| Supply voltage | 4,75-5,25 V DC |
| Mounting depth A | 60 mm |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 0,5...2,5...4,5 V redundant | |
| | 1 axis E103 1 |
| | 2 axis 2 |
| | Output options |
| | Characteristic: |
| | Inverse dual 1 |
| | Dual 2 |
| | Inverse dual with dead zone +/- 3° (standard) 3 |
| | Dual with dead zone +/- 3° 4 |

Voltage output

| | |
|---|---|
| Supply voltage | 9-32 V DC (*11,5-32) |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA |
| Mounting depth A | 65 mm |
| Option | Input for capacitive sensor |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis | |
| | 1 axis E112 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| | 4 axis* 4 |
| | 5 axis* 5 |
| | 6 axis* 6 |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC | |
| | 1 axis E132 1 |
| | 2 axis 2 |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

| | | |
|---|--|--------|
| | 3 axis* | 3 |
| | 4 axis* | 4 |
| | 5 axis* | 5 |
| | 6 axis* | 6 |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | | |
| | 1 axis | E136 1 |
| | 2 axis | 2 |
| | 3 axis* | 3 |
| | 4 axis* | 4 |
| | 5 axis* | 5 |
| | 6 axis* | 6 |
| Output options | | |
| Characteristic: | | |
| | Inverse dual *1 | 1 |
| | Dual *1 | 2 |
| | Inverse dual with dead zone +/- 3° *1 (standard) | 3 |
| | Dual with dead zone +/- 3° *1 | 4 |
| *1 not combinable with output E136X + E138X | | |
| | Single *2 | 5 |
| | Single with dead zone *2 (standard) | 6 |
| *2 not combinable with output E112X and E132X | | |
| *Axis for grip functions, interface can vary depending upon actuation element! | | |
| Voltage output with other value on request! | | |

| Current output | | |
|--|--|--------|
| Supply voltage | 9-32 V DC | |
| Current carrying capacity | Direction signal 150 mA | |
| | Zero position signal 500 mA | |
| Mounting depth A | 65 mm | |
| Option | Input for capacitive sensor | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector | |
| | 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector | |
| | Optional with plug connector (standard plug connectors see page 120) | |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | |
| | 1 axis | E206 1 |
| | 2 axis | 2 |
| | 3 axis* | 3 |
| | 4 axis* | 4 |
| | 5 axis* | 5 |
| | 6 axis* | 6 |
| 20...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | | |
| | 1 axis | E208 1 |
| | 2 axis | 2 |
| | 3 axis* | 3 |
| | 4 axis* | 4 |
| | 5 axis* | 5 |
| | 6 axis* | 6 |

4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal

| | |
|---------|--------|
| 1 axis | E214 1 |
| 2 axis | 2 |
| 3 axis* | 3 |
| 4 axis* | 4 |
| 5 axis* | 5 |
| 6 axis* | 6 |

20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal

| | |
|---------|--------|
| 1 axis | E216 1 |
| 2 axis | 2 |
| 3 axis* | 3 |
| 4 axis* | 4 |
| 5 axis* | 5 |
| 6 axis* | 6 |

Output options

| | |
|---|---|
| Single | 5 |
| Single with dead zone +/- 3° (standard) | 6 |

*Axis for grip functions, interface can vary depending upon actuation element!

Current output with other value on request!

CAN

| | |
|--------------------------|--|
| Supply voltage | 9-36 V DC |
| Idle current consumption | 120 mA |
| Mounting depth A | 60 mm |
| Protocol | CANopen CiA DS 301 or SAE J 1939 (based on) |
| Baud rate | 125 kBit/s to 1 Mbit/s |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) CAN (OUT) cable 300 mm with plug connector M12 (female) External in-/outputs cable 300 mm long without plug connector |
| | Optional with plug connector (standard plug connectors see page 120) |

S

CAN

- 7 analog joystick axis
- 15 digital joystick functions
- *With the use of external inputs, the joystick functions are reduced by 7 pieces!
- Input for capacitive sensor

E312 1

With additional external in-/outputs

- 8 external LED-outputs, 1 switching output (potentialfree, 100 mA), 7 external digital inputs
- 16 external LED-outputs, 1 switching output (potentialfree, 100 mA), 7 external digital inputs

2

3

With additional digital outputs for the main-axis

- 2 direction signals + 1 zero position signal (potential-free) per axis

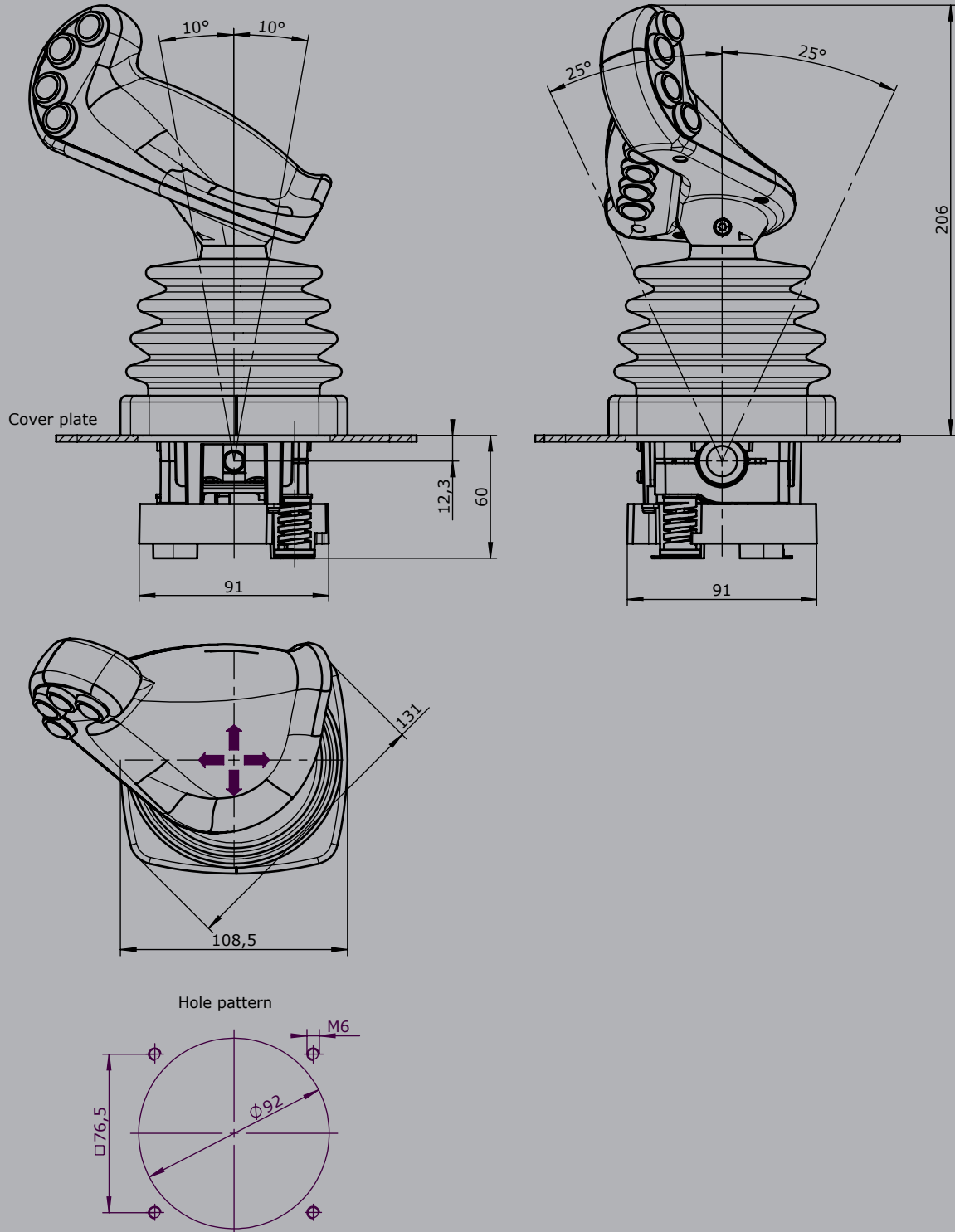
3

Additional analog outputs on request!

| CANopen Safety | |
|--|---|
| Supply voltage | 9-36 V DC |
| Idle current consumption | 120 mA |
| Mounting depth A | 60 mm |
| Protocol | CANopen Safety EN50325-5 |
| Baud rate | 125 kBit/s to 1 Mbit/s |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) CAN (OUT) cable 300 mm with plug connector M12 (female) External in-/outputs cable 300 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| S | |
| CANopen Safety | |
| - 7 analog joystick axis | E411 1 |
| - 15 digital joystick functions | |
| <i>*With the use of external inputs, the joystick functions are reduced by 7 pieces!</i> | |
| - Input for capacitive sensor | |
| With additional external in-/outputs | |
| - 8 external LED-outputs, 1 switching output (potentialfree, 100 mA), 7 external digital inputs | 2 |
| - 16 external LED-outputs, 1 switching output (potentialfree, 100 mA), 7 external digital inputs | 3 |
| With additional digital outputs for the main-axis | |
| - 2 direction signals + 1 zero position signal (potential-free) per axis | 3 |
| <i>Additional analog outputs on request!</i> | |

| Other outputs | |
|---|--|
| Voltage output for PVG32 0,25...0,5...0,75Us, power supply 9-32 V DC | |
| Mounting depth A | 60 mm |
| Option | Input for capacitive sensor |
| Wiring: | 1. cable 14 x 0,25 mm ² 300 mm long without plug connector 2. cable 14 x 0,25 mm ² 300 mm long without plug connector (optional for grip function) Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| S | |
| | 1 axis E907 1 |
| | 2 axis 2 |
| | 3 axis 3 |
| | 4 axis 4 |
| | 5 axis 5 |
| | 6 axis 6 |
| Main-axis with additional direction signals and zero direction signals (potential-free) per main-axis | 3 |

| Attachments | |
|--|----------|
| Z01 Mating connector (CAN) M12 (male insert) with 2 m cable | 20201140 |
| Z02 Mating connector (CAN) M12 (female contact) with 2 m cable | 20202298 |



Multi-Axis Controller V1



The V1 is a robust Joystick commonly used in electro-hydraulic applications. The modular design enables the switching device to be used universally. Long life and high reliability is ensured by the latest contactless hall-technology.

Technical data

| | |
|-----------------------|--|
| Mechanical life V1 | 6 million operating cycles |
| Supply voltage | See interface |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP65 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

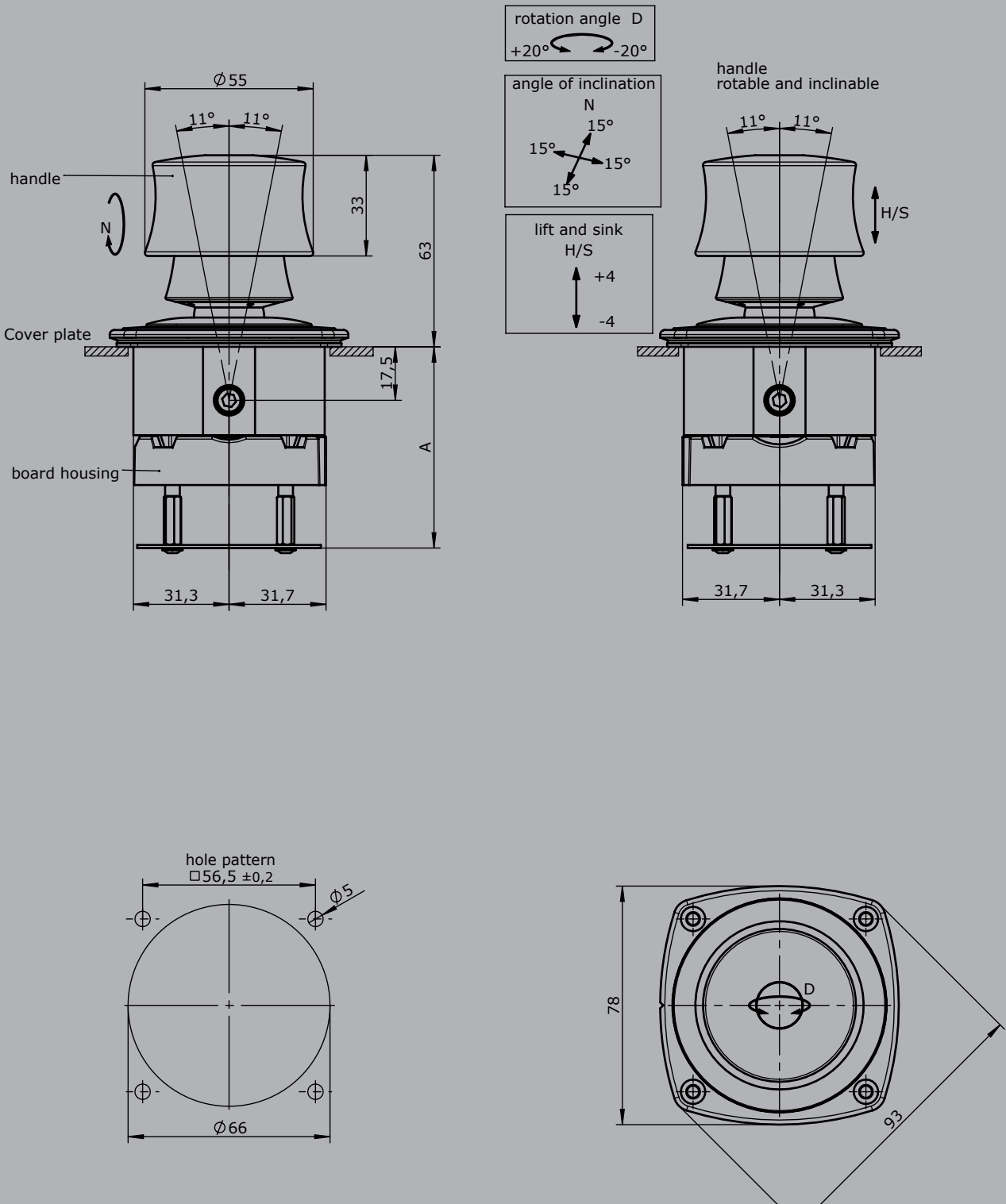


| | V1 | P | H11 | H13 | H15 | H17 | -Z | +Z | -B | -E... | -S... | -X |
|---|----|---|-----|-----|-----|-----|----|----|----|-------|-------|----|
| Basic unit | | | | | | | | | | | | |
| V1.1 1-axis | | | | | | | | | | | | |
| V1 2-axis | | | | | | | | | | | | |
| Gate | | | | | | | | | | | | |
| P Cross gate | | | | | | | | | | | | |
| PX Special gate | | | | | | | | | | | | |
| Grip / Grip functions | | | | | | | | | | | | |
| Grip (included in basic unit!) | | | | | | | | | | | | |
| H11 Additional axis 1 / Grip up - down | | | | | | | | | | | | |
| H13 Additional axis 2 / Grip rotate left - right | | | | | | | | | | | | |
| H15 Additional axis 3 / Grip tilt forwards - backwards | | | | | | | | | | | | |
| H17 Additional axis 4 / Grip tilt left - right | | | | | | | | | | | | |
| Axis 1 | | | | | | | | | | | | |
| Z Spring return | | | | | | | | | | | | |
| R Friction brake | | | | | | | | | | | | |
| Axis 2 (not applicable to V1.1) | | | | | | | | | | | | |
| Z Spring return | | | | | | | | | | | | |
| R Friction brake | | | | | | | | | | | | |
| Cover housing | | | | | | | | | | | | |
| B Cover housing (included in basic unit!) | | | | | | | | | | | | |
| Interface (description see on the following pages) | | | | | | | | | | | | |
| E1xx Voltage output | | | | | | | | | | | | |
| More interfaces on request! | | | | | | | | | | | | |
| Plug connectors | | | | | | | | | | | | |
| S... Standard plug connectors (see page 120) | | | | | | | | | | | | |
| Special model | | | | | | | | | | | | |
| X Special / customer specified | | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Voltage output (not stabilized)

| | | |
|---|---|--------|
| Supply voltage | 4,75-5,25V DC | |
| Current carrying capacity | Direction signal 8 mA | |
| Mounting depth A | 85 mm | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| 0,5...2,5...4,5V redundant signals per axis | | |
| | 1 axis | E103 1 |
| | 2 axis | 2 |
| | 3 axis* | 3 |
| | 4 axis* | 4 |
| | 5 axis* | 5 |
| | 6 axis* | 6 |
| Output options | | |
| Characteristic: | | |
| | Inverse dual | 1 |
| | Dual | 2 |
| | Inverse dual with dead zone +/- 3° (standard) | 3 |
| | Dual with dead zone +/- 3° | 4 |
| <i>More outputs on request!</i> | | |



Double-Handle Controller D85



The Double-Handle Controller D85 is a robust switching device for electro hydraulic and hoisting applications. Long life and high reliability is ensured by the latest contactless hall-technology. The modular design enables the switching device to be used universally.



Technical data

| | |
|-----------------------|----------------------------|
| Mechanical life D85 | 8 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP54 front |

| | D85 | S5 | Q | / | Q | -Z | +R | -B | -E... | -S... | -X |
|--|-----|----|---|---|---|----|----|----|-------|-------|----|
| Basic unit | | | | | | | | | | | |
| D85 | | | | | | | | | | | |
| Control-handle extended | | | | | | | | | | | |
| Standard 160 mm* | | | | | | | | | | | |
| S5 -20 mm | | | | | | | | | | | |
| S8 +20 mm | | | | | | | | | | | |
| <i>*Only available in combination with handle!</i> | | | | | | | | | | | |
| Grip- control-handle left | | | | | | | | | | | |
| Knob | | | | | | | | | | | |
| M Mechanical zero interlock | | | | | | | | | | | |
| T Dead man | | | | | | | | | | | |
| H Signal button | | | | | | | | | | | |
| D Push button | | | | | | | | | | | |
| Q T-grip | | | | | | | | | | | |
| QD T-grip with push button side | | | | | | | | | | | |
| B10... Palm Grip B10... (see page 213) | | | | | | | | | | | |
| Grip- control-handle right | | | | | | | | | | | |
| See grip-control-handle left | | | | | | | | | | | |
| Axis 1: direction 1-2 left | | | | | | | | | | | |
| Z Spring return | | | | | | | | | | | |
| R Friction brake | | | | | | | | | | | |
| Axis 2: direction 3-4 left | | | | | | | | | | | |
| Z Spring return | | | | | | | | | | | |
| R Friction brake | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

D85 S5 Q / Q -Z +R -B -E... -S... -X

| Cover housing | |
|---|---|
| B | Cover housing |
| Interface (description see following pages) | |
| E1xx | Voltage output |
| E2xx | Current output |
| E3xx | CAN-interface |
| E4xx | CANOpen Safety |
| E5xx | Profibus DP interface |
| E6xx | Profinet |
| E7xx | PROFIsafe |
| E8xx | PWM output |
| E9xx | Other outputs |
| Plug connectors | |
| S... | Standard plug connectors (see page 120) |
| Special model | |
| X | Special/ customer specified |

Combination possibilities with our handles



| Digital output | |
|---|---|
| Supply voltage | 9-32 V DC |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA |
| Mounting depth A | 85 mm |
| Wiring | Cable 500mm long without plug connector Optional with plug connector (standard plug connectors see page 120) |
| 2 direction signals + 1 zero position signal (galvanically isolated) per axis | |
| | 2 axis |
| | E001 2 |

| Voltage output (not stabilized) | |
|---|--|
| Supply voltage | 4,75-5,25 V DC |
| Current carrying capacity | Direction signal 8 mA |
| Mounting depth A | 85 mm |
| Wiring | Cable 500 mm long without plug connector Optional with plug connector (standard plug connectors see page 120) |
| 0,5...2,5...4,5V redundant + 2 direction signals per axis | |
| | 2 Achsen |
| | E104 2 |
| Output options | |
| Characteristic: | |
| Inverse dual | 1 |
| Dual | 2 |
| Inverse dual with dead zone +/- 3° (standard) | 3 |
| Dual with dead zone +/- 3° | 4 |

| Voltage output | | | | | |
|---|---|--------|--|--------|---|
| Supply voltage | 9-32 V DC (*11,5-32) | | | | |
| Current carrying capacity | Direction signal 150 mA | | | | |
| | Zero position signal 500 mA | | | | |
| Mounting depth A | 85 mm | | | | |
| Option | Input for capacitive sensor | | | | |
| Wiring | Cable 500 mm long without plug connector | | | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | | | S |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis | | | | | |
| | | 2 axis | | E112 2 | |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC | | | | | |
| | | 2 axis | | E132 2 | |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | | | | | |
| | | 2 axis | | E136 2 | |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring | | | | | |
| | | 2 axis | | E138 2 | |
| Output options | | | | | |
| Characteristic: | | | | | |
| | Inverse dual *1 | | | | 1 |
| | Dual *1 | | | | 2 |
| | Inverse dual with dead zone +/- 3° *1 (standard) | | | | 3 |
| | Dual with dead zone +/- 3° *1 | | | | 4 |
| *1 not combinable with output E136X and E138X | | | | | |
| | Single *2 | | | | 5 |
| | Single with dead zone +/- 3° *2 (standard) | | | | 6 |
| *2 not combinable with output E112X and E132X | | | | | |
| Digital output signals: | | | | | |
| Output signals standard: | | | | | |
| | Direction signals and zero position signals 1,5A 24 V DC | | | | 1 |
| <i>Voltage output with other value on request!</i> | | | | | |

| Current output | |
|--|---|
| Supply voltage | 9-32 V DC |
| Current carrying capacity | Direction signal 150 mA |
| | Zero position signal 500 mA |
| Mounting depth A | 85 mm |
| Option | Input for capacitive sensor |
| Wiring | Cable 500 mm long without plug connector |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring signal and error signal | |
| | 2 axis |
| | E206 2 |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 2 axis |
| | E208 2 |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 2 axis |
| | E214 2 |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 2 axis |
| | E216 2 |
| +20...0...-20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring and error signal | |
| | 2 axis |
| | E226 2 |
| Output options | |
| | Single |
| | 5 |
| | Single with dead zone +/- 3° (standard) |
| | 6 |
| Digital output signals: | |
| Output signals standard: | |
| | Direction signals and zero position signals 1,5A 24 V DC |
| | 1 |
| <i>Current output with other value on request!</i> | |

| CAN | |
|---------------------------|---|
| Supply voltage | 9-36 V DC |
| Idle current consumption | 120 mA |
| Current carrying capacity | Direction signal 100 mA |
| | Zero position signal 100 mA |
| | External digital output for LEDs 5-30 mA (dependent on the number of LEDs) |
| Mounting depth A | Digital switching output (potential-free) 100 mA |
| | E3091: 85 mm |
| | E3091X: 105 mm |
| | E3101X - E3103X: 105 mm |
| Protocol | E3104X - E3105X: 125 mm |
| | CANOpen CiA DS 301 or SAE J 1939 (based on) |
| Baud rate | 125 kBit/s to 1 Mbit/s (standard 250 kBit/s) |
| Output value | 255...0...255 |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) |
| | External in-/outputs cable 300 mm without plug connector |
| | External in-/outputs cable 300 mm without plug connector (additionally from 32 in-/outputs) |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

| Optional with plug connector (standard plug connectors see page 120) | | S |
|--|------------------------------------|---|
| CAN expansion stage 1 - 7 analoge Joystickachsen - 16 digitale Joystickfunktionen - Input for capacitive sensor With additional external in-/outputs - 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs - 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs <i>External LED-outputs can be used in the grip for LEDs</i> *With the use of capacitive sensor, the external digital inputs reduce by one input! | E309 1 2 3 | |
| CAN expansion stage 2 - 10 analog joystick axis - 16 digital joystick functions - 2 inputs for capacitive sensor With additional external in-/outputs - 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs - 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs - 24 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 24 external digital inputs - 32 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 32* external digital inputs <i>External LED-outputs can be used in the grip for LEDs</i> *With the use of capacitive sensor, the external digital inputs reduce by one input! | E310 1 2 3 4 5 | |
| Main-axis with additional digital-/analog outputs separately wired (not via CAN) - 2 direction signals + 1 zero position signal (potential-free) per main-axis <i>Additional analog outputs on request!</i> | | |

| CANopen Safety | |
|---------------------------|---|
| Supply voltage | 9-36 V DC |
| Idle current consumption | 120 mA |
| Current carrying capacity | Direction signal 100 mA |
| | Zero position signal 100 mA |
| | External digital output for LEDs 5-30 mA (depending on the number of LEDs) |
| | Digital switching output (potential-free) 100 mA |
| Mounting depth A | E4091: 85 mm |
| | E4091X: 105 mm |
| | E4101X - E4103X: 105 mm |
| | E4104X - E4105X: 125 mm |
| Protocol | CAN Safety EN50325-5 |
| Baud rate | 125 kBit/s to 1 MBit/s (Standard 250 kBits) |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) |
| | CAN (OUT) cable 300 mm with plug connector M12 (female) |
| | External in-/outputs cable 300 mm without plug connector |
| | External in-/outputs cable 300 mm without plug connector (additionally from 32 in-/outputs) |

| Optional with plug connector (standard plug connectors see page 120) | | S |
|---|--|--------|
| CANopen Safety expansion stage 1 | | E409 1 |
| - 7 analog joystick axis | | |
| - 16 digital joystick functions | | |
| - Input for capacitive sensor | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs | | 3 |
| <i>External LED-outputs can be used in the grip for LEDs</i> | | |
| <i>*With the use of capacitive sensor, the external digital inputs reduce by one input!</i> | | |
| CANopen Safety expansion stage 2 | | E410 1 |
| - 10 analog joystick axis | | |
| - 16 digital joystick functions | | |
| With additional external in-/outputs | | |
| - 8 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs | | 2 |
| - 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs | | 3 |
| - 24 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 24 external digital inputs | | 4 |
| - 32 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 32* external digital inputs | | 5 |
| <i>External LED-outputs can be used in the grip for LEDs</i> | | |
| <i>*With the use of capacitive sensor, the external digital inputs reduce by one input!</i> | | |
| Main-axis with additional digital-/analog outputs separately wired (not via CAN) | | |
| - 2 direction signals + 1 zero position signal (potential-free) per main-axis | | 3 |
| <i>Additional analog outputs on request!</i> | | |

| Profibus DP | | | S |
|---|--|--------|---|
| Supply voltage | 18-30 V DC | | |
| Baud rate | to 12 MBit/s | | |
| Output value | 0...128...255 | | |
| Mounting depth A | 105 mm | | |
| Wiring | Profibus, cable 100 mm with plug D-Sub 9 | | |
| | Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm ² 300 mm long without plug connector | | |
| | External in-/outputs, cable 300 mm long without plug connector | | |
| Optional with plug connector (standard plug connectors see page 120) | | | S |
| Profibus DP | | E501 1 | |
| - 4 analog joystick axis | | | |
| - 16 digital joystick function | | | |
| - Input for capacitive sensor | | | |
| With additional external in-/outputs | | | |
| - 8 external LED-output, 8 external digital input | | 2 | |
| - 16 external LED-output, 16 external digital input | | 3 | |
| <i>External LED-outputs can be used in the grip for LEDs</i> | | | |
| With additional contact equipment separately wired (not via profibus) | | | |
| - 2 direction contacts + 1 zero position contact (not potential-free) per main-axis | | | 1 |
| - 1 zero position contact (potential-free) per main-axis | | | 2 |

| Profinet | | | |
|---|--|--------|---|
| Supply voltage | 18-30 V DC | | |
| Baud rate | to 100 MBit/s | | |
| Output value | 0...512...1023 | | |
| Mounting depth A | 105 mm | | |
| Verdrahtung | Profinet (1), cable 300 mm with M12 plug connector (female) Profinet (2), cable 300 mm with M12 plug connector (female) Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm ² 300 mm long without plug connector External in-/outputs, cable 300 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| Profinet | | E601 1 | |
| - 4 analog joystick axis | | | |
| - 16 digital joystick functions | | | |
| - Input for capacitive sensor | | | |
| With additional external in-/outputs | | | |
| - 8 external LED-outputs, 8 external digital inputs | | 2 | |
| - 16 external LED-outputs, 16 external digital inputs | | 3 | |
| *External LED-outputs can be used in the grip for LEDs | | | |
| Main-axis with additional signals separately wired (not via profinet) | | | |
| - 2 direction signals + zero position signal (potential-free) per main-axis | | | 3 |

| PROFIsafe | | | |
|---|--|--------|---|
| Supply voltage | 18-30 V DC | | |
| Baud rate | to 12 MBit/s | | |
| Output value | 0...512...1023 | | |
| Mounting depth A | 105 mm | | |
| Wiring | Profinet (1), cable 300 mm with M12 plug connector (female) Profinet (2), cable 300 mm with M12 plug connector (female) Supply voltage (if applicable contact wiring) cable 12 x 0,25 mm ² 300 mm long without plug connector External in-/outputs, cable 300 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| | | E701 1 | |
| - 4 analog joystick axis | | | |
| - 16 digital joystick functions | | | |
| - Input for capacitive sensor | | | |
| With additional external in-/outputs | | | |
| - 8 external LED-outputs, 8 external digital inputs | | 2 | |
| - 16 external LED-outputs, 16 external digital inputs | | 3 | |
| *External LED-outputs can be used in the grip for LEDs | | | |
| Main-axis with additional signals separately wired (not via profinet safe) | | | |
| - 2 direction signals + zero position signal (potential-free) per main-axis | | | 3 |

| PWM Outputs | |
|--|---|
| Supply Voltage: | 9-32 V DC |
| Valve control current: | max. 3 A |
| PWM-frequency: | 1225 Hz |
| Dither frequency: | 1...250 Hz adjustable |
| Mounting depth A | 85 mm |
| Other features | Creep speed per axis 5 configurable switching outputs 2A LED outputs for status indication Input for redundant deadman |
| Wiring: | Built-in socket Phoenix 2-pole (power supply) Cable 1 (PWM) 12 x 1 mm ² 300 mm long without plug Cable 2 (switching output) 12 x 1 mm ² 300 mm long without plug Cable 3 (creep speed / dead man) 14 x 0,25 mm ² 300mm long without plug Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| PWM Output 0-3 A for 2 proportional valve magnets per axis | 2 axis |
| | E801 2 |
| | S |

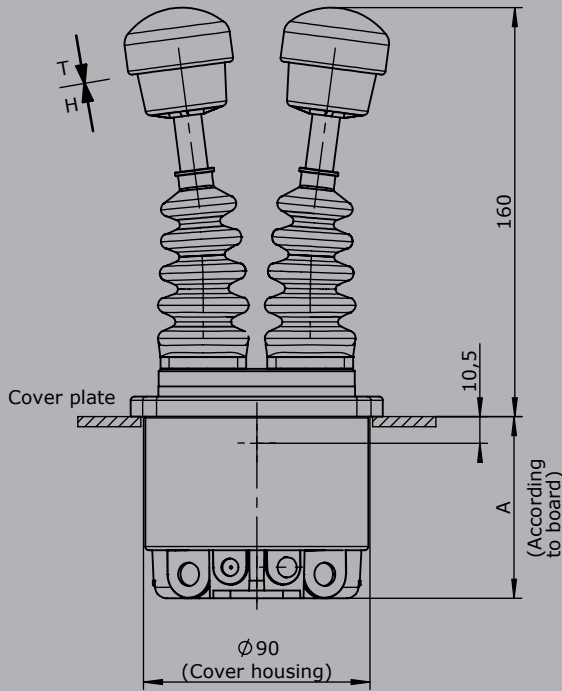
| Other outputs | |
|---|--|
| Voltage output for PVG32 0,25...0,5...0,75 Us, power supply 9-32 V DC | |
| Option | Input for capacitive sensor |
| Wiring: | Cable 14 x 0,25 mm ² 300 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| | 2 axis |
| | E907 2 |
| | S |
| Main-axis with additional direction contacts per main-axis | 4 |
| 8 Bit Gray-Code with direction signals per main-axis, supply voltage 9-36 V DC | |
| Wiring: | Cable 37 x 0,14 mm ² 300 mm long without plug connector (axis 1+2) Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| | 2 axis |
| | E903 2 |
| | S |
| 8 Bit Binär-Code with direction signals per main-axis, supply voltage 9-36 V DC | |
| Wiring: | Cable 37 x 0,14 mm ² 300 mm long without plug connector (axis 1+2) Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| | 2 axis |
| | E904 2 |
| | S |

| Attachments | |
|--|------------|
| Z01 Mating connector (CAN) M12 (male insert) with 2 m cable | 20201140 |
| Z02 Mating connector (CAN) M12 (female contact) with 2 m cable | 20202298 |
| Z03 Mating connector (Profibus) straight | 22201440 |
| Z04 Mating connector (Profibus) 90° angled | 22201741 |
| Z05 Mating connector (Profinet) M12 (male insert) with 2 m cable | 5300000222 |

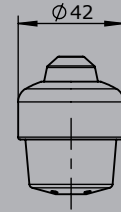
Double-Handle Controller D85



T = Dead man's button
H = Signal button

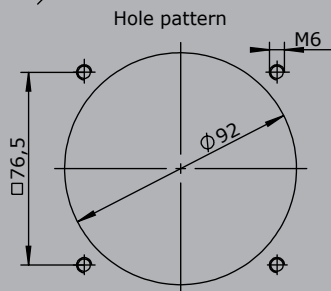
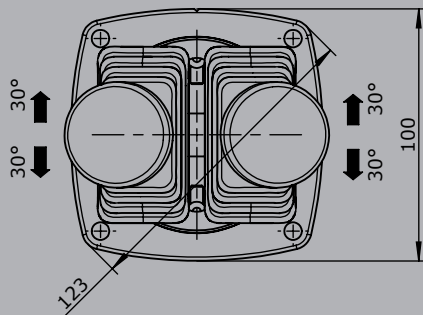
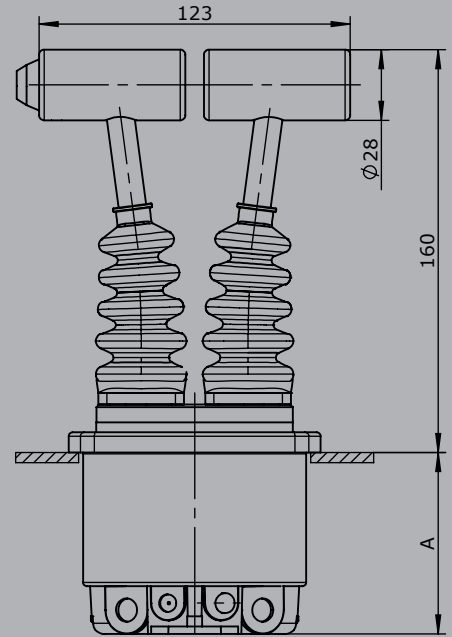


Knob solid
D = Push button

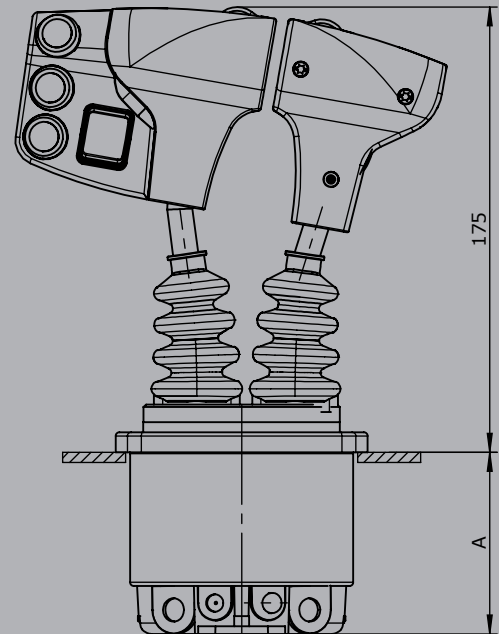


To build in:
Direction 1-2
Direction 3-4

T - grip
D = Push button



Palm grip B10



Multi-Axis Controller V28



The V28 is a compact joystick commonly used in electro-hydraulic applications. Long life and high reliability is ensured by the latest contactless hall-technology. With many outputs and grip options the V28 series is hugely customisable.

Technical data

| | |
|-----------------------|--|
| Mechanical life V28 | 5 million operating cycles |
| Supply voltage | See interface |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | | Example | | | | | | | | | |
|---|---|---------|---|---|------|------|-------|-------|----|--|--|
| | | V28 | P | T | -GS9 | -B10 | -E... | -S... | -X | | |
| Basic unit | | | | | | | | | | | |
| V28.1 | 1-axis | | | | | | | | | | |
| V28 | 2-axis | | | | | | | | | | |
| Gate | | | | | | | | | | | |
| P | Cross gate | | | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | | | |
| | Knob (included in basic unit!) | | | | | | | | | | |
| D | Knob with push button | | | | | | | | | | |
| GS9 | Hall-twist grip with spring return | | | | | | | | | | |
| GS9-D | Hall-twist grip with spring return and push button on top | | | | | | | | | | |
| B ... | Palm Grip B... (see page Palm Grip 154) | | | | | | | | | | |
| Spring return (included in basic unit!) | | | | | | | | | | | |
| Z | Spring return | | | | | | | | | | |
| Degree of protection | | | | | | | | | | | |
| B10 | Joystick-main board sealed | | | | | | | | | | |
| B11 | Joystick-main board sealed and grip function sealed, grip with drain hole | | | | | | | | | | |
| For a schematic description of the protection class, see page 121 | | | | | | | | | | | |
| Interface (description see on the following page) | | | | | | | | | | | |
| E1xx | Voltage output | | | | | | | | | | |
| E2xx | Current output | | | | | | | | | | |
| E3xx | CAN-interface | | | | | | | | | | |
| E4xx | CANopen Safety interface | | | | | | | | | | |
| Plug connectors | | | | | | | | | | | |
| S... | Standard plug connectors (see page 120) | | | | | | | | | | |
| Special model | | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Combination possibilities with our grips



Voltage output (not stabilized)

| | | |
|--|--|--------|
| Supply voltage | 4,75-5,25 V DC | |
| Current carrying capacity | Direction signal 8 mA | |
| Mounting depth A | 35 mm | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) | |
| 0,5...2,5...4,5 V redundant | 1 axis | E103 1 |
| | 2 axis | 2 |
| 0,5...2,5...4,5 V redundant + 2 direction signals per axis | 1 axis | E104 1 |
| | 2 axis | 2 |
| | Output options | |
| | Characteristic: | |
| | Inverse dual | 1 |
| | Dual | 2 |
| | Inverse Dual with dead zone +/- 3° (standard) | 3 |
| | Dual with dead zone +/- 3° | 4 |

| Voltage output | |
|---|--|
| Supply voltage | 9-32 V DC (*11,5-32) |
| Current carrying capacity | Direction signal 150 mA |
| | Zero position signal 500 mA |
| Mounting depth A | 35 mm |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector |
| | 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector |
| Optional with plug connector (<i>standard plug connectors see page 120</i>) | |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis | |
| | 1 axis E112 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| 0...5...10 V 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC sensor redundant with error monitoring | |
| | 1 axis E132 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring | |
| | 1 axis E136 1 |
| | 2 axis 2 |
| | 3 axis* 3 |
| Output options | |
| Characteristic: | |
| Inverse dual *1 | 1 |
| Dual *1 | 2 |
| Inverse dual with dead zone +/- 3° *1 (standard) | 3 |
| Dual with dead zone +/- 3° *1 | 4 |
| *1 not combinable with output E136X | |
| Single *2 | 5 |
| Single with dead zone +/- 3° *2 (standard) | 6 |
| *2 not combinable with output E112X and E132X | |
| *Axis for grip functions, interface can vary depending upon actuation element! | |
| Voltage output with other value on request! | |

Current output

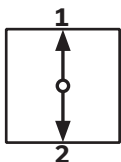
| | | | |
|--|--|------|---|
| Supply voltage | 9-32 V DC | | |
| Current carrying capacity | Direction signal 150 mA | | |
| | Zero position signal 500 mA | | |
| Mounting depth A | 35 mm | | |
| Wiring | 1. cable 14 x 0,25 mm ² 500 mm long without plug connector | | |
| | 2. cable 14 x 0,25 mm ² (optional for grip function) 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring | | | |
| | 1 axis | E206 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring | | | |
| | 1 axis | E208 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring | | | |
| | 1 axis | E214 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated) per axis, sensor redundant with error monitoring | | | |
| | 1 axis | E216 | 1 |
| | 2 axis | | 2 |
| | 3 axis* | | 3 |
| Output options | | | |
| | Single | | 5 |
| | Single with dead zone +/- 3° (standard) | | 6 |

*Axis for grip functions, interface can vary depending upon actuation element!

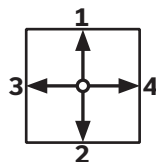
Current output with other value on request!

Identification of the installation variants with switching directions:

V28.1



V28



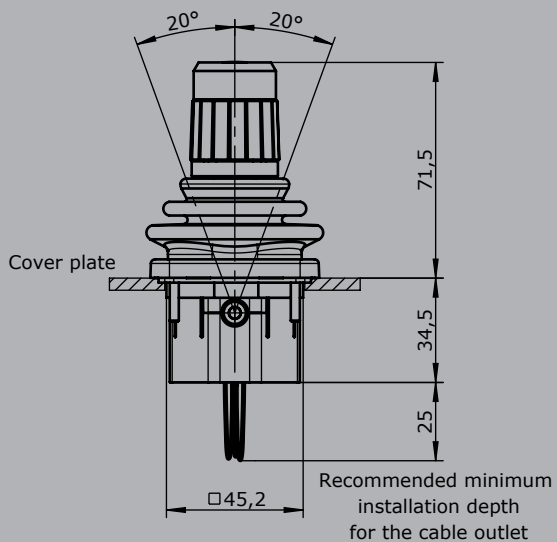
| CAN | |
|--|---|
| Supply voltage | 9-32 V DC |
| Idle current consumption | 120 mA (24 V DC) |
| Current carrying capacity | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) |
| Mounting depth A | 35 mm |
| Protocol | CANopen CiA DS 301 or SAE J1939 (based on) |
| Baud rate | 20 kBit/s to 1 Mbit/s (standard 250 kBit/s) |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) CAN (OUT) cable 300 mm with plug connector M12 (female) External in-/outputs cable 300 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| S | |
| CAN | |
| - 4 analog joystick axis | |
| - 8 digital joystick functions (incl. input for capacitive sensor) | |
| - 8 LED-Outputs (dimnable optional) for grip function | |
| E314 1 | |

| CANopen Safety | |
|--|---|
| Supply voltage | 9-32 V DC |
| Idle current consumption | 120 mA (24 V DC) |
| Current carrying capacity | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) |
| Baud rate | 20 kBit/s to 1 MBit/s (standard 250 kBit/s) |
| Mounting depth | 35 mm |
| Protocol | CANopen Safety EN50325-5 |
| Wiring | CAN (IN) cable 300 mm with plug connector M12 (male) CAN (OUT) cable 300 mm with plug connector M12 (female) External in-/outputs cable 300 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| S | |
| CANopen Safety | |
| - 4 analog joystick axis | |
| - 8 digital joystick functions (incl. input for capacitive sensor) | |
| - 8 LED-Outputs (dimnable optional) for grip function | |
| E413 1 | |

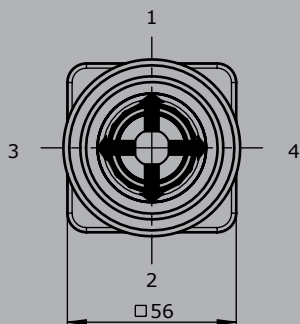
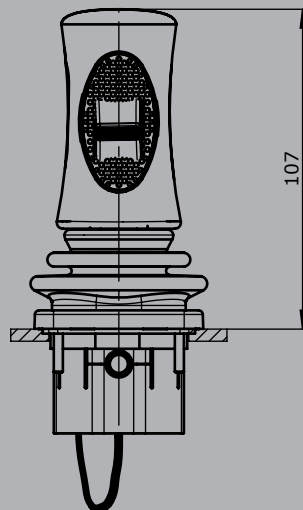
| Attachments | |
|---|----------|
| Z01 Mating connector M12 male insert with 2 m cable | 20201140 |
| Z02 Mating connector M12 female insert with 2 m cable | 20202298 |

Standard
installed from the top

Hall-twist grip GS9

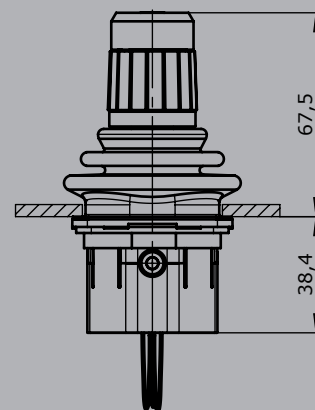
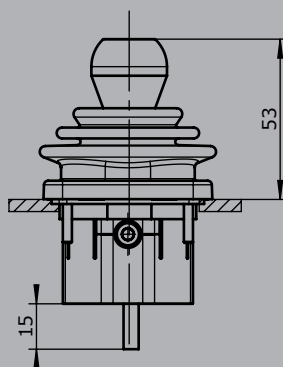


Palm grip B33

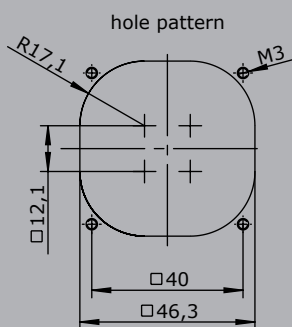


knob

installed from below



Recommended minimum installation depth for the cable outlet



Single-Axis Controller S26



The Single-Axis Controller S26 is a hall sensor switching device designed for electro-hydraulic and remote controlled hydraulic. The modular design of the switching device is universally applicable.

Technical data

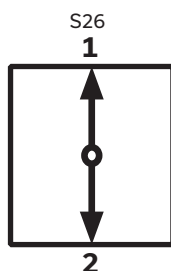
| | |
|-----------------------|--|
| Mechanical life S26 | 6 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP54, electronic assembly IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | S26 | T | Example - Z | - E... | - S... | - X |
|---|-----|---|----------------|--------|--------|-----|
| Basic unit | | | | | | |
| S26 1-axis | | | | | | |
| Grip / Palm Grip | | | | | | |
| Knob | | | | | | |
| M Mechanical zero interlock | | | | | | |
| T Dead man | | | | | | |
| H Signal button | | | | | | |
| D Push button | | | | | | |
| B... Palm Grip B... (on request!) | | | | | | |
| Z Spring return | | | | | | |
| R Friction brake | | | | | | |
| Interface (description on the following pages) | | | | | | |
| E0xx Digital output | | | | | | |
| E1xx Voltage output | | | | | | |
| E2xx Current output | | | | | | |
| Plug connectors | | | | | | |
| S.. Standard plug connectors (see page 120) | | | | | | |
| Special model | | | | | | |
| X Special / customer specified | | | | | | |

Identification of the installation variants

with switching directions:



Technical details may vary based on configuration or application! Technical data subject to change without notice!

| Digital output | |
|--|---|
| Supply voltage | 9-32 V DC |
| Current carrying capacity | Direction signal 150 mA |
| | Zero position signal 500 mA |
| Wiring | Cable 500 mm long without plug connector |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 2 direction signals + 1 zero position signal (galvanically isolated) | |
| | 1 axis |
| | E001 1 |

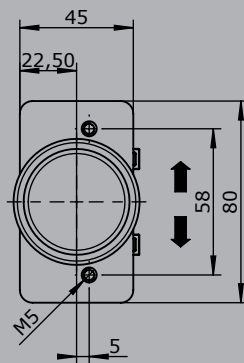
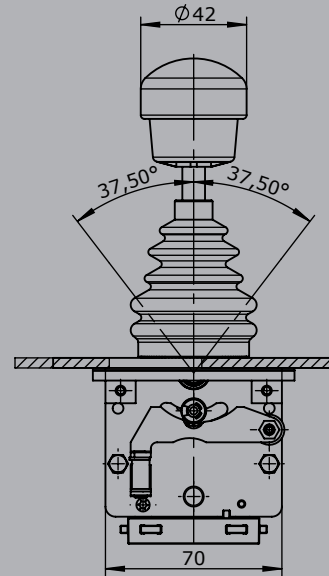
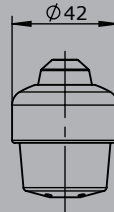
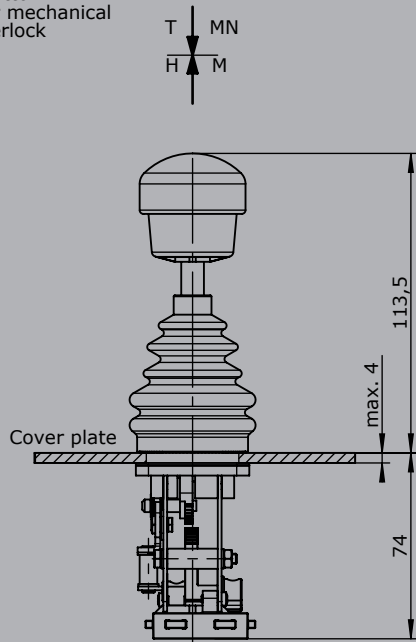
| Voltage output (not stabilized) | |
|---|---|
| Supply voltage | 4,75-5,25 V DC |
| Current carrying capacity | Direction signal 8 mA |
| | Zero position signal 500 mA |
| Wiring | Cable 500 mm long without plug connector |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 0,5...2,5...4,5 V redundant + 2 direction signals | |
| | 1 axis |
| | E104 1 |
| Output options | |
| Characteristic: | |
| Inverse dual | 1 |
| Dual | 2 |
| Inverse dual with dead zone +/- 3° (standard) | 3 |
| Dual with dead zone +/- 3° *1 | 4 |

| Voltage output | |
|--|---|
| Supply voltage | 9-32 V DC (*11,5-32 V) |
| Current carrying capacity | Direction signal 150 mA |
| | Zero position signal 500 mA |
| Wiring | Cable 500 mm long without plug connector |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) | |
| | 1 axis |
| | E112 1 |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC | |
| | 1 axis |
| | E132 1 |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | |
| | 1 axis |
| | E136 1 |
| Output options | |
| Characteristic: | |
| Inverse dual *1 | 1 |
| Dual *1 | 2 |
| Inverse dual with dead zone +/- 3° *1 (standard) | 3 |
| Dual with dead zone +/- 3° *1 | 4 |
| *1 not combinable with output E136X | |
| Single *2 | 5 |
| Single with dead zone *2 (standard) | 6 |
| *2 not combinable with output E112X and E132X | |
| <i>Voltage output with other value on request!</i> | |

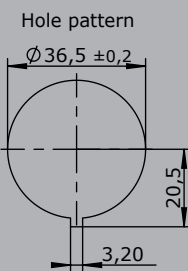
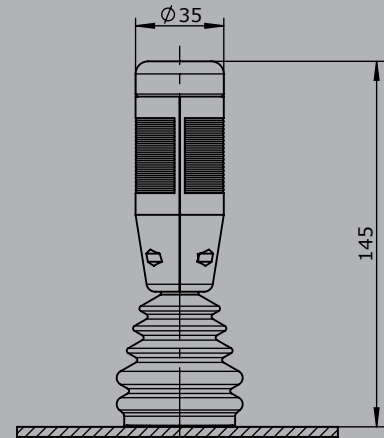
| Current output | | |
|--|---|--------|
| Supply voltage | 9-32 V DC | |
| Current carrying capacity | Direction signal 150 mA | |
| | Zero position signal 500 mA | |
| Wiring | Cable 500 mm long without plug connector | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | |
| S | | |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E206 1 |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E208 1 |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E214 1 |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E216 1 |
| Output options | | |
| | Single | 5 |
| | Single with dead zone +/-3° (standard) | 6 |
| <i>Current output with other value on request!</i> | | |

T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

Knob solid
 D = Push button



Palm grip B5
 B5 T = Dead man's button



Multi-Axis Controller V22



The V22 is a joystick commonly used in electro-hydraulic applications. Long life and high reliability is ensured by the latest contactless hall-technology.

Technical data

| | |
|-----------------------|--|
| Mechanical life V22 | 3 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP67 front |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

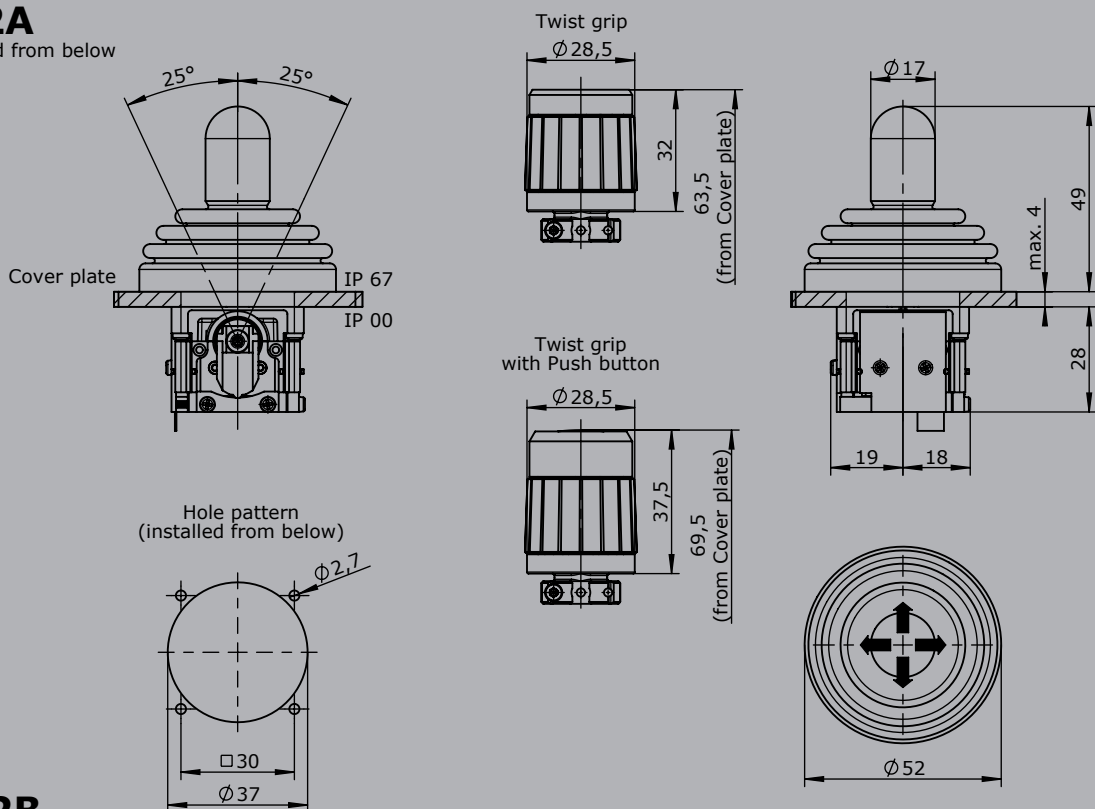


| | V22A | -P | Example | D | -E10321 | -X |
|--|---|----|---------|------------|---------|----|
| Basic unit | | | | | | |
| V22.1A | 1-axis with spring return, installation from below | | | | | |
| V22A | 2-axis with spring return, installation from below | | | | | |
| V22.1B | 1-axis with spring return, installation from top | | | | | |
| V22B | 2-axis with spring return, installation from top | | | | | |
| Gate | | | | | | |
| P | Cross gate | | | | | |
| P X | Special gate | | | | | |
| Grip | | | | | | |
| | Knob (standard) | | | | | |
| D | Push button | | | | | |
| GS9 | Hall-twist grip with spring return | | | | | |
| GS9-D | Hall-twist grip with spring return and push button on top | | | | | |
| Interface | | | | | | |
| Voltage output | | | | | | |
| 0,5...2,5...4,5 V redundant, Ub= 5 V | 1 axis | | | | E103 1 | |
| | 2 axis | | | | 2 | |
| Characteristic: | | | | | | |
| | Inverse dual (standard) | | | | | 1 |
| | Dual | | | | | 2 |
| Special model | | | | | | |
| X | Special / customer specified | | | | | |
| Attachments | | | | | | |
| Mating connector JST 8-pole | | | | 5300000260 | | |
| Mating connector JST 8-pole with single wire 500 mm long | | | | 5300000261 | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

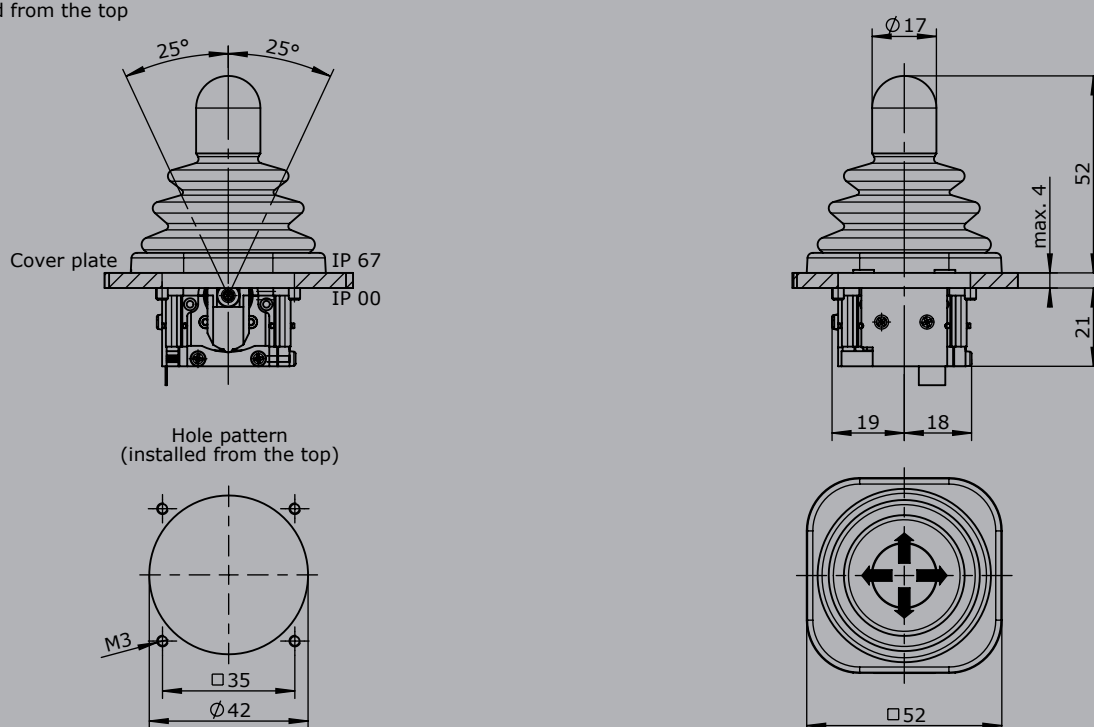
V22A

Installed from below



V22B

Installed from the top



Single-Axis Controller S11



The S11 is a one-axis joystick designed for electro-hydraulic and remote controlled hydraulic. Long life and high reliability is ensured by the latest contactless hall-technology. The modular design of the switching device is universally applicable.

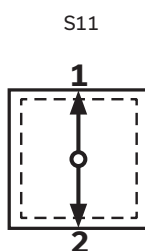
Technical data

| | |
|-----------------------|--|
| Mechanical life S11 | 6 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP65, electronic assembly IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to EN IEC 61508) |



| | S11 | T | Example - Z | - E... | - S... | - X |
|---|-----|---|----------------|--------|--------|-----|
| Basic unit | | | | | | |
| S11 1-axis | | | | | | |
| Grip / Palm Grip | | | | | | |
| Knob (standard) | | | | | | |
| M Mechanical zero interlock | | | | | | |
| T Dead man | | | | | | |
| D Push button | | | | | | |
| GS8 Knob GS8 | | | | | | |
| Z Spring return <i>(included in basic unit!)</i> | | | | | | |
| R Friction brake | | | | | | |
| Interface <i>(description on the following page)</i> | | | | | | |
| E0xx Digital output | | | | | | |
| E1xx Voltage output | | | | | | |
| E2xx Current output | | | | | | |
| Plug connectors | | | | | | |
| S.. Standard plug connectors <i>(see page 120)</i> | | | | | | |
| Special model | | | | | | |
| X Special / customer specified | | | | | | |

Identification of the installation variants with switching directions:



Digital Output

| | | |
|-----------------------------------|---|--------|
| Supply voltage | 9-32 V DC | |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA | |
| Wiring | Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| Cable 500mm long with plug (male) | | |
| | 1 axis | E001 1 |

Voltage output (not stabilized)

| | | |
|--|---|--------|
| Supply voltage | 4,75-5,25 V DC | |
| Current carrying capacity | Direction signal 8 mA | |
| Wiring | Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| 0,5...2,5...4,5V redundant + 2 direction signals | | |
| | 1 axis | E104 1 |
| | Output options | |
| | Characteristic: | |
| | Inverse dual | 1 |
| | Dual | 2 |
| | Inverse dual with dead zone +/- 3° (standard) | 3 |
| | Dual with dead zone +/- 3° | 4 |

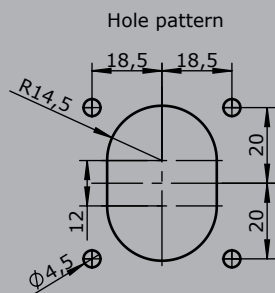
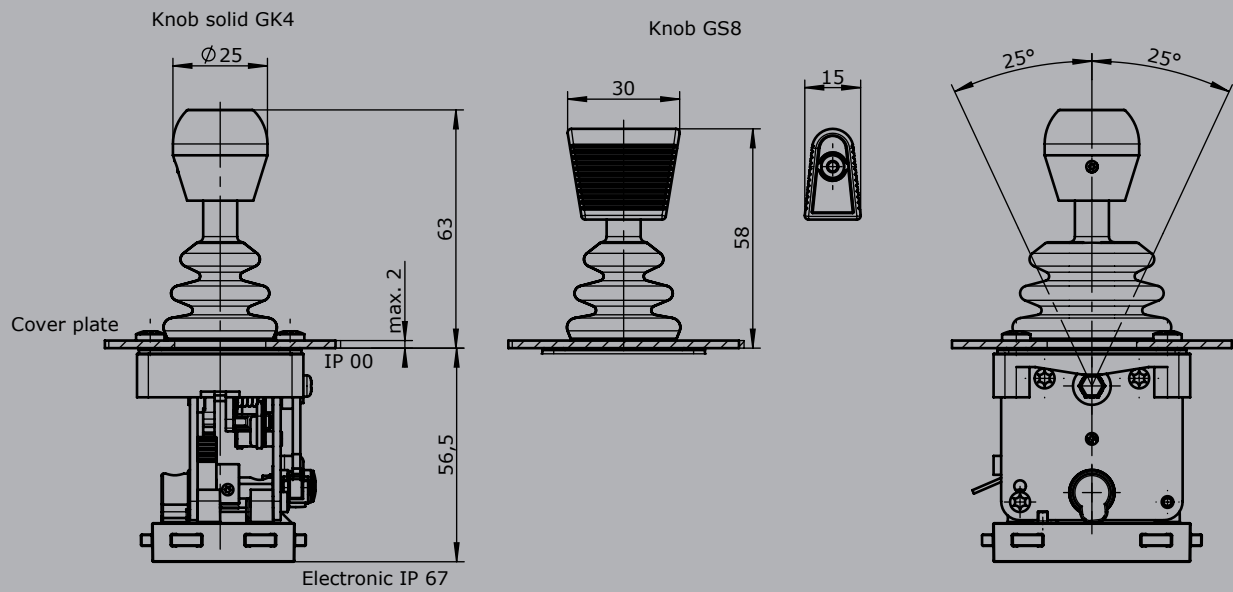
Voltage output

| | | |
|--|---|--------|
| Supply voltage | 9-32 V DC (*11,5-32 V) | |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA | |
| Wiring | Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) | | |
| | 1 axis | E112 1 |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC | | |
| | 1 axis | E132 1 |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | | |
| | 1 axis | E136 1 |
| | Output options | |
| | Characteristic: | |
| | Inverse dual *1 | 1 |
| | Dual *1 | 2 |
| | Inverse dual with dead zone +/- 3° *1 (standard) | 3 |
| | Dual with dead zone +/- 3° *1 | 4 |
| | *1 not combinable with output E136X | |
| | Single *2 | 5 |
| | Single with dead zone *2 (standard) | 6 |
| | *2 not combinable with output E112X and E132X | |

Voltage output with other value on request!

| Current output | | | |
|--|---|--------|---|
| Supply voltage | 9-32 V DC | | |
| Current carrying capacity | Direction signal 150 mA | | |
| | Zero position signal 500 mA | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E206 1 | |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E208 1 | |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E214 1 | |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | | |
| | 1 axis | E216 1 | |
| Output options | | | |
| | Single | | 5 |
| | Single with dead zone +/-3° (standard) | | 6 |
| Voltage output with other value on request! | | | |

T = Dead man's button



Multi-Axis Controller

V8 / VV8



The V8/VV8 is a robust joystick commonly used in electro-hydraulic applications. With many output options including voltage, amperage and switch contacts and many grip options the V8 / VV8 series is hugely customisable.

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life V8 | 10 million operating cycles |
| Mechanical life VV8 | 20 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP54 |



| | VV8 | S5 | P | T | -2RP | Example +3ZP | -B | -A05 P184 | +A050 P184 | E9012 | -X |
|---|---|----|---|---|------|-----------------|----|-----------|------------|-------|----|
| Basic unit | | | | | | | | | | | |
| VV8 | 2-axis, reinforced version | | | | | | | | | | |
| Control-handle extended | | | | | | | | | | | |
| | Standard 160 mm* | | | | | | | | | | |
| S5 | -20 mm | | | | | | | | | | |
| S8 | +20 mm | | | | | | | | | | |
| <i>*Only available in combination with a handle!</i> | | | | | | | | | | | |
| Gate | | | | | | | | | | | |
| P | Cross gate | | | | | | | | | | |
| P X | Special gate | | | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | | | |
| T | Dead man | | | | | | | | | | |
| Axis 1 | | | | | | | | | | | |
| 2 | Contacts | | | | | | | | | | |
| R | Friction brake | | | | | | | | | | |
| P | Potentiometer | | | | | | | | | | |
| Axis 2 | | | | | | | | | | | |
| 3 | Contacts | | | | | | | | | | |
| Z | Spring return | | | | | | | | | | |
| P | Potentiometer | | | | | | | | | | |
| Cover housing | | | | | | | | | | | |
| B | Cover housing | | | | | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | | | | | | |
| A050 | Arrangement MSP21-0 | | | | | | | | | | |
| P184 | Potentiometer T301 2 x 5 kOhm | | | | | | | | | | |
| Description axis 2 (direction 3-4) | | | | | | | | | | | |
| A05 | Arrangement MSP21 | | | | | | | | | | |
| P184 | Potentiometer T301 2 x 5 kOhm | | | | | | | | | | |
| Interface (description see on the following pages) | | | | | | | | | | | |
| E9012 | Potentiometer output for proportional valve PVG32 | | | | | | | | | | |
| Special model | | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Combination possibilities with our grips



| | VV8 | S5 | P | T | -2 R P | + | 3 Z P | -B | - | A05 P184 | + | A050 | P184 | E9012 | - | X |
|--------------------------------|--|---|--------|--|--------|---|-------|----|---|----------|---|------|------|-------|---|---|
| Basic unit | | | | | | | | | | | | | | | | |
| V81 | 1-axis | | | | | | | | | | | | | | | |
| V8 | 2-axis | | | | | | | | | | | | | | | |
| | reinforced version | | | | | | | | | | | | | | | |
| VV81 | 1-axis | | | | | | | | | | | | | | | |
| VV8 | 2-axis | | | | | | | | | | | | | | | |
| Control-handle extended | | | | | | | | | | | | | | | | |
| S5 | -20 mm | | | | | | | | | | | | | | | |
| S8 | +20 mm | | | | | | | | | | | | | | | |
| Gate | | | | | | | | | | | | | | | | |
| P | Cross gate | | | | | | | | | | | | | | | |
| P X | Special gate | | | | | | | | | | | | | | | |
| Grip/ Palm Grip | | | | | | | | | | | | | | | | |
| | Knob (included in basic unit!) | | | | | | | | | | | | | | | |
| M | Mechanical zero interlock | | | | | | | | | | | | | | | |
| MH | Mechanical zero interlock + signal contact | | | | | | | | | | | | | | | |
| T | Dead man | | | | | | | | | | | | | | | |
| H | Signal button | | | | | | | | | | | | | | | |
| D | Push button | | | | | | | | | | | | | | | |
| DV | Flush push button | | | | | | | | | | | | | | | |
| B... | Palm Grip B... (see page Palm Grip 154) | | | | | | | | | | | | | | | |
| Axis 1: direction 1-2 | | | | | | | | | | | | | | | | |
| 1 | 1 contact | Standard contact - arrangement see page 122 | | | | | | | | | | | | | | |
| 2 | 2 contacts | e.g. | | | | | | | | | | | | | | |
| 3 | 3 contacts | A98 | MS0 | Zero position contact | | | | | | | | | | | | |
| | | A05 | MS21 | Direction contacts | | | | | | | | | | | | |
| | | A050 | MS21-0 | Direction contacts + zero position contact | | | | | | | | | | | | |
| Z | Spring return | | | | | | | | | | | | | | | |
| R | Friction brake only available with a VV8! | | | | | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

| | | | | |
|-----|------------------------------------|--|---------------------------------------|-------------|
| (P) | Mounting options for potentiometer | | | |
| P | Potentiometer | P181 | T301 2 x 0,5 kOhm | I max. 1 mA |
| | | P182 | T301 2 x 1 kOhm | I max. 1 mA |
| | | P183 | T301 2 x 2 kOhm | I max. 1 mA |
| | | P184 | T301 2 x 5 kOhm | I max. 1 mA |
| | | P185 | T301 2 x 10 kOhm | I max. 1 mA |
| | | <i>More potentiometers on request!</i> | | |
| H | Hall-Potentiometer | E14811 | 0,5...2,5...4,5 V / 4,5 V...2,5...0,5 | |

VV8 S5 P T -2 R P + 3 Z P -B - A05 P184 + A050 P184 E9012 - X

Axis 2: direction 3-4 (not applied for V81/VV81)

| | | | | |
|-----|---|---|-----------------------------------|--|
| 1 | 1 contact | Standard contact - arrangement see page 122 | | |
| 2 | 2 contacts | e.g. | | |
| 3 | 3 contacts | A98 | MS0 | Zero position contact |
| | | A05 | MS21 | Direction contacts |
| | | A050 | MS21-0 | Direction contacts + zero position contact |
| Z | Spring return | | | |
| R | Friction brake only available with a VV8! | | | |
| (P) | Mounting options for potentiometer | | | |
| P | Potentiometer | P181 | T301 2 x 0,5 kOhm | I max. 1 mA |
| | | P182 | T301 2 x 1 kOhm | I max. 1 mA |
| | | P183 | T301 2 x 2 kOhm | I max. 1 mA |
| | | P184 | T301 2 x 5 kOhm | I max. 1 mA |
| | | P185 | T301 2 x 10 kOhm | I max. 1 mA |
| | | <i>More potentiometers on request!</i> | | |
| H | Hall-Potentiometer | E14811 | 0,5...2,5...4,5V/4,5V...2,5...0,5 | |

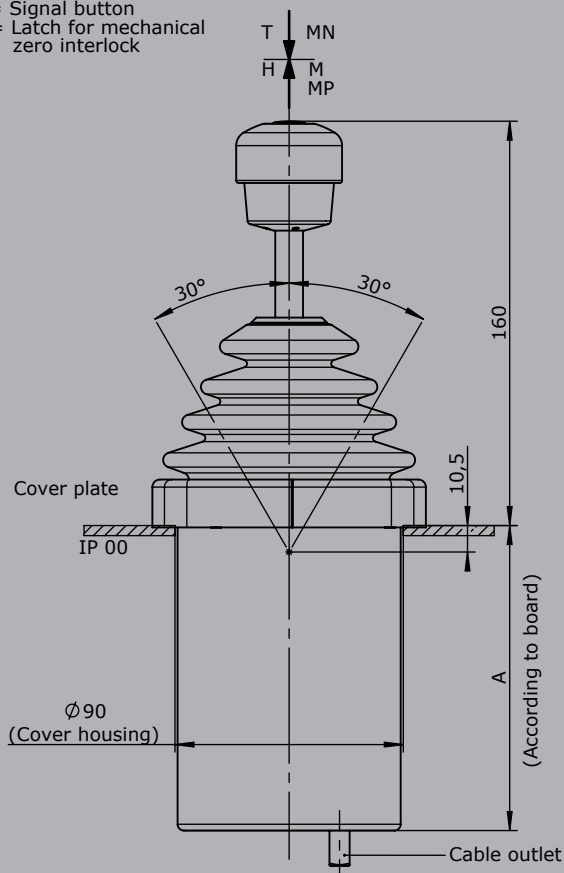
VV8 S5 P T -2 R P + 3 Z P -B - A05 P184 + A050 P184 E9012 - X

| | |
|----------------------|---------------|
| Cover housing | |
| B | Cover housing |

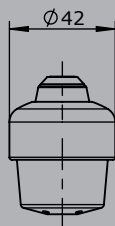
| | |
|------------------|---|
| Interface | |
| | Potentiometer output |
| E901 | Potentiometer output for proportional valve PVG32 |
| | 0,25...0,5...0,75 Us |
| 1 | 1 axis |
| 2 | 2 axis |
| 3 | 3 axis |
| 4 | 4 axis |

| | |
|----------------------|------------------------------|
| Special model | |
| X | Special / customer specified |

T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

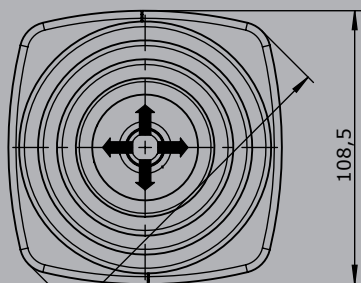
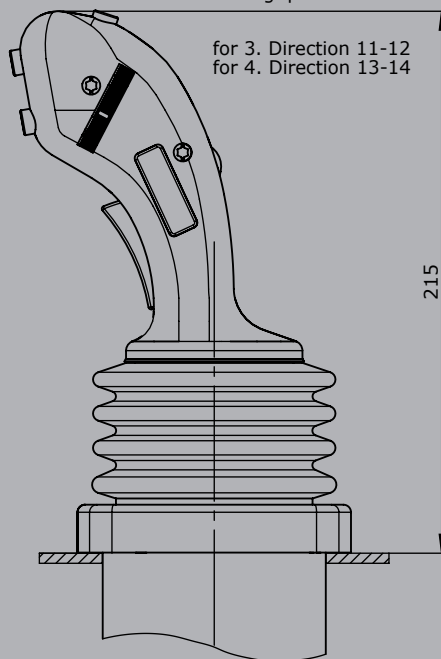


Knob solid
 D = Push button

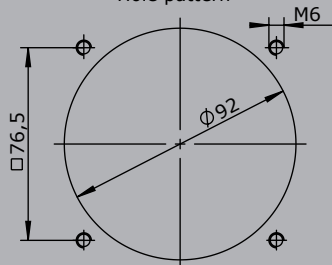


Palm grip B3

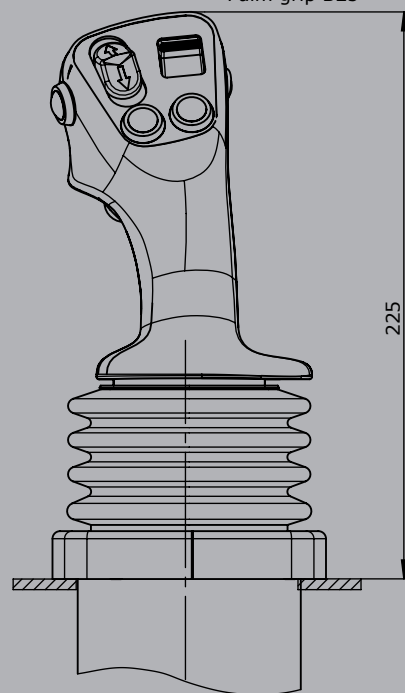
for 3. Direction 11-12
 for 4. Direction 13-14



Hole pattern



Palm grip B25



Multi-Axis Controller

V6 / VV6



The Multi-Axis Controller V6 / VV6 is a robust switching device designed for crane systems and hoisting equipment. The modular design and the many possible combinations with our Palm Grips make this joystick universally applicable.

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life V6 | 10 million operating cycles |
| Mechanical life VV6 | 20 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP54 front |



| | V62L | S5 | P | T | Example | | | | | -X |
|---|-------------------------------|----|---|---|---------|----------|-----------|-----------|--|----|
| | | | | | -01 Z P | +03A R C | -A05 P134 | +A110 C01 | | |
| Basic unit | | | | | | | | | | |
| V62L | 2-axis left | | | | | | | | | |
| Control-handle extended | | | | | | | | | | |
| S5 | -20 mm | | | | | | | | | |
| Gate | | | | | | | | | | |
| P | Cross gate | | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | | |
| T | Dead man | | | | | | | | | |
| Axis 1 (direction 1-2) | | | | | | | | | | |
| 01 | 2 contacts (2A 250 V AC15) | | | | | | | | | |
| Z | Spring return | | | | | | | | | |
| P | Potentiometer | | | | | | | | | |
| Axis 2 (direction 3-4) | | | | | | | | | | |
| 03A | 6 contacts (4A 250 V AC15) | | | | | | | | | |
| R | Friction brake | | | | | | | | | |
| C | Opto-electronical encoder | | | | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | | | | | |
| A05 | Arrangement MS21 | | | | | | | | | |
| P134 | Potentiometer T396 2 x 5 kOhm | | | | | | | | | |
| Description axis 2 (direction 3-4) | | | | | | | | | | |
| A110 | Arrangement MS24-0 | | | | | | | | | |
| C01 | OEC 2-1-1 | | | | | | | | | |
| Special model | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Combination possibilities with our grips



V62L S5 P T -01 Z P +03A R C -A05 P134 +A110 C01 -X

Basic unit

- V61L 1-axis left
- V61R 1-axis right
- V61.1 1-axis
- V64.1 1-axis
- V62L 2-axis left
- V62R 2-axis right
- V64 2-axis

reinforced version

- VV61L 1-axis left
- VV61R 1-axis right
- VV61.1 1-axis
- VV64.1 1-axis
- VV62L 2-axis left
- VV62R 2-axis right
- VV64 2 axis

Control-handle extended

Standard 180 mm*

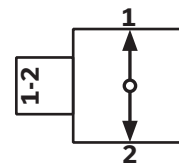
- S3 -40 mm
- S5 -20 mm
- S8 +20 mm

*Only available in combination with a handle!

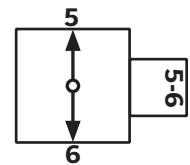
Gate

- P Cross gate
- P X Special gate

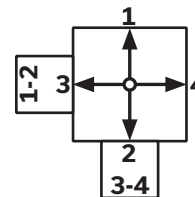
Identification of the installation variants with switching directions:



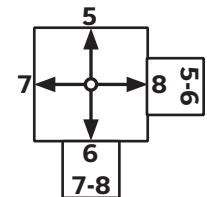
V61L/VV61L



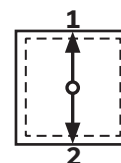
V61R/VV61R



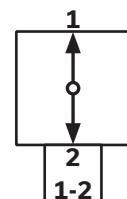
V62L/VV62L



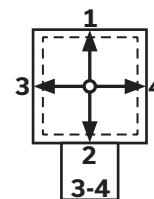
V62R/VV62R



V64.1/VV64.1



V61.1/VV61.1



V64/VV64

V62L S5 P T -01 Z P +03A R C -A05 P134 +A110 C01 -X

| Grip / Palm Grip | |
|---|---|
| | Knob (included in basic unit!) |
| M | Mechanical zero interlock |
| MN | Mechanical zero interlock (push down) |
| T | Dead man |
| MT* | Mechanical zero interlock + dead man |
| H | Signal button |
| MH | Mechanical zero interlock + signal button |
| D | Push button |
| MD* | Mechanical zero interlock + push button |
| DV | Flush push button |
| MDV* | Mechanical zero interlock + flush push button |
| *Only possible with VV6! | |
| B... | Palm Grip B... (see Palm Grip page 154) |
| <i>Attention! When using some handles the deflection angle can be reduced to 28°!</i> | |

V62L S5 P T -01 Z P +03A R C -A05 P134 +A110 C01 -X

| Axis 1: direction 1-2 left / direction 5-6 right | | | | |
|--|--|--|-------------------|-------------|
| (Standard contacts gold-plated 2A 250 V AC15) | | | | |
| 01 <input type="checkbox"/> | 2 contacts | Standard contact - arrangement see page 122 | | |
| 02 <input type="checkbox"/> | 4 contacts | z.B. | | |
| 03 <input type="checkbox"/> | 6 contacts | A980 | MS00 | |
| 04 <input type="checkbox"/> | 8 contacts | A05 | MS21 | |
| 05 <input type="checkbox"/> | 10 contacts | A0500 | MS21-00 | |
| 06 <input type="checkbox"/> | 12 contacts | A110 | MS24-0 | |
| <input type="checkbox"/> | silver contacts (4A 250V AC15) | A99 contact - arrangement according customer request | | |
| Z | Spring return | | | |
| R | Friction brake | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA |
| | | More potentiometers on request! | | |
| C | Encoder | C... Encoder see page 130 | | |

V62L S5 P T -01 Z P +03A R C -A05 P134 +A110 C01 -X

Axis 2: direction 3-4 left / Direction 7-8 right

(not applicable for V/VV61, V/VV61.1, V/VV64.1)

(Standard contacts gold-plated 2A 250 V AC15)

| | | | | |
|----|-------------------------------------|------------------------------------|--|---------|
| 01 | <input type="checkbox"/> | 2 contacts | Standard contact - arrangement see page 122 | |
| 02 | <input type="checkbox"/> | 4 contacts | z.B. | |
| 03 | <input type="checkbox"/> | 6 contacts | A980 | MS00 |
| 04 | <input type="checkbox"/> | 8 contacts | A05 | MS21 |
| 05 | <input type="checkbox"/> | 10 contacts | A0500 | MS21-00 |
| 06 | <input type="checkbox"/> | 12 contacts | A110 | MS24-0 |
| | <input checked="" type="checkbox"/> | A= Silver contacts (4A 250 V AC15) | A99 contact - arrangement according customer request | |

Z Spring return

R Friction brake

(P) Possibility of mounting potentiometer and encoder (Gessmann-types)

| | | | | |
|---|---------------|---------------------------------|-------------------|-------------|
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA |
| | | More potentiometers on request! | | |

C Encoder C... Encoder see page 157

V62L S5 P T -01 Z P +03A R C -A05 P134 +A110 C01 -X

Special model

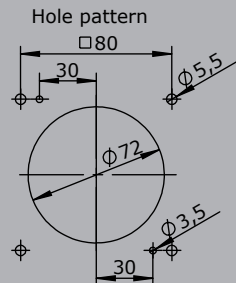
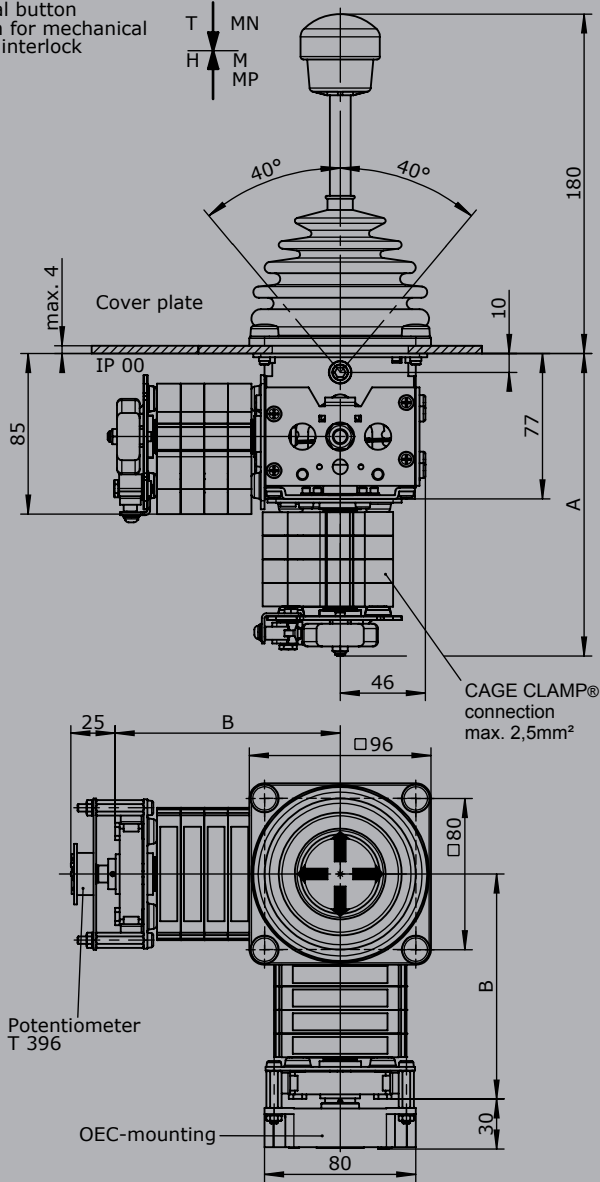
X Special /customer specified

Attachments

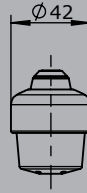
Indicating labels

Indicating labels with engraving

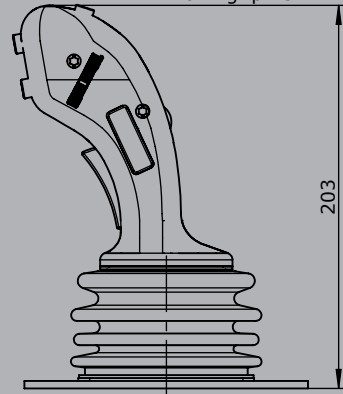
T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock



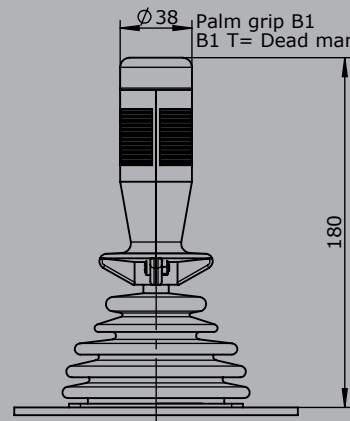
Knob solid
 D = Push button



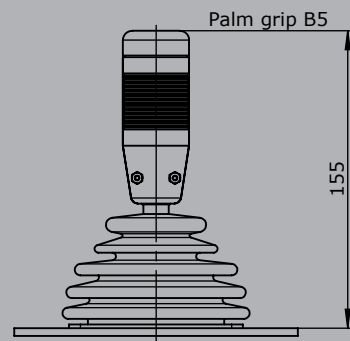
Palm grip B3



Palm grip B1
 B1 T = Dead man's button



Palm grip B5



| Type | No. of contacts | Dim. A | Dim. B |
|------|-----------------|--------|--------|
| 01 | 2 | 119 | 82 |
| 02 | 4 | 131 | 94 |
| 03 | 6 | 144 | 107 |
| 04 | 8 | 156 | 119 |
| 05 | 10 | 169 | 132 |
| 06 | 12 | 181 | 144 |

Multi-Axis Controller VA6



The Multi-Axis Controller VA6 is available in either single-axis or multi-axis options and is a robust explosion proof controller commonly used in crane and hoisting applications. The modular design enables the switching device to be used universally.

Technical data

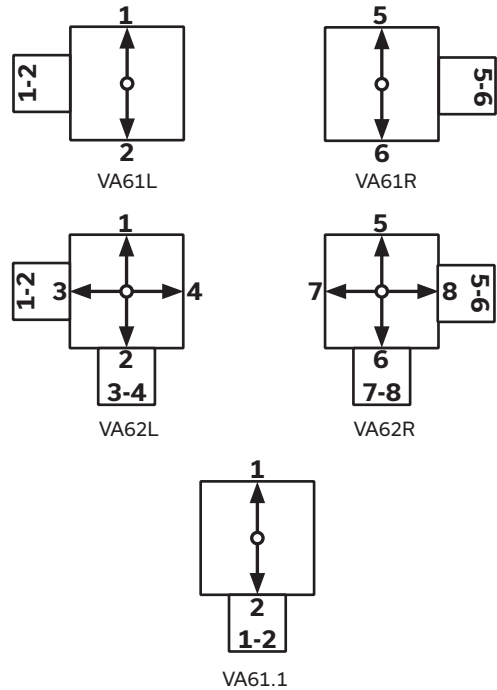
| | |
|-----------------------|--|
| Mechanical life VA6 | 10 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP54 front IP66 (microswitch and potentiometer) |
| Identifications | ⊕ II 2G IIC T5 or T6 ⊕ II 2D T85° or T95°C |
| Group of devices | II |
| Equipment category | 2D and 2G |
| Certificate | OBAC 17 ATEX 0126X |



| | VA62L | S5 | P | T | -01 Z P | +03 R | -A05 P144 | +A110 |
|---|---|----|---|---|---------|-------|-----------|-------|
| Basic unit | <div style="text-align: right; margin-bottom: 10px;"><i>Example</i></div> VA62L S5 P T -01 Z P +03 R -A05 P144 +A110 | | | | | | | |
| VA62L 2-axis left | | | | | | | | |
| Control-handle extended | | | | | | | | |
| S5 -20 mm | | | | | | | | |
| Gate | | | | | | | | |
| P Cross gate | | | | | | | | |
| Grip / Palm Grip | | | | | | | | |
| T Dead man | | | | | | | | |
| Axis 1 (direction 1-2) | <div style="text-align: right; margin-bottom: 10px;"><i>Example</i></div> VA62L S5 P T -01 Z P +03 R -A05 P144 +A110 | | | | | | | |
| 01 2 contacts | | | | | | | | |
| Z Spring return | | | | | | | | |
| P Potentiometer | | | | | | | | |
| Axis 2 (direction 3-4) | <div style="text-align: right; margin-bottom: 10px;"><i>Example</i></div> VA62L S5 P T -01 Z P +03 R -A05 P144 +A110 | | | | | | | |
| 03 6 contacts | | | | | | | | |
| R Friction brake | | | | | | | | |
| Description axis 1 (direction 1-2) | <div style="text-align: right; margin-bottom: 10px;"><i>Example</i></div> VA62L S5 P T -01 Z P +03 R -A05 P144 +A110 | | | | | | | |
| A05 Arrangement MS21 | | | | | | | | |

| | VA62L | S5 | P | T |
|--------------------------------|---------------------------------------|----|---|---|
| Basic unit | | | | |
| VA61L | 1-axis left | | | |
| VA61R | 1-axis right | | | |
| VA61.1 | 1-axis | | | |
| VA62L | 2-axis left | | | |
| VA62R | 2-axis right | | | |
| Control-handle extended | | | | |
| | Standard 180 mm | | | |
| S3 | -40 mm | | | |
| S5 | -20 mm | | | |
| S8 | +20 mm | | | |
| Gate | | | | |
| P | Cross gate | | | |
| P X | Special gate | | | |
| Grip / Palm Grip | | | | |
| | Knob (included in basic unit!) | | | |
| M | Mechanical zero interlock | | | |
| MN | Mechanical zero interlock (push down) | | | |
| T | Dead man | | | |
| H | Signal button | | | |
| D | Push button | | | |
| DV | Flush push button | | | |

Identification of the installation variants with switching directions:



| | VA62L | S5 | P | T | -01 Z P | + 03 R | A05 | P144 | + A110 |
|---|---|---|-------------------|---|-------------|--------|-----|------|--------|
| Axis 1: direction 1-2 left / direction 5-6 right | | | | | | | | | |
| | (contacts gold-plated 2A 250V AC15, II 2G Ex d IIC T6, connecting cable 6 m) | | | | | | | | |
| 01 | 2 contacts | Standard contact - arrangement see page 122 | | | | | | | |
| 02 | 4 contacts | z.B. | | | | | | | |
| 03 | 6 contacts | A980 MS00 | | | | | | | |
| 04 | 8 contacts | A05 MS21 | | | | | | | |
| 05 | 10 contacts | A0500 MS21-00 | | | | | | | |
| 06 | 12 contacts | A110 MS24-0 | | | | | | | |
| | A99 contact - arrangement according customer request | | | | | | | | |
| Z | Spring return | | | | | | | | |
| R | Friction brake | | | | | | | | |
| P | Potentiometer Ex | P144 | T1350 2 x 5 kOhm | | I max. 1 mA | | | | |
| | | P145 | T1350 2 x 10 kOhm | | I max. 1 mA | | | | |
| | II 2G Ex d IIC T6 Gb Connecting cable 6 m | | | | | | | | |

VA62L S5 P T -01 Z P +03 R -A05 P144 +A110

Axis 2: direction 3-4 left / Direction 7-8 right

(not applicable for VA61, VA61.1)

(contacts gold-plated 2A 250 V AC15,  II 2G Ex d IIC T6, connection cable 6 m)

- 01 2 contacts
- 02 4 contacts
- 03 6 contacts
- 04 8 contacts
- 05 10 contacts
- 06 12 contacts

Standard contact - arrangement see page 122

z.B.

A980 MS00

A05 MS21

A0500 MS21-00

A110 MS24-0

A99 contact - arrangement according customer request


Z Spring return

R Friction brake

P Potentiometer Ex

P144 T1350 2 x 5 kOhm I max. 1 mA

P145 T1350 2 x 10 kOhm I max. 1 mA

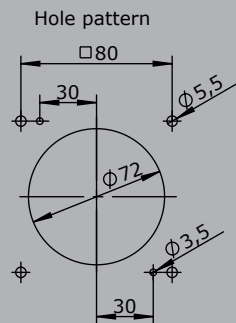
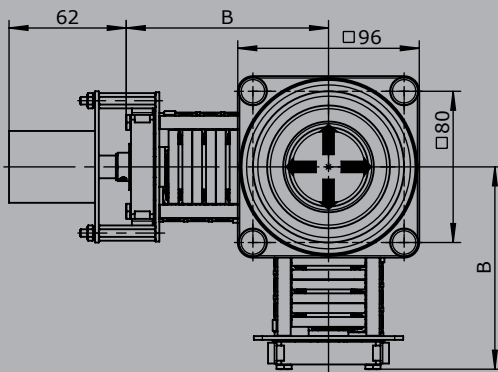
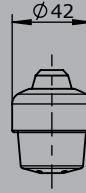
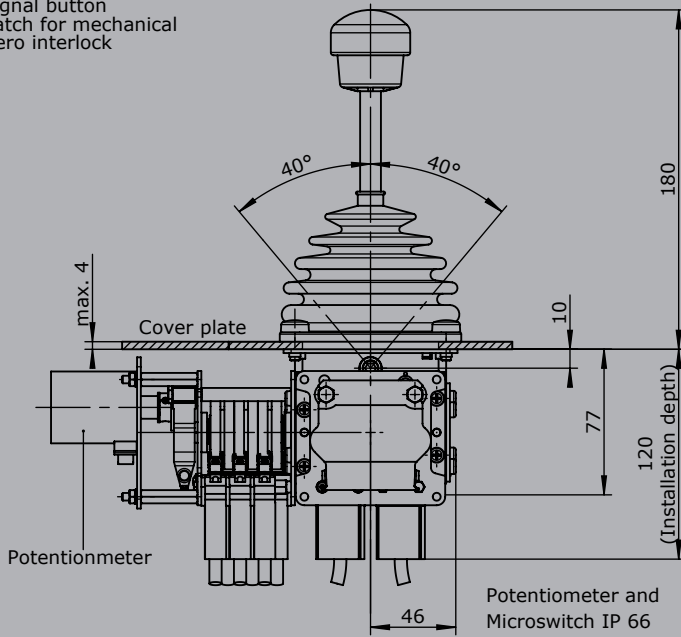
 II 2G Ex d IIC T6 Gb

connection cable 6 m



T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

Knob solid
 D= Push button



| Type | No. of contacts | Dim. B |
|------|-----------------|--------|
| 01 | 2 | 82 |
| 02 | 4 | 94 |
| 03 | 6 | 107 |
| 04 | 8 | 119 |
| 05 | 10 | 132 |
| 06 | 12 | 144 |

Double-Handle Controller D8



The Double-Handle Controller D8 is a robust switching device for electro hydraulic and the hoisting applications. The modular design enables the switching device to be used universally.

Technical data

| | |
|-----------------------|----------------------------|
| Mechanical life D8 | 8 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP54 front |

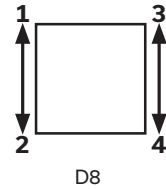


| | D8 | S5 | Q / Q | -2ZP | +3 RP | -B | -A05 P184 | +A050 P184 | -E9012 | -S... | -X |
|---|---|----|-------|------|-------|----|-----------|------------|--------|-------|----|
| Basic unit | D8 | | | | | | | | | | |
| Control-handle extended | S5 -20 mm | | | | | | | | | | |
| Grip- control-handle left | Q T-grip | | | | | | | | | | |
| Grip- control-handle right | Q T-grip | | | | | | | | | | |
| Axis 1 (direction 1-2) | 2 2 contacts (1,5A 24 V DC13) | | | | | | | | | | |
| Z | Spring return | | | | | | | | | | |
| P | Potentiometer | | | | | | | | | | |
| Axis 2 (direction 3-4) | 3 3 contacts (1,5A 24 V DC13) | | | | | | | | | | |
| R | Friction brake | | | | | | | | | | |
| P | Potentiometer | | | | | | | | | | |
| Cover housing | B Cover housing | | | | | | | | | | |
| Description axis 1 (direction 1-2) | A05 Arrangement MSP21 | | | | | | | | | | |
| P184 | Potentiometer T301 2 x 5 kOhm | | | | | | | | | | |
| Description axis 2 (direction 3-4) | A050 Arrangement MSP21-0 | | | | | | | | | | |
| P184 | Potentiometer T301 2 x 5 kOhm | | | | | | | | | | |
| Interface | E9012 Potentiometer output for proportional valve PVG32 | | | | | | | | | | |
| Plug connector | S... Standard plug connector (see page 120) | | | | | | | | | | |
| Special model | X Special / customer specified | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

| | D8 | S5 | Q / Q | -2 Z P | +3 R P | -B | -A05 | P184 | +A050 | P184 | -E9012 | -X |
|--|----|----|-------|--------|--------|----|------|------|-------|------|--------|----|
| Basic unit | | | | | | | | | | | | |
| D8 | | | | | | | | | | | | |
| Control-handle extended | | | | | | | | | | | | |
| Standard 160 mm* | | | | | | | | | | | | |
| S5 -20 mm | | | | | | | | | | | | |
| S8 +20 mm | | | | | | | | | | | | |
| <i>*Only in combination with knob!</i> | | | | | | | | | | | | |
| Grip- control-handle left | | | | | | | | | | | | |
| Knob | | | | | | | | | | | | |
| M Mechanical zero interlock | | | | | | | | | | | | |
| T Dead man | | | | | | | | | | | | |
| H Signal button | | | | | | | | | | | | |
| D Push button | | | | | | | | | | | | |
| Q T-grip | | | | | | | | | | | | |
| QD T-grip with push button side | | | | | | | | | | | | |
| B10... Palm Grip B10... (see page 184) | | | | | | | | | | | | |
| Grip- control-handle right | | | | | | | | | | | | |
| Knob | | | | | | | | | | | | |
| M Mechanical zero interlock | | | | | | | | | | | | |
| T Dead man | | | | | | | | | | | | |
| H Signal button | | | | | | | | | | | | |
| D Push button | | | | | | | | | | | | |
| Q T-grip | | | | | | | | | | | | |
| QD T-grip with push button side | | | | | | | | | | | | |
| B10... Ball handle B10... (see page 184) | | | | | | | | | | | | |

Identification of the installation variants with switching directions:



| | D8 | S5 | Q / Q | -2 Z P | +3 R P | -B | -A05 | P184 | +A050 | P184 | -E9012 | -X |
|---|--------|---------------------------------------|-------------|--------|--------|----|------|------|-------|------|--------|----|
| Axis 1: direction 1-2 left | | | | | | | | | | | | |
| 1 1 contact | | | | | | | | | | | | |
| 2 2 contacts | | | | | | | | | | | | |
| 3 3 contacts | | | | | | | | | | | | |
| Standard contact - arrangement see page 122 | | | | | | | | | | | | |
| e.g. | | | | | | | | | | | | |
| A98 | | | | | | | | | | | | |
| A05 | | | | | | | | | | | | |
| A050 | | | | | | | | | | | | |
| A99 contact - arrangement for customer request | | | | | | | | | | | | |
| Z Spring return | | | | | | | | | | | | |
| R Friction brake | | | | | | | | | | | | |
| (P) Mounting options for potentiometer and encoder (Gessmann-types) | | | | | | | | | | | | |
| P Potentiometer | P181 | T301 2 x 0,5 kOhm | I max. 1 mA | | | | | | | | | |
| | P182 | T301 2 x 1 kOhm | I max. 1 mA | | | | | | | | | |
| | P183 | T301 2 x 2 kOhm | I max. 1 mA | | | | | | | | | |
| | P184 | T301 2 x 5 kOhm | I max. 1 mA | | | | | | | | | |
| | P185 | T301 2 x 10 kOhm | I max. 1 mA | | | | | | | | | |
| <i>More potentiometers on request!</i> | | | | | | | | | | | | |
| H Hall-potentiometer | E14811 | 0,5...2,5...4,5 V / 4,5...2,5...0,5 V | | | | | | | | | | |

Combination possibilities with our handles



D8 S5 Q / Q -2 Z P +3 R P -B A05 P184 +A050 P184 -E9012 -X

Axis 2: direction 3-4

- 1 1 contacts
- 2 2 contacts
- 3 3 contacts

Standard contact - arrangement see page 122
 e.g.
 A98
 A05
 A050
 A99 contact - arrangement for customer request

- Z Spring return
- R Friction brake
- (P) Mounting options for potentiometer and encoder (Gessmann-types)

| P | Potentiometer | | | |
|---|---------------|-------------------|--|-------------|
| | P181 | T301 2 x 0,5 kOhm | | I max. 1 mA |
| | P182 | T301 2 x 1 kOhm | | I max. 1 mA |
| | P183 | T301 2 x 2 kOhm | | I max. 1 mA |
| | P184 | T301 2 x 5 kOhm | | I max. 1 mA |
| | P185 | T301 2 x 10 kOhm | | I max. 1 mA |

More potentiometers on request!

Hall-Potentiometer E14811 0,5...2,5...4,5 V / 4,5...2,5...0,5 V

D8 S5 Q / Q -2 Z P +3 R P -B A05 P184 +A050 P184 -E9012 -X

Cover housing

- B Cover housing

Schnittstelle

| E901 | | Potentiometer output for proportional valve PVG32 0,25...0,5...0,75 Us | |
|------|--|--|--------|
| 1 | | | 1 axis |
| 2 | | | 2 axis |

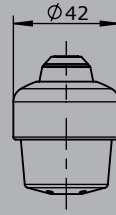
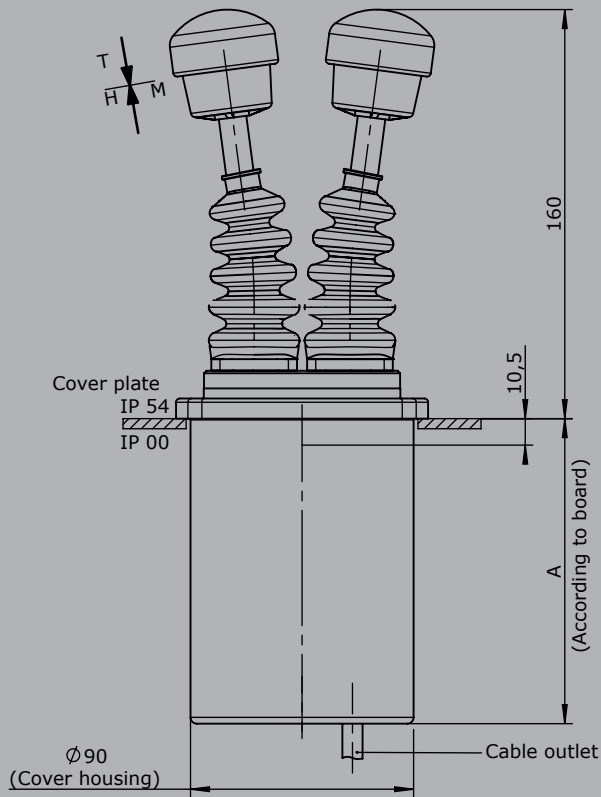
Special model

- X Special / customer specified

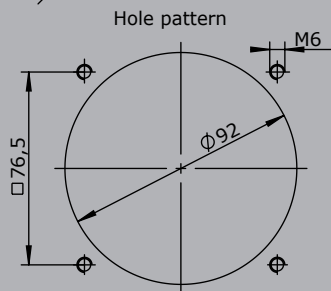
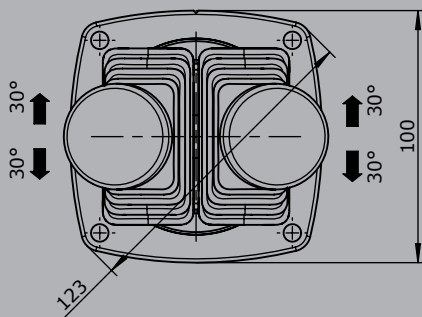
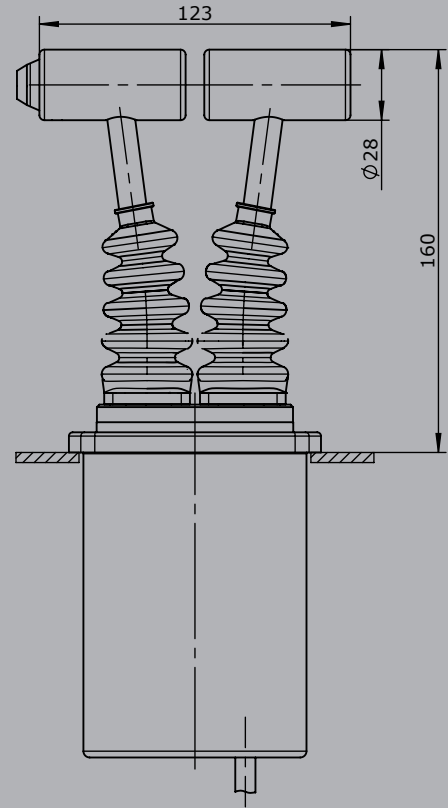
T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

Knob solid
 D = Push button

T - grip
 D = Push button



To build in:
 Direction 1-2
 Direction 3-4



Double-Handle Controller

D64 / DD64



The Double-Handle Controller D64/DD64 is a robust controller used commonly in crane and hoisting applications. The modular design enables the switching device to be used universally.

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life D64 | 10 million operating cycles |
| Mechanical life DD64 | 20 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP54 front |



| | D64 | S5 | Q | / | Q | -01 Z P | +03A R C | -A05 P134 | +A110 C01 | -X |
|---|---|----|---|---|---|---------|----------|-----------|-----------|----|
| Basic unit | D64 | | | | | | | | | |
| Control-handle extended | S5 -20 mm | | | | | | | | | |
| Grip- control handle left | Q T-grip | | | | | | | | | |
| Grip- control handle right | Q T-grip | | | | | | | | | |
| Axis 1 (direction 1-2) | 01 2 contacts (2A 250 V AC15) Z Spring return P Potentiometer | | | | | | | | | |
| Axis 2 (direction 3-4) | 03A 6 contacts (4A 250 V AC15) R Friction brake C Opto-electronical encoder | | | | | | | | | |
| Description axis 1 (direction 1-2) | A05 Arrangement MSP21 P134 Potentiometer T396 2 x 5 kOhm | | | | | | | | | |
| Description axis 2 (direction 3-4) | A110 Arrangement MSP 24-0 C01 OEC 2-1-1 | | | | | | | | | |
| Special model | X Special / customer specified | | | | | | | | | |

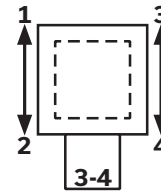
Technical details may vary based on configuration or application! Technical data subject to change without notice!

Combination possibilities with our handles



| | D64 | S5 | Q / Q | -01 Z P | +03 A R C | -A05 | P134 | +A110 | C01 | -X |
|--|-----|----|-------|---------|-----------|------|------|-------|-----|----|
| Basic unit | | | | | | | | | | |
| D64 | | | | | | | | | | |
| Reinforced version | | | | | | | | | | |
| DD64 | | | | | | | | | | |
| Control-handle long | | | | | | | | | | |
| Standard 180 mm* | | | | | | | | | | |
| S5 -20 mm | | | | | | | | | | |
| S8 +20 mm | | | | | | | | | | |
| *Only in combination with knob! | | | | | | | | | | |
| Grip- control handle left | | | | | | | | | | |
| Knob | | | | | | | | | | |
| M Mechanical zero interlock | | | | | | | | | | |
| T Dead man | | | | | | | | | | |
| H Signal button | | | | | | | | | | |
| D Push button | | | | | | | | | | |
| DV Flush push button | | | | | | | | | | |
| Q T-grip | | | | | | | | | | |
| QM T-grip with mechanical zero interlock | | | | | | | | | | |
| QMH T-grip with mechanical zero interlock + signal contact | | | | | | | | | | |
| QH T-grip + signal button | | | | | | | | | | |
| QD T-grip + push button side | | | | | | | | | | |
| B10 Palm Grip B10... (see page 184) | | | | | | | | | | |
| Grip- control handle right | | | | | | | | | | |
| Knob | | | | | | | | | | |
| M Mechanical zero interlock | | | | | | | | | | |
| T Dead man | | | | | | | | | | |
| H Signal button | | | | | | | | | | |
| D Push button | | | | | | | | | | |
| DV Flush push button | | | | | | | | | | |
| Q T-grip | | | | | | | | | | |
| QM T-grip with mechanical zero interlock | | | | | | | | | | |
| QMH T-grip with mechanical zero interlock + signal contact | | | | | | | | | | |
| QH T-grip with signal button | | | | | | | | | | |
| QD T-grip push button side | | | | | | | | | | |
| B10... Palm Grip B10... (see page 184) | | | | | | | | | | |

Identification of the installation variants with switching directions:



D64 / DD64

D64 S5 Q / Q -01 Z P +03 A R C -A05 P134 +A110 C01 -X

Axis 1: direction 1-2

(Standard contacts gold-plated 2A 250 V AC15)

| | | | | |
|----|--------------------------|-------------|--|---------|
| 01 | <input type="checkbox"/> | 2 contacts | Standard contacts - see arrangement page 122 | |
| 02 | <input type="checkbox"/> | 4 contacts | e.g. | |
| 03 | <input type="checkbox"/> | 6 contacts | A980 | MS00 |
| 04 | <input type="checkbox"/> | 8 contacts | A05 | MS21 |
| 05 | <input type="checkbox"/> | 10 contacts | A0500 | MS21-00 |
| 06 | <input type="checkbox"/> | 12 contacts | A110 | MS24-0 |

= Silver contact (4A 250 V AC15) A99 contact - arrangement according customer request

- Z Spring return
- R Friction brake
- (P) Mounting options for potentiometer and encoder (Gessmann-types)

| | | | | |
|---|---------------|--|-------------------|-------------|
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA |
| | | <i>More potentiometers on request!</i> | | |

C Encoder C... Encoder see page 130

D64 S5 Q / Q -01 Z P +03 A R C -A05 P134 +A110 C01 -X

Axis 2: direction 3-4

(Standard contacts gold plated 2A 250 V AC15)

| | | | | |
|----|--------------------------|-------------|--|---------|
| 01 | <input type="checkbox"/> | 2 contacts | Standard contact - see arrangement on page 122 | |
| 02 | <input type="checkbox"/> | 4 contacts | e.g. | |
| 03 | <input type="checkbox"/> | 6 contacts | A980 | MS00 |
| 04 | <input type="checkbox"/> | 8 contacts | A05 | MS21 |
| 05 | <input type="checkbox"/> | 10 contacts | A0500 | MS21-00 |
| 06 | <input type="checkbox"/> | 12 contacts | A110 | MS24-0 |

= Silver contacts (4A 250 V AC15) A99 contact - arrangement according customer request

- Z Spring return
- R Friction brake
- (P) Mounting options for potentiometer and encoder (Gessmann-types)

| | | | | |
|---|---------------|--|-------------------|-------------|
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA |
| | | <i>More potentiometers on request!</i> | | |

C Encoder C... Encoder see page 130

Special model

X Special / customer specified

Attachments

- Indicating labels
- Indicating labels engraved

Double-Handle Controller

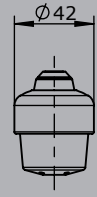
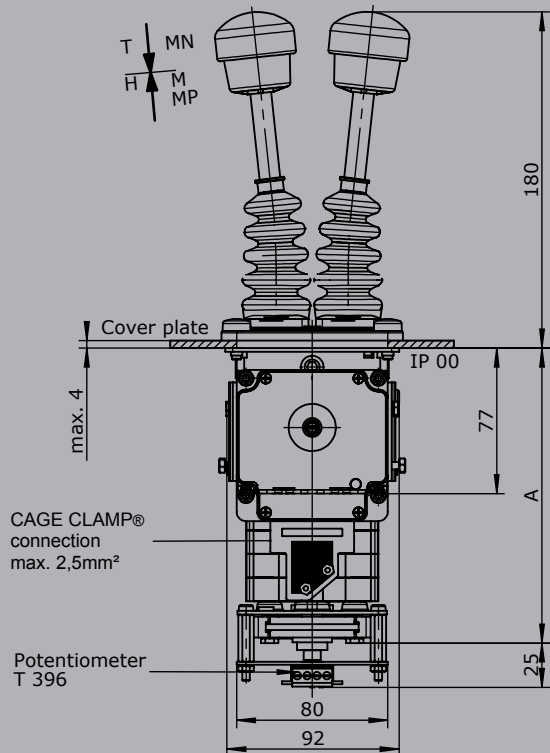
D64 / DD64



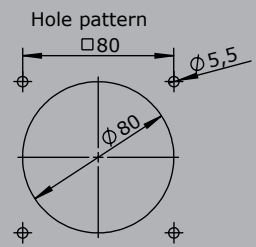
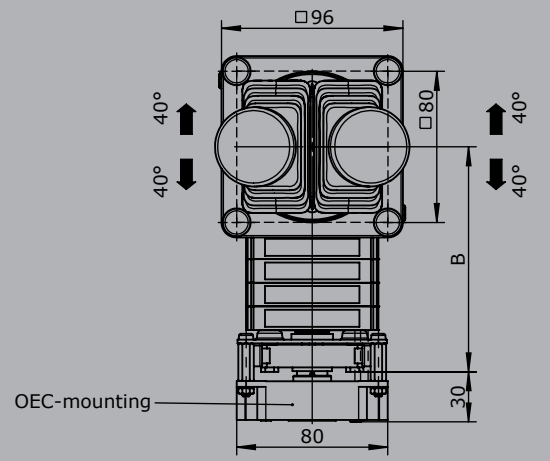
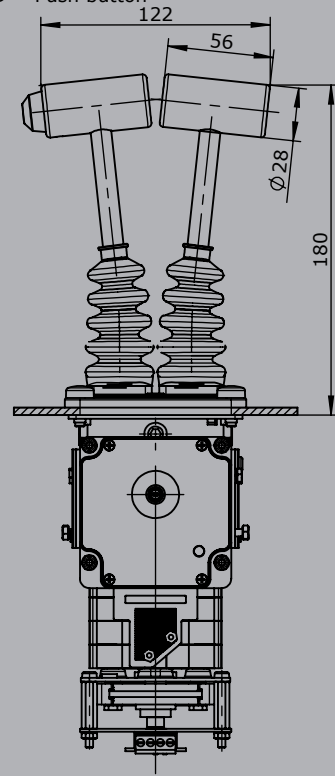
T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

Knob solid
 D = Push button

T - grip
 D = Push button



To build in:
 Direction 1-2
 Direction 3-4



| Type | No. of contacts | Dim. A | Dim. B |
|------|-----------------|--------|--------|
| 01 | 2 | 119 | 82 |
| 02 | 4 | 131 | 94 |
| 03 | 6 | 144 | 107 |
| 04 | 8 | 156 | 119 |
| 05 | 10 | 169 | 132 |
| 06 | 12 | 181 | 144 |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Multi-Axis Controller V11



The Multi-Axis Controller V11 is a robust switching device for crane and hoisting applications. The modular design enables the switching device to be used universally.

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life | 10 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP54 front |



| | V11L | S5 | P | T | Example | | | | -X |
|---|------|----|---|---|---------|--|--|--|----|
| Basic unit | | | | | | | | | |
| V11L 2-axis left | | | | | | | | | |
| Control-handle extended | | | | | | | | | |
| S5 -20 mm | | | | | | | | | |
| Gate | | | | | | | | | |
| P Cross gate | | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | |
| T Dead man | | | | | | | | | |
| Axis 1 (direction 1-2) | | | | | | | | | |
| 01 2 contacts (2A 250 V AC15) | | | | | | | | | |
| Z Spring return | | | | | | | | | |
| P Potentiometer | | | | | | | | | |
| Axis 2 (direction 3-4) | | | | | | | | | |
| 03A 6 contacts (4A 250 V AC15) | | | | | | | | | |
| R Friction brake | | | | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | | | | |
| A05 Arrangement MS21 | | | | | | | | | |
| P324 Potentiometer T365 2 x 5 kOhm | | | | | | | | | |
| Description axis 2 (direction 3-4) | | | | | | | | | |
| A110 Arrangement MS24-0 | | | | | | | | | |
| Special model | | | | | | | | | |
| X Special / customer specified | | | | | | | | | |

Combination possibilities with our grips

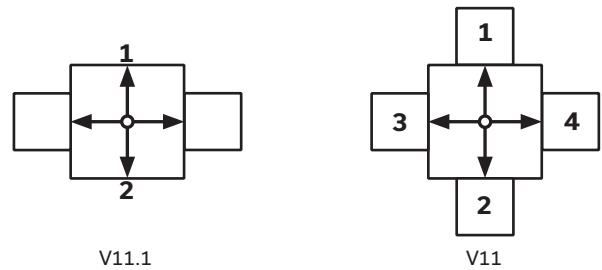


V11L S5 P T - 01 Z P + 03A R P - A05 P324 + A110 P325 - X

| | V11L | S5 | P | T |
|---|---|----|---|---|
| Basic unit | | | | |
| V11L | 2-axis left | | | |
| V11R | 2-axis right | | | |
| V11.1L | 1-axis left | | | |
| V11.1R | 1-axis right | | | |
| Control-handle extended | | | | |
| | Standard 120 mm* | | | |
| S5 | -20 mm | | | |
| S8 | +20 mm | | | |
| *Only available in combination with a handle! | | | | |
| Gate | | | | |
| P | Cross gate | | | |
| P X | Special gate | | | |
| Grip / Palm Grip | | | | |
| | Knob (included in basic unit!) | | | |
| M | Mechanical zero interlock | | | |
| MN | Mechanical zero interlock (push down) | | | |
| T | Dead man | | | |
| H | Signal button | | | |
| D | Push button | | | |
| DV | Flush push button | | | |
| B... | Palm Grip B... (see page Palm Grip 154) | | | |

Identification of the installation variants

with switching directions:



V11L S5 P T - 01 Z P + 03A R P - A05 P324 + A110 P325 - X

Axis 1: direction 1-2 left / direction 5-6 right

(Standard contacts gold-plated 2A 250 V AC15)

| | | | | | |
|-----|--|---------------------------------|--|------------------|-------------|
| 01 | <input type="checkbox"/> | 2 contacts | Standard contact - arrangement see page 122 | | |
| 02 | <input type="checkbox"/> | 4 contacts | e.g. | | |
| 03 | <input type="checkbox"/> | 6 contacts | A980 | MS00 | |
| | | | A05 | MS21 | |
| | | | A0500 | MS21-00 | |
| | | | A110 | MS24-0 | |
| | | | (Max. 4 steps per switching direction possible!) | | |
| | <input checked="" type="checkbox"/> | Silver contacts (4A 250 V AC15) | A99 contact - arrangement according customer request | | |
| Z | Spring return | | | | |
| R | Friction brake | | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | | |
| P | Potentiometer | | P324 | T365 2 x 5 kOhm | I max. 1 mA |
| | | | P325 | T365 2 x 10 kOhm | I max. 1 mA |
| | | | <i>More potentiometers on request!</i> | | |
| C | Encoder | | C... Encoder see page 130 | | |

V11L S5 P T - 01 Z P + 03A R P - A05 P324 + A110 P325 - X

Axis 2: direction 3-4 left / direction 7-8 right

(not applied for V11.1)

(Standard contacts gold-plated 2A 250 V AC15)

| | | | | | |
|-----|--|---------------------------------|--|------------------|-------------|
| 01 | <input type="checkbox"/> | 2 contacts (2A 250V AC15) | Standard contact - arrangement see page 122 | | |
| 02 | <input type="checkbox"/> | 4 contacts (2A 250V AC15) | z.B. | | |
| 03 | <input type="checkbox"/> | 6 contacts (2A 250V AC15) | A980 | MS00 | |
| | | | A05 | MS21 | |
| | | | A0500 | MS21-00 | |
| | | | A110 | MS24-0 | |
| | | | (Max. 4 steps per switching direction possible!) | | |
| | <input checked="" type="checkbox"/> | Silver contacts (4A 250 V AC15) | A99 contact - arrangement according customer request | | |
| Z | Spring return | | | | |
| R | Friction brake | | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | | |
| P | Potentiometer | | P324 | T365 2 x 5 kOhm | I max. 1 mA |
| | | | P325 | T365 2 x 10 kOhm | I max. 1 mA |
| | | | <i>More potentiometers on request!</i> | | |
| C | Encoder | | C... Encoder see page 130 | | |

V11L S5 P T - 01 Z P + 03A R P - A05 P324 + A110 P325 - X

Special model

X Special / customer specified

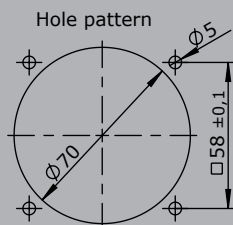
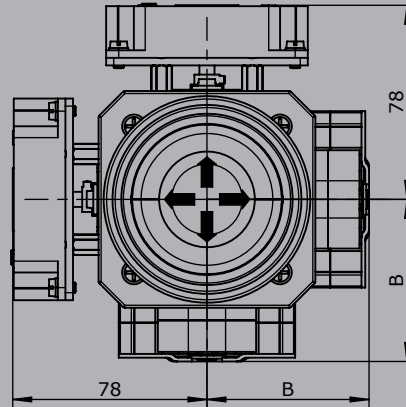
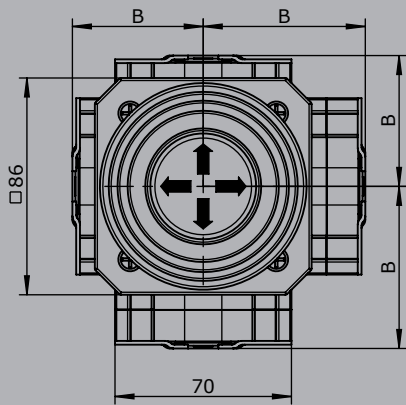
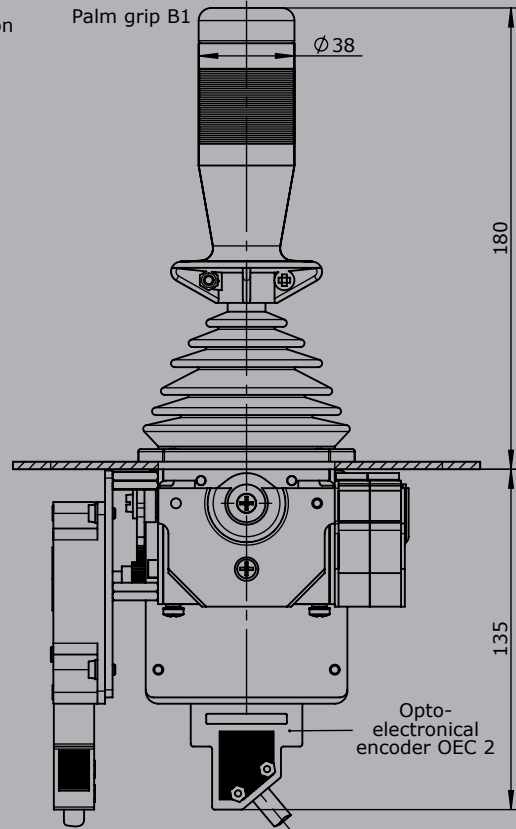
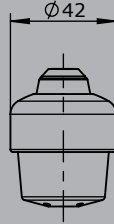
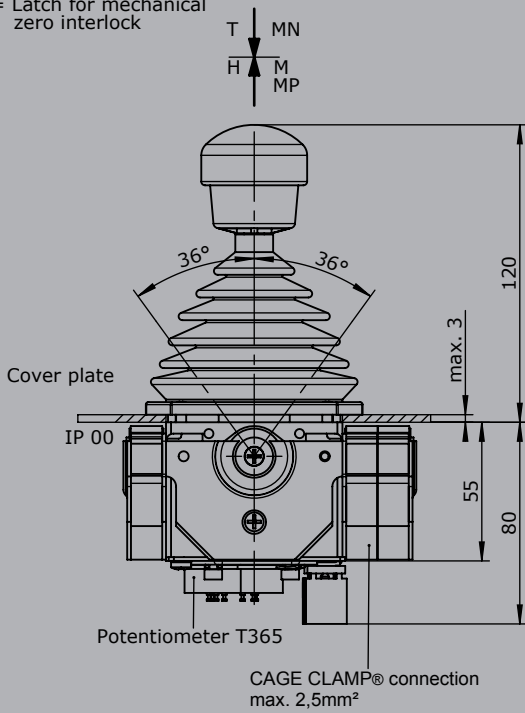
Attachments

- Indicating labels
- Indicating labels with engraving

T = Dead man's button
H = Signalbutton
M = Latch for mechanical zero interlock

Knob solid
D= Push button

Palm grip B1



| Type | No. of contacts | Dim. B |
|------|-----------------|--------|
| 01 | 2 | 51 |
| 02 | 4 | 64 |
| 03 | 6 | 76 |

Multi-Axis Controller V14



The V14 is a robust switching device for remote control and electro-hydraulic applications. Due to its modular design, this control unit can be used universally. The integrated sensor system has signal and potentiometer tracks in conductive plastic technology. Switching contacts are also available as an option.

Technical data

| | |
|-----------------------|----------------------------|
| Mechanical life V14 | 6 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | up to IP65 |



| | V14L | S8 | P | T | Example | | | | | -X |
|--|------------------------------|----|---|---|---------|-------|----------|-------|--|----|
| | | | | | -01 Z C | +03 R | -A05 C61 | +A110 | | |
| Basic unit | | | | | | | | | | |
| V14L | 2-axis left | | | | | | | | | |
| Control-handle extended | | | | | | | | | | |
| | Standard 60 mm** | | | | | | | | | |
| S8 | +20 mm | | | | | | | | | |
| <i>*Only available in combination with grip!</i> | | | | | | | | | | |
| Gate | | | | | | | | | | |
| P | Cross gate | | | | | | | | | |
| Grip / Palm Grip | | | | | | | | | | |
| T | Dead man | | | | | | | | | |
| Axis 1 (direction 1-2) | | | | | | | | | | |
| O1 | 2 contacts (2A 250 V AC15) | | | | | | | | | |
| Z | Spring return | | | | | | | | | |
| C | Mechanical encoder | | | | | | | | | |
| Axis 2 (direction 3-4) | | | | | | | | | | |
| O3 | 6 contacts (2A 250 V AC15) | | | | | | | | | |
| R | Friction brake | | | | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | | | | | |
| A05 | Arrangement MSP21 | | | | | | | | | |
| C61 | Mechanical encoder MEC 1-2 | | | | | | | | | |
| Description axis 2 (direction 3-4) | | | | | | | | | | |
| A110 | Arrangement MS24-0 | | | | | | | | | |
| Special model | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Combination possibilities with our grips

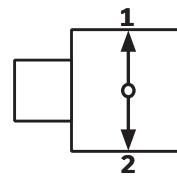


| | V14L | S8 | P | T |
|---|---|----|---|---|
| Basic unit | | | | |
| V14.1L | 1-axis left | | | |
| V14.1R | 1-axis right | | | |
| V14L | 2-axis left | | | |
| V14R | 2-axis right | | | |
| Control-handle extended | | | | |
| | Standard 60 mm* | | | |
| S8 | +20 mm | | | |
| *Only available in combination with a handle! | | | | |
| Gate | | | | |
| P | Cross gate | | | |
| P X | Special gate | | | |
| Grip / Palm Grip | | | | |
| | Knob 25 mm (standard) | | | |
| M | Mechanical zero interlock | | | |
| MH | Mechanical zero interlock + signal contact | | | |
| T | Dead man | | | |
| H | Signal button | | | |
| GK1 | Knob 42 mm | | | |
| GK1M | Mechanical zero interlock | | | |
| GK1MN | Mechanical zero interlock (push down) | | | |
| GK1T | Dead man | | | |
| GK1H | Signal button | | | |
| GK1MH | Mechanical zero interlock + signal contact | | | |
| GK1D | Push button | | | |
| GK1DV | Flush push button | | | |
| GS9 | Hall-twist grip with spring return | | | |
| GS9-D | Hall-twist grip with spring return and push button on top | | | |
| B... | Palm Grip B... (see page Palm Grip page 154) | | | |

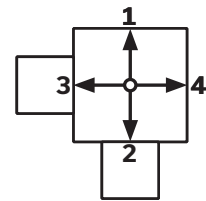
*Attention! The Multi-Axis Controller V14 is not suitable for large Palm Grips (B3, B7/B8, B9...)

| | V14L | S8 | P | T | - | 01 Z C | + | 03 R | - | A05 | C61 | + | A110 | - | X |
|---|------------|--|---|---|---|--------|---|------|---|-----|-----|---|------|---|---|
| Axis 1: direction 1-2 left / direction 5-6 right | | | | | | | | | | | | | | | |
| (Standard contacts gold-plated 2A 250V AC15) | | | | | | | | | | | | | | | |
| 01 | 2 contacts | Standard contact - arrangement see page 122 | | | | | | | | | | | | | |
| 02 | 4 contacts | e.g. | | | | | | | | | | | | | |
| 03 | 6 contacts | A05 MS21 | | | | | | | | | | | | | |
| | | A0500 MS21-00 | | | | | | | | | | | | | |
| | | A110 MS24-0 | | | | | | | | | | | | | |
| | | A99 contact - arrangement according customer request | | | | | | | | | | | | | |

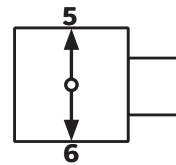
Identification of the installation variants with switching directions:



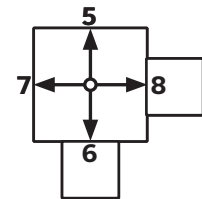
V14.1L



V14L



V14.1R



V14R

V14L S8 P T - 01Z C + 03 R - A05 C61 + A110 - X

Z Spring return *(included in basic unit!)*

R Friction brake

C Mechanical encoder

| | | |
|-----|-------------------------------|----------------------|
| C61 | MEC 1-2 | |
| | EA/02-10 | I max. 1 mA |
| | Potentiometer track | 2 x 10 kOhm |
| | Direction tack | Arrangement MS26-0 |
| C62 | MEC 1-7 | |
| | EA/10-10 | I max. 1 mA |
| | Potentiometer track | 2 x 5 kOhm |
| | Direction track | Arrangement MS26-0-1 |
| C63 | MEC 1-6 | |
| | EA/09-10 | |
| | 6 Bit Gray Code | |
| C64 | MEC 1-6-5 | |
| | ER/36-10 | Us=18-30 V |
| | Current output 20...4...20 mA | |
| C65 | MEC 1-6-8 | |
| | ER/36-12 | Us=18-30 V |
| | Current output 20...0...20 mA | |
| C67 | MEC 1-6-9 | |
| | ER/36-11 | Us=18-30 V |
| | Voltage output 10...0...10 V | |

H Hall-Potentiometer

E14811

0,5...2,5...4,5 V / 4,5...2,5...0,5 V

V14L S8 P T - 01Z C + 03 R - A05 C61 + A110 - X

Axis 2: direction 3-4 left / direction 7-8 right

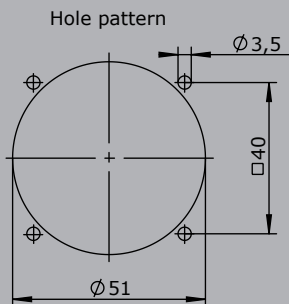
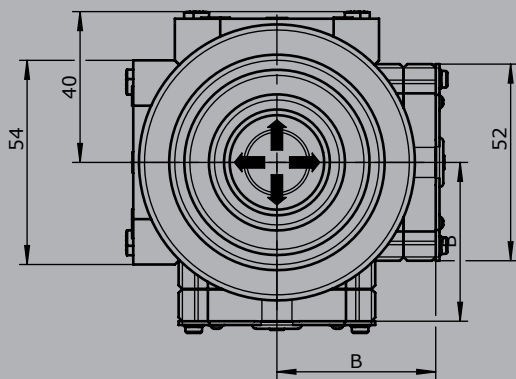
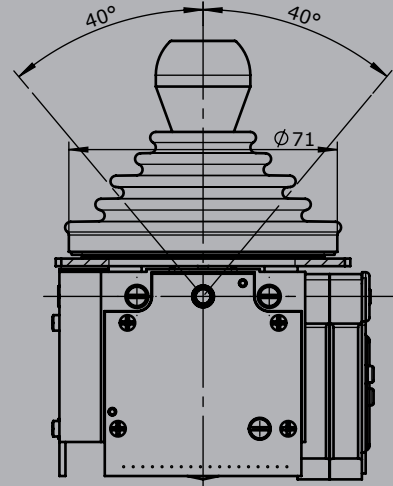
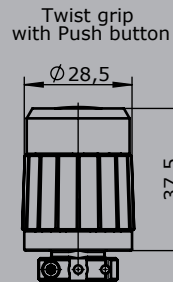
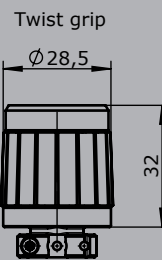
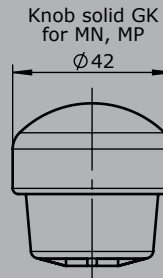
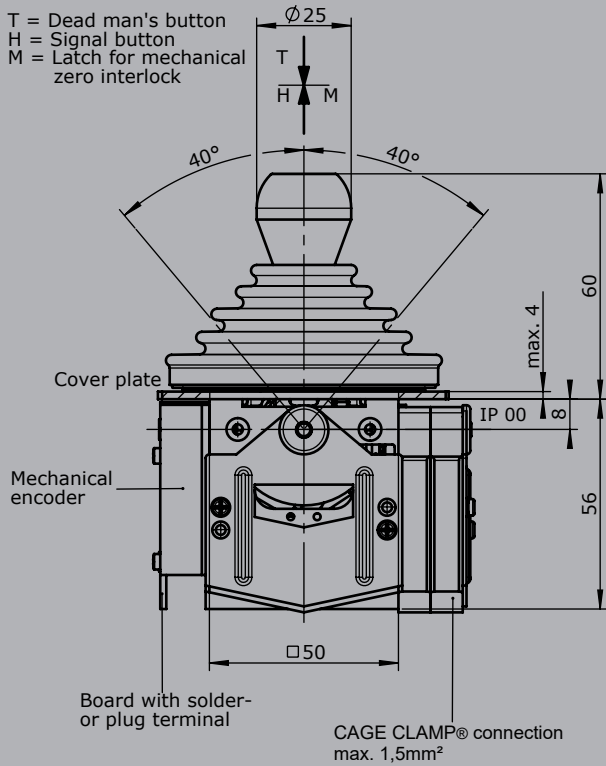
(not applied for V14.1L and V14.1R)

See description axis 1!

Special model

X Special / customer specified

T = Dead man's button
H = Signal button
M = Latch for mechanical zero interlock



| Type | No. of contacts | Dim. |
|------|-----------------|------|
| 01 | 2 | 36 |
| 02 | 4 | 45 |
| 03 | 6 | 54 |

Single-Axis Controller S14



The S14 is a compact single-axis joystick designed for remote control and electrohydraulic applications. Due to its modular design, this control unit can be used universally. The integrated sensor system has signal and potentiometer tracks in conductive plastic technology. Optionally switch contacts are also available.

Technical data

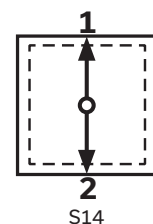
| | |
|-----------------------|----------------------------|
| Mechanical life S14 | 6 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP65 |



| | S14L | S8 | T | -01ZC | -A05 C61 | -X |
|---|------|----|---|-------|----------|----|
| Basic unit | | | | | | |
| S14L | | | | | | |
| Control-handle extended | | | | | | |
| Standard 60 mm* | | | | | | |
| S8 +20 mm | | | | | | |
| <i>*Only possible in combination with handle!</i> | | | | | | |
| Grip / Palm Grip | | | | | | |
| T Dead man | | | | | | |
| Axis 1 (direction 1-2) | | | | | | |
| O1 2 contacts (2A 250 V AC15) | | | | | | |
| Z Spring return | | | | | | |
| C Mechanical encoder | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | |
| A05 Arrangement MSP21 | | | | | | |
| C61 Mechanical encoder MEC 1-2 | | | | | | |
| Special model | | | | | | |
| X Special / customer specified | | | | | | |

| | S14L | S8 | T | -01ZC | -A05 C61 | -X |
|---|------|----|---|-------|----------|----|
| Basic unit | | | | | | |
| S14L 1-axis left | | | | | | |
| S14R 1-axis right | | | | | | |
| Control-handle extended | | | | | | |
| Standard 60 mm* | | | | | | |
| S8 +20 mm | | | | | | |
| <i>*Only possible in combination with handle!</i> | | | | | | |
| Grip / Palm Grip | | | | | | |
| Knob (standard) | | | | | | |
| M Mechanical zero interlock | | | | | | |
| MH Mechanical zero interlock + signal contact | | | | | | |
| T Dead man | | | | | | |
| H Signal button | | | | | | |
| GK1 Knob 42 mm | | | | | | |
| GK1M Mechanical zero interlock | | | | | | |

Identification of the installation variants with switching directions:



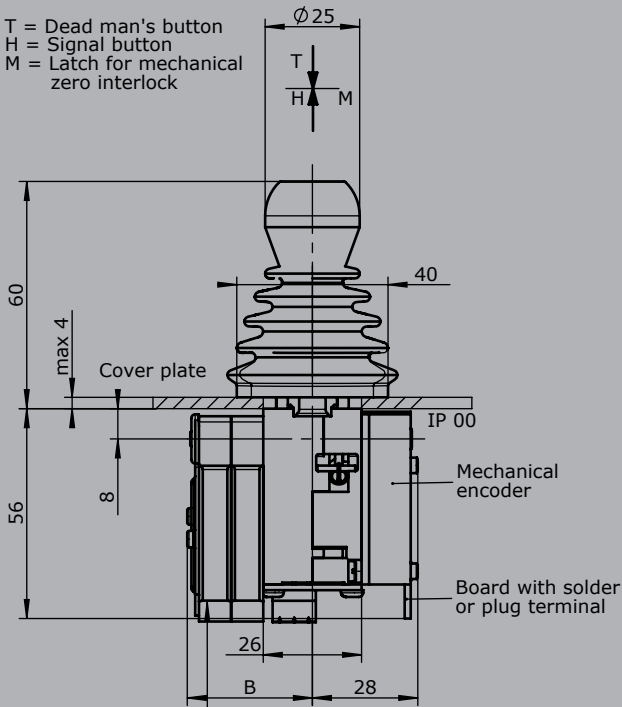
Technical details may vary based on configuration or application! Technical data subject to change without notice!

| | S14L | S8 | T | -01ZC | -A05 | C61 | -X |
|-------|---|----|---|-------|------|-----|----|
| GK1MN | Mechanical zero interlock (push down) | | | | | | |
| GK1T | Dead man | | | | | | |
| GK1H | Signal button | | | | | | |
| GK1MH | Mechanical zero interlock + signal contact | | | | | | |
| GK1D | Push button | | | | | | |
| GK1DV | Flush push button | | | | | | |
| GS9 | Hall-twist grip with spring return | | | | | | |
| GS9-D | Hall-twist grip with spring return and push button on top | | | | | | |
| B ... | Palm Grip B... (on request!) | | | | | | |

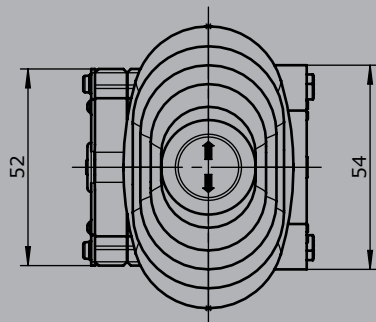
| | S14L | S8 | T | -01ZC | -A05 | C61 | -X |
|---|--|--|---------------------------------|-------|----------------------|-----|---------------------------------------|
| Axis 1: direction 1-2 left / direction 5-6 right | | | | | | | |
| | (Standard contacts gold-plated 2A 250V AC15) | | | | | | |
| 01 | 2 contacts | Standard contact - arrangement see page 122 | | | | | |
| 02 | 4 contacts | z.B. | | | | | |
| 03 | 6 contacts | A05 MS21 | | | | | |
| | | A0500 MS21-00 | | | | | |
| | | A110 MS24-0 | | | | | |
| | | A99 contact - arrangement according customer request | | | | | |
| Z | Spring return (included in basic unit!) | | | | | | |
| R | Friction brake | | | | | | |
| C | Mechanical encoder | C61 | MEC 1-2 | | | | |
| | | | EA/02-10 | | I max. 1 mA | | |
| | | | Potentiometer track | | 2 x 10 kOhm | | |
| | | | Direction track | | Arrangement MS26-0 | | |
| | | C62 | MEC 1-7 | | | | |
| | | | EA/10-10 | | I max. 1 mA | | |
| | | | Potentiometer track | | 2 x 5 kOhm | | |
| | | | Direction track | | Arrangement MS26-0-1 | | |
| | | C63 | MEC 1-6 | | | | |
| | | | EA/09-10 | | | | |
| | | | 6 Bit Gray Code | | | | |
| | | C64 | MEC 1-6-5 | | | | |
| | | | ER/36-10 | | Us= 18-30 V | | |
| | | | Current output 20...4...20 mA | | | | |
| | | C65 | MEC 1-6-8 | | | | |
| | | | ER/ 36-10 | | Us= 18-30 V | | |
| | | | Current output 20...0...20 mA | | | | |
| | | C67 | MEC 1-6-9 | | | | |
| | | | ER/36-11 | | Us= 18-30 V | | |
| | | | Voltage output 10...0...10V | | | | |
| | | | More potentiometers on request! | | | | |
| H | Hall-Potentiometer | E14811 | | | | | 0,5...2,5...5,4 V / 4,5...2,5...0,5 V |

| | S14L | S8 | T | -01ZC | -A05 | C61 | -X |
|----------------------|------------------------------|----|---|-------|------|-----|----|
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |

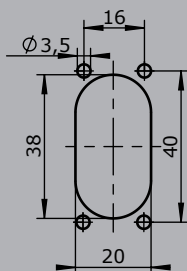
T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock



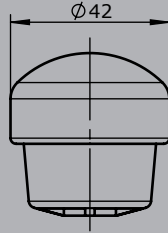
CAGE CLAMP® connection
 max. 1,5mm²



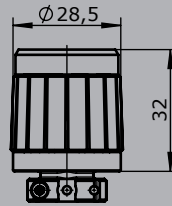
Hole pattern



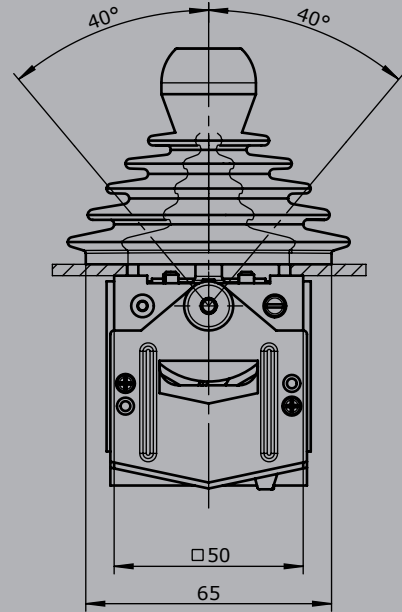
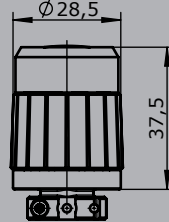
Knob solid GK
 for MN, MP



Twist grip



Twist grip
 with Push button



| Type | No. of contacts | Dim. B |
|------|-----------------|--------|
| 01 | 2 | 24 |
| 02 | 4 | 33 |
| 03 | 6 | 42 |

Single-Axis Controller

S2 / SS2 / S21



The Single-Axis Controller S2 / SS2 / S21 is a robust switching device for remote controlled and electrohydraulic applications. The modular design of the switching device is universally applicable.

Technical data

| | |
|--------------------------|-----------------------------|
| Mechanical life S2 / S21 | 6 million operating cycles |
| Mechanical life SS2 | 10 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP54 |

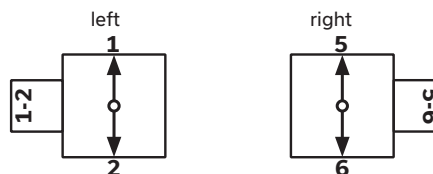


Example

| | S2L | S5 | T | - 02 Z P | - A050 P134 | - X |
|---|-----|----|---|----------|-------------|-----|
| Basic unit | | | | | | |
| S2L left | | | | | | |
| Control-handle extended | | | | | | |
| S5 -20 mm | | | | | | |
| Grip / Palm Grip | | | | | | |
| T Dead man | | | | | | |
| Axis 1 (direction 1-2) | | | | | | |
| 02 3 contacts (2A 250 V AC15) | | | | | | |
| Z Spring return | | | | | | |
| P Potentiometer | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | |
| A050 Arrangement MSP21-0 | | | | | | |
| P134 Potentiometer T396 2 x 5 kOhm | | | | | | |
| Special model | | | | | | |
| X Special / customer specified | | | | | | |

| | S2L | S5 | T | - 02 Z P | - A050 P134 | - X |
|---|-----|----|---|----------|-------------|-----|
| Basic unit | | | | | | |
| S2L Single-Axis Controller left | | | | | | |
| S2R Single-Axis Controller right | | | | | | |
| S21L Single-Axis Controller left with flange 96 x 96 mm | | | | | | |
| S21R Single-Axis Controller right with flange 96 x 96 mm | | | | | | |
| Reinforced version | | | | | | |
| SS2L Single-Axis Controller left | | | | | | |
| SS2R Single-Axis Controller right | | | | | | |
| SS21L Single-Axis Controller left with flange 96 x 96 mm | | | | | | |
| SS21R Single-Axis Controller right with flange 96 x 96 mm | | | | | | |
| Control-handle extended | | | | | | |
| Standard | | | | | | |
| S5 -20 mm | | | | | | |
| S8 +20 mm | | | | | | |

Identification of the installation variants with switching directions:



Technical details may vary based on configuration or application! Technical data subject to change without notice!

Combination possibilities with our handles (valid for Single-Axis Controller S21)



S2L S5 T - 02 Z P - A050 P134 - X

Grip / Palm Grip

- Knob (standard)
- M Mechanical zero interlock
- MN Mechanical zero interlock (push down)
- T Dead man
- MT Mechanical zero interlock + dead man
- H Signal button
- MH Mechanical zero interlock + signal button
- D Push button
- MD Mechanical zero interlock + push button
- DV Flush push button
- MDV Mechanical zero interlock + flush push button
- B... Palm Grip B... (see page Palm Grip 154)

S2L S5 T - 02 Z P - A050 P134 - X

Axis 1: direction 1-2 left / direction 5-6 right

| | | | | |
|-----|--|---|-------------------|-------------|
| 02 | 3 contacts | Standard contact - arrangement see page 122 | | |
| 03 | 5 contacts | z.B. | | |
| 04 | 7 contacts | A98 | MS0 | |
| 05 | 9 contacts | A05 | MS21 | |
| | | A0500 | MS21-00 | |
| | | A110 | MS24-0 | |
| | | <i>A99 contact - arrangement according customer request</i> | | |
| Z | Spring return | | | |
| R | Friction brake | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA |
| | | <i>More potentiometers on request!</i> | | |
| C | Encoder | C... Encoder see page 157 | | |

S2L S5 T - 02 Z P - A050 P134 - X

Special model

- X Special / customer specified
- X1 Microswitch (MZT 1) positively driven NC contact

Attachments

- Indicating labels
- Indicating labels with engraving

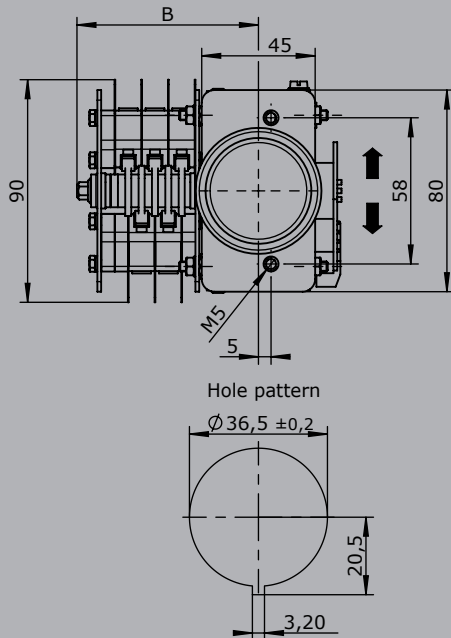
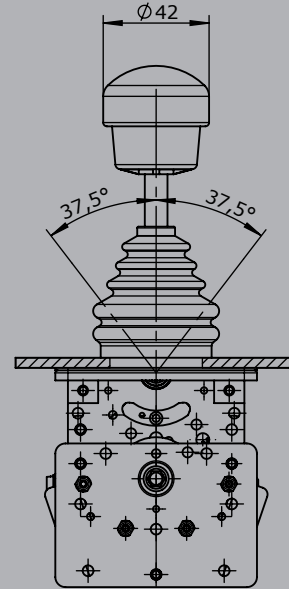
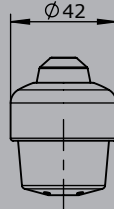
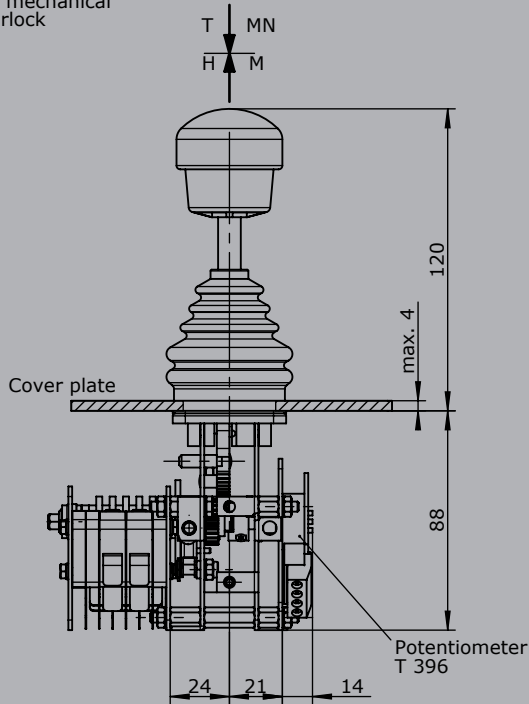
Single-Axis Controller

S2 / SS2 / S21

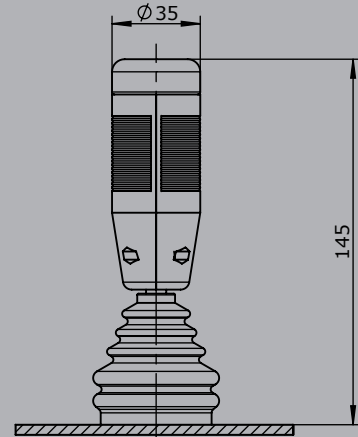


T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

Knob solid
 D = Push button



Palm grip B5
 B5 T = Dead man's button



| Type | No. of contacts | Maß B |
|------|-----------------|-------|
| 02 | 3 | 62 |
| 03 | 5 | 72 |
| 04 | 7 | 83 |
| 05 | 9 | 93 |

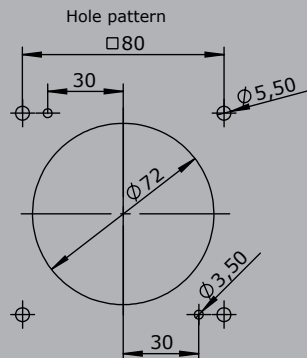
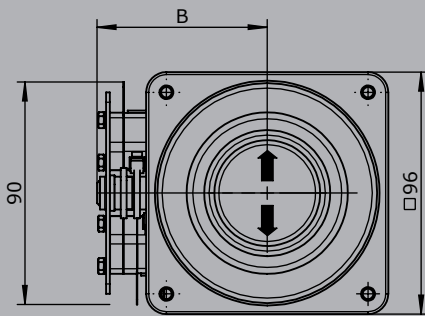
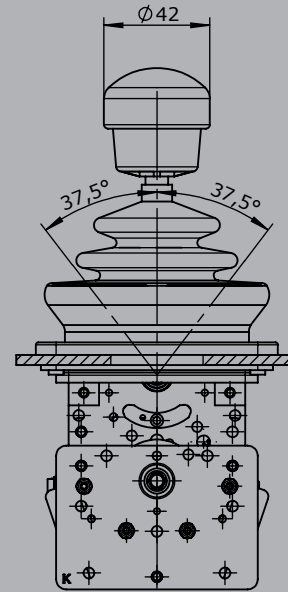
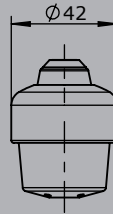
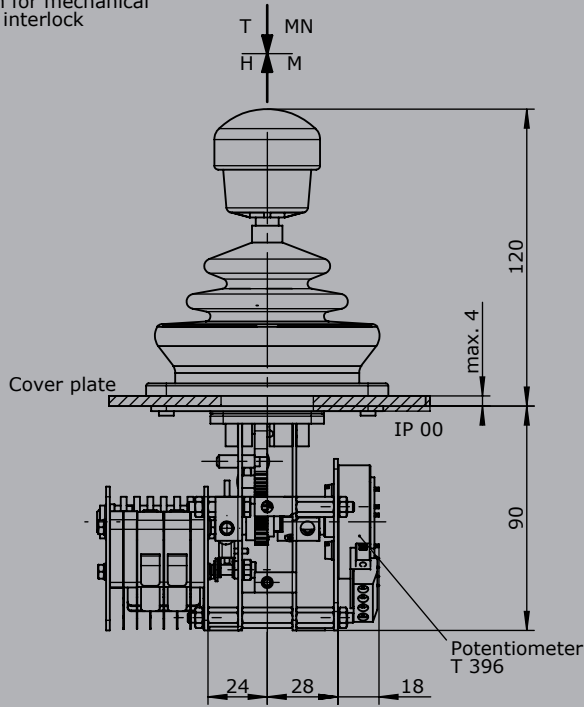
Single-Axis Controller

S2 / SS2 / S21

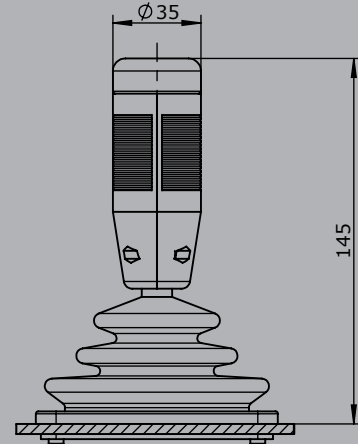


T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

Knob solid
 D = Push button



Palm grip B5
 B5 T = Dead man's button



| Type | No. of contacts | Maß B |
|------|-----------------|-------|
| 02 | 3 | 62 |
| 03 | 5 | 72 |
| 04 | 7 | 83 |
| 05 | 9 | 93 |

Single-Axis Controller

S22 / SS22



The Single-Axis Controller S22 / SS22 is a robust switching device for remote controlled and electrohydraulic applications. The modular design of the switching device is universally applicable.

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life S22 | 6 million operating cycles |
| Mechanical life SS22 | 10 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP54 |

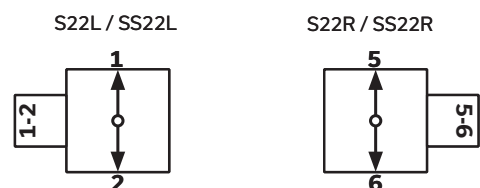


| | S22L | S5 | T | - 3 Z P | - A050 P134 | - X |
|---|------------------------------------|----|---|---------|-------------|-----|
| Basic unit | S22L left | | | | | |
| Control-handle extended | S5 -20 mm | | | | | |
| Grip / Palm Grip | T Dead man | | | | | |
| Axis 1 (direction 1-2) | 3 3 contacts (2A 250 V AC15) | | | | | |
| | Z Spring return | | | | | |
| | P Potentiometer | | | | | |
| Description axis 1 (direction 1-2) | A050 Arrangement MSP21-0 | | | | | |
| | P134 Potentiometer T396 2 x 5 kOhm | | | | | |
| Special model | X Special / customer specified | | | | | |

| | S22L | S5 |
|--------------------------------|------------------------------------|----|
| Basic unit | S22L Single-Axis Controller left | |
| | S22R Single-Axis Controller right | |
| | Reinforced version | |
| | SS22L Single-Axis Controller left | |
| | SS22R Single-Axis Controller right | |
| Control-handle extended | Standard | |
| | S5 -20 mm | |
| | S8 +20 mm | |

T - 3 Z P - A050 P134 - X

Identification of the installation variants with switching directions:



Technical details may vary based on configuration or application! Technical data subject to change without notice!

S22L S5 T - 3 Z P - A050 P134 - X

Grip / Palm Grip

| | |
|------|---|
| | Knob (standard) |
| M | Mechanical zero interlock |
| MN | Mechanical zero interlock (push down) |
| T | Dead man |
| MT | Mechanical zero interlock + dead man |
| H | Signal button |
| MH | Mechanical zero interlock + signal button |
| D | Push button |
| MD | Mechanical zero interlock + push button |
| DV | Flush push button |
| MDV | Mechanical zero interlock + flush push button |
| B... | Palm Grip B... (on request!) |

S22L S5 T - 3 Z P - A050 P134 - X

Axis 1: direction 1-2 left / direction 5-6 right

| | | | |
|-----|--|--|-------------------------------|
| 1 | 1 contact | Standard contact - arrangement see page 122 | |
| 2 | 2 contacts | z.B. | |
| 3 | 3 contacts | A98 | MS0 |
| 4 | 4 contacts | A05 | MS21 |
| | | A0500 | MS21-00 |
| | | A99 contact - arrangement according customer request | |
| Z | Spring return | | |
| R | Friction brake | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm max. 1 mA |
| | | P132 | T396 2 x 1 kOhm max. 1 mA |
| | | P133 | T396 2 x 2 kOhm max. 1 mA |
| | | P134 | T396 2 x 5 kOhm max. 1 mA |
| | | P135 | T396 2 x 10 kOhm max. 1 mA |
| | | More potentiometers on request! | |
| C | Codierer | C...Encoder see page 130 | |

S22L S5 T - 3 Z P - A050 P134 - X

Special model

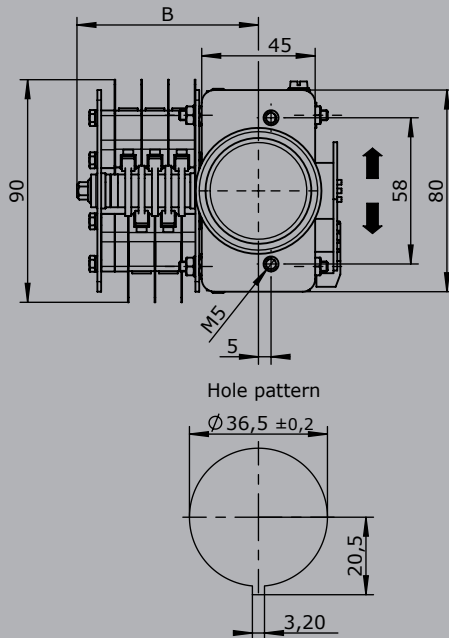
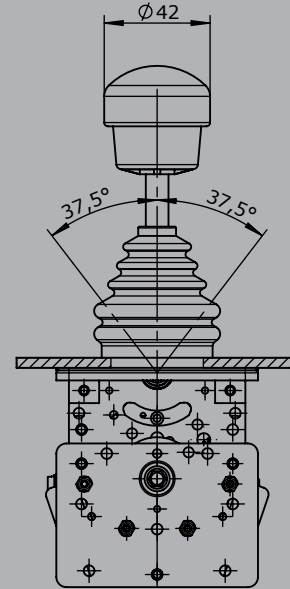
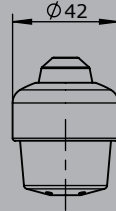
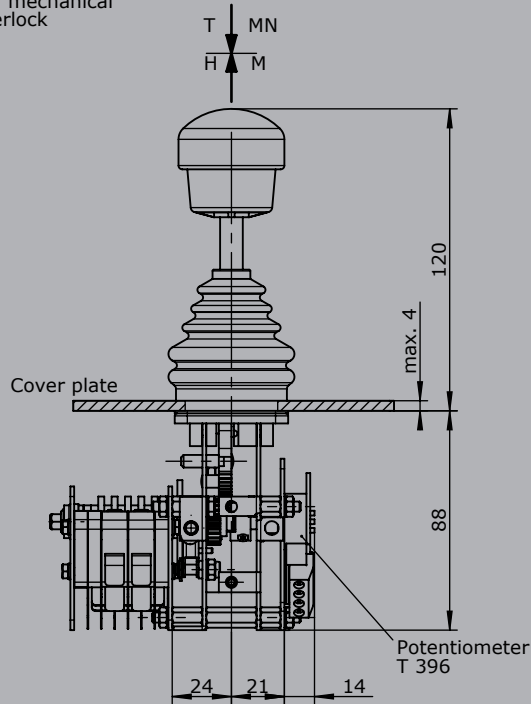
| | |
|----|------------------------------|
| X | Special / customer specified |
| X1 | Switching run 2-0-2 |

Attachments

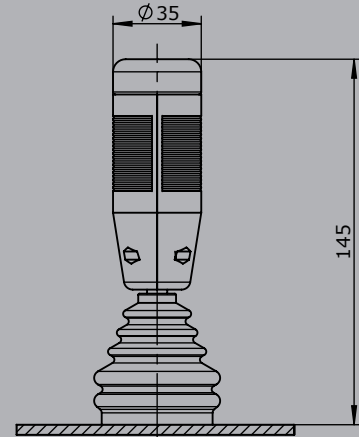
| |
|----------------------------------|
| Indicating labels |
| Indicating labels with engraving |

T = Dead man's button
 H = Signal button
 M = Latch for mechanical zero interlock

Knob solid
 D = Push button



Palm grip B5
 B5 T = Dead man's button



| Type | No. of contacts | Maß B |
|------|-----------------|-------|
| 02 | 3 | 62 |
| 03 | 5 | 72 |
| 04 | 7 | 83 |
| 05 | 9 | 93 |

Multi-Axis Controller V23



The V23 is a switching device for remote control applications. The integrated sensor system has signal and potentiometer tracks in conductive plastic technology. Detent points are optionally selectable. Due to its small dimensions it can be optimally integrated into small remote control housings.

Technical data

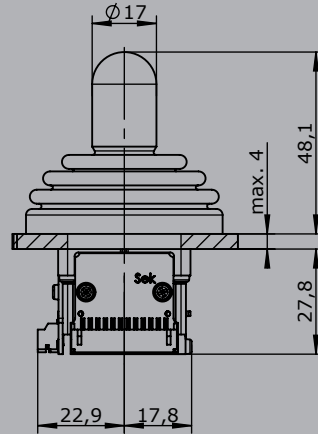
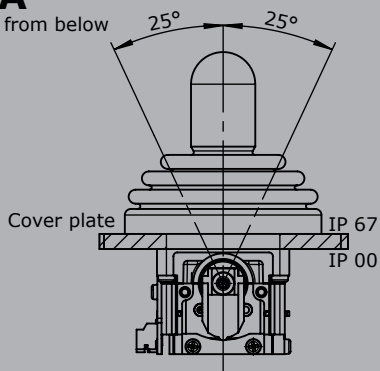
| | |
|-----------------------|----------------------------|
| Mechanical life V23 | 3 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP67 front |



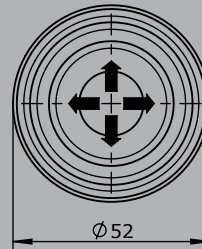
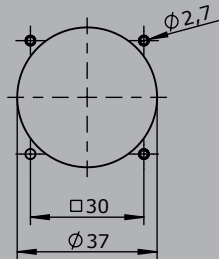
| | V23A | -P | -C80 | +C80 | -X |
|---|--|------------------|------|------|----|
| Basic unit | | | | | |
| V23.1A | 1-axis with spring return, installation from below | | | | |
| V23A | 2-axis with spring return, installation from below | | | | |
| V23.1B | 1-axis with spring return, installation from top | | | | |
| V23B | 2-axis with spring return, installation from top | | | | |
| Gate | | | | | |
| P | Cross gate | | | | |
| P X | Special gate | | | | |
| Axis 1: direction 1-2 | | | | | |
| C80 | Mechanical encoder | | | | |
| | MEC 3-1 | | | | |
| | EA/26-10 | | | | |
| | Potentiometer resistance | | | | |
| | Contact arrangement | | | | |
| | with 12-pol. JST-connector | | | | |
| | | I max. 1 mA | | | |
| | | 2x5 kOhm | | | |
| | | Arrangement MS24 | | | |
| Axis 2: direction 3-4 (not applied for V23.1) | | | | | |
| <i>See description axis 1!</i> | | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |
| Attachments | | | | | |
| Mating connector JST 12-polig (included in delivery!) | | 5300000263 | | | |
| Mating connector JST 12-pole with single wire 500 mm long | | 5300000264 | | | |

V23A

Installed from below

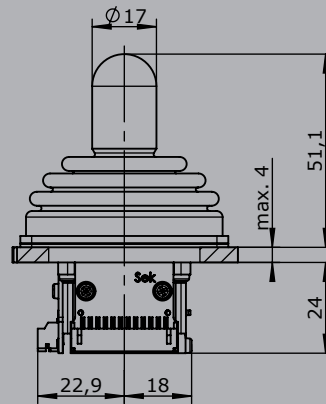
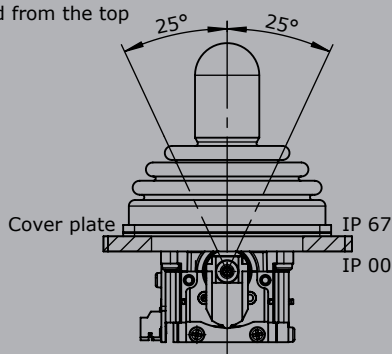


Hole pattern
(installed from below)

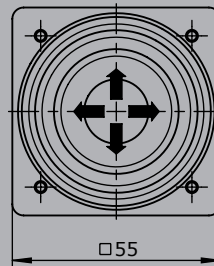
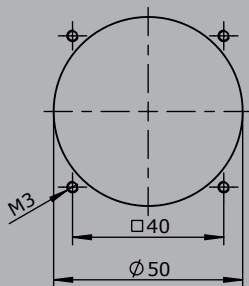


V23B

Installed from the top



Hole pattern
(installed from the top)



Multi-Axis Controller V20



The V20 is a rugged switching device for remote control. The integrated sensor technology has signal and potentiometer tracks in conductive plastic technology. Detent points can be integrated as an option.

Technical data

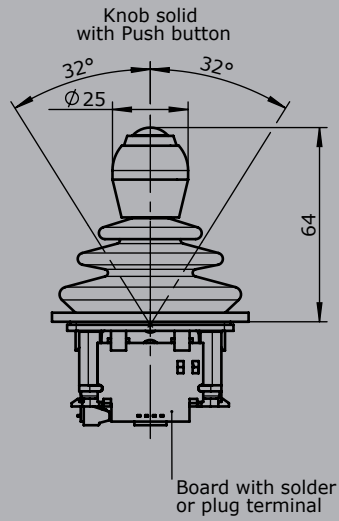
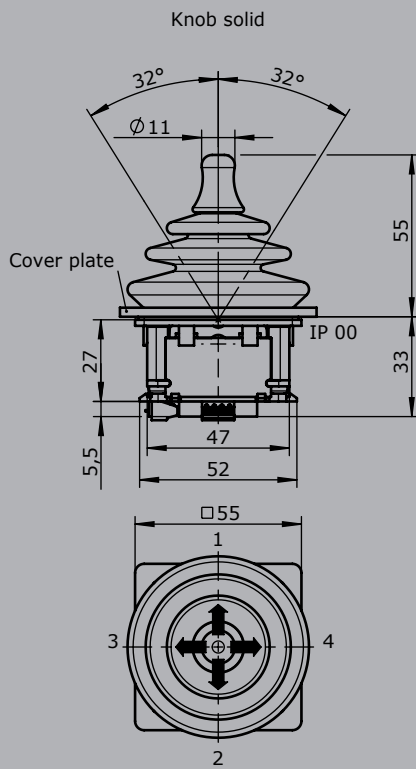
| | |
|-----------------------|----------------------------|
| Mechanical life V20 | 3 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP65 (optional IP67) |



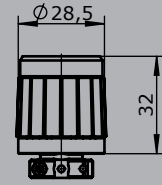
| | | V20 | -P | Example D | -C71 | +C71 | -B | -X |
|--------------------------------|---|-----|----|--------------|---------------------|------|----|----|
| Basic unit | | | | | | | | |
| V20.1 | 1-axis with spring return | | | | | | | |
| V20 | 2-axis with spring return | | | | | | | |
| V20.1A | 1-axis with spring return, IP67 front | | | | | | | |
| V20A | 2-axis with spring return, IP67 front | | | | | | | |
| Gate | | | | | | | | |
| p | Cross gate | | | | | | | |
| P X | Special gate | | | | | | | |
| Grip | | | | | | | | |
| | Knob (standard) | | | | | | | |
| D | Push button | | | | | | | |
| GS9 | Hall-twist grip with spring return | | | | | | | |
| GS9-D | Hall-twist grip with spring return and push button on top | | | | | | | |
| Axis 1: direction 1-2 | | | | | | | | |
| C70 | Mechanical encoder | | | | | | | |
| | MEC 2-1 | | | | | | | |
| | EA/15-10 | | | | I max. 1 mA | | | |
| | Potentiometer track | | | | 2 x 5 kOhm | | | |
| | Direction track | | | | Arrangement MS224-0 | | | |
| C71 | Mechanical encoder | | | | | | | |
| | MEC 2-2 | | | | | | | |
| | EA/11-10 | | | | I max. 1 mA | | | |
| | Potentiometer track | | | | 2 x 5 kOhm | | | |
| | Direction track | | | | Arrangement MS24-0 | | | |
| C72 | Mechanical encoder | | | | | | | |
| | MEC 2-5 | | | | | | | |
| | EA/21-10 | | | | I max. 1 mA | | | |
| | Potentiometer track | | | | 2 x 5 kOhm | | | |
| | Direction track | | | | Arrangement MS25-0 | | | |
| Axis 2: direction 3-4 | | | | | | | | |
| <i>See description axis 1!</i> | | | | | | | | |
| Cover housing | | | | | | | | |
| B | Cover housing KBQ 905 (IP65) | | | | | | | |
| Special model | | | | | | | | |
| X | Special / customer specified | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

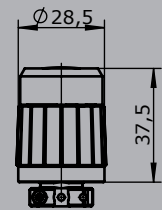
V20 Standard degree of protection front IP 65



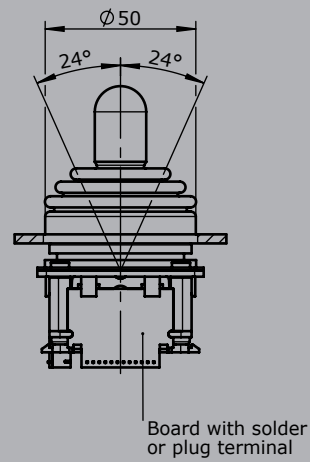
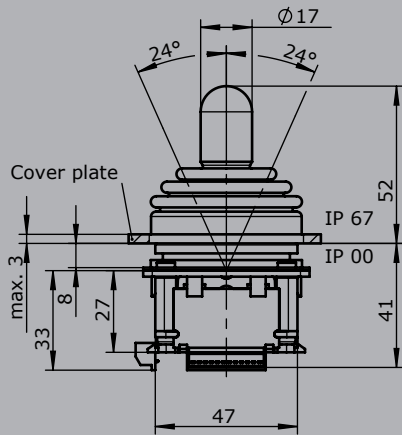
Twist grip



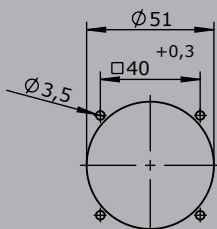
Twist grip with Push button



V20 Degree of protection front IP 67



Hole pattern



Single-Axis Controller S1



The S1 is a one-axis joystick for remote control and eletro-hydraulic applications. The modular design of the switching device is universally applicable.

Technical data

| | |
|-----------------------|----------------------------|
| Mechanical life S1 | 6 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP65 |



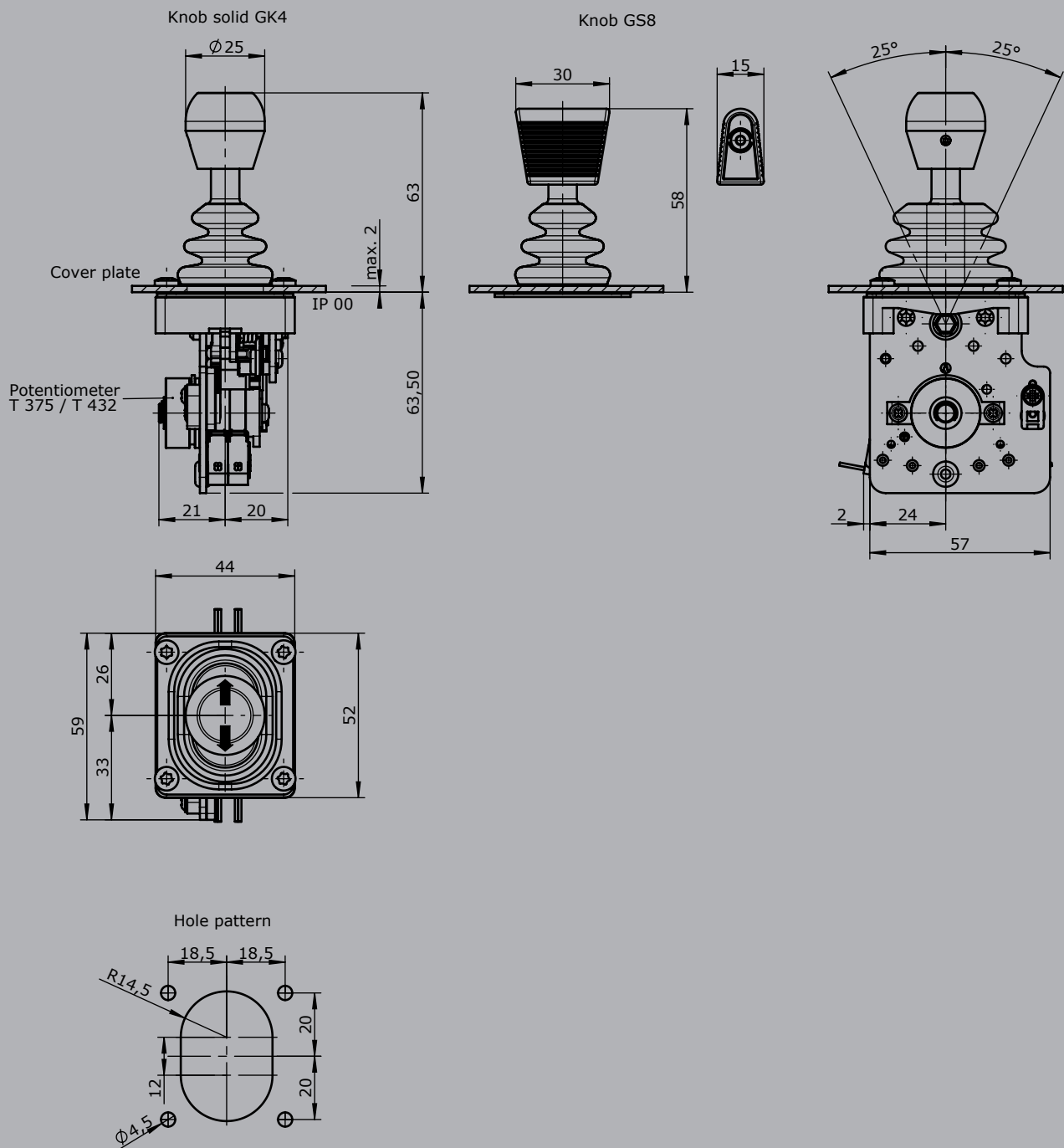
| | | Example | | | | |
|---|--------------------------------|---------|---|---------|------------|-----|
| | | S1 | T | - 2 Z P | - A05 P374 | - X |
| Basic unit | | | | | | |
| S1 | 1-axis | | | | | |
| Grip / Palm Grip | | | | | | |
| T | Dead man | | | | | |
| Axis 1 (direction 1-2) | | | | | | |
| 2 | 2 contacts (1,5A 24 V DC13) | | | | | |
| Z | Spring return | | | | | |
| P | Potentiometer | | | | | |
| Description axis 1 (direction 1-2) | | | | | | |
| A05 | Arrangement MSP21 | | | | | |
| P374 | Potentiometer T 375 2 x 5 kOhm | | | | | |
| Special model | | | | | | |
| X | Special / customer specified | | | | | |

| | | S1 | T | - 2 Z P | - A05 P374 | - X |
|-------------------------|---------------------------|----|---|---------|------------|-----|
| Basic unit | | | | | | |
| S1 | 1-axis | | | | | |
| Grip / Palm Grip | | | | | | |
| | Knob (standard) | | | | | |
| M | Mechanical zero interlock | | | | | |
| T | Dead man | | | | | |
| D | Push button | | | | | |
| GS8 | Knob GS8 | | | | | |

| | | S1 | T | - 2 Z P | - A05 P374 | - X |
|-----------------------------------|---|--|--------|------------|-------------|-----|
| Axis 1: direction 1-2 left | | | | | | |
| 1 | 1 contact | Standard contact - arrangement see page 122 | | | | |
| 2 | 2 contacts | z.B. | | | | |
| 3 | 3 contacts | A05 | MS21 | | | |
| 4 | 4 contacts | A050 | MS21-0 | | | |
| | | A060 | MS22-0 | | | |
| | | A99 contact - arrangement according customer request | | | | |
| Z | Spring return (included in basic unit!) | | | | | |
| R | Friction brake | | | | | |
| P | Potentiometer | P372 | T375 | 2 x 1 kOhm | I max. 1 mA | |
| | | P374 | T375 | 2 x 5 kOhm | I max. 1 mA | |
| | | P274 | T430 | 2 x 5 kOhm | I max. 1 mA | |
| | | With direction track | | | | |

| | | S1 | T | - 2 Z P | - A05 P374 | - X |
|----------------------|------------------------------|----|---|---------|------------|-----|
| Special model | | | | | | |
| X | Special / customer specified | | | | | |

T = Dead man's button



Control-Switch N6



The Control-Switch N6 is a rugged switching device for hoisting applications. The modular design enables the switching device to be used universally. The N6 is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life N6 | 10 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP54 |



| | N6 | -DG | Example -01 Z P | -A05 P134 | -X |
|---|----------------------------------|-----|--------------------|-----------|----|
| Basic unit | | | | | |
| N6 | incl. ISO-front plate 88 x 88 mm | | | | |
| Grip | | | | | |
| DG | Twist grip | | | | |
| Axis 1 (direction 2-4) | | | | | |
| 01 | 2 contacts (2A 250 V AC15) | | | | |
| Z | Spring return | | | | |
| P | Potentiometer | | | | |
| Description axis 1 (direction 3-4) | | | | | |
| A05 | Arrangement MSP21 | | | | |
| P134 | Potentiometer T396 2 x 5 kOhm | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |

N6 -DG -01 Z P -A05 P134 -X

Basic unit

| | |
|-----|--|
| N6 | incl. ISO-front plate 88 x 88 mm |
| N6A | incl. ISO-front plate 88 x 88 mm, IP65 (front) |

Grip

| | |
|----|------------|
| KN | Knob |
| HG | Ball grip |
| DG | Twist grip |

Axis 1: direction 3-4

(Standard contacts gold-plated 2A 250 V AC15)

| | | | | |
|-----|---|---|-------------------|-------------|
| 01 | <input type="checkbox"/> 2 contacts | Standard contact - arrangement see page 122 | | |
| 02 | <input type="checkbox"/> 4 contacts | z.B. | | |
| 03 | <input type="checkbox"/> 6 contacts | A980 | MS00 | |
| 04 | <input type="checkbox"/> 8 contacts | A05 | MS21 | |
| 05 | <input type="checkbox"/> 10 contacts | A0500 | MS21-00 | |
| 06 | <input type="checkbox"/> 12 contacts | A110 | MS24-0 | |
| | <input checked="" type="checkbox"/> Silver contacts (4A 250 V AC15) | A99 contacts - arrangement according customer request | | |
| Z | Spring return | | | |
| R | Friction brake | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA |
| | | P138 | T396 2 x 2 kOhm | I max. 1 mA |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA |
| | | <i>More potentiometers on request!</i> | | |
| C | C... Encoder see page 130 | | | |

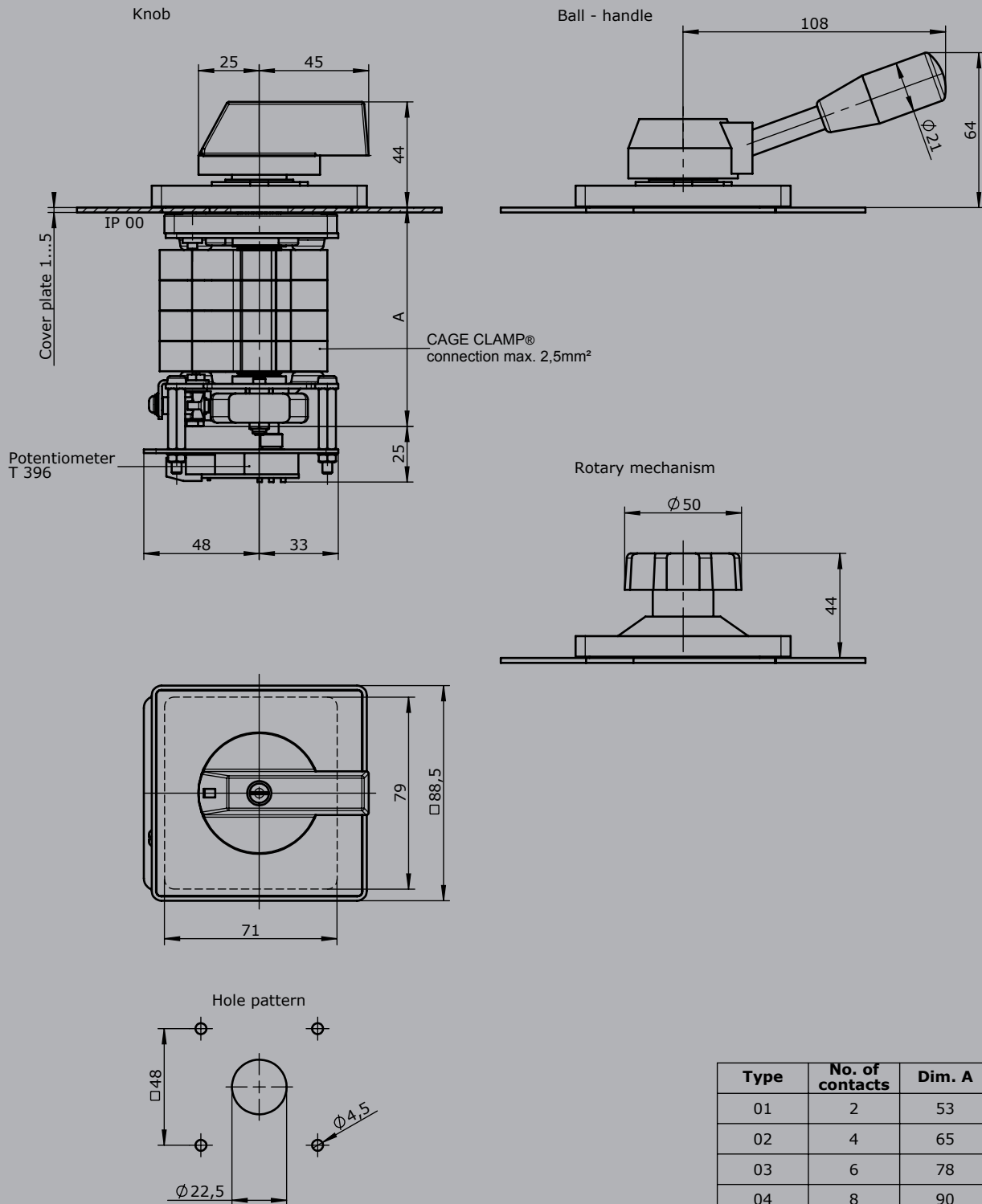
N6 -DG -01 Z P -A05 P134 -X

Special model

| | |
|---|------------------------------|
| X | Special / customer specified |
|---|------------------------------|

Attachments

| |
|---------------------------------|
| Indicating label |
| Indicating label with engraving |



| Type | No. of contacts | Dim. A | Spring return |
|------|-----------------|--------|---------------|
| 01 | 2 | 53 | +25 |
| 02 | 4 | 65 | |
| 03 | 6 | 78 | |
| 04 | 8 | 90 | |
| 05 | 10 | 103 | |
| 06 | 12 | 115 | |

Control-Switch N9



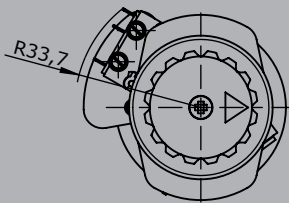
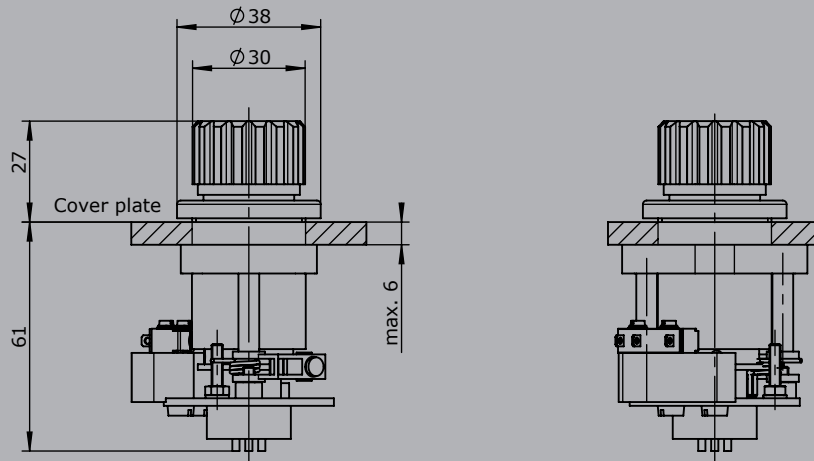
The Control-Switch N9 is a rugged switching device for electrohydraulic and hoisting applications. The modular design enables the switching device to be used universally.

Technical data

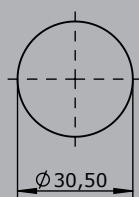
| | |
|-----------------------|-----------------------------|
| Mechanical life N9 | 10 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP54 |



| | | N9 | Example -2 R P | | -A05 | P134 | -X |
|------------------------------|--|--|--|-------------|------|------|----|
| Basic unit | | | | | | | |
| N9 | Control switch with twist grip | | | | | | |
| Axis 1: direction 3-4 | | | | | | | |
| 1 | 1 contact | | Standard contact - arrangement see page 122 | | | | |
| 2 | 2 contacts | | z.B. A98 MS0 A05 MS21 A99 contacts - arrangement according customer request | | | | |
| R | Friction brake (included in basic unit) | | | | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | | | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA | | | |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA | | | |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA | | | |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA | | | |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA | | | |
| | | <i>More potentiometers on request!</i> | | | | | |
| H | Hall-Potentiometer | E14811 | 0,5...2,5...4,5 V / 4,5...2,5...0,5 V | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |



Hole pattern



Steering Column Switch V23



The Steering Column Switch V23 is designed for mounting on a steering column.

Technical data

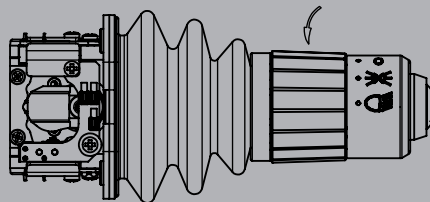
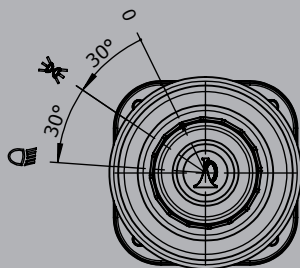
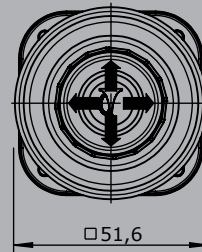
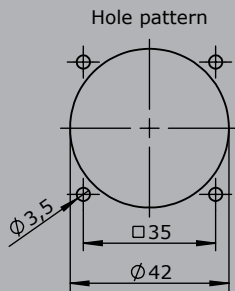
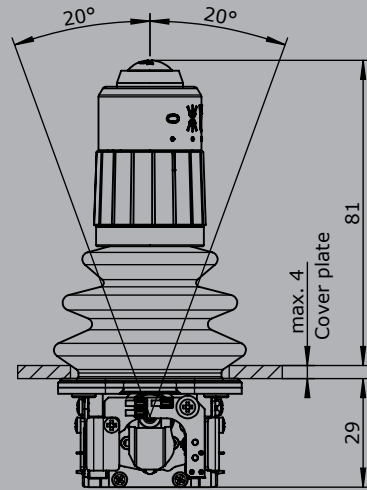
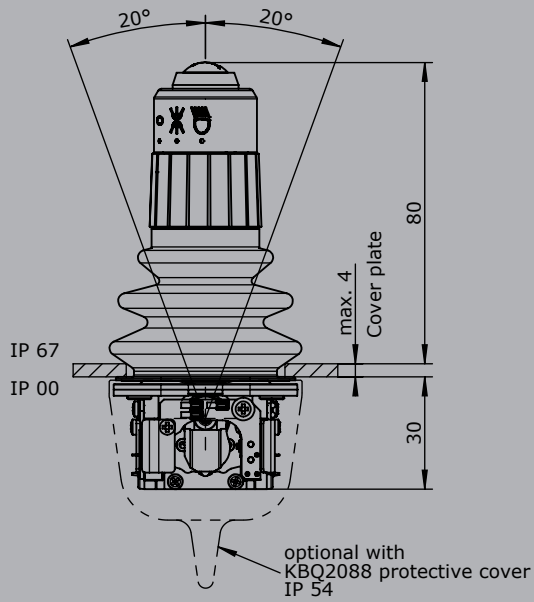
Mechanical life V23S 1 million operating cycles
 Operation temperature -40°C to +85°C



| | V23S | -D | -F2 | -2 | +2 | -X |
|--|--|----|-----|----|----|----|
| Basic unit | | | | | | |
| V23.1S | 1-axis with detent | | | | | |
| V23S | 2-axis with detent | | | | | |
| Grip | | | | | | |
| D | Push button (I _{max} = 10 mA) | | | | | |
| F1 | Switching function 1-stage | | | | | |
| F2 | Switching function 2-stage | | | | | |
| Axis 1: direction 1-2 | | | | | | |
| 2 | 2 contacts 1,5A 24 V DC | | | | | |
| Axis 2: direction 3-4 (not applied for V23.1) | | | | | | |
| See description axis 1! | | | | | | |
| Special model | | | | | | |
| X | Special / customer specified | | | | | |

Steering column switch

mounting from below



Molex Micro-Fit 3.0 - Suited for conductor cross-section 0,1 til 0,75 mm²

S004 Male housing 10-pole

S012 Female housing 10-pole

S006 Male housing 14-pole

S014 Female housing 14-pole

S007 Male housing 18-pole

S015 Female housing 18-pole



Deutsch DTM - Suited for conductor cross-section 0,25 til 1,5 mm²

S017 Male housing 4-pole

S022 Female housing 4-pole

S018 Male housing 6-pole

S023 Female housing 6-pole

S019 Male housing 8-pole

S024 Female housing 8-pole

S021 Male housing 12-pole

S026 Female housing 12-pole



Deutsch DT - Suited for conductor cross-section 0,25 til 2,0 mm²

S027 Male housing 4-pole

S032 Female housing 4-pole

S028 Male housing 6-pole

S033 Female housing 6-pole

S029 Male housing 8-pole

S034 Female housing 8-pole

S031 Male housing 12-pole

S036 Female housing 12-pole



AMP CPC - Suited for conductor cross-section 0,12 til 1,5 mm²

S037 Male housing CPC 13 9-pole

S040 Female housing CPC 13 9-pole

S038 Male housing CPC 17 14-pole

S041 Female housing CPC 17 14-pole

S039 Male housing CPC 23 37-pole

S042 Female housing CPC 23 37-pole



AMP Mini-Universal MATE-N-LOK (sealed) - Suited for conductor cross-section 0,12 til 1,5 mm²

S043 Cap housing 4-pole

S048 plug housing 4-pole

S044 Cap housing 6-pole

S049 plug housing 6-pole

S045 Cap housing 8-pole

S050 plug housing 8-pole

S046 Cap housing 10-pole

S051 plug housing 10-pole



P pin

S socket

Phoenix - Suited for conductor cross-section til 1,5 mm²

S053 Male housing IC 2,5 (STGF) 8-pole with screw terminal

S057 Female housing MSTB 2,5 (STF) 8-pole with screw terminal

S054 Male housing IC 2,5 (STGF) 12-pole with screw terminal

S058 Female housing MSTB 2,5 (STF) 12-pole with screw terminal

S055 Male housing IC 2,5 (STGF) 14-pole with screw terminal

S059 Female housing MSTB 2,5 (STF) 14-pole with screw terminal

S056 Male housing IC 2,5 (STGF) 18-pole with screw terminal

S060 Female housing MSTB 2,5 (STF) 18-pole with screw terminal





IP

Protection



Degree of protection

| | |
|-----|---|
| B10 | Joystick-main circuit board grouted (IP67) |
| B11 | Joystick-main circuit board grouted (IP67) and grip function sealed, grip with drain hole |

Utilization categories for control switches to IEC/EN 60947-5-1

| Type of current | Utilization category | Typical examples of application | Normal conditions of use | | | | | |
|--|----------------------|---|--------------------------|----------------|-------|----------------|----------------|-------|
| | | | Make | | | Breake | | |
| I= current made, I _c = current broken I _e = rated operational current, U= voltage before make U _e = rated operational voltage U _r = recovery voltage T _{0,95} = time in ms, to reach 95% of the steady-state current. P= U _e · I _e = steady-state power consumption in watts | | | I | U | cos | I _c | U _r | cos |
| | | | I _e | U _e | | I _e | U _e | |
| alternating current | AC12 | Control of resistive loads and solid state loads with isolation by opto couplers control of a.c. electromagnetic loads (> 72VA) | 1 | 1 | 0,9 | 1 | 1 | 0,9 |
| | AC15 | | 10 | 1 | 0,3 | 1 | 1 | 0,3 |
| Direct current | DC 12 | Control of resistive loads and solid state loads with isolation by opto couplers Control of d.c. electromagnets | 1 | 1 | 1 ms | 1 | 1 | 1 ms |
| | DC 13 | | 1 | 1 | 6 · P | 1 | 1 | 6 · P |

The value 6·P results from an empirical relationship with is found to represent most d.c. magnetic loads to an upper limit of P = 50 W viz 6·P = 300 ms. Loads having power consumption greater than 50 W are assumed to consist of smaller loads in parallel. Therefore 300 ms is to be an upper limit, irrespective of the power consumption value.

| Attach our switching device | V6 N6 S6 N61 N62 | | VV6 DD64 | | V11 | | V5 S2-S23 | | VV5 SS2-SS21 | |
|--|--|----------|------------------------------|---------|------------------------------|----------|--------------------|----------|-------------------|----------|
| Rated isolation voltage U _i in Volt | 250 | | 250 | | 250 | | 250 | | 250 | |
| Rated operational voltage U _e in Volt | 250 | | 250 | | 250 | | 250 | | 250 | |
| Rated operational current in Ampere | I _e AC 12 6 or 16 | | 6 or 16 | | 6 or 16 | | 10 | | 10 | |
| AC 15 | 2 | 4 | 2 | 4 | 2 | 4 | 2 | 4 | 2 | 4 |
| DC 12 24 V | 6 | 8 | 6 | 8 | 6 | 8 | 4 | 8 | 4 | 8 |
| 48 V | 2 | 4 | 2 | 4 | 2 | 4 | 2 | 4 | 2 | 4 |
| 110 V | 0,5 | 1 | 0,5 | 1 | 0,5 | 1 | 0,2 | 1 | 0,2 | 1 |
| 220 V | 0,1 | 0,5 | 0,1 | 0,5 | 0,1 | 0,5 | 0,1 | 0,5 | 0,1 | 0,5 |
| Contacts gold-coated 24 V | 5 mA | | 5 mA | | 5 mA | | 5 mA | | 5 mA | |
| DC 13 24 V | 1 | | 1 | | 1 | | 3 | | 3 | |
| 48 V | 0,5 | | 0,5 | | 0,5 | | 1,5 | | 1,5 | |
| 110 V | 0,2 | | 0,2 | | 0,2 | | 0,1 | | 0,1 | |
| 220 V | 0,05 | | 0,05 | | 0,05 | | 0,05 | | 0,05 | |
| Short-circuit-protection in Ampere Fuse Circuit-breaker G-characteristic | 6 6 | 16 16 | 6 6 | 6 16 | 6 6 | 16 16 | 10 10 | 10 10 | 10 10 | 10 10 |
| Terminal screws Plug-in connector CAGE CLAMP® connection is a registered trademark of WAGO Kontakttechnik GmbH Germany | M 3,5 2,5 mm ² | | M 3,5 2,5 mm ² | | M 3,5 2,5 mm ² | | M 3,5 6,3 x 0,8 | | M3,5 6,3 x 0,8 | |
| Conductor sizes in mm ² finely stranded with end steeves | 1,5 | | 1,5 | | 1,5 | | 1,5 | | 1,5 | |
| Mechanical life in million (operation cycles) max. switching frequency c/h 1000 | 10 | | 20 | | 10 | | 6 | | 10 | |
| Mechanical shock resistance IEC 68-2-27 | Shock-amplitude > 15 Shock duration 20 ms | | | | | | | | | |
| Clearances and creepage distances IEC 947-1; 2.5.46.51 | Overvoltage category III pollution grade 3 | | | | | | | | | |

| Attach our switching device | V8 V85 D8 | VV8 VV85 D3 S3 | V10 V25 S1 | V14 S14 | V3 | Dead man`s button signal button push button |
|--|--|----------------|------------|--------------------------------|--|---|
| Rated isolation voltage Ui in Volt | 110 | 110 | 110 | 250 | 500 | 250 |
| Rated operational voltage Ue in Volt | 110 | 110 | 110 | 250 | 350 | 250 |
| Rated operational voltage in Ampere | | | | | | |
| AC 12 | 2 | 2 | 2 | 6 | 16 | 6 |
| AC 15 | 0,5 | 0,5 | 0,5 | 2 | 4 | 2 |
| DC 12 24 V | 2 | 2 | 2 | 6 | 8 | 4 |
| 48 V | 1 | 1 | 1 | 2 | 4 | 2 |
| 110 V | 0,1 | 0,1 | 0,1 | 0,5 | 1 | 0,2 |
| 220 V | | | | 0,1 | 0,5 | 0,1 |
| Contacts gold-coated 24 V | 5 mA | 5 mA | 5 mA | 5 mA | 5 mA | 5 mA |
| DC 13 24 V | 1,5 | 1,5 | 1,5 | 1 | 1 | 3 |
| 48 V | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 1,5 |
| 110 V | 0,05 | 0,05 | 0,05 | 0,2 | 0,2 | 0,1 |
| 220 V | | | | 0,05 | 0,05 | 0,05 |
| Short-circuit-protection in Ampere Fuse 9L Circuit-breaker G-characteristic | 4 4 | 4 4 | 4 4 | 6 6 | 16 16 | 6 6 |
| Terminal screws Plug-in connector CAGE CLAMP® connection is a registered trademark of WAGO Kontakttechnik GmbH Germany | Solder terminal | | | M4 1,5 mm ² | M 3,5 6,3 x 0,8 | 6,3 x 0,8 |
| Conductor sizes in mm ² finely stranded with end steeves | 0,5 | 0,5 | 0,5 | 1 | 1,5 | 1,5 |
| Mechanical life in million (operation cycles) max. switching frequency c/h 1000 | 8 | 12 | 8 | 6 | 6 | 10 |
| Mechanical shock resistance IEC 68-2-27 | Shock-amplitude > 15 Shock duration 20 ms | | | | | |
| Clearances and creepage distances IEC 947-1; 2.5.46.51 | Overvoltage category III pollution grade 3 | | | | | |
| Degree of protection to IEC/EN 60529 | 1. numeral protection of contact and foreign bodies | | | 2. numeral protection of water | | |
| | IP00 | No protection | | | No protection | |
| | IP54 | Dust-protected | | | protected against splashing water | |
| | IP65 | dust-tight | | | protected against water jets | |
| | IP66 | dust-tight | | | protected against powerful water jets | |
| | IP67 | dust-tight | | | protected against the effects of temporary immersion in water | |

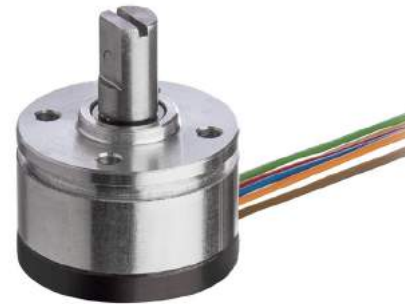
Hall-Potentiometer HG2



The Hall-Potentiometer HG2 is distinguished by its precision and longevity.

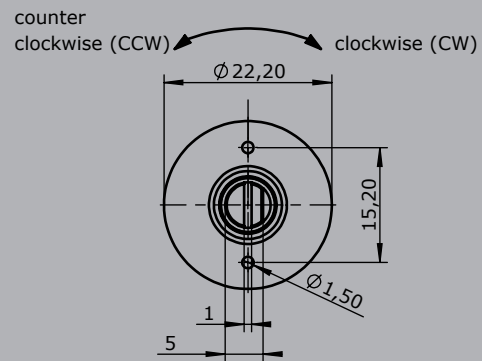
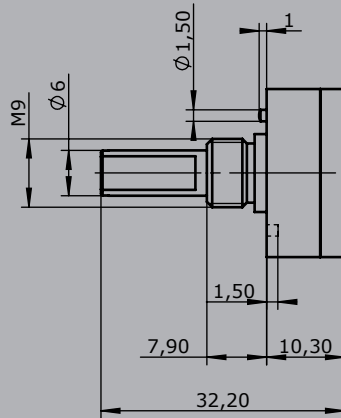
Technical data

| | |
|-----------------------|--|
| Mechanical life | 10 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

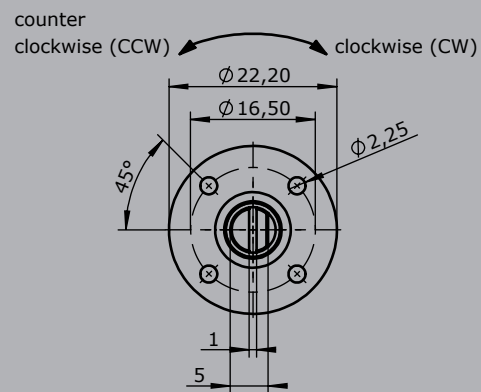
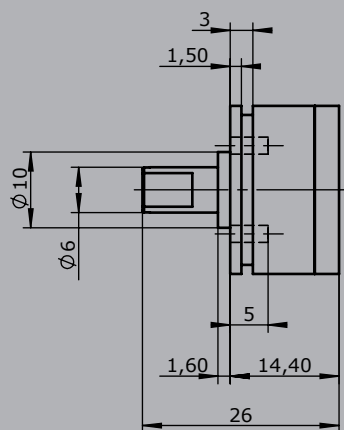


| | HG2A | -60 | Example -6 | -E14811 | -X |
|--|--|-----|---------------|---------|----|
| Basic unit | | | | | |
| HG2A | Hall-Potentiometer HG2 Model A | | | | |
| HG2B | Hall-Potentiometer HG2 Model B | | | | |
| Operating distance | | | | | |
| 0-360° possible | | | | | |
| Example 60° => 60 | | | | | |
| Dead zone around the center position | | | | | |
| 0 No dead zone | | | | | |
| Example +/-3° => 6 | | | | | |
| Interface | | | | | |
| Voltage output HG2 | | | | | |
| E1481 | 1 0,5...2,5...4,5 V dual inverse Ub= 5 V DC | | | | |
| | 2 0,5...2,5...4,5 V dual positive gradient clockwise (cw) Ub= 5 V DC | | | | |
| | 3 0,5...2,5...4,5 V dual positive gradient counter clockwise (ccw) Ub= 5 V DC | | | | |
| E1491 | 1 0,5...2,5...4,5 V positive gradient clockwise (cw) with zero position signal Ub= 5 V DC | | | | |
| | 2 0,5...2,5...4,5 V positive gradient counter clockwise (ccw) with zero position signal Ub= 5 V DC | | | | |
| | 3 0,5...2,5...4,5 V positive gradient clockwise (cw) with direction signals Ub= 5 V DC | | | | |
| | 4 0,5...2,5...4,5 V positive gradient counter clockwise (ccw) with direction signals Ub= 5 V DC | | | | |
| <i>More interfaces (for example SPI BUS) on request!</i> | | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |

HG2A



HG2B



Hall-Potentiometer

N10



The N10 is a Hall-Potentiometer for electrohydraulic and hoisting applications. Long life and high reliability is ensured by the latest contactless hall-technology. Up to 18 detent points can be integrated.

Technical data

| | |
|--|--|
| Mechanical life | 10 million operating cycles |
| Mechanical life with detent/friction brake | 3 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP67 (electronic) |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

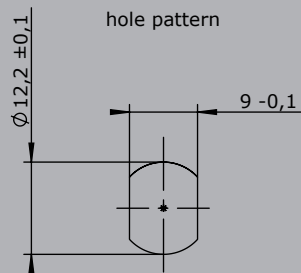
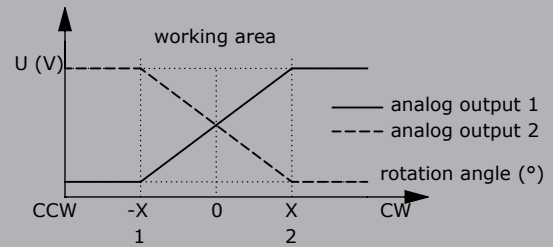
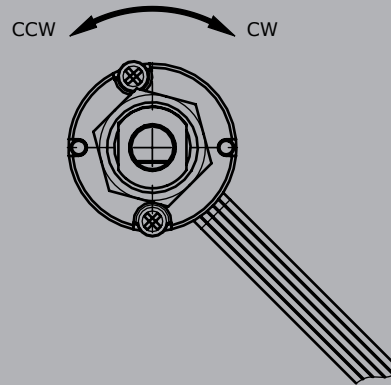
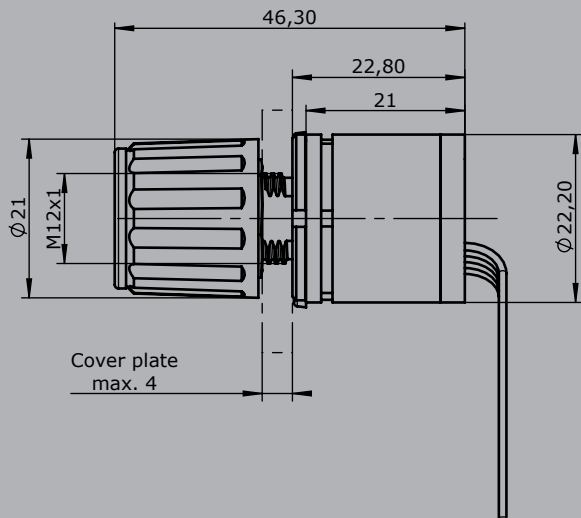


| | N10 | -90 | Example 1 | -6 | -E14811 | -X |
|--|-----|-----|--------------|----|---------|----|
| Basic unit | | | | | | |
| N10A Hall-Potentiometer with rotary knob | | | | | | |
| Operating distance | | | | | | |
| 360° (rotating without stop) | | | | | | |
| 270° | | | | | | |
| 180° | | | | | | |
| 90° | | | | | | |
| Detent | | | | | | |
| 0 Without detent, with friction brake | | | | | | |
| 1 Detent point in middle position | | | | | | |
| 3 Detent point in Position 1 | | | | | | |
| 4 Detent point in Position 2 | | | | | | |
| R15 Detent point at intervals of 15° | | | | | | |
| Dead zone around the center position | | | | | | |
| 0 No dead zone | | | | | | |
| Example +/-3° => 6 | | | | | | |
| Interfaces | | | | | | |
| Voltage output | | | | | | |
| E1481 1 0,5...2,5...4,5 V dual inverse Ub= 5 V DC | | | | | | |
| 2 0,5...2,5...4,5 V dual positive gradient clockwise (cw) Ub= 5 V DC | | | | | | |
| 3 0,5...2,5...4,5 V dual positive gradient counter clockwise (ccw) Ub= 5 V DC | | | | | | |
| E1491 1 0,5...2,5...4,5 V positive gradient clockwise (cw) with zero position signal Ub= 5 V DC | | | | | | |
| 2 0,5...2,5...4,5 V positive gradient counter clockwise (ccw) with zero position signal Ub= 5 V DC | | | | | | |
| 3 0,5...2,5...4,5 V positive gradient clockwise (cw) with direction signals Ub= 5 V DC | | | | | | |
| 4 0,5...2,5...4,5 V positive gradient counter clockwise (ccw) with direction signals Ub= 5 V DC | | | | | | |
| <i>More interfaces (for example SPI Bus) on request!</i> | | | | | | |
| Special model | | | | | | |
| X Special / customer specified | | | | | | |

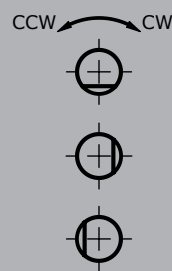
Technical details may vary based on configuration or application! Technical data subject to change without notice!

Hall-Potentiometer

N10



Position of the shaft:



Potentiometer with attach to our switching device



| for mounting on | Typ | Capacity (W) | I _{max} wiper (mA) | Typ | Expansion | with centre tap life | | | | | Hall 0,5...2,5...4,5V / 4,5...2,5...0,5V | Part No. | Addition for Part No. | Comment |
|--|---------|--------------|-----------------------------|--------------------------|--------------------------|--------------------------|------------|------------|------------|-------------|---|--------------------------|--------------------------|--|
| | | | | | | 2 x 0,5 kOhm | 2 x 1 kOhm | 2 x 2 kOhm | 2 x 5 kOhm | 2 x 10 kOhm | | | | |
| | | | | | | 1 | 2 | 3 | 4 | 5 | | | | |
| V6 / VV6 D64 / DD64 V5 / VV5 V3 S2 / SS2 S6 N6 P7 P8 | T1420 | 1,5 | 10 | P44 | <input type="checkbox"/> | x | x | x | x | x | | 524004400 | <input type="checkbox"/> | characteristic progressive *1 R= 2 x 6,5 kOhm |
| | T132 | 2,5 | 10 | P05 | <input type="checkbox"/> | x | x | x | x | x | | 524000500 | <input type="checkbox"/> | |
| | T132 Öl | 2,5 | 10 | P06 | <input type="checkbox"/> | x | x | | x | x | | 524000600 | <input type="checkbox"/> | |
| | T178 | 1,5 | 10 | P07 | <input type="checkbox"/> | | x | x | x | | | 524000700 | <input type="checkbox"/> | |
| | T238 | 1 | 10 | P08 | <input type="checkbox"/> | x | x | x | x | x*1 | | 524000800 | <input type="checkbox"/> | |
| | T133 | 60 | 85 | P10 | <input type="checkbox"/> | x | | | | | | 524001000 | <input type="checkbox"/> | |
| | T396 | 0,5 | 1 | P13 | <input type="checkbox"/> | x | x | x | x | x | | 524001300 | <input type="checkbox"/> | |
| T1350 Ex | 0,5 | 1 | P14 | <input type="checkbox"/> | x | x | x | x | x | | 524001400 | <input type="checkbox"/> | | |
| T1360 | | | | P43 | <input type="checkbox"/> | | | | | x | 5240043009 | <input type="checkbox"/> | | |
| V8 / VV8 D8 P10 P11 P12 | T239 | 1 | 10 | P17 | <input type="checkbox"/> | | | x | x | | | 524001700 | <input type="checkbox"/> | with direction lines |
| | T301 | 0,5 | 1 | P18 | <input type="checkbox"/> | | x | x | x | x | | 524001800 | <input type="checkbox"/> | |
| | T426 | 0,5 | 1 | P19 | <input type="checkbox"/> | | | | x | x | | 524001900 | <input type="checkbox"/> | |
| | T432 | 0,5 | 1 | P20 | <input type="checkbox"/> | | | | x | | | 524002000 | <input type="checkbox"/> | |
| | T246 | 0,5 | 1 | P21 | <input type="checkbox"/> | x | x | | x | x | | 524002100 | <input type="checkbox"/> | |
| | T362 | 0,5 | 1 | P22 | <input type="checkbox"/> | | x | x | x | | | 524002200 | <input type="checkbox"/> | |
| | T1003 | | | | P42 | <input type="checkbox"/> | | | | | x | 5240042009 | <input type="checkbox"/> | |
| T1360 | | | | P43 | <input type="checkbox"/> | | | | | x | 5240043009 | <input type="checkbox"/> | | |
| V10 S1 Palm handle | T321 | 1 | 10 | P24 | <input type="checkbox"/> | | x | | | | | 524002400 | <input type="checkbox"/> | with direction lines |
| | T320 | 0,5 | 1 | P25 | <input type="checkbox"/> | | x | | x | | | 524002500 | <input type="checkbox"/> | |
| | T1187 | 0,5 | 1 | P27 | <input type="checkbox"/> | | | | x | | | 524002700 | <input type="checkbox"/> | |
| | T375 | 0,5 | 1 | P37 | <input type="checkbox"/> | | x | | x | | | 524003700 | <input type="checkbox"/> | |
| T997 | | | | P41 | <input type="checkbox"/> | | | | | x | 5240041009 | <input type="checkbox"/> | | |
| V11 | T316 | 1 | 10 | P31 | <input type="checkbox"/> | | | | x*2 | | | 524003100 | <input type="checkbox"/> | *2 R= 2 x 4 kOhm |
| | T365 | 0,5 | 1 | P32 | <input type="checkbox"/> | | | | x | x | | 524003200 | <input type="checkbox"/> | |
| D3 S3 | T318 | 0,5 | 1 | P48 | <input type="checkbox"/> | | | | x | | | 524004800 | <input type="checkbox"/> | |

| for mounting on | Typ | Capacity (W) | I _{max} wiper (mA) | Typ | Expansion | without centre tap life | | | | | Part No. | Addition for Part No. | Comment | |
|---|----------|--------------|-----------------------------|-----|--------------------------|-------------------------|--------|--------|--------|---------|----------|-----------------------|--------------------------|--|
| | | | | | | 0,5 kOhm | 1 kOhm | 2 kOhm | 5 kOhm | 10 kOhm | | | | |
| | | | | | | 1 | 2 | 3 | 4 | 5 | | | | |
| V6 / VV6 D64 / DD64 V5 / VV5 V3 S2 / SS2 S6 N6 P7 / P8 | T1491 | 1,5 | 10 | P46 | <input type="checkbox"/> | x | x | x | x | x | | 524004600 | <input type="checkbox"/> | |
| | T131 | 2,5 | 10 | P03 | <input type="checkbox"/> | x | x | x | x | x | | 524000300 | <input type="checkbox"/> | |
| | T131 Oil | 2,5 | 10 | P04 | <input type="checkbox"/> | | x | | x | x | | 524000400 | <input type="checkbox"/> | |
| | T134 | 60 | 85 | P11 | <input type="checkbox"/> | | | | x | | | 524001100 | <input type="checkbox"/> | |
| | T374 | 0,5 | 1 | P12 | <input type="checkbox"/> | x | x | x | x | x | | 524001200 | <input type="checkbox"/> | |
| V8 / VV8 / D8 P10/P11/P12 | T244 | 0,5 | 1 | P23 | <input type="checkbox"/> | | | x | x | x | | 524002300 | <input type="checkbox"/> | |
| | T397 | 0,5 | 1 | P47 | <input type="checkbox"/> | | x | x | x | | | 524004700 | <input type="checkbox"/> | |
| V10 / S1 Palm grip | T337 | 0,5 | 1 | P26 | <input type="checkbox"/> | | x | x | x | x | | 524002600 | <input type="checkbox"/> | |
| GE1/GE2 | PW70 | 5 | 30 | P45 | <input type="checkbox"/> | x | x | | x | | | 524004500 | <input type="checkbox"/> | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Opto-electronical encoder OEC 2 with digital output gray-/binär-cdode

| | | | | | |
|----------------|------------------------------|---|-----------|------|-------|
| Power supply | 18-30 V DC | | | | |
| Rotation angle | Max. +/-150° (by 9 Bit 300°) | | | | |
| Digital output | 8 Bit Gray-Code T359 | Output characteristic linear | OEC 2-1-1 | C01 | 410 g |
| | 8 Bit Binary-Code T359 | Output characteristic linear | OEC 2-2-1 | C02 | 410 g |
| | 6 Bit Gray-Code T359 | Output characteristic linear | OEC 2-3-1 | C031 | 410 g |
| | 6 Bit Gray-Code T359 | Output characteristic quadratic | OEC 2-3-2 | C032 | 410 g |
| | 6 Bit Binary-Code T359 | Output characteristic linear | OEC 2-4-1 | C041 | 410 g |
| | 6 Bit Binary-Code T359 | Output characteristic quadratic | OEC 2-4-2 | C042 | 410 g |
| | 9 Bit Gray-Code T384 | Output characteristic linear one side clockwise | OEC 2-5-4 | C054 | 410 g |
| | 9 Bit Gray-Code T384 | Output characteristic linear one side anticlockwise | OEC 2-5-5 | C055 | 410 g |
| | 9 Bit Binary-Code T384 | Output characteristic linear one side clockwise | OEC 2-6-4 | C064 | 410 g |
| | 9 Bit Binary-Code T384 | Output characteristic linear one side anticlockwise | OEC 2-6-5 | C065 | 410 g |

6 Bit-type T359

| PIN connection | Colour-code |
|--------------------------|-------------|
| 1 Not connected | - |
| 2 D4 | brown |
| 3 D3 | green |
| 4 D2 | yellow |
| 5 D1 | grey |
| 6 Not connected | - |
| 7 Not connected | - |
| 8 Housing 0 V | black |
| 9 Input 18-30 V DC | red |
| 10 Not connected | - |
| 11 Not connected | - |
| 12 Direction-signal left | violet |
| 13 Direction-signal grey | grey-pink |
| 14 D6 | red-blue |
| 15 D5 | white-green |
| - Cable screen | brown-green |

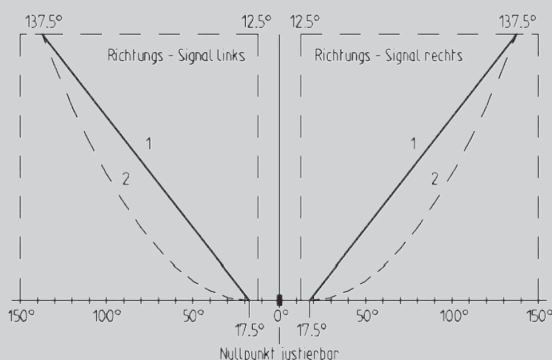
8-Bit-type T359

| PIN connection | Colour-code |
|---------------------------|-------------|
| 1 Not connected | - |
| 2 D6 | brown |
| 3 D5 | green |
| 4 D4 | yellow |
| 5 D3 | grey |
| 6 D2 | pink |
| 7 D1 | blue |
| 8 Housing 0 V | black |
| 9 Input 18-30 V DC | red |
| 10 Not connected | - |
| 11 Not connected | - |
| 12 Direction-signal left | violett |
| 13 Direction-signal right | grey-pink |
| 14 D8 | red-blue |
| 15 D7 | white-green |
| - Cable screen | brown-green |

9 Bit-type T384

| PIN connection | Colour-code |
|--------------------------|-------------|
| 1 Not connected | - |
| 2 D6 | brown |
| 3 D5 | green |
| 4 D4 | yellow |
| 5 D3 | grey |
| 6 D2 | pink |
| 7 D1 | blue |
| 8 Housing 0 V | black |
| 9 Input 18-30 V DC | red |
| 10 Not connected | - |
| 11 Not connected | - |
| 12 Direction-signal left | violett |
| 13 D9 | grey-pink |
| 14 D8 | red-blue |
| 15 D7 | white-green |
| - Cable screen | brown-green |

6 Bit-type T359



8 Bit-type T359

9 Bit-type T384

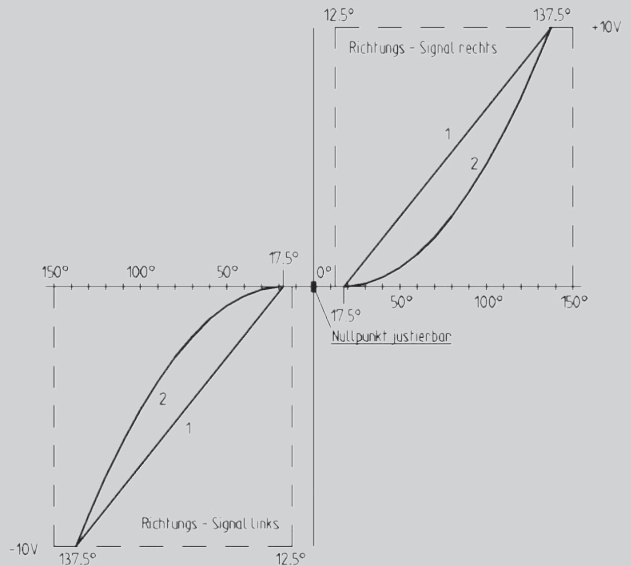
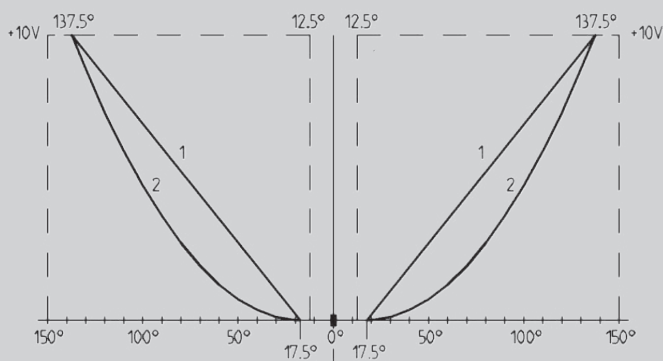


Opto-electronic encoder OEC 2 with voltage output

| | | | | | |
|----------------|----------------------|---------------------------------|-------------|------|-------|
| Power supply | 18 - 30 V DC | | | | |
| Scanning | 6 Bit Gray-Code | | | | |
| Rotation angle | Max. +/-150° | | | | |
| Voltage output | 10...0...10 V T366 | Output characteristic linear | OEC 2-3-1-1 | C111 | 410 g |
| | 10...0...10 V T366 | Output characteristic quadratic | OEC 2-3-2-1 | C112 | 410 g |
| | -10...0...+10 V T367 | Output characteristic linear | OEC 2-3-1-2 | C151 | 410 g |
| | -10...0...+10 V T367 | Output characteristic quadratic | OEC 2-3-2-2 | C152 | 410 g |

Voltage output

| PIN connection | Colour-code |
|---------------------------|-------------|
| 1 Not connected | - |
| 2 Not connected | - |
| 3 Not connected | - |
| 4 Not connected | - |
| 5 Not connected | - |
| 6 Not connected | - |
| 7 Not connected | - |
| 8 Housing 0V | blue |
| 9 Input 18-30V DC | brown |
| 10 Not connected | - |
| 11 Voltage output | green |
| 12 Direction signal left | yellow |
| 13 Direction signal right | grey |
| 14 Not connected | - |
| 15 Not connected | - |
| - Cable screen | white |



Opto-electronical encoder OEC 2 with current output

| | | | | | |
|----------------|-----------------------|---------------------------------|-------------|------|-------|
| Power supply | 18 - 30 V DC | | | | |
| Scanning | 6 Bit Gray-Code | | | | |
| Rotation angle | Max. +/-150° | | | | |
| Output current | 20...4...20 mA T368 | Output characteristic linear | OEC 2-3-1-5 | C191 | 410 g |
| | 20...4...20 mA T368 | Output characteristic quadratic | OEC 2-3-2-5 | C192 | 410 g |
| | 20...0...20 mA T368 | Output characteristic linear | OEC 2-3-1-8 | C201 | 410 g |
| | 20...0...20 mA T368 | Output characteristic quadratic | OEC 2-3-2-8 | C202 | 410 g |
| | -20...0...+20 mA T369 | Output characteristic linear | OEC 2-3-1-6 | C231 | 410 g |
| | -20...0...+20 mA T369 | Output characteristic quadratic | OEC 2-3-2-6 | C232 | 410 g |

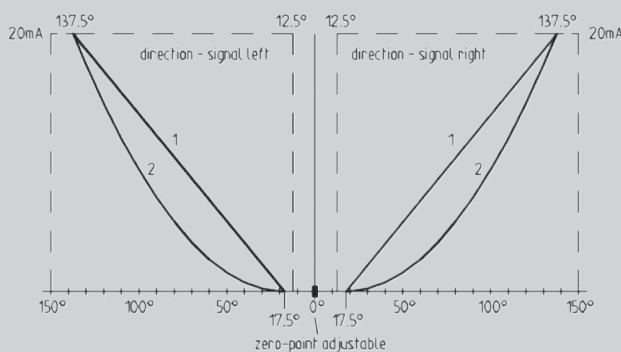
6 Bit-Type T368

| PIN connection | | Colour-code |
|----------------|------------------------|-------------|
| 1 | Not connected | - |
| 2 | Not connected | - |
| 3 | Not connected | - |
| 4 | Not connected | - |
| 5 | Not connected | - |
| 6 | Not connected | - |
| 7 | Not connected | - |
| 8 | Housing 0 V | blue |
| 9 | Input 18-30 V DC | brown |
| 10 | Not connected | - |
| 11 | Current output | green |
| 12 | Direction signal left | yellow |
| 13 | Direction signal right | grey |
| 14 | Not connected | - |
| 15 | Not connected | - |
| - | Cable screen | white |

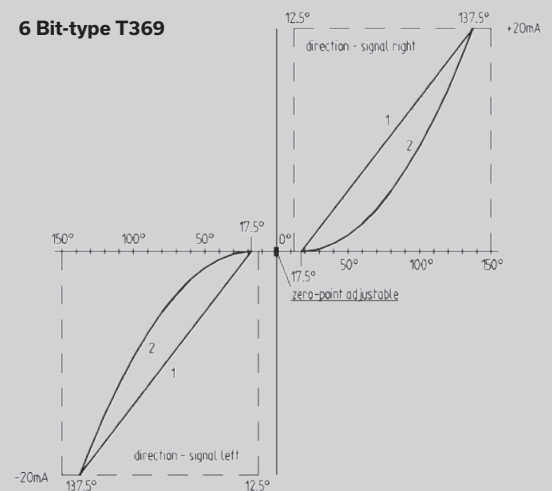
6 Bit-Type T369

| PIN connection | | Colour-code |
|----------------|------------------------|-------------|
| 1 | Not connected | - |
| 2 | Not connected | - |
| 3 | Not connected | - |
| 4 | Not connected | - |
| 5 | Not connected | - |
| 6 | Not connected | - |
| 7 | Not connected | - |
| 8 | Housing 0V | blue |
| 9 | Input 18-30 V DC | brown |
| 10 | Not connected | - |
| 11 | Current output | green |
| 12 | Direction signal left | yellow |
| 13 | Direction signal right | grey |
| 14 | Not connected | - |
| 15 | Not connected | - |
| - | Cable screen | white |

6 Bit-type T368



6 Bit-type T369



Attachment

| | |
|--|------------|
| Plug with cable 14 x 0,25 mm ² , 2000 mm long, cable head open (for OEC 2 with digital outputs) | 5300000495 |
| Plug with cable 7 x 0,34 mm ² , 2000 mm long, cable head open (for OEC 2 with analog outputs) | 5300000496 |

The OEC 2 is able for mounting on V6,VV6/D64,DD64/V11/S2,SS2/S6/N6. For mounting a potentiometer mounting option (P) of the respective controller is required!

Opto-Electronic Encoder

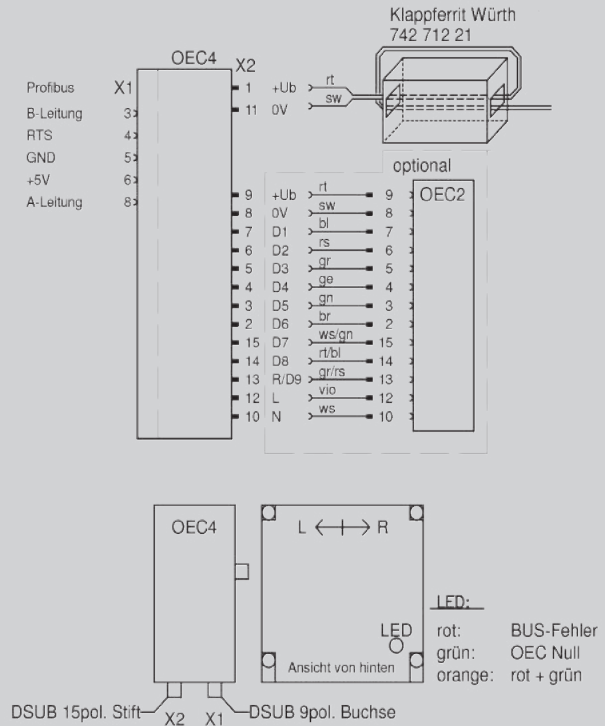
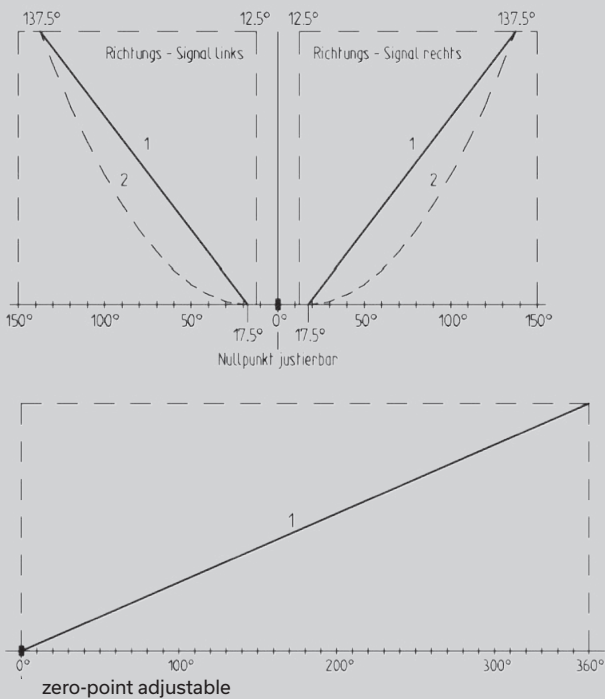
OEC 4
with interface Profibus DP



Opto-electronic encoder

| | |
|----------------|---|
| Power supply | 18 - 30 V DC |
| Scanning | 6, 8 or 9 Bit Gray-Code |
| Rotation angle | Max. +/-150° |
| Interface | Profibus, DP, address 0-99 adjustable above selector switch |

| | | | | |
|----------------|--|-------------|------|-------|
| Voltage output | 8 Bit Gray-Code T496 linear | OEC 4-1-1-2 | C27 | 820 g |
| | 8 Bit Binary-Code T496 linear | OEC 4-2-1-2 | C28 | 820 g |
| | 6 Bit Gray-Code T496 linear | OEC 4-3-1-2 | C291 | 820 g |
| | 6 Bit Gray-Code T496 quadratic | OEC 4-3-2-2 | C292 | 820 g |
| | 6 Bit Binary-Code T496 linear | OEC 4-4-1-2 | C301 | 820 g |
| | 6 Bit Binary-Code T496 quadratic | OEC 4-4-2-2 | C302 | 820 g |
| | 9 Bit Gray-Code T497 linear one sided right turn | OEC 4-5-4-2 | C314 | 820 g |
| | 9 Bit Gray-Code T497 linear one sided left turn | OEC 4-5-5-2 | C315 | 820 g |
| | 9 Bit Binary-Code T497 linear one sided right turn | OEC 4-6-4-2 | C324 | 820 g |
| | 9 Bit Binary-Code T497 linear one sided left turn | OEC 4-6-5-2 | C325 | 820 g |

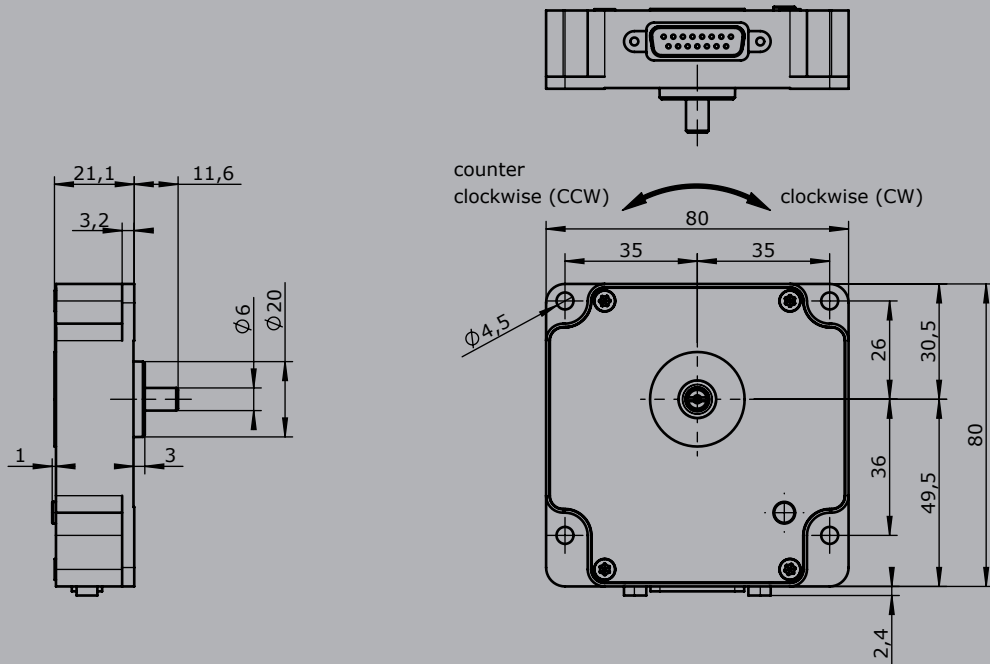


Attachment

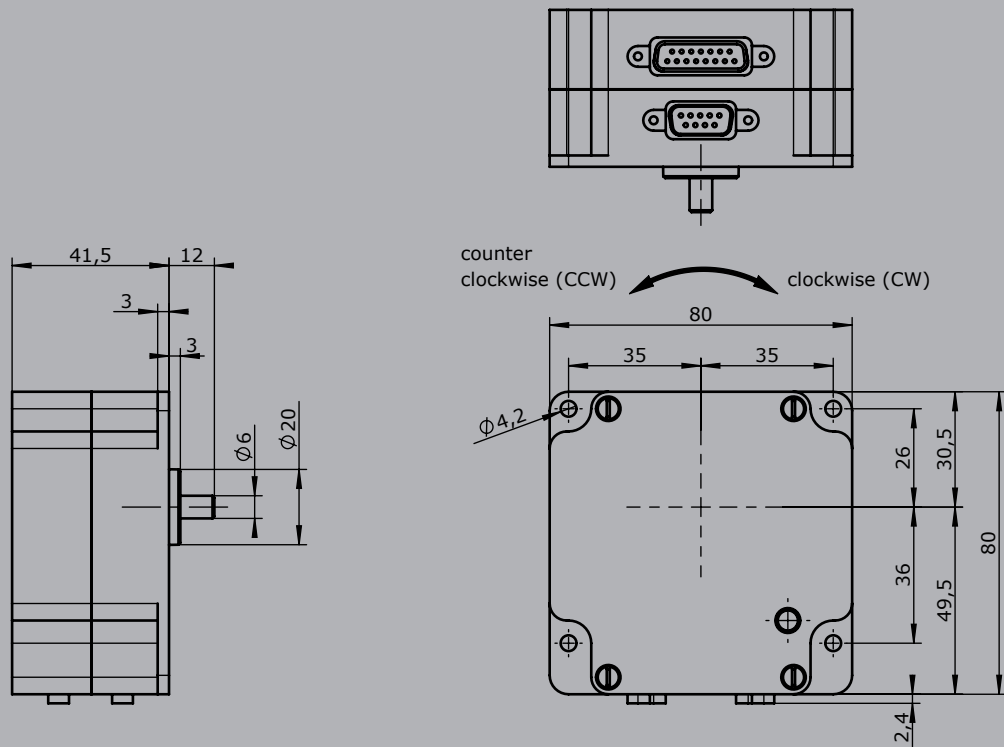
- Plug (Profibus) straight
- Plug (Profibus) 90° angled
- Plug with cable 2 x 0,25 mm², 2000 mm long, cable head open (cable for current supply OEC 4 single application)
- Connecting cable OEC 4/ OEC 2 (14 x 0,25 mm²) with 2 plug connectors incl. cable for current supply (2 x 0,25 mm² 2000 mm long, cable head open)

The OEC 4 is able for mounting on V6,VV6/D64,DD64/V11/S2,SS2/S6/N6. For mounting a potentiometer mounting option (P) of the respective controller is required! For a controller with one axis is required 1 piece of OEC 4, for a controller with 2 axis are required 1 piece of OEC 4 and 1 piece of OEC 2.

OEC 2



OEC 4

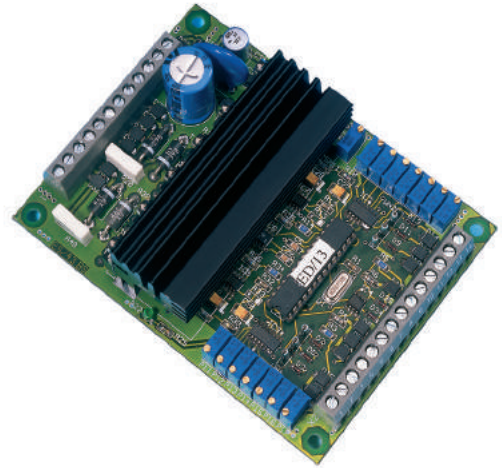




The Electronic Control Unit ES/43 serves for control of proportional valves without position control. There is a version for 4 proportional valve solenoids (ES / 43-10) and a version for 2 Proportional valve solenoids (ES / 43-11) available.

Features:

- Stabilized voltage
- Chopper output stage with adjustable frequency
- Ramp time setting ON/OFF delay
- Creep speed circuit adjustable
- Solenoid current setting separate for minimum current and maximum current
- Output current controlled independently of temperature and solenoid
- Power output short-circuit-proof with overload protection
- Voltage input protected against polarity reversal
- Mechanical selection of direction by means of contacts
- LED operating voltage and working display
- Microprocessor technology therefore especially adaptable



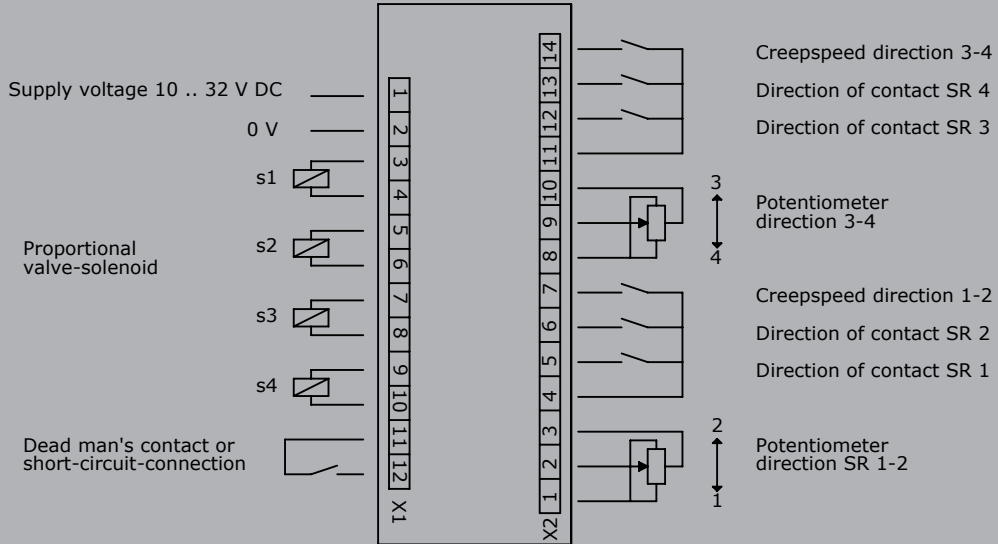
Technical data:

| | | | | |
|----------------------------|--------------------|----------------|---------------|----------------|
| - Supply voltage | | 10... | 32 V DC | <i>Example</i> |
| - Residual ripple | | 20% | | |
| - Control voltage range | Ue | 0... | 5 V | |
| - Control current | Ie | < 1mA | | |
| - Dither frequency | f | 25... | 250Hz | |
| - Proportional valve S 1-4 | I min. | 0... | 1A | |
| Output | I max. = I min ... | | 2A at 12 Volt | |
| Output | I max. = I min ... | | 1A at 24 Volt | |
| - Ramp time setting | t on | 0,2... | 25 sec | |
| | t off | 0,2... | 25 sec | |
| - Creep speed | variable reduction | | 25...75% | |
| - Operating temperature | | -40°C to +85°C | | |
| - Storage temperature | | -40°C to +80°C | | |

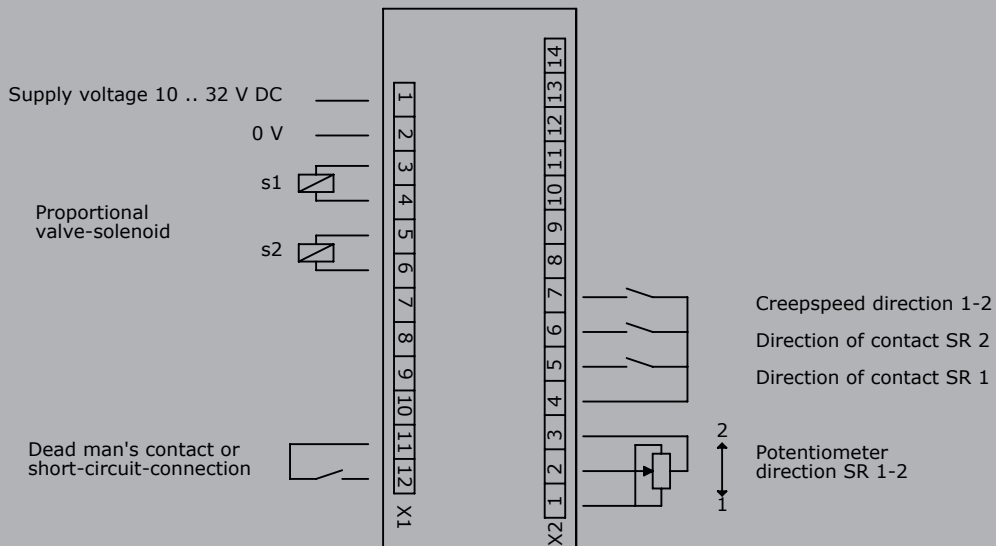
Electronic Control Unit for 4 proportional valves solenoid ES/43-10

Electronic Control Unit for 2 proportional valves solenoid ES/43-11

ES / 43-10
4 Proportional valves-solenoid



ES / 43-11
2 Proportional valves-solenoid





The V21 is a Mini-Joystick commonly used in electro-hydraulic applications. The V21 is especially suitable for installation in our ball grips. Long life and high reliability is ensured by the latest contactless hall-technology.

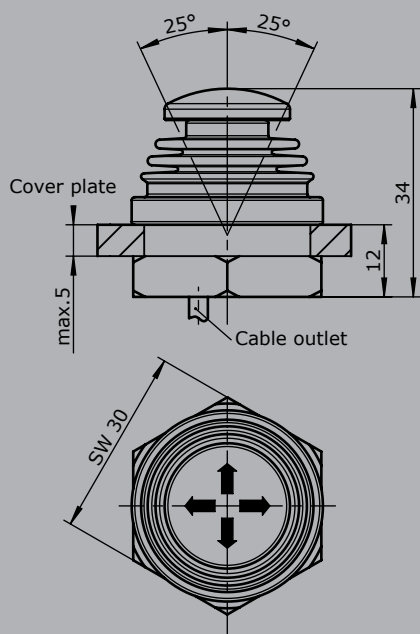
Technical data

| | |
|-----------------------|--|
| Mechanical life | 5 million operating cycles |
| Operating force | 1,6 to 3,5N |
| Supply voltage | 5V DC stabilized |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

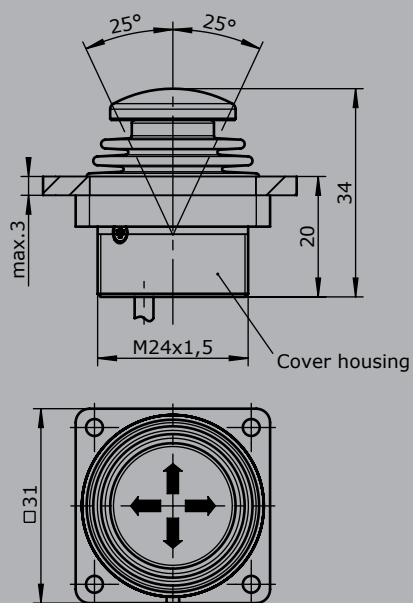


| | V21 | P | -1 | -E1032 | -X |
|--|---|---|----|--------|----|
| Basic unit | | | | | |
| V21.1 | 1-axis, installation from top with fixing nut | | | | |
| V21 | 2-axis, installation from top with fixing nut | | | | |
| V21.1A | 1-axis, with flange, installation from below | | | | |
| V21A | 2-axis, with flange, installation from below | | | | |
| V21.1B | 1-axis, with flange, installation from top | | | | |
| V21B | 2-axis, with flange, installation from top | | | | |
| Gate | | | | | |
| P | Cross gate | | | | |
| P X | Special gate | | | | |
| Knob | | | | | |
| | Standard | | | | |
| 1 | KBAD 980 | | | | |
| 2 | KBAD 1658 | | | | |
| 3 | KBAD 1690 | | | | |
| Interface | | | | | |
| Voltage output | | | | | |
| 0,5...2,5...4,5 V redundant by $U_b = 5 V$ | 1 axis | | | E103 1 | |
| | 2 axis | | | 2 | |
| | Characteristic: | | | | |
| | Inverse dual (standard) | | | 1 | |
| | Dual | | | 2 | |
| SPI-Interface on request | | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |

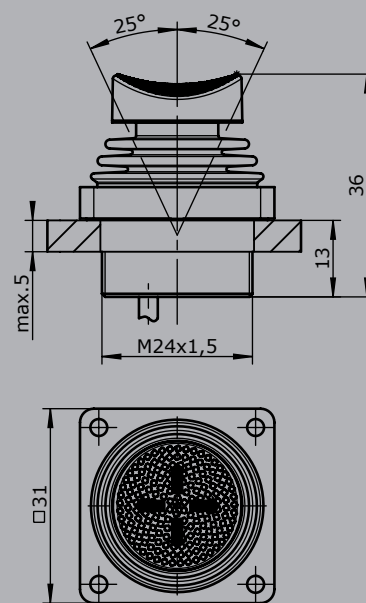
Standard
installed from the top



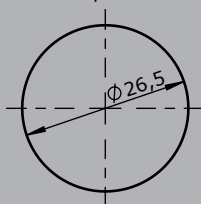
Version A with flange
installed from below



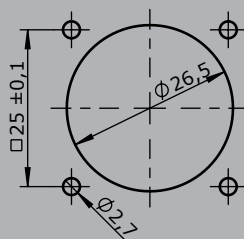
Version B with flange
installed from the top
with actuator KBAD 980



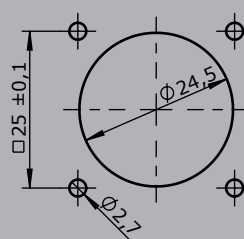
Hole pattern



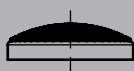
Hole pattern



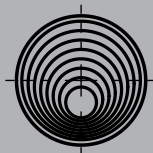
Hole pattern



Actuator KBAD 1658



Actuator KBAD 1690





The Mini-Joystick S9 is a hallsensor switching device designed for electro-hydraulic applications. Long life and high reliability is ensured by the latest contactless hall-technology. Due to its small size, the S9 is particularly suitable for installation in our ball handles.

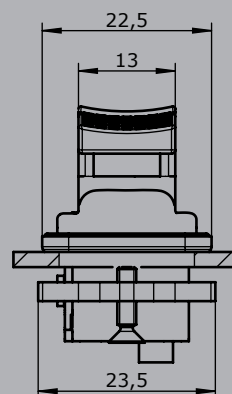
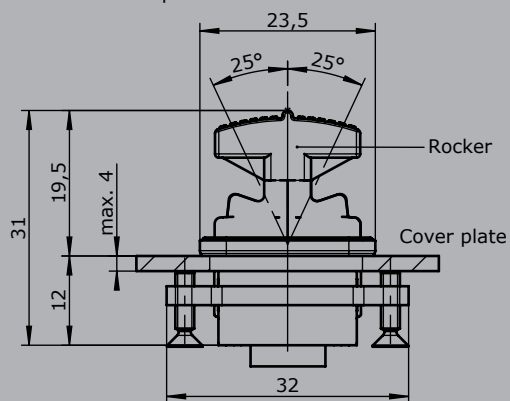
Technical data

| | |
|-----------------------|--|
| Mechanical life S9 | 5 million operating cycles |
| Operating force | 1,6 to 3,5N |
| Supply voltage | 5V DC stabilized |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

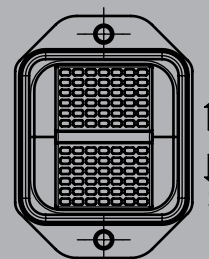
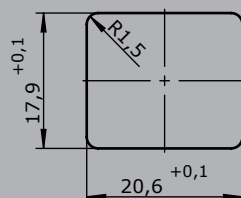


| | Example S9 | - E10311 | - X |
|--|----------------------------|----------|-----|
| Basic unit | | | |
| S9 | | | |
| Interface | | | |
| 0,5...2,5...4,5 V redundant by Ub= 5 V | | E1031 | |
| | Output option inverse dual | | 1 |
| | Output option dual | | 2 |
| Special model | | | |
| X Special / customer specified | | | |

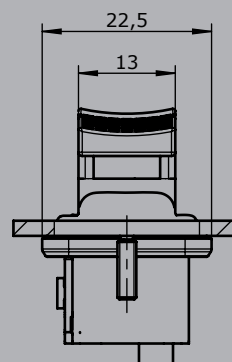
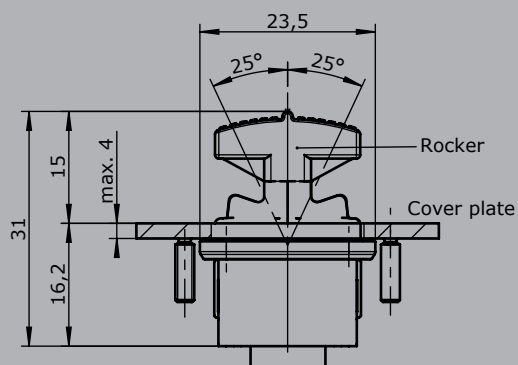
Installed from the top



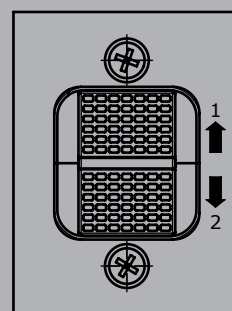
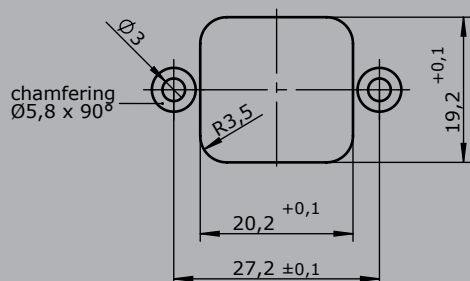
Hole pattern
(installed from the top)



Installed from below



Hole pattern
(installed from below)



The S15 is a Fingertip Joystick designed for electro-hydraulic applications. A long service life and high reliability is achieved by the latest contactless hall-technology. With the different actuator colours the appearance can be individually designed.

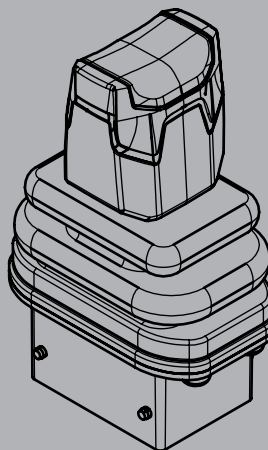
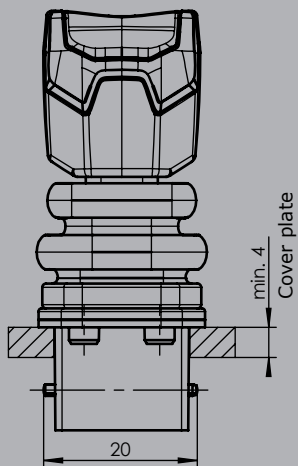
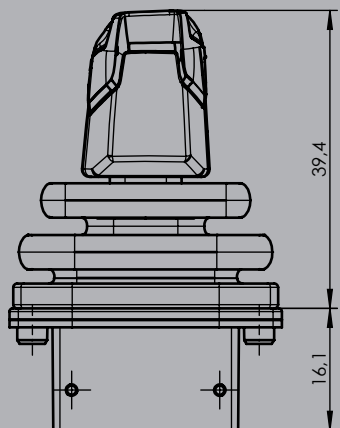
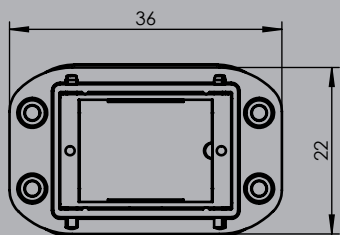
Technical data

| | |
|-----------------------|--|
| Mechanical life S15 | 5 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

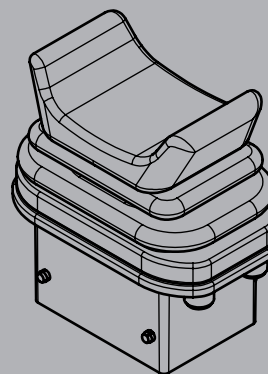
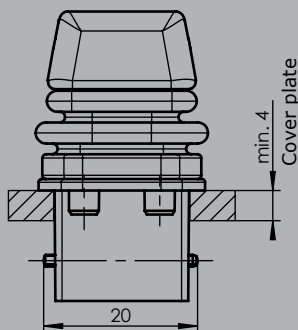
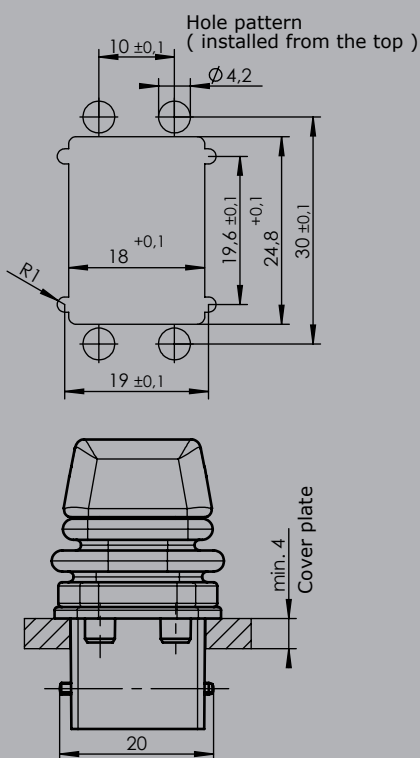
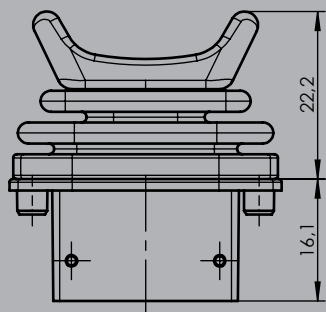
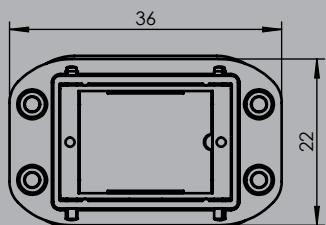


| | Example | | | | | |
|---|-----------------------------|-----|-----|-----|--------|----|
| | S15 | - 2 | - 1 | - 1 | -E1031 | -X |
| Basic unit | | | | | | |
| S15 Fingertip Joystick | | | | | | |
| Actuator | | | | | | |
| 1 Actuator form A | | | | | | |
| 2 Actuator form B | | | | | | |
| Actuator colour | | | | | | |
| 1 Black | | | | | | |
| 2 Grey* | | | | | | |
| 3 Blue* | | | | | | |
| 4 Red* | | | | | | |
| 5 Yellow* | | | | | | |
| 6 Orange* | | | | | | |
| <i>*not possible with actuator form B!</i> | | | | | | |
| Mechanical function | | | | | | |
| 1 T-0-T | | | | | | |
| Interface | | | | | | |
| 0,5...2,5...4,5 V redundant by Ub= 5 V | 1 axis | | | | E1031 | |
| 0,5...2,5...4,5 V redundant + direction signal at Ub= 5 V | 1 axis | | | | E104 1 | |
| | Characteristic inverse dual | | | | | 1 |
| | Characteristic dual | | | | | 2 |
| SPI - Interface on request | | | | | | |
| Special model | | | | | | |
| X Special / customer specified | | | | | | |

S15 fingertip with actuator edition A



S15 fingertip with actuator edition B



The Hall-Cross Switch HK1 is a contactless Mini-Joystick designed for electro-hydraulic applications. Different actuators are available. Optionally a version with Push button is possible.

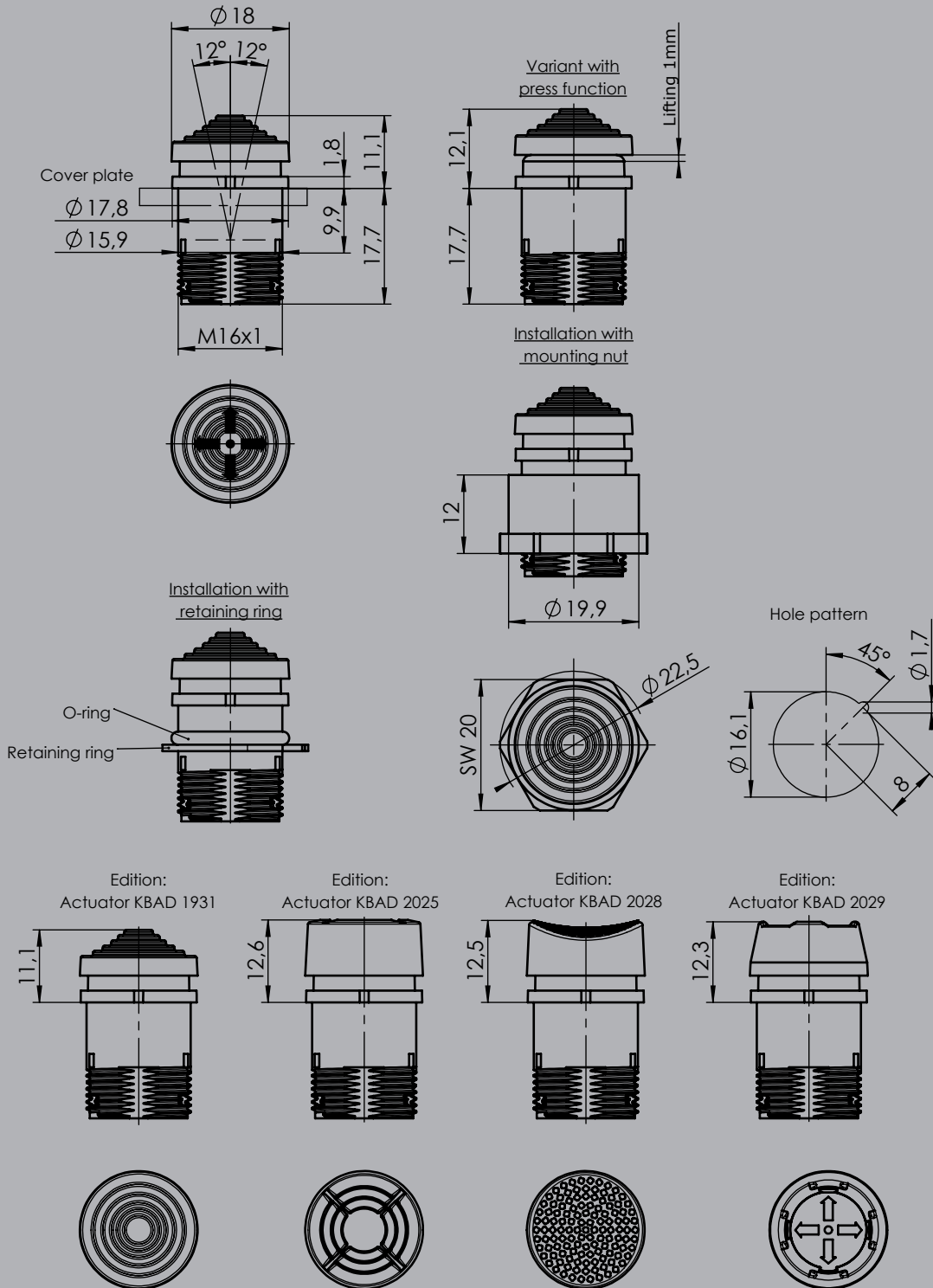
Technical data

| | |
|-----------------------|----------------------------|
| Mechanical life HK1 | 1 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP67 (electronic) |



| | | Example | -D | -1 | -1 | -0 | -E1031 | -X |
|---------------------------------------|---|---------|----|----|----|----|--------|----|
| | | HK1 | | | | | | |
| Basic unit | | | | | | | | |
| HK1 | Hall-Cross Switch | | | | | | | |
| Additional function | | | | | | | | |
| D | Push button | | | | | | | |
| Knob | | | | | | | | |
| 1 | KBAD 1931 (Mountain Style) | | | | | | | |
| 2 | KBAD 2025 (Stadium Style) | | | | | | | |
| 3 | KBAD 2028 (Concave Style) | | | | | | | |
| 4 | KBAD 2029 (Tower Style) | | | | | | | |
| Knob colour | | | | | | | | |
| 1 | black (only with actuator 1, 3, 4 possible!) | | | | | | | |
| 2 | grey (only with actuator 2 possible!) | | | | | | | |
| Incon coloured cap insert | | | | | | | | |
| 0 | without icon coloured cap insert | | | | | | | |
| 1 | white transparent* (printing on the reserve side possible, this makes the imprint abrasion resistant!) | | | | | | | |
| 2 | white* | | | | | | | |
| 3 | yellow* | | | | | | | |
| 4 | green* | | | | | | | |
| 5 | blue* | | | | | | | |
| 6 | black* | | | | | | | |
| 7 | red* | | | | | | | |
| 8 | orange* | | | | | | | |
| <i>Only with actuator 4 possible!</i> | | | | | | | | |

| | HK1 | -D | -1 | -1 | -0 | -E1031 | -X |
|---|------------------------------|----|----|----|--------|--------|---------------------------|
| Interface | | | | | | | |
| Digital output | | | | | | | |
| 2 direction signal per axis | | | | | | | |
| | | | | | E004 | 1 | |
| | | | | | | 2 | |
| Voltage output | | | | | | | |
| 0,5...2,5...4,5 V redundant at Ub = 5 V | | | | | | | |
| | | | | | E103 1 | | |
| | | | | | | 2 | |
| Characteristics: | | | | | | | |
| | | | | | | | Inverse dual (standard) 1 |
| | | | | | | | Dual 2 |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |



The Thumbwheel S12 is designed for electro-hydraulic applications. Long life and high reliability is ensured by the latest contactless hall-technology. By the combination of different actuators, lighting options and colours you can customise the appearance.

Technical data

| | |
|-----------------------|--|
| Mechanical life S12 | 5 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | S12 | Example - A | - 2 | - 1 | - 1 | -E1031 | -X |
|--|-----|----------------|------|-----|-----|--------|----|
| Basic unit | | | | | | | |
| S12 Thumbwheel S12 | | | | | | | |
| S12B Thumbwheel S12 with actuator version B | | | | | | | |
| S12C Thumbwheel S12 with actuator version C | | | | | | | |
| Mounting frame | | | | | | | |
| A with mounting frame | | | | | | | |
| without mounting frame | | | | | | | |
| Illumination | | | | | | | |
| 1 Unlighted | | | | | | | |
| 2 Functional lighting 2-colour red-green (separate switchable) U_LED= 4,5 - 5,5 V* | | | | | | | |
| 3 Functional lighting 2-colour white-red (separate switchable) U_LED= 4,5 - 5,5 V* | | | | | | | |
| 4 Functional lighting 2-colour white-green (separate switchable) U_LED= 4,5 - 5,5 V* | | | | | | | |
| <i>*not possible with S12B and S12C!</i> | | | | | | | |
| Actuator colour | | | | | | | |
| | S12 | S12B | S12C | | | | |
| 1 Black | √ | √ | √ | | | | |
| 2 Grey | √ | | | | | | |
| 3 Blue | √ | | | | | | |
| 4 Red | √ | | √ | | | | |
| 5 Yellow | √ | | | | | | |
| 6 Orange | √ | | | | | | |
| 7 Green | √ | | | | | | |

S12 - A - 2 - 1 -1 -E1031 -X

Mechanical function

- 1 T-0-T
- 2 R-0-R*¹
- 3 T-0-R*¹
- 4 R-0-T*¹
- 5 R-R*¹
- 6 R-R-0-R-R*

*not possible with S12B and S12C!

*¹ not possible with S12B!

Interface

0,5...2,5...4,5 V redundant by Ub= 5 V

1 axis

E103 1

0,5...2,5...4,5 V redundant + 2 direction signals by Ub= 5 V

1 axis

E104 1

Output option inverse dual

1

Output option dual

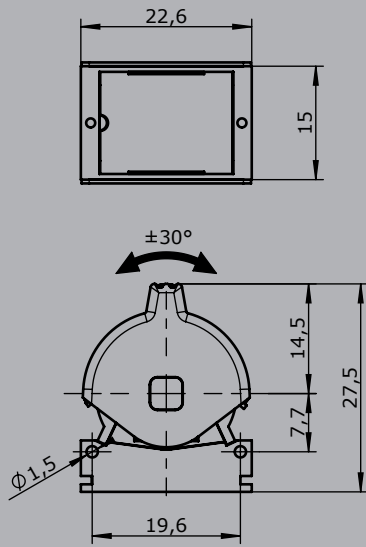
2

SPI - Interface on request

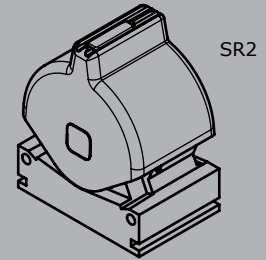
Special model

X Special / customer specified

S12 without mounting frame
Version A

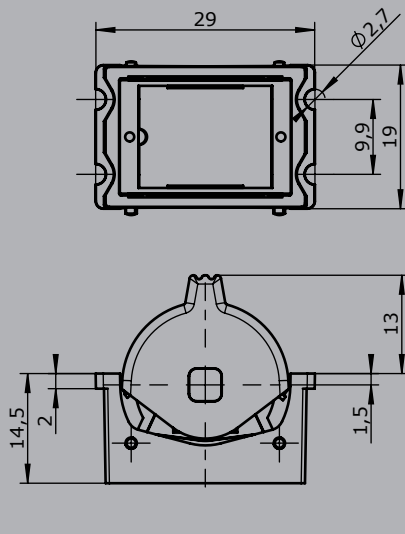


S12 with LED
SR1

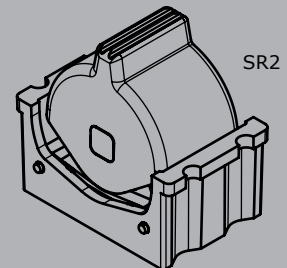


SR2

S12 with mounting frame
Version A

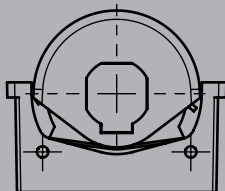


S12 without LED
SR1

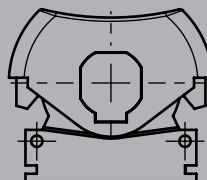


SR2

Version B
with actuator KBAD 1731



Version C
with actuator KBAD 1858



The Thumbwheel S16 is designed for electro-hydraulic applications. The S16 can be optimally used with the scroll and push function as a selection device for displays.

Technical data

| | |
|-----------------------|--|
| Mechanical life S16 | 5 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

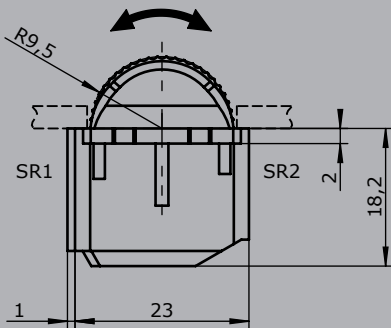


Example

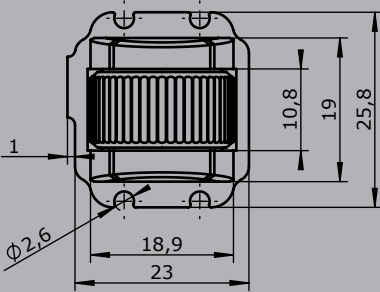
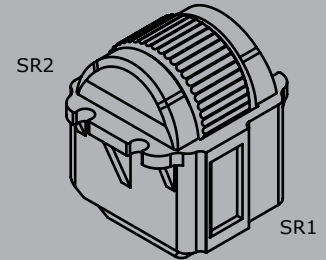
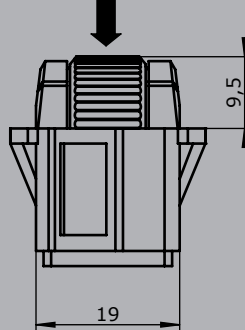
| | S16 | -D | -2 | -2 | -E10311 | -X |
|--|------------------------------|----|----------------------------|----|---------|----|
| Basic unit | | | | | | |
| S16 | Thumbwheel S16 | | | | | |
| Additional function | | | | | | |
| D | Push function | | | | | |
| Mounting direction | | | | | | |
| 1 | vertical | | | | | |
| 2 | horizontal | | | | | |
| Actuator colour | | | | | | |
| 1 | black | | | | | |
| 2 | grey | | | | | |
| Interface | | | | | | |
| 0,5...2,5...4,5 V redundant by Ub= 5 V | | | | | | |
| | | | 1 axis | | E103 1 | |
| | | | Output option inverse dual | | | 1 |
| | | | Output option dual | | | 2 |
| SPI - Interface on request | | | | | | |
| Special model | | | | | | |
| X | Special / customer specified | | | | | |

S16 Mounting Position Crosswise

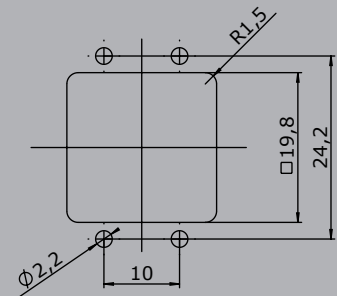
Thumbwheel 360° (18 Steps)



Pushbutton Function

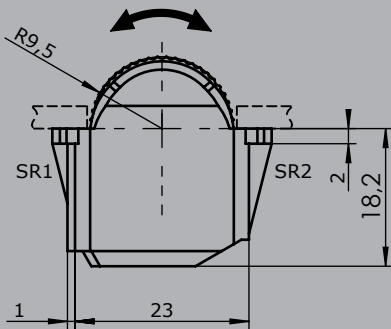


hole pattern and cut out

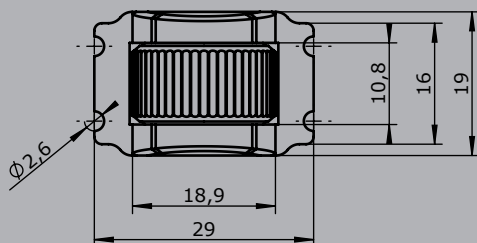
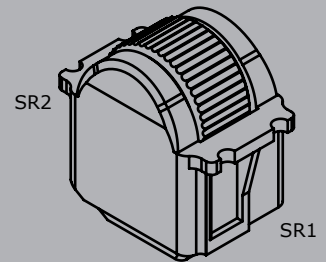
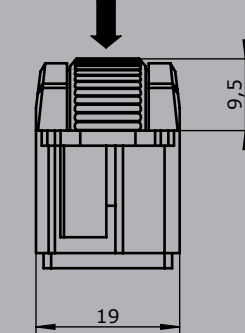


S16 Mounting Position Lengthwise

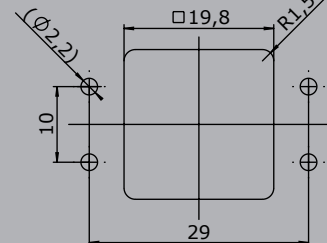
Thumbwheel 360° (18 Steps)



Pushbutton Function



hole pattern and cut out



The Hall-Push Button impressed by its durability and versatility. It is available in five basic versions. By combining different lighting options, colours and symbols, it is possible to customize.

Technical data

| | |
|-----------------------|--|
| Mechanical life | 10 million operating cycles |
| Operation temperature | -40°C til +85°C |
| Degree of protection | IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | | HD1 | -2 | -1 | -1 | -1 | -E0111 | -X |
|---------------------------------|---|-----|----|----|----|----|--------|----|
| Basic unit | | | | | | | | |
| HD1 | Hall-Push Button digital with bellow | | | | | | | |
| HD2 | Hall-Push Button digital without bellow | | | | | | | |
| HD3 | Hall-Push Button digital, flat mounting without bellow | | | | | | | |
| HD4 | Hall-Push Button digital without bellow, actuator convex | | | | | | | |
| HD5 | Hall-Push Button digital, flat mounting without bellow, actuator convex | | | | | | | |
| Illumination | | | | | | | | |
| 1 | Unlighted | | | | | | | |
| 2 | Night light white, U_LED=4,5 - 5,5 V* | | | | | | | |
| 3 | Functional lighting 2-coloured red-green (single shiftable) U_LED=4,5 - 5,5 V* | | | | | | | |
| 4 | Functional lighting 2-coloured red-white (single shiftable) U_LED=4,5 - 5,5 V* | | | | | | | |
| 5 | Functional lighting 2-coloured green-white (single shiftable) U_LED=4,5 - 5,5 V* | | | | | | | |
| *Not possible with HD4 and HD5! | | | | | | | | |
| Actuator colour | | | | | | | | |
| 1 | Transparent | | | | | | | |
| 2 | Black* | | | | | | | |
| 3 | White* | | | | | | | |
| 4 | Yellow* | | | | | | | |
| 5 | Green* | | | | | | | |
| 6 | Blue* | | | | | | | |
| 7 | Red* | | | | | | | |
| 8 | Orange* | | | | | | | |
| 9 | Grey* | | | | | | | |
| *Only possible by HD4 and HD5! | | | | | | | | |
| Icon coloured cap insert | | | | | | | | |
| 0 | Without icon coloured cap insert (only for HD4 and HD5) | | | | | | | |
| 1 | White transparent* (Print on back side possible, thereby the print is resistant to abrasion!) | | | | | | | |
| 2 | White* | | | | | | | |
| 3 | Yellow* | | | | | | | |
| 4 | Green* | | | | | | | |
| 5 | Blue* | | | | | | | |
| 6 | Black* | | | | | | | |
| 7 | Red* | | | | | | | |
| 8 | Orange* | | | | | | | |
| *Not possible with HD4 and HD5! | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

HD1 -2 -1 -1 -1 -E0111 -X

Symbol

- 1 Without
- 2 Buzzer*
- 3 Arrow up*
- 4 Arrow down*
- 5 Turtle*
- 6 Rabbit*
- X Custom-made*

*Only possible by HD1 til HD3!

*More Symbols on request!

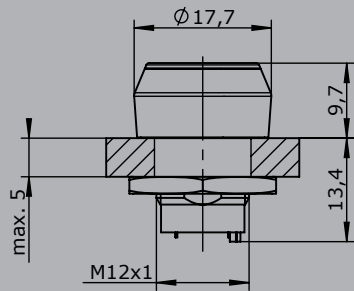
Interface

- E0101 Push button signal not redundant $U_b=4,5 - 5,5$ V DC
- E0111 Push button signal redundant $U_b=4,5 - 5,5$ V DC
- E0201 Push button signal not redundant $U_b=4 - 32$ V DC
- E0211 Push button signal redundant $U_b=4 - 32$ V DC
- 0 Energy safe I (Hall) max. = 3,2 mA (limited)
- 1 Possible for optocoupler and PLC
- 2 Power switch (Open Drain) $I_{Hallmax}= 25$ mA

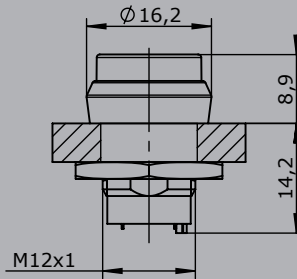
Special model

- X Special / customer specified

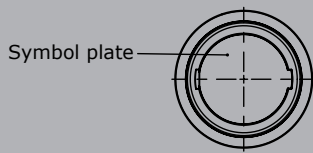
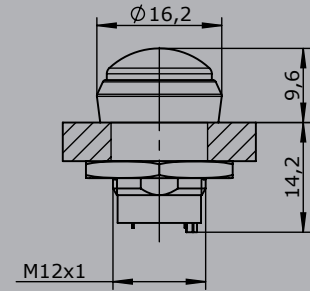
Edition:
HD1



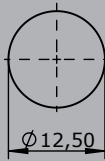
Edition:
HD2



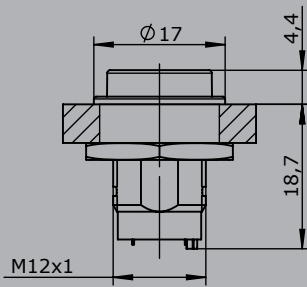
Edition:
HD4



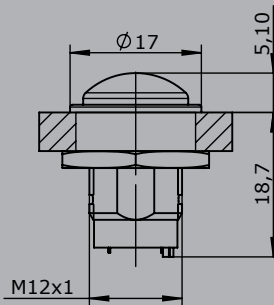
Hole pattern
HD1, HD2, HD4



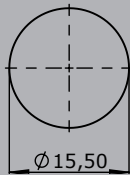
Edition:
HD3



Edition:
HD5



Hole pattern
HD3, HD5





The Palm Grip B35 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC 13 (*1 0,1A 24 V DC13) |

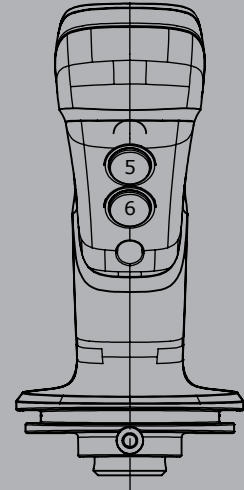
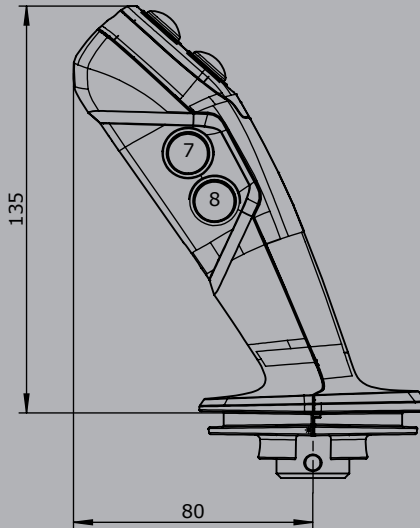
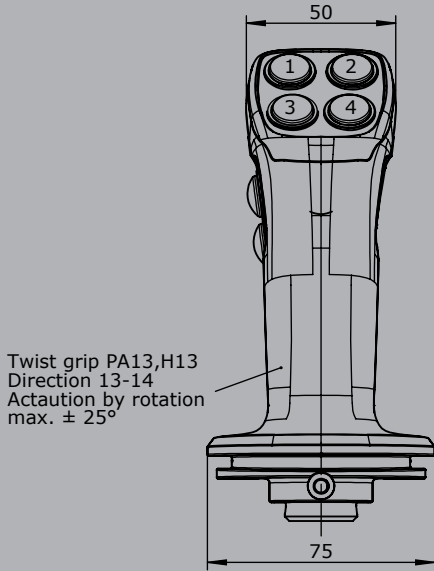


| | B35 | -2D | W | K | SE | S12 | H13 | -X |
|--|-----|-----|---|---|----|-----|-----|----|
| Basic unit | | | | | | | | |
| B35 Palm Grip | | | | | | | | |
| Digital actuating element | | | | | | | | |
| D Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | | | | | |
| HD Hall-Push Button (see page 151) | | | | | | | | |
| W Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | | | |
| K Lever switch | | | | | | | | |
| SE Sensor Button capacitive with external control electronics | | | | | | | | |
| S Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | | | |
| V Vibration | | | | | | | | |
| Analog actuating element | | | | | | | | |
| S12 Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | | | |
| S16 Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | | | |
| V21 Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | | | |
| HK Hall-Cross Switch (see page 143) | | | | | | | | |
| H13 Hall-Rotary Grip, output 0,5...2,5...4,5 V inverse dual | | | | | | | | |
| Special model | | | | | | | | |
| X Special / customer specified | | | | | | | | |

B35R

Hall push button installed Pos. 1 - 4
Hall push button installed Pos. 7 - 8

Hall push button installed Pos. 5 - 6

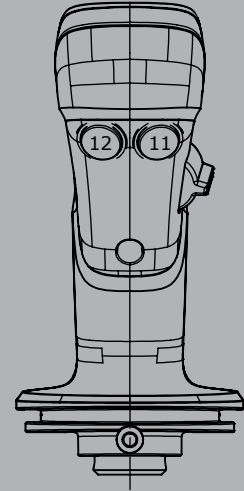
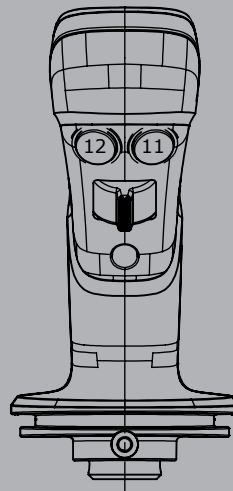
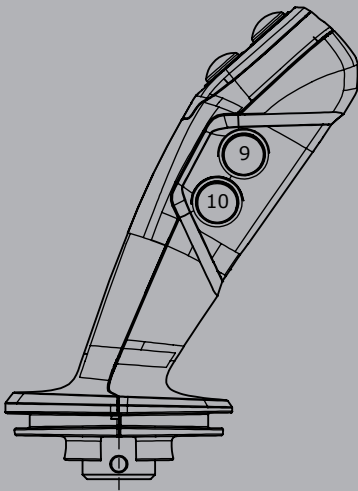


B35L

Hall push button installed Pos. 1 - 4
Hall push button installed Pos. 9 - 10

Hall push button installed Pos. 11 - 12
Rocker switch installed Pos. 6

Hall push button installed Pos. 11 - 12
Rocker switch can be installed on the side

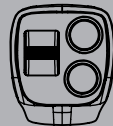
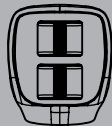


Edition: B35
Rocker switch installed Pos. 1+3
Rocker switch installed Pos. 2+4

Edition: B35
Rocker switch installed Pos. 1+2
Rocker switch installed Pos. 3+4

Edition: B35
Rocker switch installed Pos. 1+3
Hall push button installed Pos. 2+4

Edition: B35
Rocker switch installed Pos. 1+2
Hall push button installed Pos. 3+4



Palm Grip B34



The Palm Grip B34 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

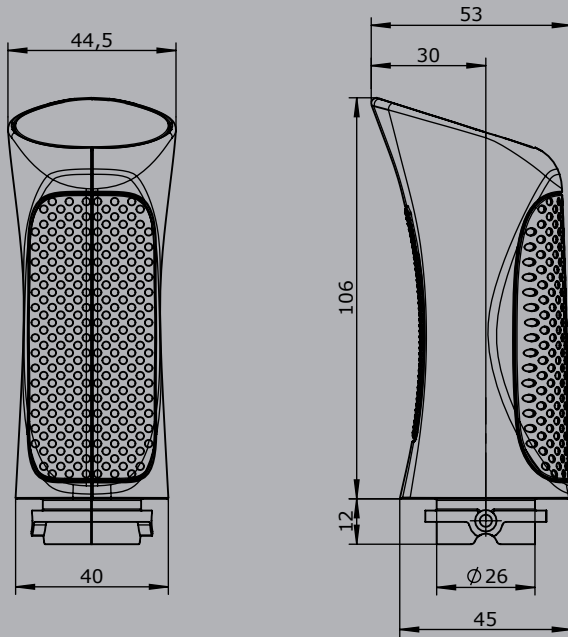


Technische Daten

| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC 13 (*1 0,1A 24 V DC13) |

| | B34L | Example -2D | W | S12 | -X |
|-----------------------------------|---|----------------|---|-----|----|
| Basic unit | | | | | |
| B34L | Palm Grip left | | | | |
| B34R | Palm Grip right | | | | |
| Digitale actuating element | | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | |
| HD | Hall-Push Button (see page 151) | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | |
| K | Lever switch | | | | |
| Analog actuating element | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |

B34

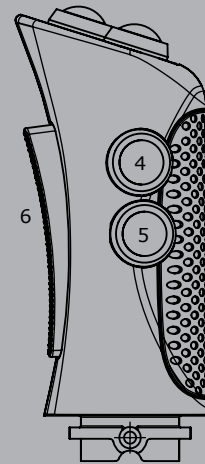
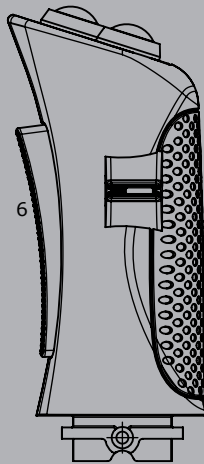
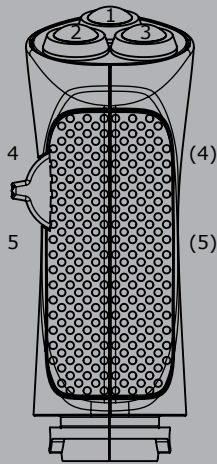


Edition:

- Push button installed Pos. 1-3
- Rocker switch installed Pos. 4-5
- Lever switch installed Pos. 6
- Position rocker switch or push button left hand ()

Edition:

- Push button installed Pos. 1-3,4,5
- Lever switch installed Pos. 6



Palm Grip B33



The Palm Grip B33 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

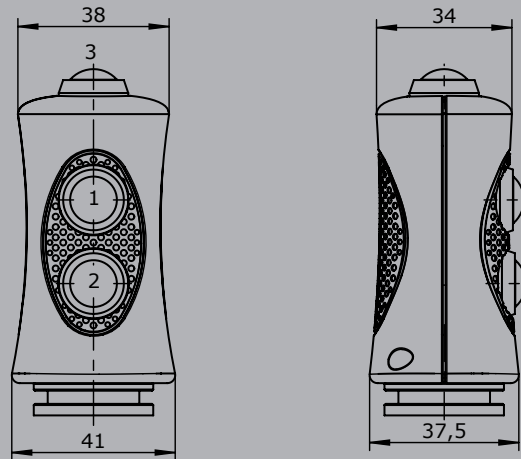
| | |
|-----------------------|----------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | *1 0,1A 24 V DC13 |



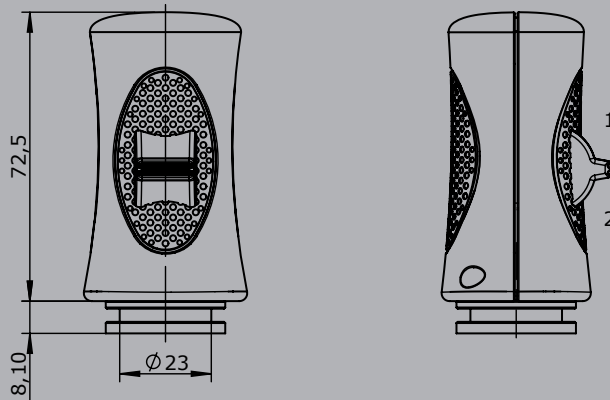
| | B33L | Example -2D | S12 | -X |
|--|------|----------------|-----|----|
| Basic unit | | | | |
| B33L Palm Grip left | | | | |
| B33R Palm Grip right | | | | |
| Digitale actuating element | | | | |
| D Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | |
| HD Hall-Push Button (see page 151) | | | | |
| Analog actuating element | | | | |
| S12 Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | |
| S16 Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | |
| Special model | | | | |
| X Special / customer specified | | | | |

B33

Edition:
Push button installed Pos. 1,2,3



Edition:
Rocker switch installed Pos. 1+2



Palm Grip B32



The Palm Grip B32 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

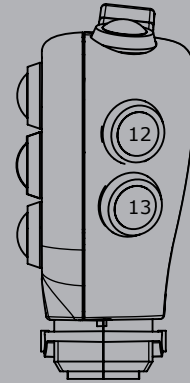
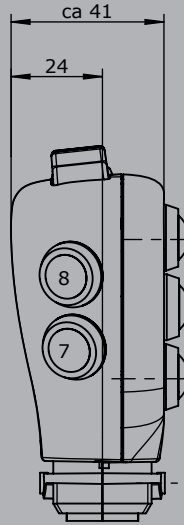
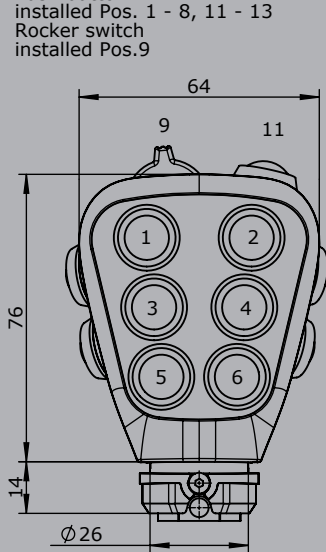
| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC 13 (*1 0,1A 24 V DC13) |



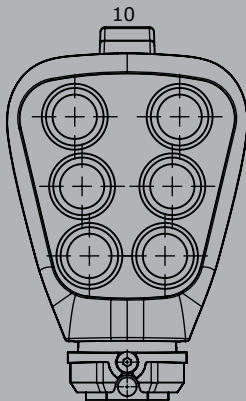
| | | Example | | | | | |
|-----------------------------------|--|---------|-----|---|----|-----|----|
| | | B32L | -2D | W | SE | S12 | -X |
| Basic unit | | | | | | | |
| B32L | Palm Grip left | | | | | | |
| B32R | Palm Grip right | | | | | | |
| Digitale actuating element | | | | | | | |
| D | Push Button KDA21 * ¹ Colour: red, black, yellow, green, blue, white, orange | | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | |
| Analog actuating element | | | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |

B32

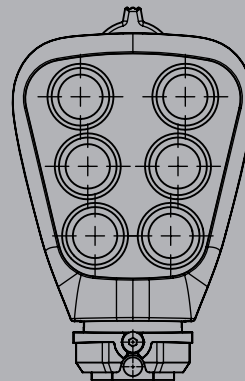
Push button
installed Pos. 1 - 8, 11 - 13
Rocker switch
installed Pos.9



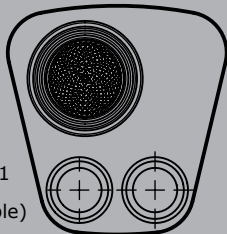
Push button
installed Pos. 1 - 8, 12 + 13
Rocker switch lengthwise
installed Pos. 10



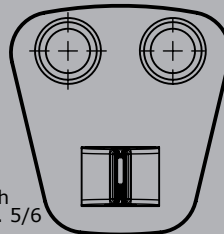
Rocker switch crosswise
installed Pos. 10



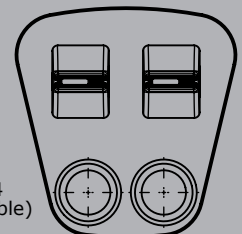
Edition:
Multi-axis controller V21
installed Pos. 1/3
(Pos. 9 - 11 not available)



Edition:
Rocker switch
installed Pos. 5/6



Edition:
Rocker switch
installed Pos.1/3 + 2/4
(Pos. 9 - 11 not available)



Palm Grip B31



The Palm Grip B31 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long).

Technical data

| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |



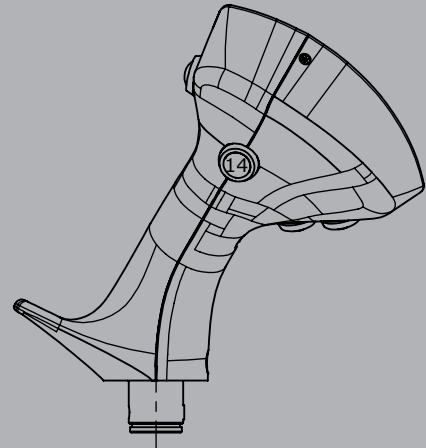
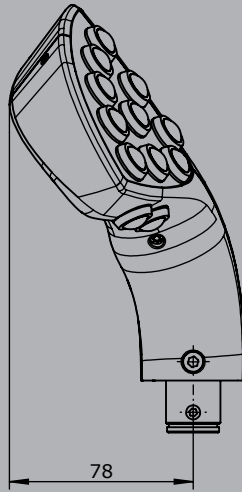
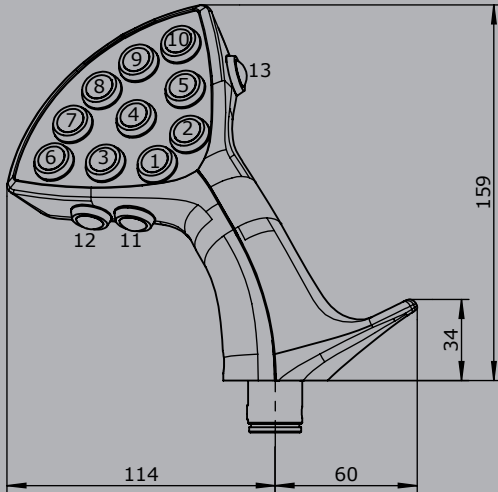
| | | Example | | | | | | |
|----------------------------------|---|---------|-----|---|----|-----|-----|----|
| | | B31R | -2D | W | HK | S12 | V21 | -X |
| Basic unit | | | | | | | | |
| B31L | Palm Grip left | | | | | | | |
| B31R | Palm Grip right | | | | | | | |
| Digital actuating element | | | | | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | | |
| Analog actuating element | | | | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | | | | |

| CAN | |
|---------------------------------|--|
| Supply voltage | 9-32 V DC |
| Idle current consumption | 80 mA (24 V DC) |
| Current carrying capacity | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LED's) |
| Protocol | CANopen CiA DS 301, SAE J1939 (based on) or CANopen Safety EN50325-5 |
| Baud rate | 20 kBit/s to 1 Mbit/s (standard 250 kBit/s) |
| CAN | |
| - 5 analog joystick axis | E313 1 |
| - 24 digital joystick functions | |
| Additional with 16 LED-outputs | 2 |
| CANopen Safety | |
| - 5 analog joystick axis | E412 1 |
| - 24 digital joystick functions | |
| Additional with 16 LED-outputs | 2 |
| Special model | |
| X | Special / customer specified |

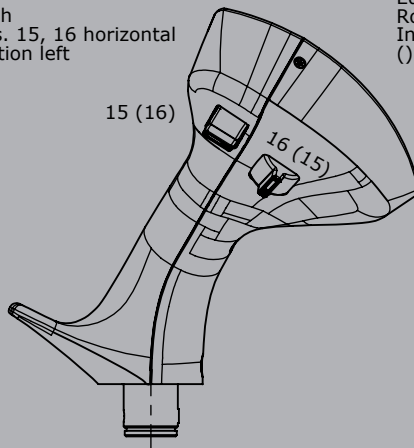
Technical details may vary based on configuration or application! Technical data subject to change without notice!

B31R

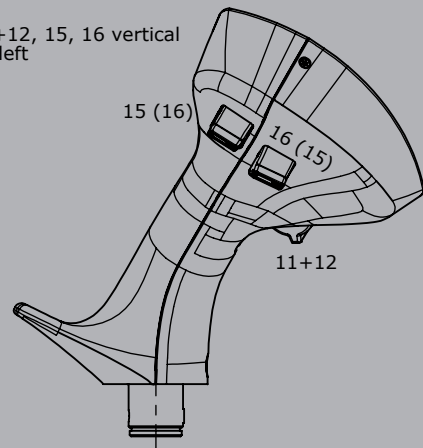
Edition:
Push button installed Pos. 1-14



Edition:
Rocker switch
Installed Pos. 15, 16 horizontal
() = Installation left

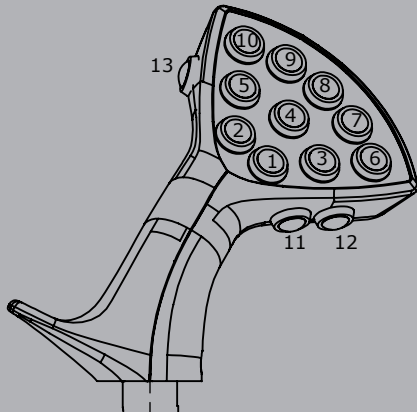


Edition:
Rocker switch
Installed Pos. 11+12, 15, 16 vertical
() = Installation left

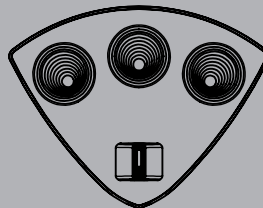


B31L

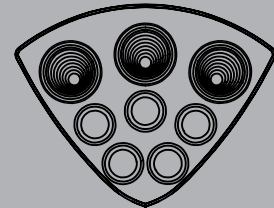
Edition:
Push button installed Pos. 1-14



Edition:
Multi-axis controller V21
Installed Pos. 6+7, Pos.8, Pos. 9+10
Rocker switch installed Pos. 1+2



Edition:
Multi-axis controller V21
Installed Pos. 6+7, Pos.8, Pos. 9+10
Push button installed Pos. 1-5





The Palm Grip B30 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

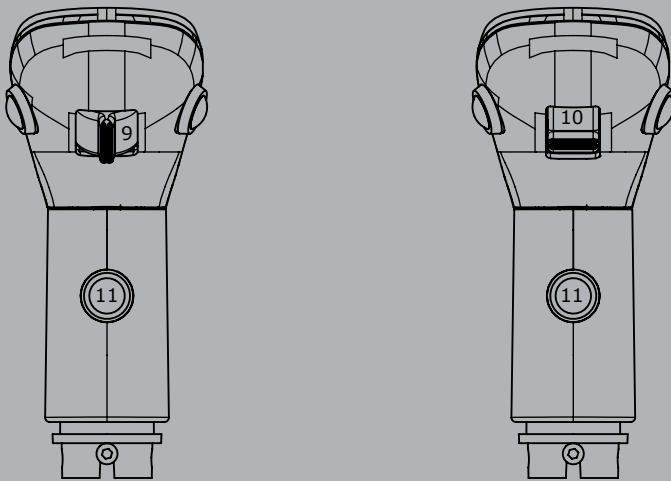
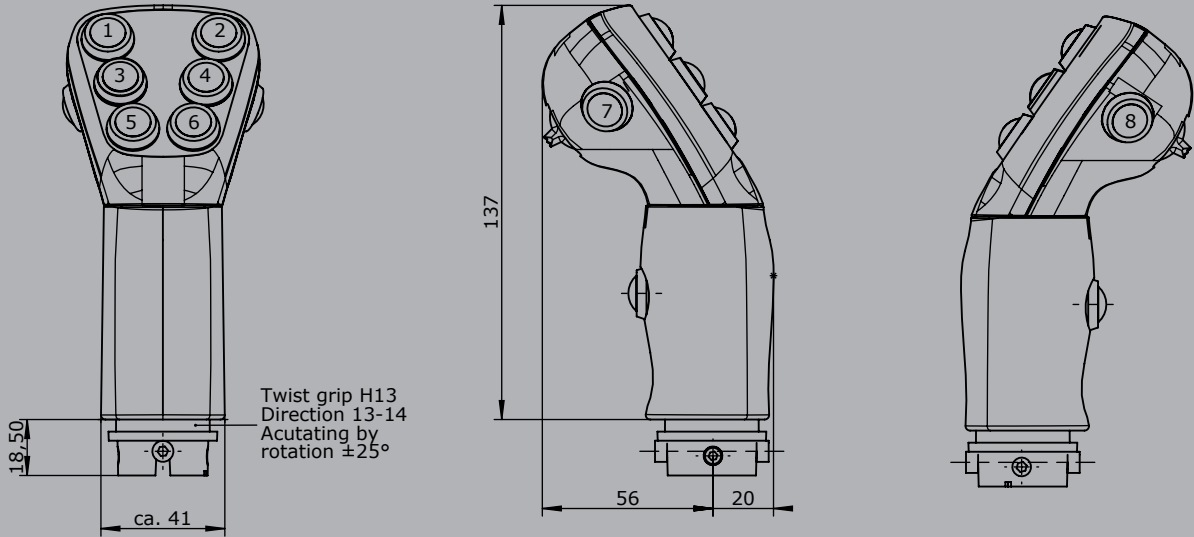
| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC 13 (*1 0,1A 24 V DC13) |



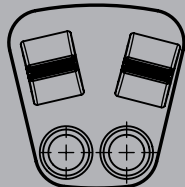
| | | B30 | -2D | W | SR | SE | S12 | H13 | -X |
|----------------------------------|--|-----|-----|---|----|----|-----|-----|----|
| Basic unit | | | | | | | | | |
| B30 | Palm Grip | | | | | | | | |
| Digital actuating element | | | | | | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | | | |
| SR | Sliding switch R-O-R | | | | | | | | |
| ST | Sliding switch T-0-T | | | | | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | | | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | | | |
| Analog actuating element | | | | | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | | | | | |
| H13 | Hall-Rotary Grip Output 0,5...2,5...4,5 V inverse dual | | | | | | | | |
| Special model | | | | | | | | | |
| X | Special / customer specified | | | | | | | | |

B30

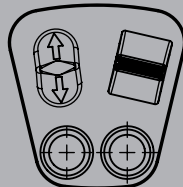
Push button
installed Pos. 1 - 8 +11
Rocker switch
installed Pos. 9+10



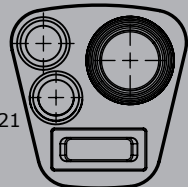
Edition:
installed Pos. 3+1
Rocker switch
installed Pos. 2+4
Rocker switch



Edition:
installed Pos. 3+1
Sliding switch
installed Pos. 2+4
Rocker switch



Edition:
installed Pos. 2+4
Multi-axis controller V21
installed Pos. 5+6
Rocker switch



Palm Grip B29



The Palm Grip B29 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

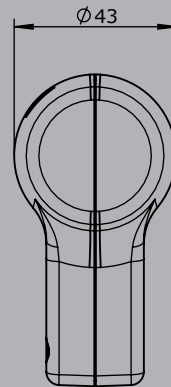
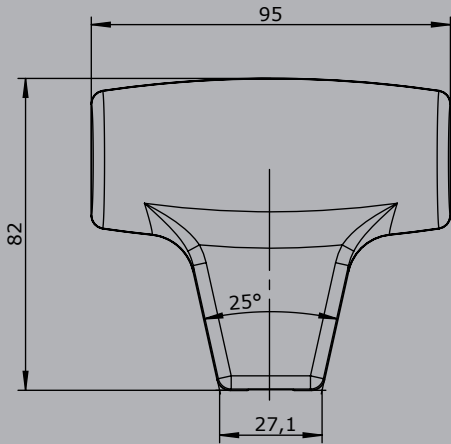
Technical data

| | |
|-----------------------|----------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 0,1A 24 V DC13 |

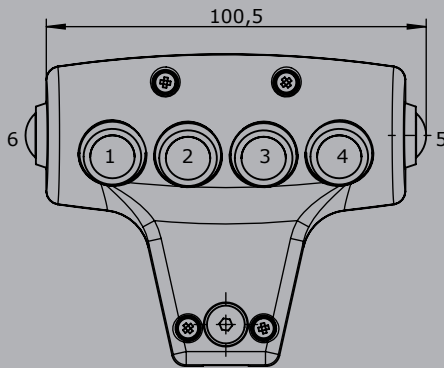


| | Example | | |
|--|---------|-----|----|
| | B29 | -2D | -X |
| Basic unit | | | |
| B29 Palm Grip | | | |
| Digital actuating element | | | |
| D Push Button KDA21 Colour: red, black, yellow, green, blue, white, orange | | | |
| HD Hall-Push Button (see page 151) | | | |
| SE Sensor Button capacitive with external control electronics | | | |
| S Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | |
| Special model | | | |
| X Special / customer specified | | | |

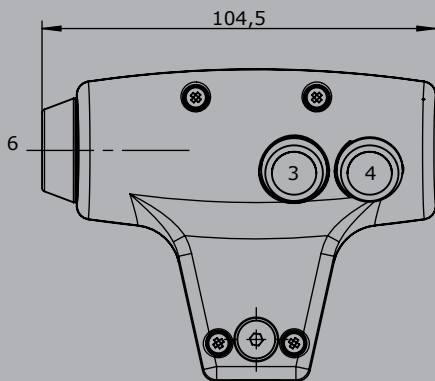
B29



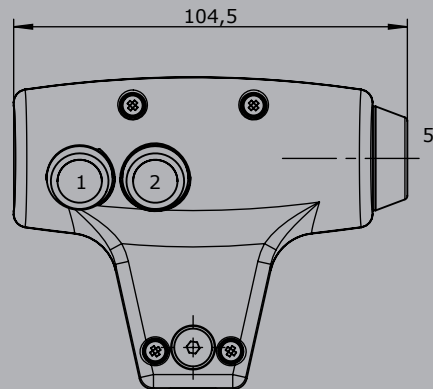
Edition:
Push button installed Pos. 1-6



Edition:
Sensor installed Pos. 6,
Push button installed Pos. 3,4



Edition:
Sensor installed Pos. 5,
Push button installed Pos. 1,2



Palm Grip B28



The Palm Grip B28 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 10 mm (standard).

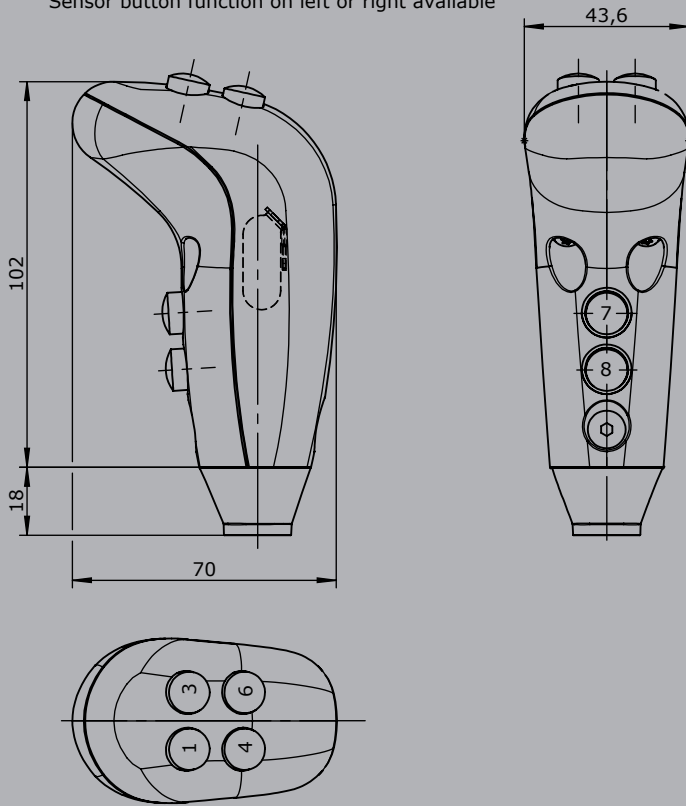
Technical data

Operating temperature -40°C to +85°C
Degree of protection up to IP54

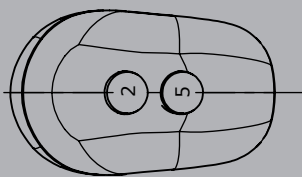


| | | <i>Example</i> | | | |
|----------------------------------|--|----------------|-----|----|----|
| | | B28 | -2D | SE | -X |
| Basic unit | | | | | |
| B28 | Palm Grip | | | | |
| Digital actuating element | | | | | |
| D | Push Button (1,5A 24 V DC13) Colour: red, black, yellow, green, blue, grey | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |

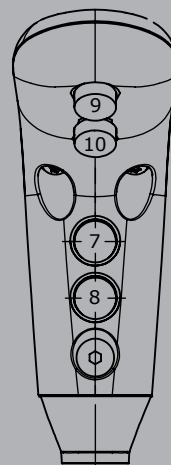
Edition:
Push button installed
Pos. 1,3,4,6,7,8
Sensor button function on left or right available



Edition:
Push button installed
Pos. 2,5,7,8
Sensor button function on left or right available



Edition:
Push button installed
Pos. 7,8,9,10
Sensor button function on left or right available



Palm Grip B26



The Palm Grip B26 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

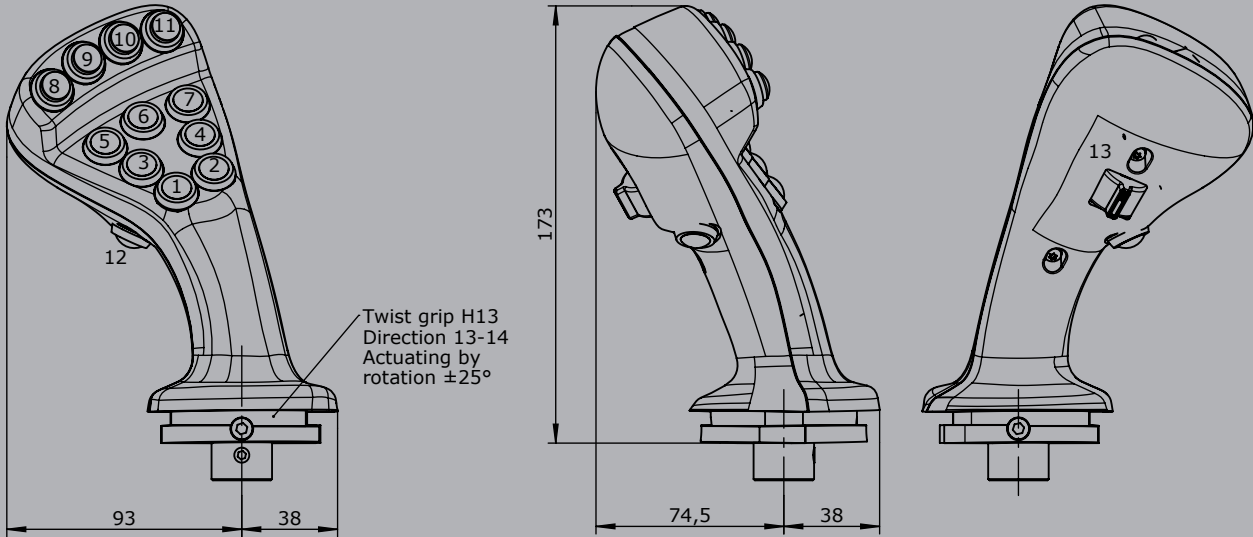
| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC 13 (*1 0,1A 24 V DC13) |



| | B26L | -2D | HD | W | S12 | V21 | H13 | -X |
|----------------------------------|---|-----|----|---|-----|-----|-----|----|
| Basic unit | | | | | | | | |
| B26L | Palm Grip left | | | | | | | |
| B26R | Palm Grip right | | | | | | | |
| Digital actuating element | | | | | | | | |
| D | Push Button KDA21 *1 | | | | | | | |
| | Colour: red, black, yellow, green, blue, white, orange | | | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white | | | | | | | |
| | Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | | |
| SR | Sliding switch R-O-R | | | | | | | |
| ST | Sliding Button T-O-T | | | | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | | | | |
| S | Sensor Button capacitive without external control electronics | | | | | | | |
| | (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | | |
| V | Vibration | | | | | | | |
| Analog actuating element | | | | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | | | | |
| H13 | Hall-Rotary Grip | | | | | | | |
| | Output 0,5...2,5...4,5 V inverse dual | | | | | | | |
| Special model | | | | | | | | |
| X | Special / customer specified | | | | | | | |

B26R

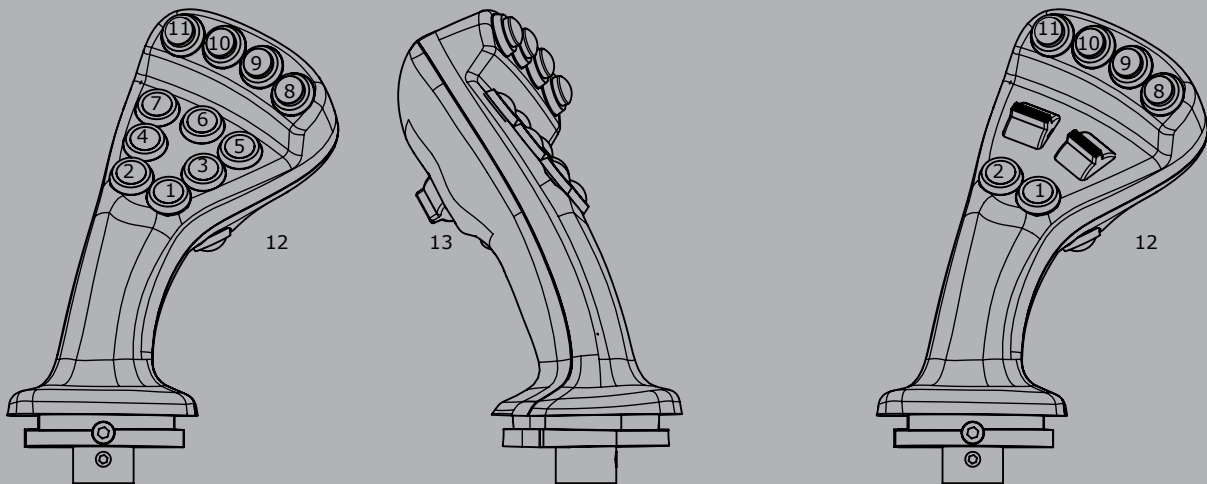
Edition:
Push button installed Pos. 1-12
Rocker switch installed Pos. 13



B26L

Edition:
Push button installed Pos. 1-12
Rocker switch installed Pos. 13

Edition:
Push button installed Pos. 1+2, 8-12
Rocker switch installed Pos. 3+5, 4+7





The Palm Grip B25 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.



Technical data

| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC 13 (*1 0,1A 24 V DC13) |

| | | Example | | | | | | | |
|----------------------------------|--|---------|---------------------------------|---|---|----|-----|--------|----|
| | | B25L | -2D | W | K | SE | V21 | H13 | -X |
| Basic unit | | | | | | | | | |
| B25L | Palm Grip left | | | | | | | | |
| B25R | Palm Grip right | | | | | | | | |
| Digital actuating element | | | | | | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | | | |
| K | Lever switch | | | | | | | | |
| SR | Sliding switch R-O-R | | | | | | | | |
| ST | Sliding switch T-0-T | | | | | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | | | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | | | |
| V | Vibration | | | | | | | | |
| Analog actuating element | | | | | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | | | | | |
| H13 | Hall-Rotary Grip, Output 0,5...2,5...4,5 V inverse dual | | | | | | | | |
| CAN | | | | | | | | | |
| Supply voltage | 9-32 V DC | | | | | | | | |
| Idle current consumption | 80 mA (24 V DC) | | | | | | | | |
| Current carrying capacity | External digital output for LEDs 5 mA - 30 mA (dependent on the number of LEDs) | | | | | | | | |
| Protocol | CANopen CiA DS 301, SAE J1939 (based on) or CANopen Safety EN50325-5 | | | | | | | | |
| Baud rate | 20 kBit/s to 1 Mbit/s (standard 250 kBit/s) | | | | | | | | |
| CAN | | E313 1 | CANopen Safety | | | | | E412 1 | |
| - 5 analog joystick axis | | | - 5 analog joystick axis | | | | | | |
| - 24 digital joystick functions | | | - 24 digital joystick functions | | | | | | |
| Additional with 16 LED-outputs | | 2 | Additional with 16 LED-outputs | | | | | 2 | |
| Special model | | | | | | | | | |
| X | Special / customer specified | | | | | | | | |

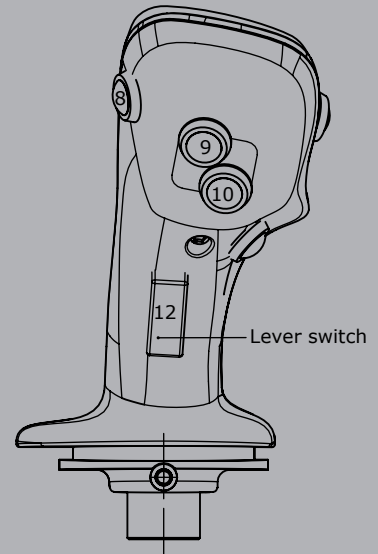
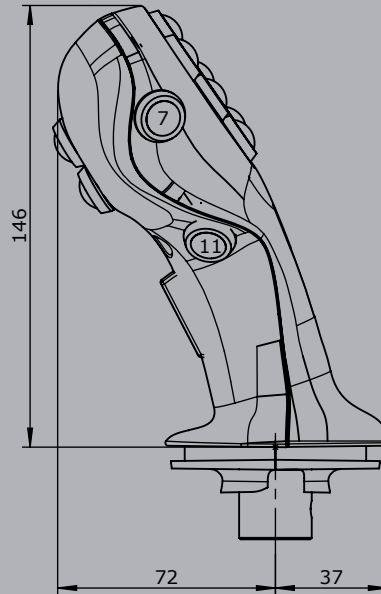
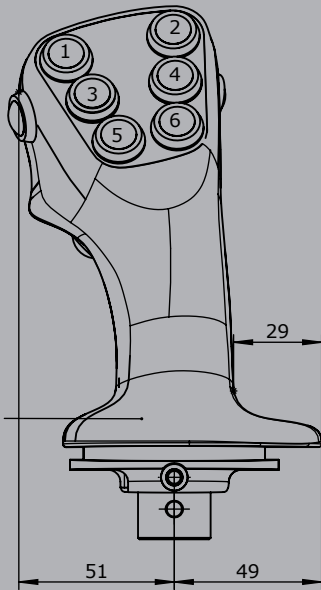
Technical details may vary based on configuration or application! Technical data subject to change without notice!

B25R

Push button installed Pos. 1 - 11
Lever switch installed Pos. 12

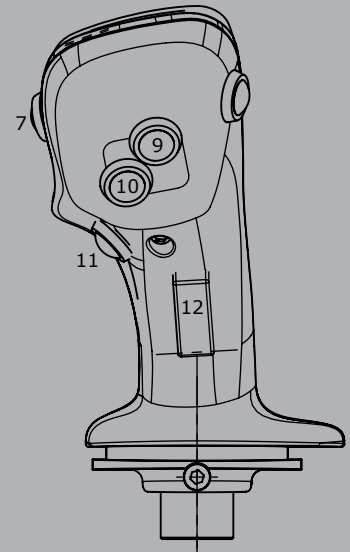
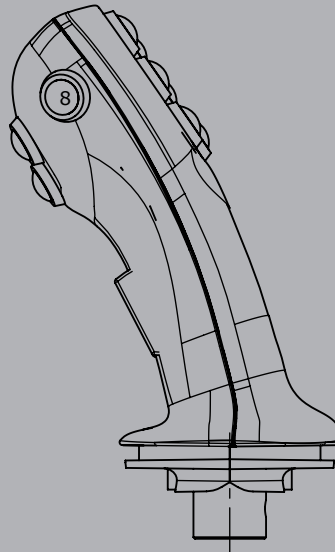
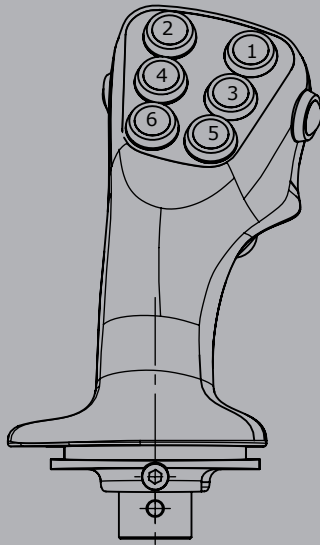
Rocker switch installed Pos. 9+10 possible

Twist grip PA13,H13
Direction 13-14
Actuating by rotation $\pm 25^\circ$



B25L

Push button installed Pos. 1 - 11
Lever switch installed Pos. 12

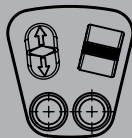


Edition: B25R
Rocker switch installed Pos. 3+1
Rocker switch installed Pos. 2+4

Edition: B25R
Sliding switch installed Pos. 3+1
Rocker switch installed Pos. 2+4

Edition: B25R
Multi-axis controller V21 installed Pos. 2+4
Rocker switch installed Pos. 5+6

Edition: B25R
Hall Push button installed Pos. 1,2,5,6,15
Rocker switch installed Pos. 3,4



Palm Grip B24



The Palm Grip B24 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The superior grip surface is framed by an illuminated coloured ring element. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

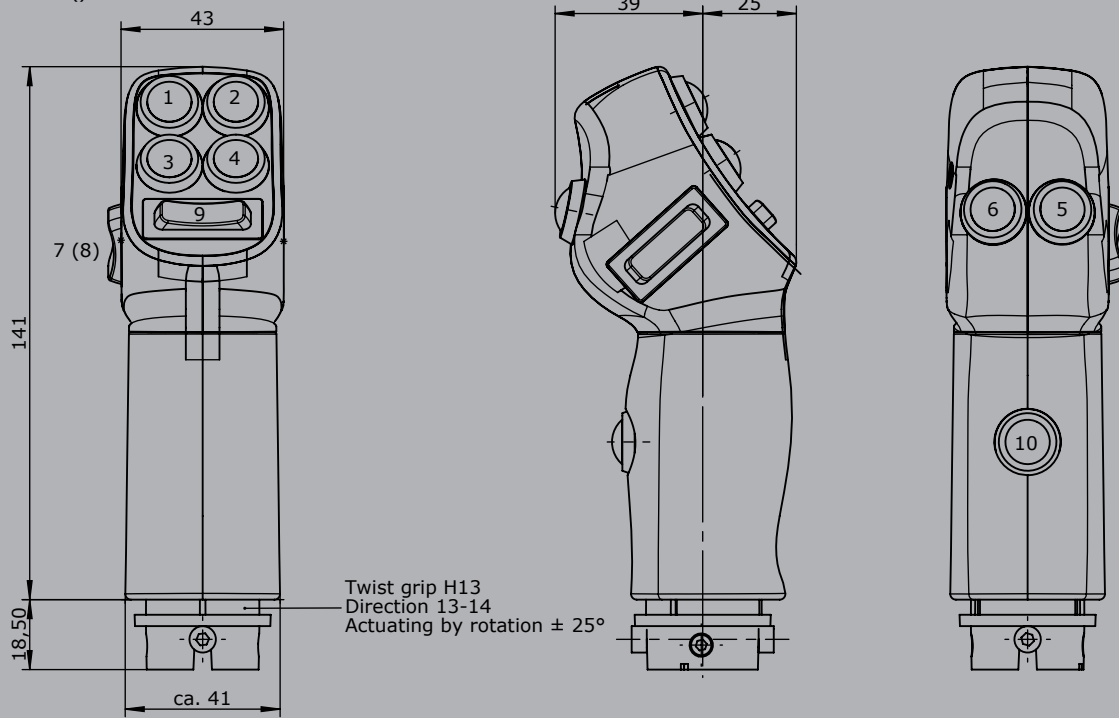


Technical data

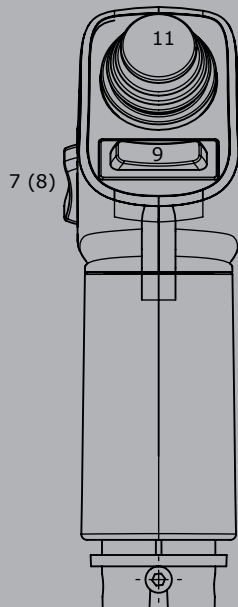
| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |

| | | Example B24 | -D | 2W | V21 | -IWH | -X |
|----------------------------------|--|----------------|----|----|-----|------|----|
| Basic unit | | | | | | | |
| B24 | Palm Grip | | | | | | |
| Digital actuating element | | | | | | | |
| D | Push Button KDA21 *B Colour: red, black, yellow, green, blue, white, orange | | | | | | |
| W | Rocker switch T-0-T | | | | | | |
| W | Rocker switch 0-T | | | | | | |
| W | Rocker switch R-0-T | | | | | | |
| W | Rocker switch R-0-R | | | | | | |
| W | Rocker switch 0-R | | | | | | |
| W | Rocker switch R-R | | | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | |
| Analog actuating element | | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | |
| H13 | Hall-Rotary Grip Output 0,5...2,5...4,5 V inverse dual | | | | | | |
| Additional option | | | | | | | |
| IWH | Colour ring white, illuminated | | | | | | |
| IRD | Colour ring red, illuminated | | | | | | |
| IBL | Colour ring blue, illuminated | | | | | | |
| WH | Colour ring white | | | | | | |
| RD | Colour ring red | | | | | | |
| BL | Colour ring blue | | | | | | |
| GN | Colour ring green | | | | | | |
| YE | Colour ring yellow | | | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |

Edition :
Push button installed Pos. 1 - 6, 10
Rocker switch / taste installed Pos. 7,(8), 9
() left



Edition :
Push button installed Pos. 5,6,10
Rocker switch / taste Pos. 7,(8), 9
multi-axis controller V21 Pos. 11
() left



Palm Grip B23



The Palm Grip B23 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.



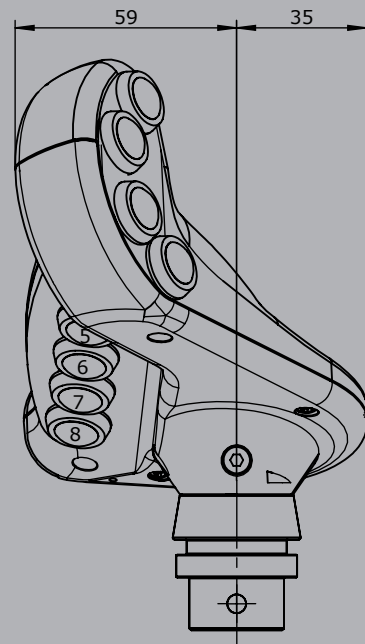
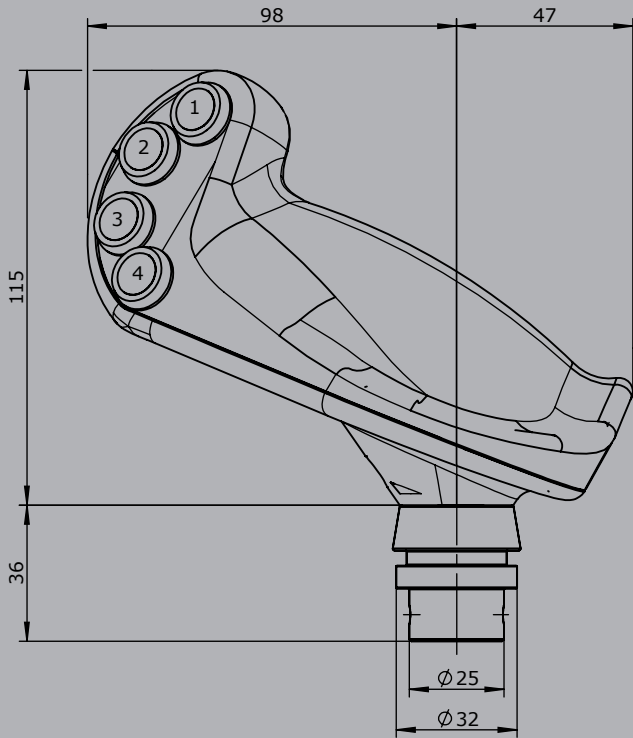
Technical data

| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |

| | B23R | -2D | W | V21 | -X |
|----------------------------------|---|-----|---|-----|----|
| Basic unit | | | | | |
| B23L | Palm Grip left | | | | |
| B23R | Palm Grip right | | | | |
| Digital actuating element | | | | | |
| D | Push Button KDA21 *1 | | | | |
| | Colour: red, black, yellow, green, blue, white, orange | | | | |
| HD | Hall-Push Button (see page 151) | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white | | | | |
| | Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | |
| Analog actuating element | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |

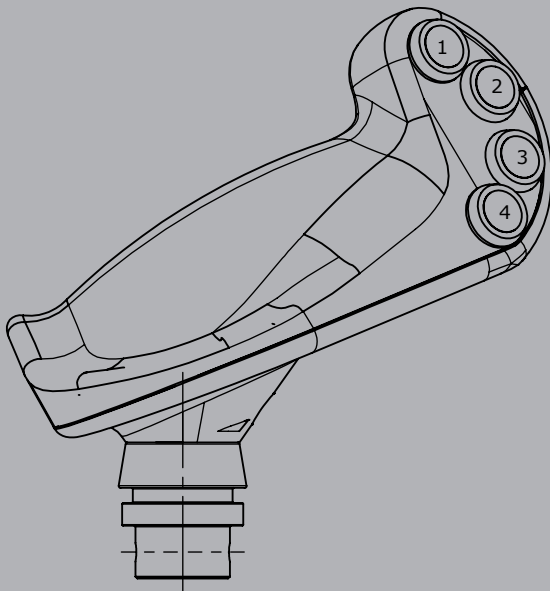
B23R

Push button installed Pos. 1 - 8

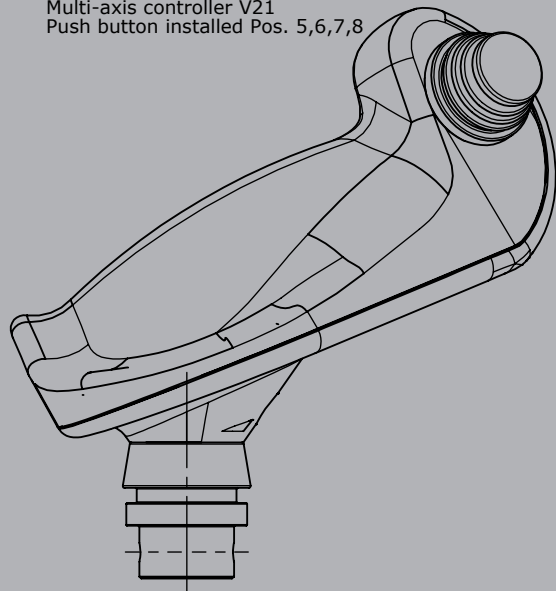


B23L

Push button installed Pos. 1 - 8



Edition :
Multi-axis controller V21
Push button installed Pos. 5,6,7,8



Palm Grip B22



The Palm Grip B22 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 7 mm.

Technical data

| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |

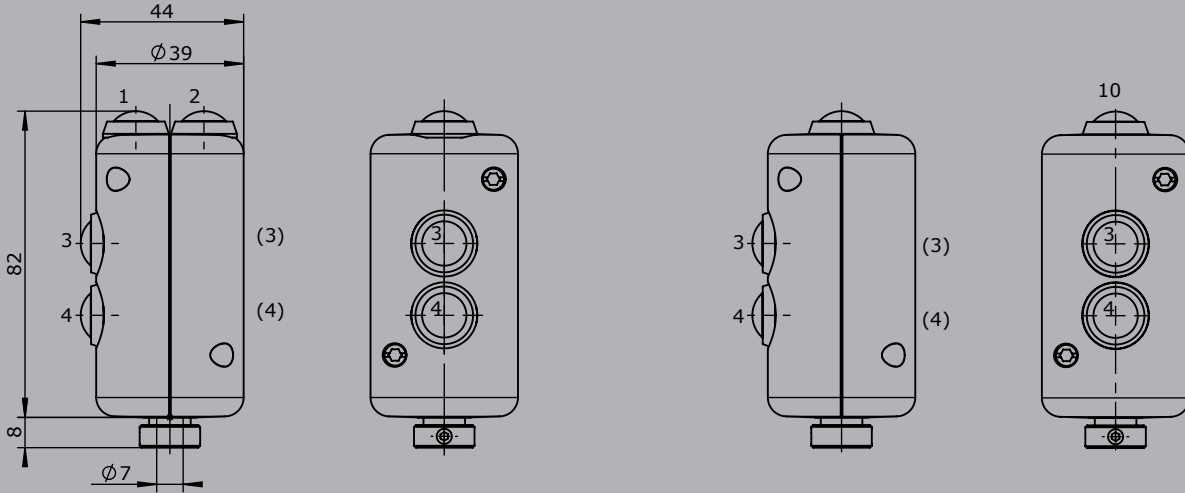


| | B22AL | Example -4D | W | -X |
|----------------------------------|--|----------------|---|----|
| Basic unit | | | | |
| B22L | Palm Grip left | | | |
| B22R | Palm Grip right | | | |
| B22AL | Palm Grip left with support | | | |
| B22AR | Palm Grip right with support | | | |
| Digital actuating element | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | |
| HD | Hall-Push Button (see page 151) | | | |
| W* | Rocker switch T-0-T | | | |
| W* | Rocker switch 0-T | | | |
| W* | Rocker switch R-0-T | | | |
| W* | Rocker switch R-0-R | | | |
| W* | Rocker switch 0-R | | | |
| W* | Rocker switch R-R | | | |
| | <i>*Only possible with version with support!</i> | | | |
| SE | Sensor Button capacitive with external control electronics | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | |
| Special model | | | | |
| X | Special / customer specified | | | |

B22

Edition:
Push button installed Pos. 1,2,3,4
Position push button left hand ()

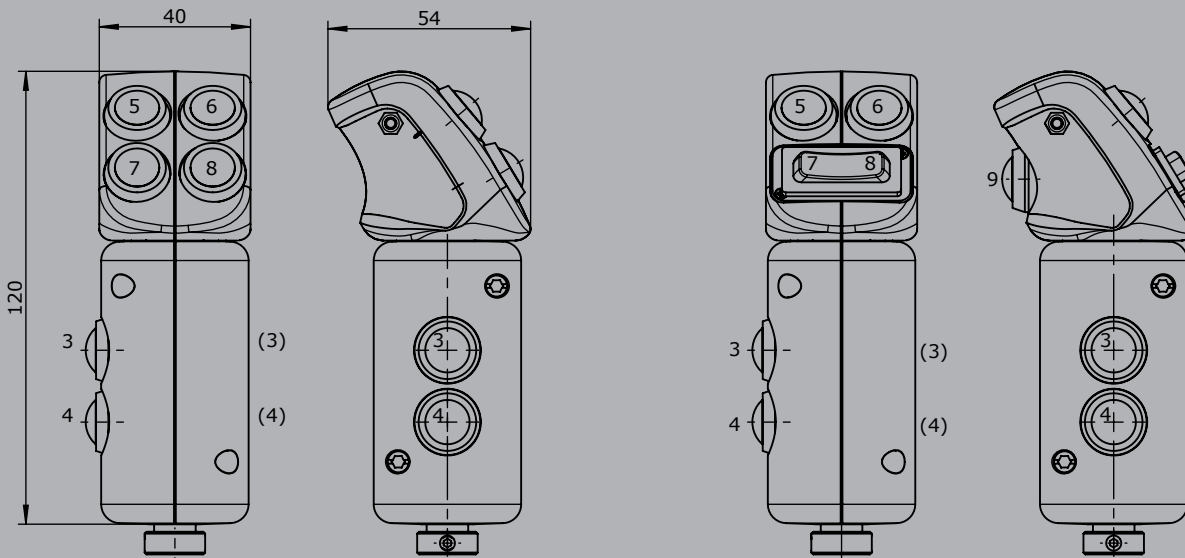
Edition:
Push button installed Pos. 3,4,10
Position push button left hand ()



B22A

Edition:
Push button installed Pos. 3,4,5,6,7,8
Position push button left hand ()

Edition:
Push button installed Pos. 3,4,5,6,9
Rocker switch installed Pos. 7-8
Position push button left hand ()



Palm Grip B20



The Palm Grip B20 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm.

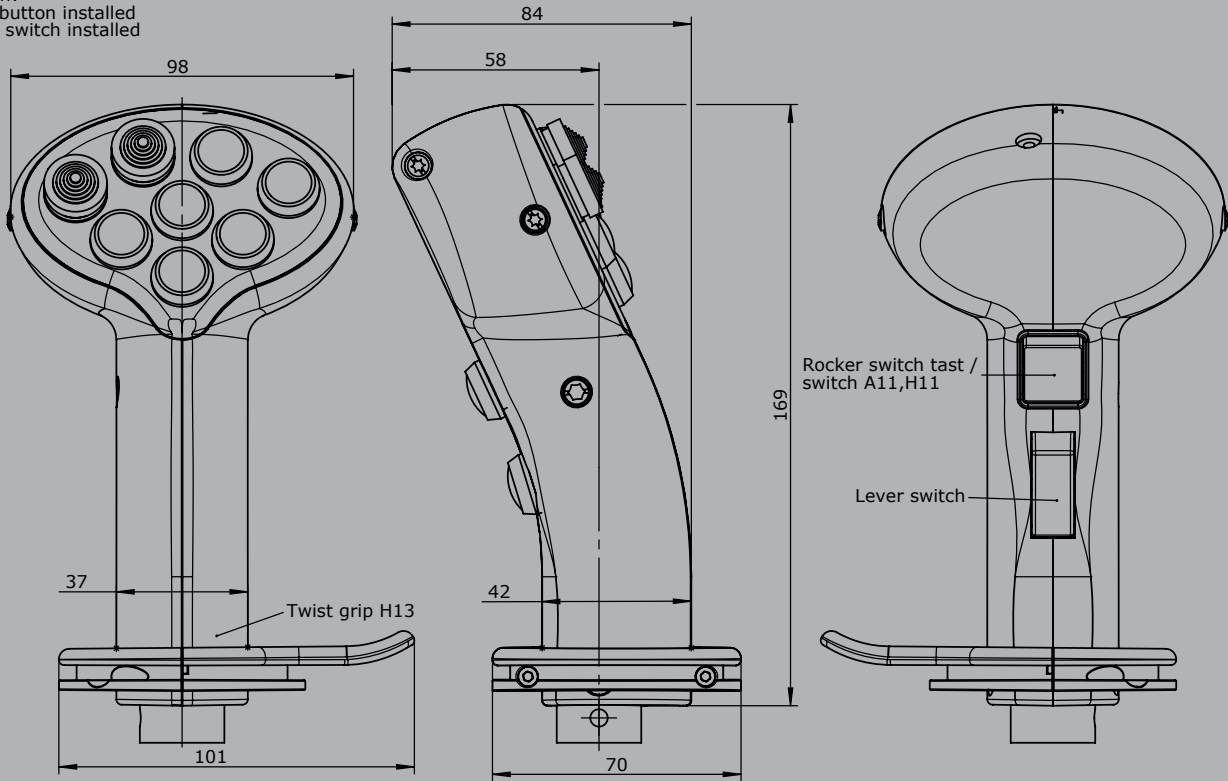
Technical data

| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |

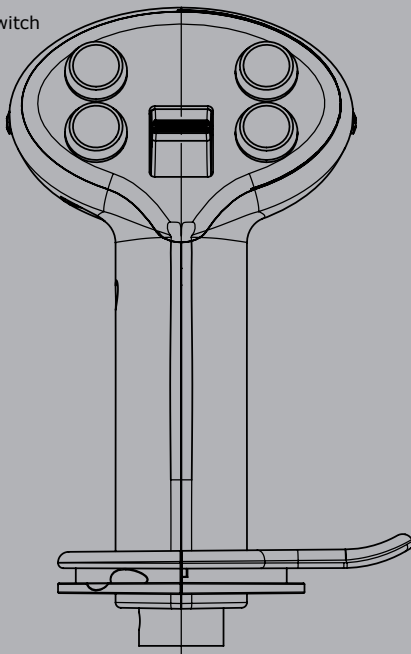


| | Example | | | | | | |
|----------------------------------|---|-----|---|---|------------|-----|----|
| | B20L | -2D | W | K | V21 | H13 | -X |
| Basic unit | | | | | | | |
| B20L | Palm Grip left with hand pad | | | | | | |
| B20R | Palm Grip right with hand pad | | | | | | |
| Digital actuating element | | | | | | | |
| D | Push Button KDA21 *1 | | | | | | |
| | Colour: red, black, yellow, green, blue, white, orange | | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white | | | | | | |
| | Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | |
| K | Lever switch | | | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | | | |
| S | Sensor Button capacitive without external control electronics | | | | | | |
| | (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | |
| Analog actuating element | | | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | | | |
| P9 | Thumbwheel with potentiometer | | | | | | |
| H13 | Hall-Rotary Grip | | | | | | |
| | Output 0,5...2,5...4,5 V inverse dual | | | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |
| Attachments | | | | | | | |
| Z01 | Bellow KMD 109 | | | | 10300009 | | |
| Z02 | Bellow KMD 190 | | | | 10300093 | | |
| Z03 | Rosette KBF 905 with 4 screws M5 x 15 necessary for bellow KMD 190 | | | | 5209900404 | | |

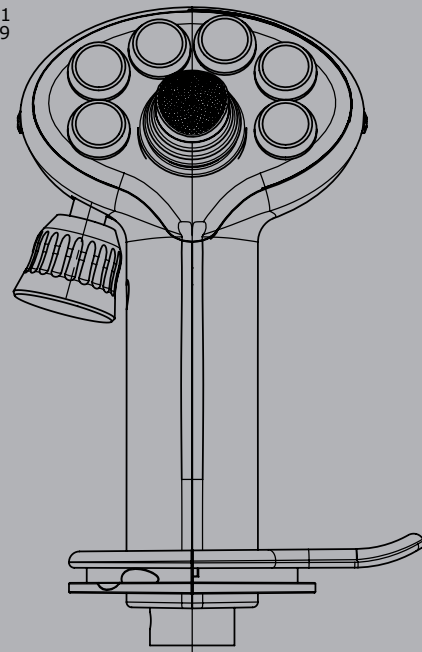
Edition:
Push button installed
Cross switch installed



Edition:
Hall rocker switch
Push button



Edition:
Multi-axis controller V21
Potentiometer drive PA9
Push button



Palm Grip

B14 / B15



The Palm Grip B14/B15 has different equipment options for many requirements. It is compatible with our Multi-axis and Single-axis controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

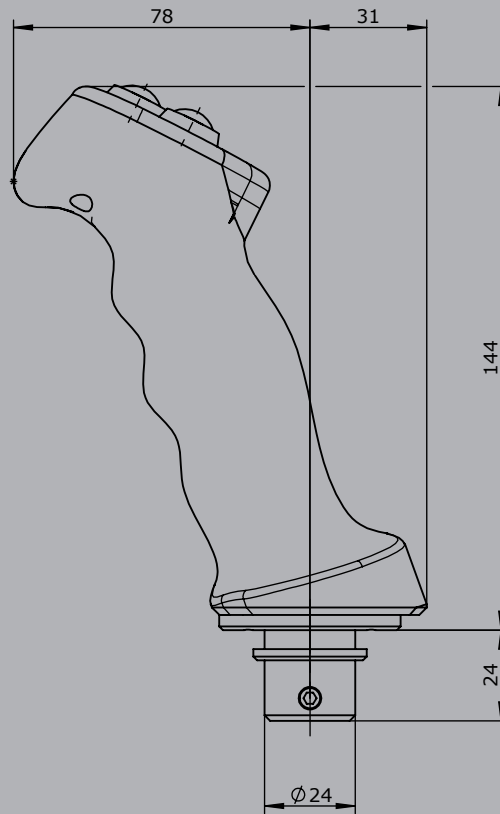
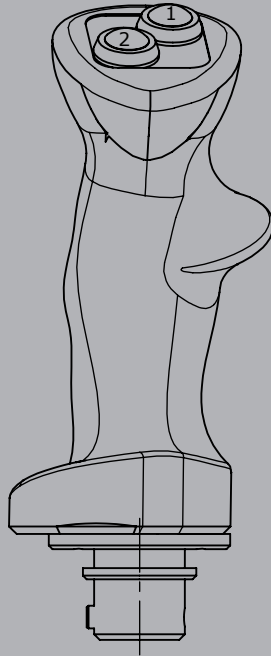
| | |
|-----------------------|----------------------------|
| Operation temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 0,1A 24 V DC13 |



| | B14 | Example -2D | -X |
|--|-----|----------------|----|
| Basic unit | | | |
| B14 Palm Grip left | | | |
| B15 Palm Grip right | | | |
| Digital actuating element | | | |
| D Push Button KDA21 (0,1A 24 V DC13) | | | |
| Colour: red, black, yellow, green, blue, white, orange | | | |
| Special model | | | |
| X Special / customer specified | | | |

B14

Push button installed Pos. 1,2



B15

Push button installed Pos. 1,2



Palm Grip B10



The Palm Grip B10 has different equipment options for many requirements. It is compatible with our Double-handle controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 10 mm.

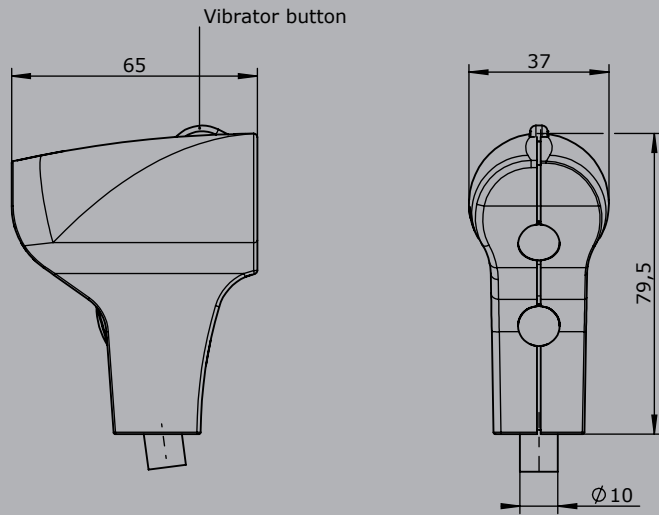
Technical data

| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |



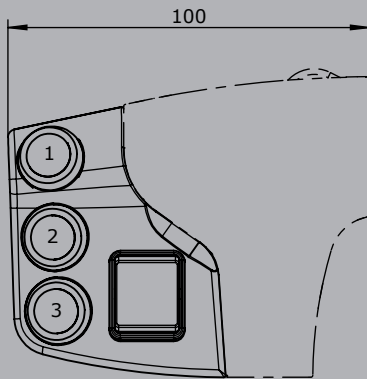
| | | B10AL | -3D | W | V | -X |
|--|--|-------|-----|---|---|----|
| Basic unit | | | | | | |
| B10L | Palm Grip left | | | | | |
| B10R | Palm Grip right | | | | | |
| B10AL | Palm Grip left with growing part | | | | | |
| B10AR | Palm Grip right with growing part | | | | | |
| Digital actuating element | | | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | |
| W* | Rocker switch T-0-T | | | | | |
| W* | Rocker switch 0-T | | | | | |
| W* | Rocker switch R-0-T | | | | | |
| W* | Rocker switch R-0-R | | | | | |
| W* | Rocker switch 0-R | | | | | |
| W* | Rocker switch R-R | | | | | |
| *Only possible with version with attachment! | | | | | | |
| V | Vibration pulse 24V DC ED 100% | | | | | |
| Special model | | | | | | |
| X | Special / customer specified | | | | | |

B10

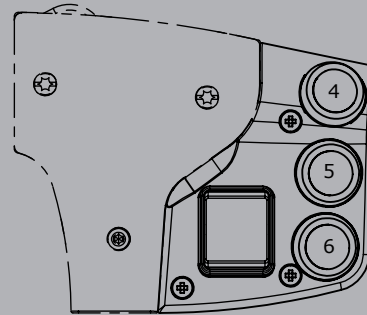


B10A

Edition installed left:
Push button installed Pos. 1,2,3
Rocker switch



Edition installed right:
Push button installed Pos. 4,5,6
Rocker switch





The Palm Grip B9 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.



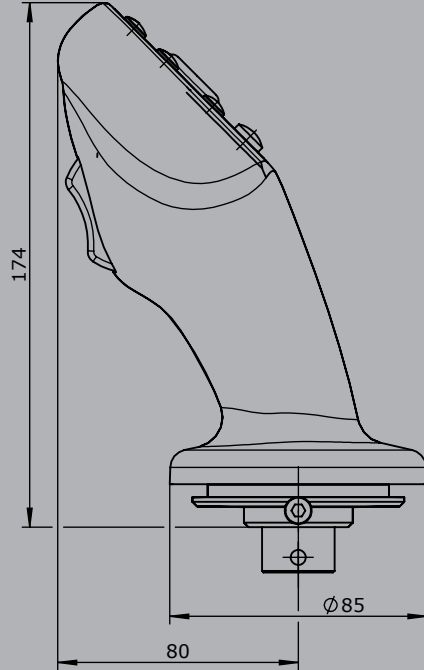
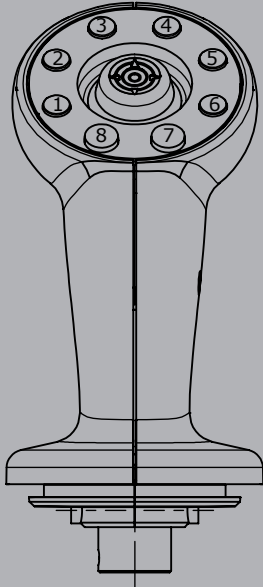
Technical data

| | |
|-----------------------|----------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP54 |
| Contact complement | 1,5A 24 V DC13 |

| | | Example | | | | | | |
|----------------------------------|---|---------|-----|----|-----|------------|------|----|
| | | B9 | -2D | KT | A13 | PA11 | PA13 | -X |
| Basic unit | | | | | | | | |
| B9 | Palm Grip | | | | | | | |
| Digital actuating element | | | | | | | | |
| D | Push Button Colour: red, black, yellow, green, blue, white | | | | | | | |
| KT | Cross switch T-0-T / T-0-T | | | | | | | |
| KR | Cross switch R-0-R / R-0-R | | | | | | | |
| A11 | Rocker switch T-0-T Pos. 11 + 12 | | | | | | | |
| A11 | Rocker switch R-0-R Pos. 11 + 12 | | | | | | | |
| A13 | Rotary Grip T-0-T | | | | | | | |
| Analog actuating element | | | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | | |
| PA11 | Rocker analog Pos. 11 + 12 Potentiometer T394 2 x 5 kOhm with direction contacts | | | | | | | |
| H11 | Rocker analog Pos. 11 + 12 Hall-Potentiometer Output 0,5...2,5...4,5 V inverse dual | | | | | | | |
| PA13 | Rotary Grip Potentiometer T375 2 x 5 kOhm with direction contacts | | | | | | | |
| H13 | Hall-Rotary Grip Output 0,5...2,5...4,5 V inverse dual | | | | | | | |
| Special model | | | | | | | | |
| X | Special / customer specified | | | | | | | |
| Attachments | | | | | | | | |
| Zubehör | | | | | | | | |
| Z01 | Bellow KMD 109 | | | | | 10300009 | | |
| Z02 | Bellow KMD 190 | | | | | 10300093 | | |
| Z03 | Rosette KBF 905 with 4 screws M5x15 necessary for bellow KMD 190 | | | | | 5209900404 | | |

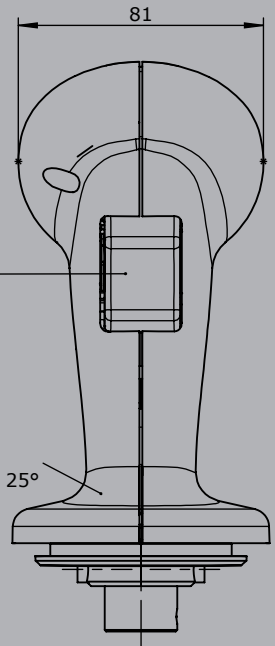
B9

Edition :
Push button installed Pos. 1 - 8
Cross switch tast

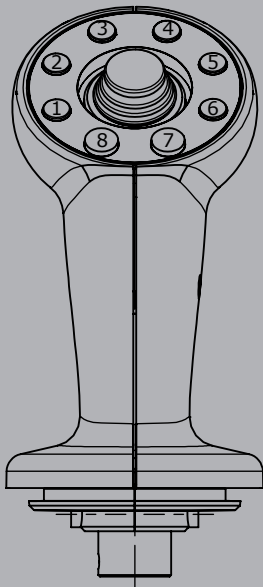


Rocker PA11, A11,H11
Direction 11-12

Twist grip PA13,H13
Direction 13-14
Actuating by rotating $\pm 25^\circ$



Edition :
Push button installed Pos. 1 - 8
Multi-axis controller V21





The Palm Grip B7 / B8 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece for the drive rod can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |

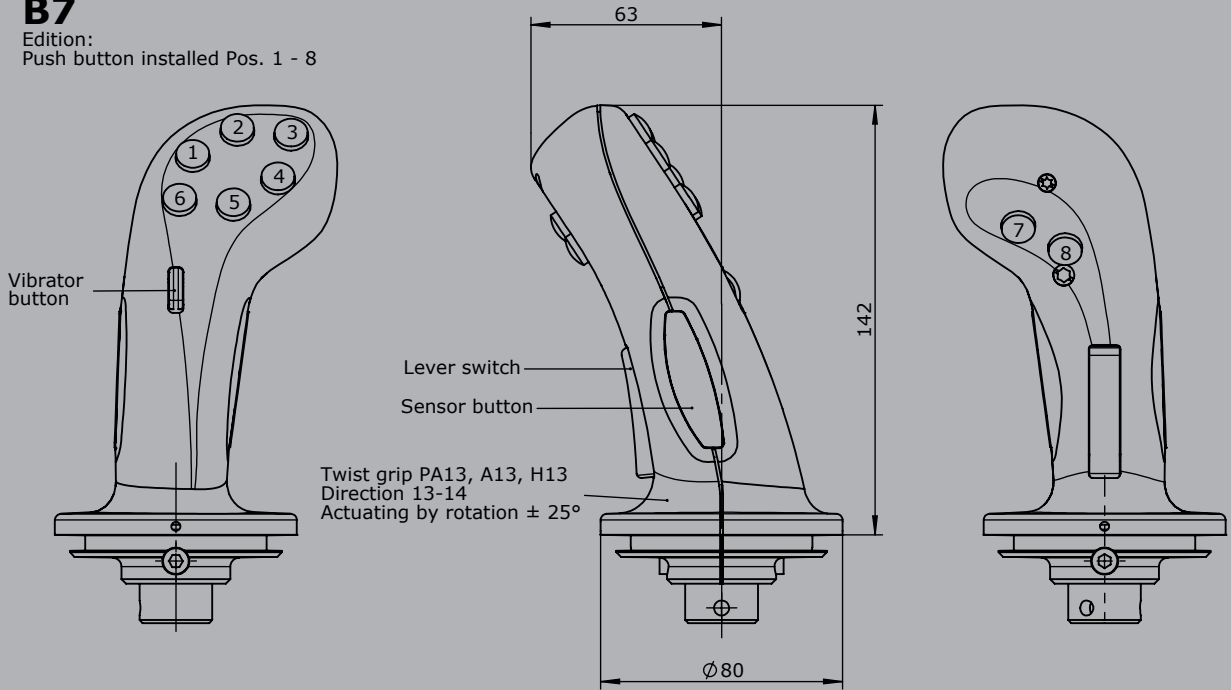


| | | Example | | | | | | | |
|----------------------------------|--|---------|-----|---|---|----|----|------------|----|
| | | B7 | -2D | W | K | SE | S9 | PA13 | -X |
| Basic unit | | | | | | | | | |
| B7 | Palm Grip left | | | | | | | | |
| B8 | Palm Grip right | | | | | | | | |
| Digital actuating element | | | | | | | | | |
| D | Push Button Colour: red, black, yellow, green, white, orange | | | | | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | | | | | |
| HD | Hall-Push Button (see page 151) | | | | | | | | |
| W | Rocker switch momentary (T) or maintained (R), colours: red, black, yellow, blue, white Mechanical functions: T-0-T, 0-T, R-0-T, R-0-R, 0-R, R-R | | | | | | | | |
| K | Lever switch | | | | | | | | |
| A13 | Rotary Grip T-0-T | | | | | | | | |
| SE | Sensor Button capacitive with external control electronics | | | | | | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | | | |
| V | Vibrator Impulse 24 V DC ED 100% | | | | | | | | |
| Analog actuating element | | | | | | | | | |
| S12 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 146) | | | | | | | | |
| S16 | Thumbwheel, output 0,5...2,5...4,5 V inverse dual (see page 149) | | | | | | | | |
| V21 | Mini-Joystick, output 0,5...2,5...4,5 V inverse dual (see page 137) | | | | | | | | |
| HK | Hall-Cross Switch (see page 143) | | | | | | | | |
| PA13 | Rotary Grip Potentiometer T375 2 x 5 kOhm with direction contacts | | | | | | | | |
| H13 | Hall-Rotary Grip Output 0,5...2,5...4,5 V inverse dual | | | | | | | | |
| Special model | | | | | | | | | |
| X | Special / customer specified | | | | | | | | |
| Attachments | | | | | | | | | |
| Z01 | Bellow KMD 109 | | | | | | | 10300009 | |
| Z02 | Bellow KMD 190 | | | | | | | 10300093 | |
| Z03 | Rosette KBF 905 with 4 screws M5x15 necessary for bellow KMD 190 | | | | | | | 5209900404 | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

B7

Edition:
Push button installed Pos. 1 - 8

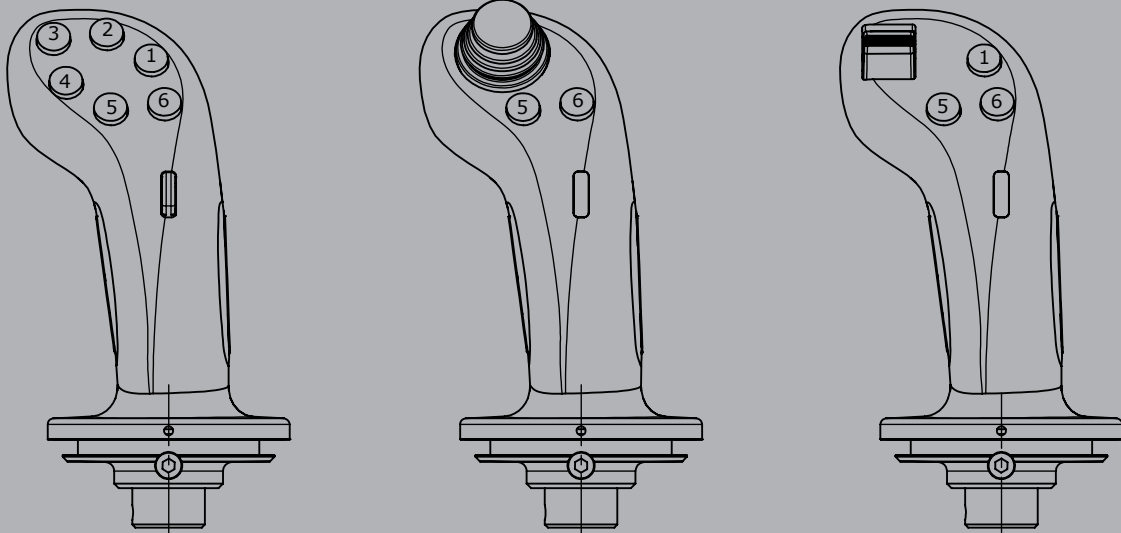


B8

Edition:
Push button installed Pos. 1 - 8

Edition:
Multi-axis controller V21
Push button installed Pos. 5,6,7,8

Edition :
Hall Rocker switch
Push button installed Pos. 1,5,6,8





The Palm Grip B6 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible cable (4 respectively 8 x 0,25 mm², 450 mm long). The mounting piece can be supplied with a tapped hole M10 (standard) or M8.

Technical data

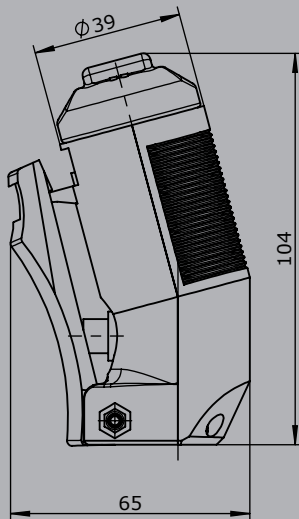
| | |
|-----------------------|----------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP54 |
| Contact complement | 1,5A 24 V DC13 |



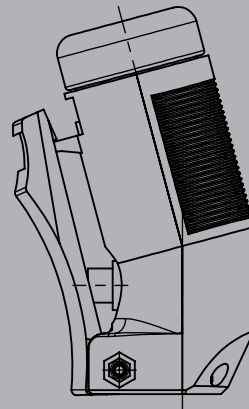
| | B6 | Example -2D | K | -X |
|---|----|----------------|---|----|
| Basic unit | | | | |
| B6 Palm Grip | | | | |
| Digital actuating element | | | | |
| D Push Button top | | | | |
| W Rocker switch top T-0-T | | | | |
| W Rocker switch top R-0-T | | | | |
| W Rocker switch top R-0-R | | | | |
| K* Lever switch | | | | |
| * Included with the delivery of Palm Grip B6! | | | | |
| Special model | | | | |
| X Special / customer specified | | | | |

B6

Edition:
Lever switch side
Rocker switch installed top



Edition:
Lever switch side
Push button top



Palm Grip B5



The Palm Grip B5 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (4 respectively 8 x 0,25 mm², 450 mm long). The mounting piece can be supplied with a tapped hole M10 (standard) or M8.

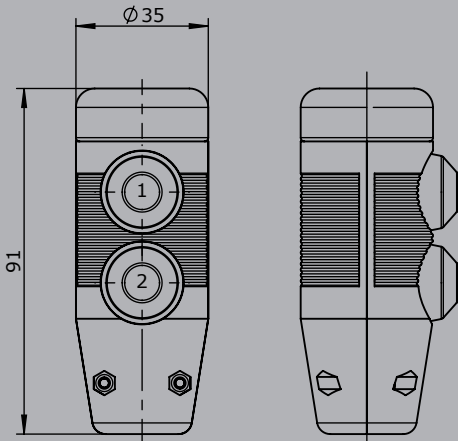
Technical data

| | |
|-----------------------|----------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP54 |
| Contact complement | 3A 24 V DC13 (*1 1,5A 24 V DC13) |

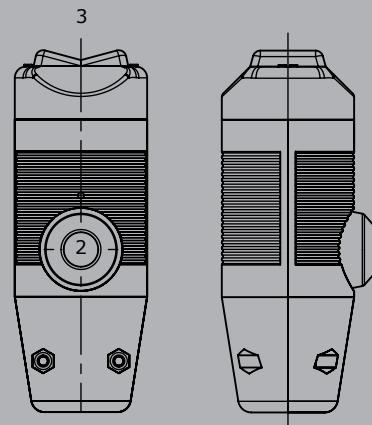


| | Example | | | |
|--|---------|-----|---|----|
| | B5 | -2D | W | -X |
| Basic unit | | | | |
| B5 Palm Grip | | | | |
| Digital actuating element | | | | |
| D Push Button top | | | | |
| D Push Button side *5 | | | | |
| W Rocker switch top T-0-T | | | | |
| W Rocker switch top R-0-T | | | | |
| W Rocker switch top R-0-R | | | | |
| T Push Button top mechanical operation (Only possible in combination with Multi-Axis Controller or single-axis controller!) | | | | |
| Special model | | | | |
| X Special / customer specified | | | | |

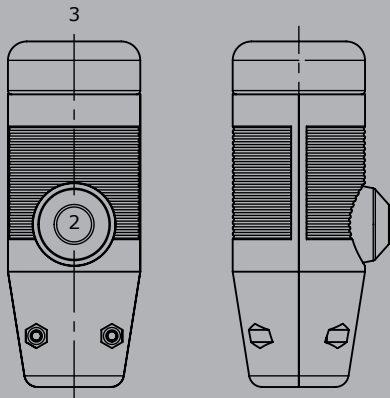
Edition:
Push button installed Pos. 1,2



Edition:
Rocker switch installed Pos. 3
Push button installed Pos. 2



Edition:
Push button installed Pos. 2,3



Palm Grip B3



The Palm Grip B3 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible single wire (0,1 mm², 450 mm long). The mounting piece can be supplied with a tapped hole 12 mm (standard) or 10 mm.

Technical data

| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | Control element up to IP67 |
| Contact complement | 1,5A 24 V DC 13 (*1 0,1A 24 V DC13) |



| | | <i>Example</i> | | | | | | | |
|----------------------------------|--|----------------|-----|---|---|----|------|------|----|
| | | B3 | -2D | W | K | SE | PA11 | PA13 | -X |
| Basic unit | | | | | | | | | |
| B3 | Palm Grip | | | | | | | | |
| Digital actuating element | | | | | | | | | |
| D | Push Button Colour: red, black, yellow, green, blue, grey | | | | | | | | |
| D | Push Button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange | | | | | | | | |
| W | Rocker switch T-0-T | | | | | | | | |
| W | Rocker switch 0-T | | | | | | | | |
| W | Rocker switch R-0-T | | | | | | | | |
| W | Rocker switch R-0-R | | | | | | | | |
| W | Rocker switch 0-R | | | | | | | | |
| W | Rocker switch R-R | | | | | | | | |
| K | Lever switch | | | | | | | | |
| SR | Sliding switch | | | | | | | | |
| ST | Sliding switch | | | | | | | | |
| ZD | Push Button with 2 steps | | | | | | | | |
| A12 | Push Button Pos. 11-12 | | | | | | | | |
| A11 | Thumbwheel T-0-T | | | | | | | | |
| A11 | Thumbwheel R-0-R | | | | | | | | |
| | L left, R right | | | | | | | | |
| A13 | Rotary Grip T-0-T | | | | | | | | |
| SE | Sensor Button capacitive | | | | | | | | |
| S | Sensor Button capacitive without external control electronics (Consistent with V85 / VV85 with interface E1xx to E6xx, E907 and V25/V27 with interfaces E3xx + E4xx+E907) | | | | | | | | |
| V | Vibration | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

B3L -2D W K SE PA11R PA13 -X

Analog actuating element

| | | | | | | | | |
|------|--|--|--|--|--|--|--|--|
| PA11 | Thumbwheel Potentiometer T375 2 x 5 kOhm with direction contacts | | | | | | | |
| H11 | Thumbwheel Hall-Potentiometer Output 0,5...2,5...4,5 V inverse dual L left, R right | | | | | | | |
| PA12 | Push Button analog Pos. 11+12 Potentiometer T375 2 x 5 kOhm with direction contacts | | | | | | | |
| H12 | Push Button analog Pos. 11+12 Hall-Potentiometer Output 0,5...2,5...4,5 V inverse dual | | | | | | | |
| PA13 | Rotary handle Potentiometer T375 2 x 5 kOhm with direction contacts | | | | | | | |
| H13 | Hall-Rotary handle Output 0,5...2,5...4,5 V inverse dual | | | | | | | |

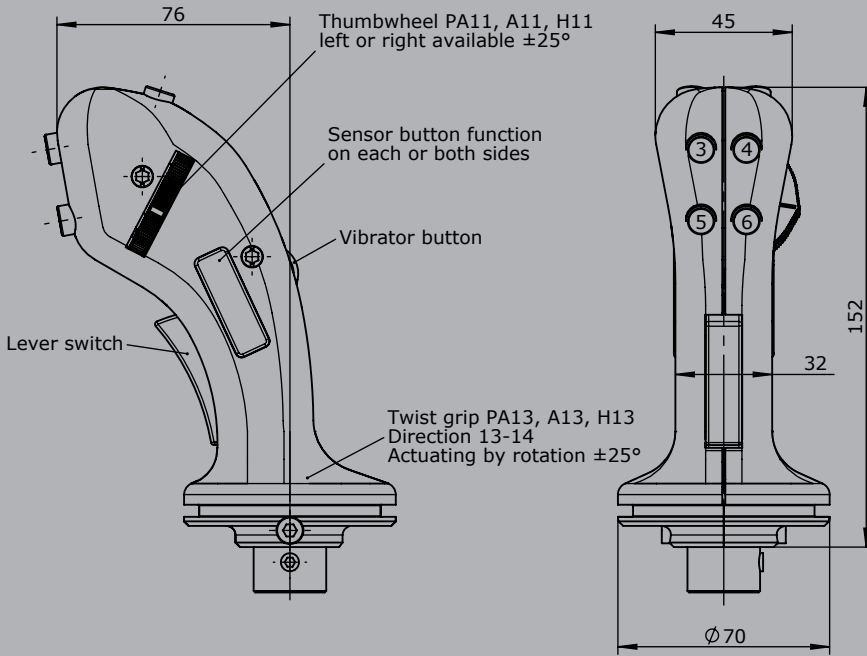
Special model

| | | | | | | | | |
|---|------------------------------|--|--|--|--|--|--|--|
| X | Special / customer specified | | | | | | | |
|---|------------------------------|--|--|--|--|--|--|--|

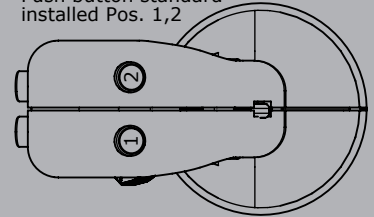
Attachments

| | | | | | | | | |
|-----|--|--|--|--|--|--|-----------|--|
| Z01 | Bellow KMD 109 | | | | | | 10300009 | |
| Z02 | Bellow KMD 190 | | | | | | 10300093 | |
| Z03 | Rosette KBF 905 with 4 screws M5 x 15 necessary for bellow KMD 190 | | | | | | 520990004 | |

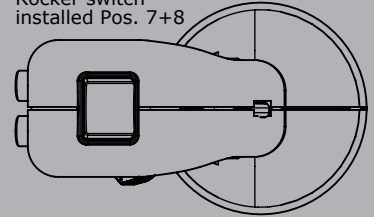
B3



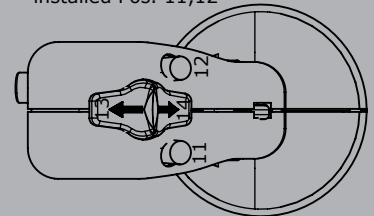
Edition:
Push button standard
installed Pos. 1,2



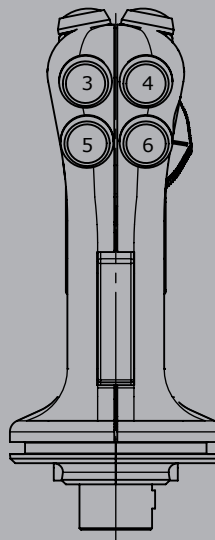
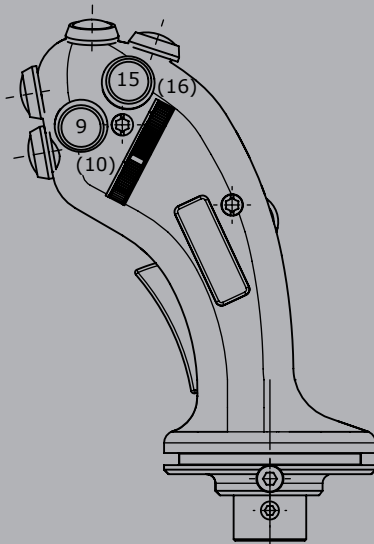
Edition:
Rocker switch
installed Pos. 7+8



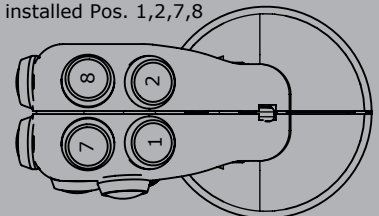
Edition:
Sliding switch
installed Pos. 13 + 14
Drive with potentiometer PA12 bzw.
Push button with 2 steps ZD
installed Pos. 11,12



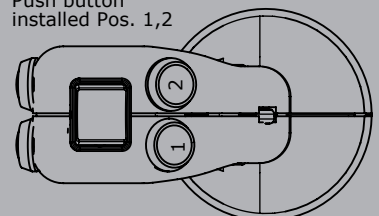
() = Installation right



Edition:
Push button KDA 21
installed Pos. 1,2,7,8



Edition:
Rocker switch
installed Pos. 7 + 8
Push button
installed Pos. 1,2



Palm Grip B2



The Palm Grip B2 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible cable (8 x 0,25 mm², 450 mm long). He can be tilted in any direction by 20 degrees and can lock in this position. The mounting piece can be supplied with a tapped hole M10 (standard) or M8.

Technical data

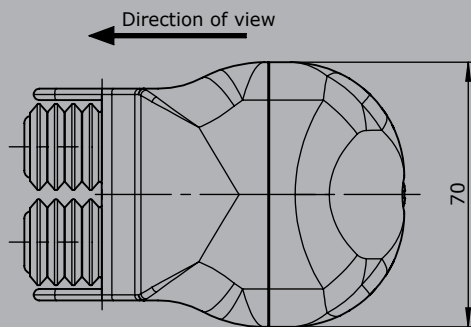
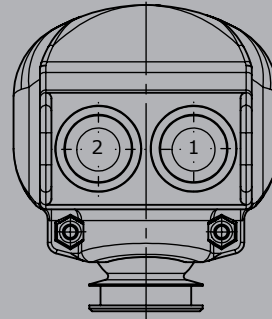
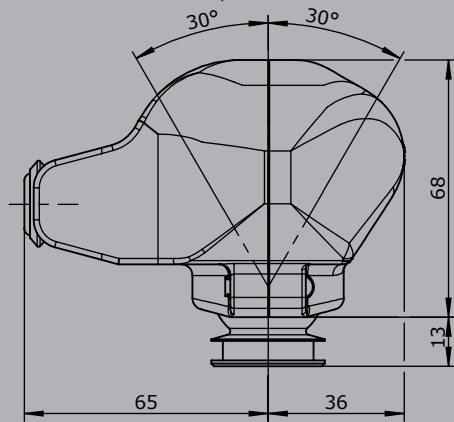
| | |
|-----------------------|------------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP54 |
| Contact complement | 1,5A 24 V DC13 (*1 0,1A 24 V DC13) |



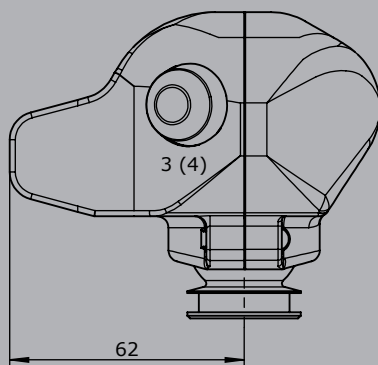
| | | Example | | | |
|----------------------------------|---|---------|-----|------|----|
| | | B2 | -2D | PA15 | -X |
| Basic unit | | | | | |
| B2 | Palm Grip | | | | |
| Digital actuating element | | | | | |
| D | Push Button KDA/70 | | | | |
| D | Push Button KDA21 *1 | | | | |
| | Colour: red, black, yellow, green, blue, white, orange | | | | |
| HD | Hall-Push Button (see page 151) | | | | |
| A15 | 2 push Button Pos. 1 + 2 interlocked | | | | |
| Analog actuating element | | | | | |
| PA15 | Push Button analog Pos. 1 + 2 | | | | |
| | 2 potentiometer T301 2 x 5 kOhm with direction contacts | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |

B2

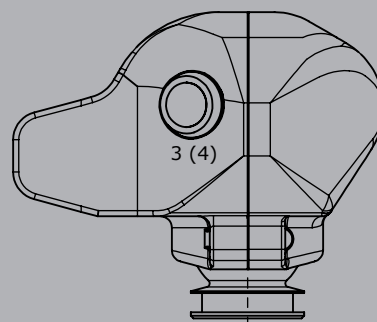
Edition:
Pusher installed Pos. 1,2



Edition:
Push button KDA / 70
installed Pos. 1,2,3,4



Edition:
Push button KDA 21
installed 1,2,3,4



Palm Grip B1



The Palm Grip B1 has different equipment options for many requirements. It is compatible with our Multi-Axis Controller or mounted on hydraulic drives. The Palm Grip has a highly flexible cable (4 respectively 8 x 0,25 mm², 450 mm long). The mounting piece can be supplied with a tapped hole M10 (standard) or M8.

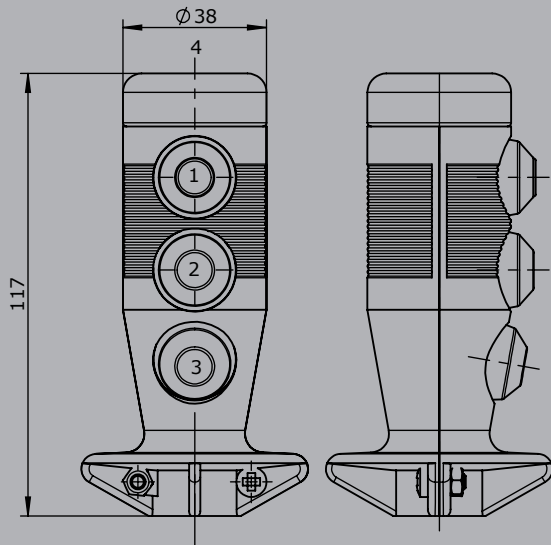
Technical data

| | |
|-----------------------|----------------------------------|
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP54 |
| Contact complement | 3A 24 V DC13 (*1 1,5A 24 V DC13) |

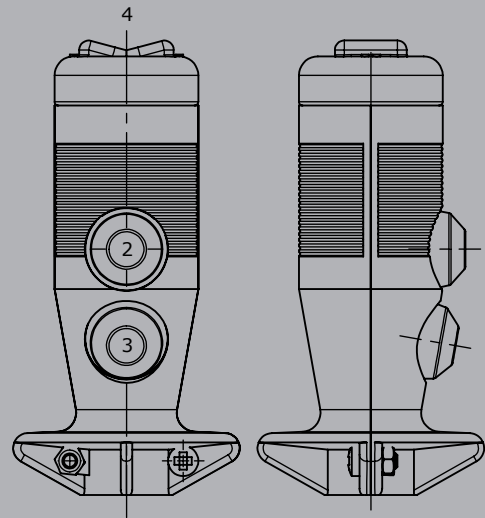


| | B1 | -2D | W | -X |
|---|----|-----|---|----|
| Basic unit | | | | |
| B1 Palm Grip | | | | |
| Digital actuating element | | | | |
| D Push Button top | | | | |
| D Push Button side *1 | | | | |
| W Rocker switch top T-0-T | | | | |
| W Rocker switch top R-0-T | | | | |
| W Rocker switch top R-0-R | | | | |
| T Push Button top with mechanical operation | | | | |
| (Only possible with Multi-Axis Controller or single-axis controller!) | | | | |
| K Lever switch | | | | |
| KT Lever switch mechanical operation | | | | |
| (Only possible with Multi-Axis Controller or single-axis controller!) | | | | |
| Special model | | | | |
| X Special / customer specified | | | | |

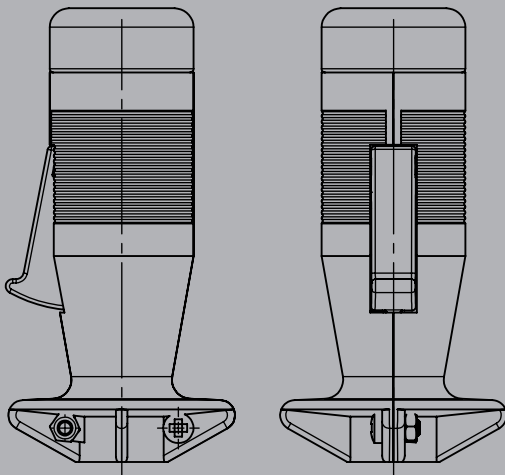
Edition:
Push button installed Pos. 1,2,3,4



Edition:
Rocker switch installed Pos. 4
Push button installed Pos. 2,3



Edition:
Lever switch installed side



Control Console C1



We designed the Control Console C1 to give our customers the maximum freedom of design and configuration options. The design has paid attention to a compact format, which can be extended with additional modules. The modular design allows individual assembly with joysticks, displays and command devices. The Control Console C1 is thus able to adapt perfectly to your product and your branding.



reddot winner 2020
industrial design



Standard colour:
Housing bottom part: anthracite RAL 7016
Housing upper part: light grey RAL 7035
Insert plate: anthracite RAL 7016

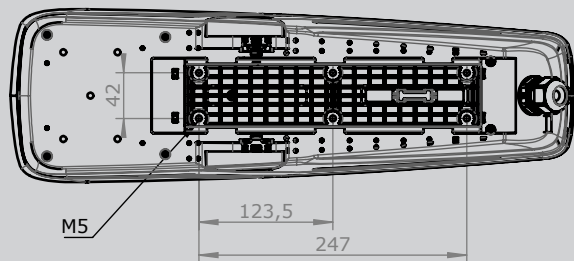
Technical data:

Operation temperature -40°C to +85°C
Horizontal adjustment +/- 30 mm

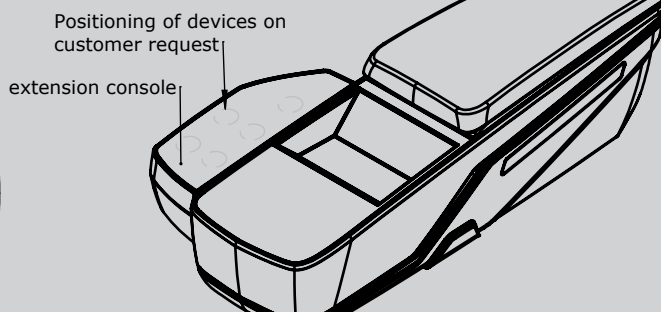
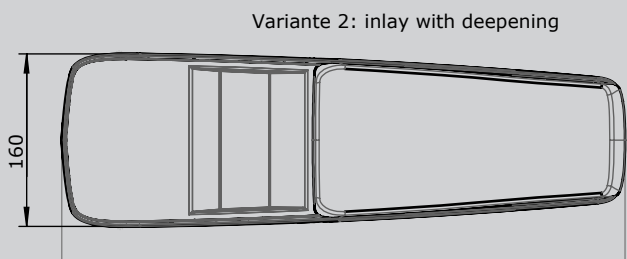
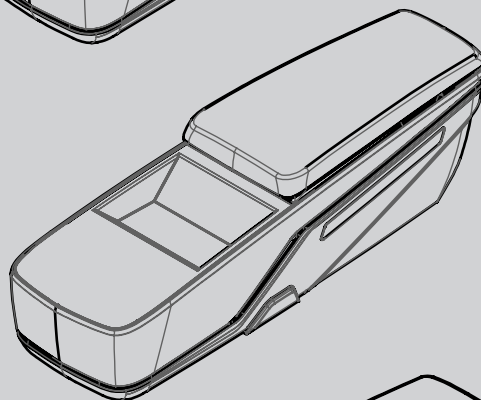
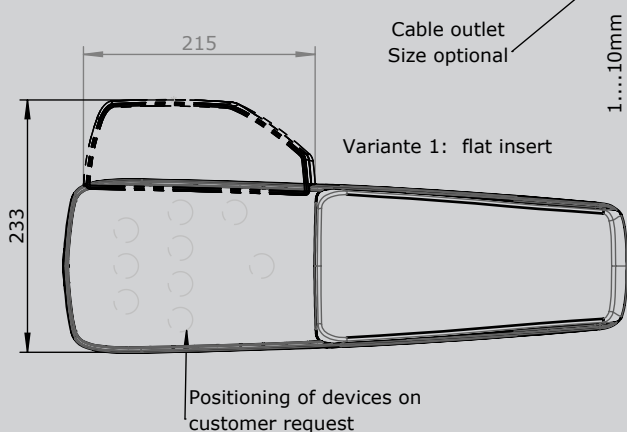
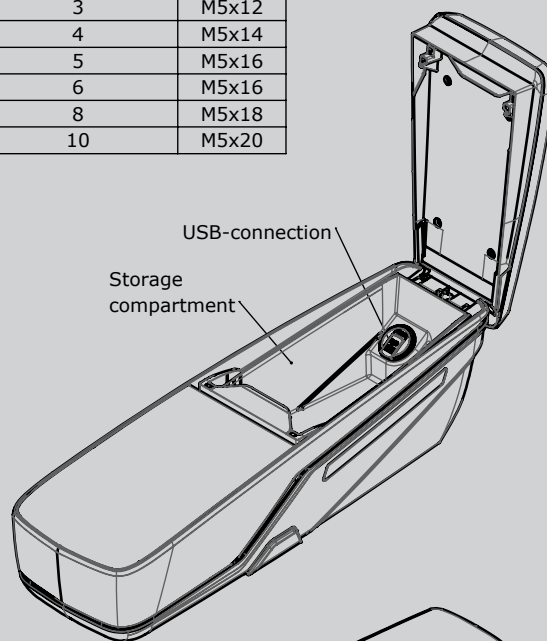
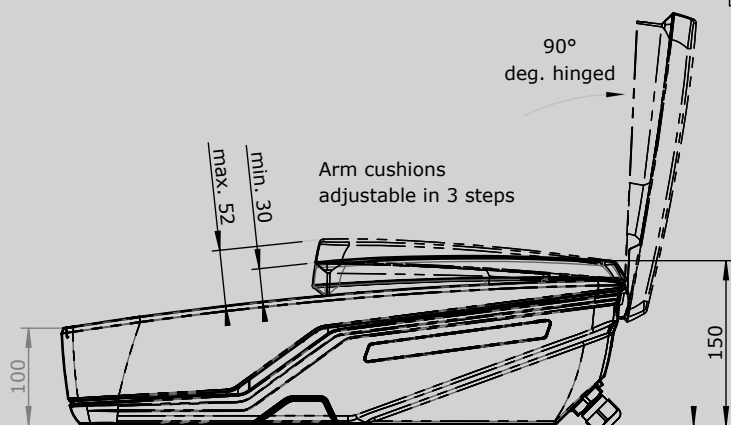
| | C1 | -1 | -1 | -1 | -0 | USB | -L1 | / | V27 | / | KLS | / | X |
|--|--------------------------------------|----|----|----|----|-----|-----|---|-----|---|-----|---|---|
| Control Console | | | | | | | | | | | | | |
| C1 | 160 x 520 mm | | | | | | | | | | | | |
| Insert plate | | | | | | | | | | | | | |
| 1 | Insert plate (flat) variant 1 | | | | | | | | | | | | |
| 2 | Insert plate (with recess) variant 2 | | | | | | | | | | | | |
| Colour housing upper part | | | | | | | | | | | | | |
| 1 | Light grey RAL 7035 | | | | | | | | | | | | |
| X | Desired colour (on request!) | | | | | | | | | | | | |
| Colour decor stripes | | | | | | | | | | | | | |
| 1 | Red | | | | | | | | | | | | |
| X | Desired colour (on request!) | | | | | | | | | | | | |
| Illumination decor stripes | | | | | | | | | | | | | |
| 0 | No illumination | | | | | | | | | | | | |
| 1 | RGB-illumination left | | | | | | | | | | | | |
| 2 | RGB-illumination right | | | | | | | | | | | | |
| 3 | RGB-illumination left + right | | | | | | | | | | | | |
| Attachments | | | | | | | | | | | | | |
| USB | USB-plugin socket 2-fold, 2 x 2,5 A | | | | | | | | | | | | |
| L1 | Logo left | | | | | | | | | | | | |
| L2 | Logo right | | | | | | | | | | | | |
| L3 | Logo left incl. lighting | | | | | | | | | | | | |
| L4 | Logo right incl. lighting | | | | | | | | | | | | |
| E1 | Extension housing right | | | | | | | | | | | | |
| D1 | Display holder (Display on request) | | | | | | | | | | | | |
| Mounting for equipment boxes | | | | | | | | | | | | | |
| V | Multi-Axis Controller (see page 1) | | | | | | | | | | | | |
| N | Control-Switch (see page 113) | | | | | | | | | | | | |
| More Control Elements (see page 137 and 243) | | | | | | | | | | | | | |
| Wiring | | | | | | | | | | | | | |
| KLS | On connector or joystick per core | | | | | | | | | | | | |
| KLK | One side on cable per core | | | | | | | | | | | | |
| Special model | | | | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

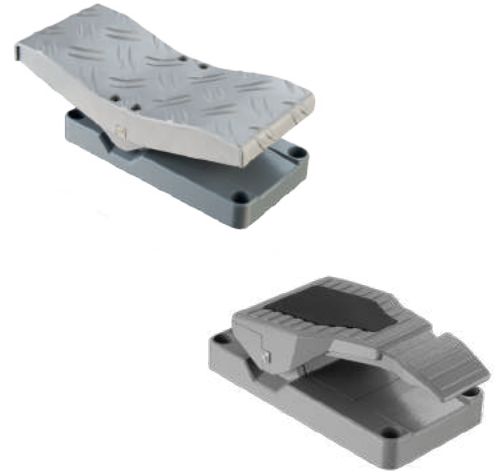
Horizontal adjustment
30 ← → 30



| Thickness of mounting plate, provided by customer (mm) | screw for mounting plate |
|--|--------------------------|
| 1 | M5x10 |
| 1,5 | M5x12 |
| 2 | M5x12 |
| 2,5 | M5x12 |
| 3 | M5x12 |
| 4 | M5x14 |
| 5 | M5x16 |
| 6 | M5x16 |
| 8 | M5x18 |
| 10 | M5x20 |



The Foot Pedal P20 is a rugged switching device for electro-hydraulic. A long service life and high reliability is ensured by the latest contactless hall-technology. Due to the modular construction and the different electrical interfaces it is universally applicable..



Technical data

| | |
|--------------------------|--|
| Mechanical life P20 | 10 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection P20 | IP67 (electronic) |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |

| | | P20 | -1 | Example -ZZ | -E1041 | -S... | -X |
|---|--|-----|----|----------------|--------|-------|----|
| Basic unit | | | | | | | |
| P20 | Foot Pedal | | | | | | |
| Pedal | | | | | | | |
| 1 | Pedal shape A 0-15° | | | | | | |
| 2 | Pedal shape B 0-25° | | | | | | |
| 3 | Pedal shape C 15°-0-15° | | | | | | |
| 4 | Pedal shape C 0-15° | | | | | | |
| | HL Gearshift mounted on the left side | | | | | | |
| | HR Gearshift mounted on the right side | | | | | | |
| Spring return | | | | | | | |
| Z | Spring return | | | | | | |
| ZZ | Spring return redundant | | | | | | |
| Interfaces <i>(description see on the following pages)</i> | | | | | | | |
| E | 0xx Switching output | | | | | | |
| E | 1xx Voltage output | | | | | | |
| E | 2xx Current output | | | | | | |
| E | 3xx CAN-interface | | | | | | |
| E | 4xx CANopen Safety interface | | | | | | |
| Plug connectors | | | | | | | |
| S... | Standard plug connectors <i>(see page 120)</i> | | | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |

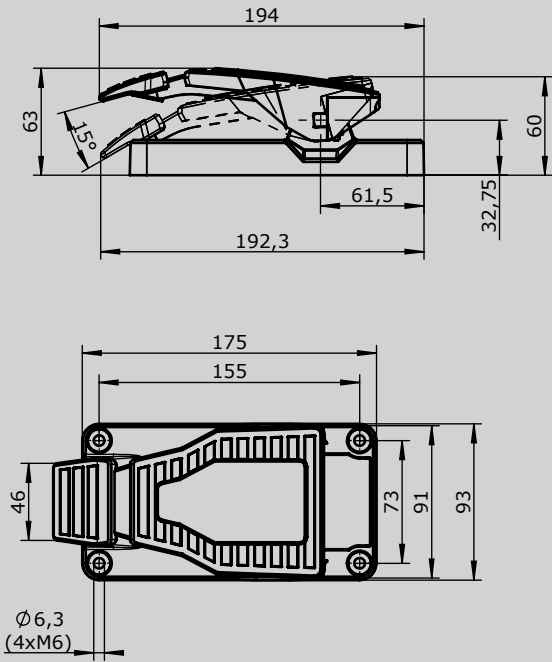
| Digital output | | |
|--|---|---|
| Supply voltage | 9-32 V DC | |
| Current carrying capacity | Direction signal 150 mA | |
| | Zero position signal 500 mA | |
| Wiring | Cable 500mm long without plug connector | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | |
| 2 direction signals + 1 zero position signal (galvanically isolated) | E001 1 | S |
| 1 direction signal + 1 zero position signal (galvanically isolated) | E003 1 | |

| Voltage output (not stabilized) | | | |
|---|---|---|---|
| Supply voltage | 4,75-5,25 V DC | | |
| Current carrying capacity | Direction signal 8 mA | | |
| | Zero position signal 500 mA | | |
| Wiring | Cable 500mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| 0,5...2,5...4,5 V redundant + 2 direction signals | E104 1 | S | |
| 0,5...2,5...4,5 V redundant + 1 direction signal | E145 1 | | |
| | | Output options | |
| | | Characteristic: | |
| | | Inverse dual | 1 |
| | | Dual | 2 |
| | | Inverse dual with dead zone +/- 3° (standard) | 3 |
| | | Dual with dead zone +/- 3° | 4 |

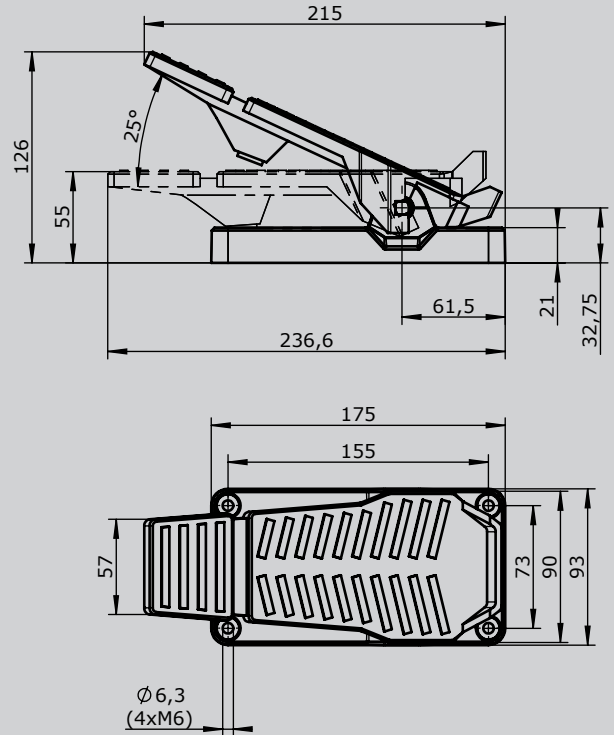
| Voltage output | | | |
|--|---|--|-----------------------|
| Supply voltage | 9-32 V DC (*11,5-32 V) | | |
| Current carrying capacity | Direction signal 150 mA | | |
| | Zero position signal 500 mA | | |
| Wiring | Cable 500mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) | E112 1 | S | |
| 0,5...2,5...4,5 V redundant + 1 direction signal + 1 zero position signal (galvanically isolated) | E146 1 | | |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC | E132 1 | S | |
| 0...5...10 V redundant + 1 direction signal + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC | E147 1 | | |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | E136 1 | S | |
| | | | Output options |
| | | Characteristic: | |
| | | Inverse dual *1 | 1 |
| | | Dual *1 | 2 |
| | | Inverse dual with dead zone +/- 3° *1 (standard) | 3 |
| | | Dual with dead zone +/- 3° *1 | 4 |
| | | *1 not combinable with output E136X | |
| | | Single *2 | 5 |
| | | Single with dead zone +/- 3° *2 (standard) | 6 |
| | | *2 not combinable with output E1121 and E1321, E1461 und E1471 | |
| Voltage output with other value on request! | | | |

| Current output | | | |
|---|---|----------|---|
| Supply voltage | 9-32 V DC | | |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | S |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | E206 1 | |
| 0...20 mA + 1 direction signal + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring signal and error signal | | E222 1 | |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | E208 1 | |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | E214 1 | |
| 4...20 mA + 1 direction signal + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | E223 1 | |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | E216 1 | |
| | Output options | | |
| | Single | | 5 |
| | Single with dead zone +/- 3° (standard) | | 6 |
| <i>Current output with other value on request!</i> | | | |
| CAN | | | |
| Supply voltage | 9-36 V DC | | |
| Idle current consumption | 120 mA | | |
| Current carrying capacity | Direction signal 100 mA | | |
| Protocol | CANopen CiA DS 301 or SAE J 1939 (based on) | | |
| Baud rate | 125 kBit/s to 1 Mbit/s (standard 250 kBit/s) | | |
| Wiring | CAN (IN) cable 500 mm with plug connector M12 (male) CAN (OUT) cable 500 mm with plug connector M12 (female) | | |
| CAN P20 | | E307 1 | |
| With additional digital output separately wired (not via CAN) | | | |
| - 1 direction signal | | | 2 |
| CANopen Safety | | | |
| Supply voltage | 9-36 V DC | | |
| Idle current consumption | 120 mA | | |
| Current carrying capacity | Direction signal 100 mA | | |
| Protocol | CANopen Safety EN50325-5 | | |
| Baud rate | 125 kBit/s bis 1 MBit/s (standard 250 kBit/s) | | |
| Wiring | CAN (IN) cable 500 mm with plug connector M12 (male) CAN (OUT) cable 500 mm with plug connector M12 (female) | | |
| CANopen Safety P20 | | E407 1 | |
| With additional digital outputs separately wired (not via CAN) | | | |
| - 1 direction signal | | | 2 |
| Attachments | | | |
| Z01 Mating connector M12 male insert with 2 m cable | | 20201140 | |
| Z02 Mating connector M12 female insert with 2 m cable | | 20202298 | |

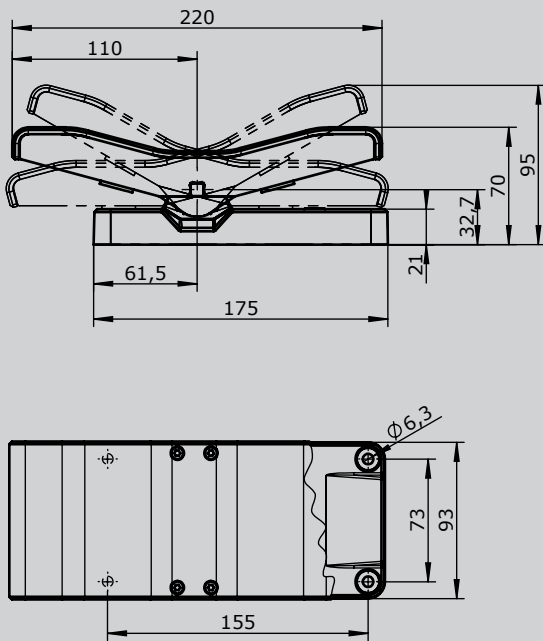
Pedal form A



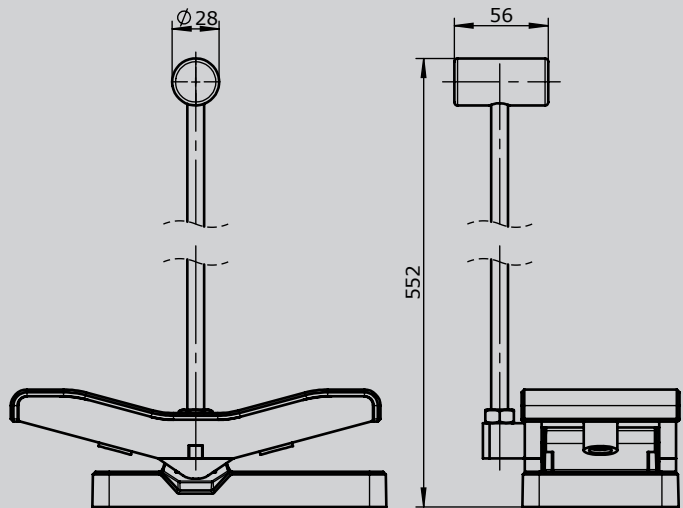
Pedal form B



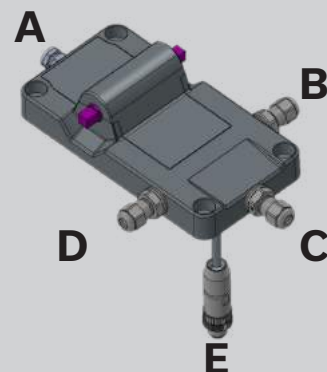
Pedal form C



optional with gear lever



Possible cable outputs



Foot Pedal

P10 / P11 / P12



The Foot Pedal P10 / P11 / P12 is a rugged switching device for electro-hydraulic. The modular design enables the switching device to be used universally. The P10/P11/P12 is resistant to oil, maritime, climate, ozone and UV radiation.

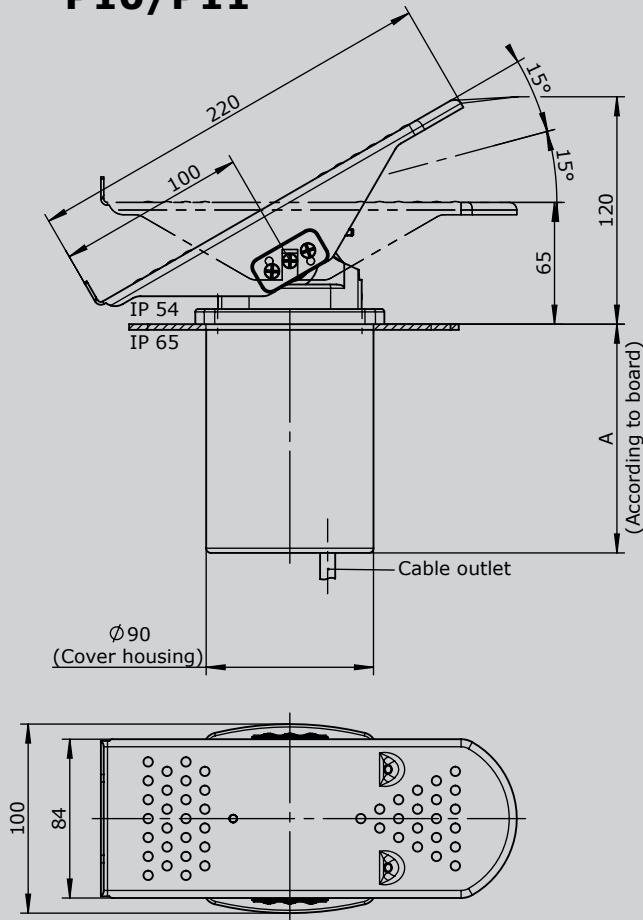
Technical data

| | |
|--------------------------|----------------------------|
| Mechanical life P10 | 8 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection P10 | IP66 |

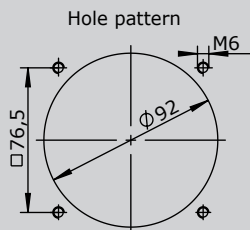
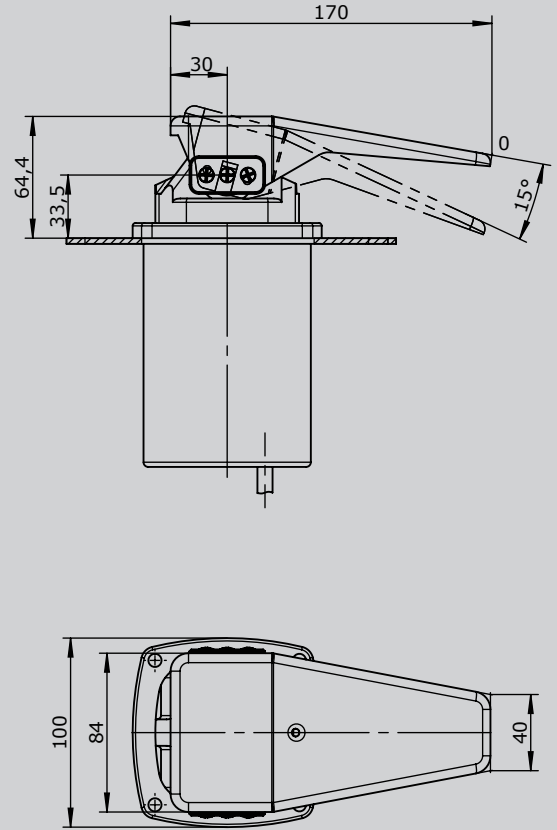


| | | P10 | -1 Z | P | -A01 | P224 | -B | -X |
|----------------------|--|--|------|--------|-------------|------|----|----|
| Basic unit | | | | | | | | |
| P10 | Foot Pedal, 0-30° | | | | | | | |
| P11 | Foot Pedal, 15°-0-15° | | | | | | | |
| P12 | Foot Pedal, 0-15° | | | | | | | |
| Detent | | | | | | | | |
| | Without | | | | | | | |
| R4 | 1-0-1 | | | | | | | |
| Direction 1-2 | | | | | | | | |
| 1 | 1 contact | Standard contact - arrangement see page 122 | | | | | | |
| 2 | 2 contacts | z.B. | | | | | | |
| 3 | 3 contacts | MS11 | A01 | | | | | |
| | | MS12 | A02 | | | | | |
| | | MS13 | A03 | | | | | |
| | | MS21 | A05 | | | | | |
| | | A99 contact - arrangement according customer request | | | | | | |
| Z | Spring return | | | | | | | |
| R | Friction brake | | | | | | | |
| (P) | Possibility of mounting potentiometer (Gessmann-types) | | | | | | | |
| P | Potentiometer | P222 | T362 | 1 kOhm | I max. 1 mA | | | |
| | | P223 | T362 | 2 kOhm | I max. 1 mA | | | |
| | | P224 | T362 | 5 kOhm | I max. 1 mA | | | |
| | | More potentiometers on request! | | | | | | |
| Cover housing | | | | | | | | |
| B | Cover housing with cable entry M20 | | | | | | | |
| Special model | | | | | | | | |
| X | Special / customer specified | | | | | | | |

P10/P11



P12



Foot Pedal

P8 / PP8



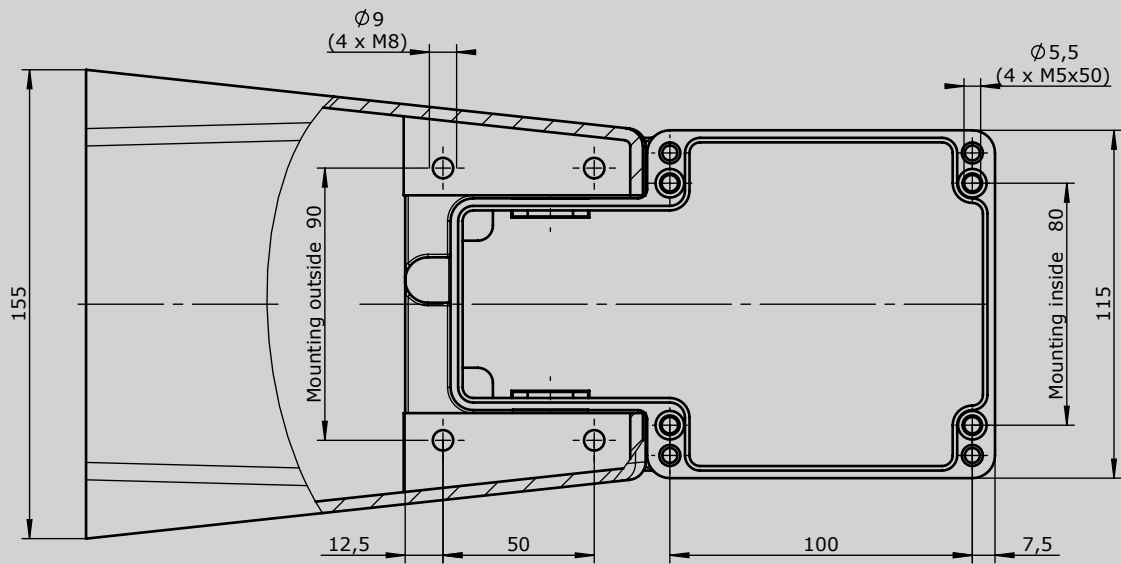
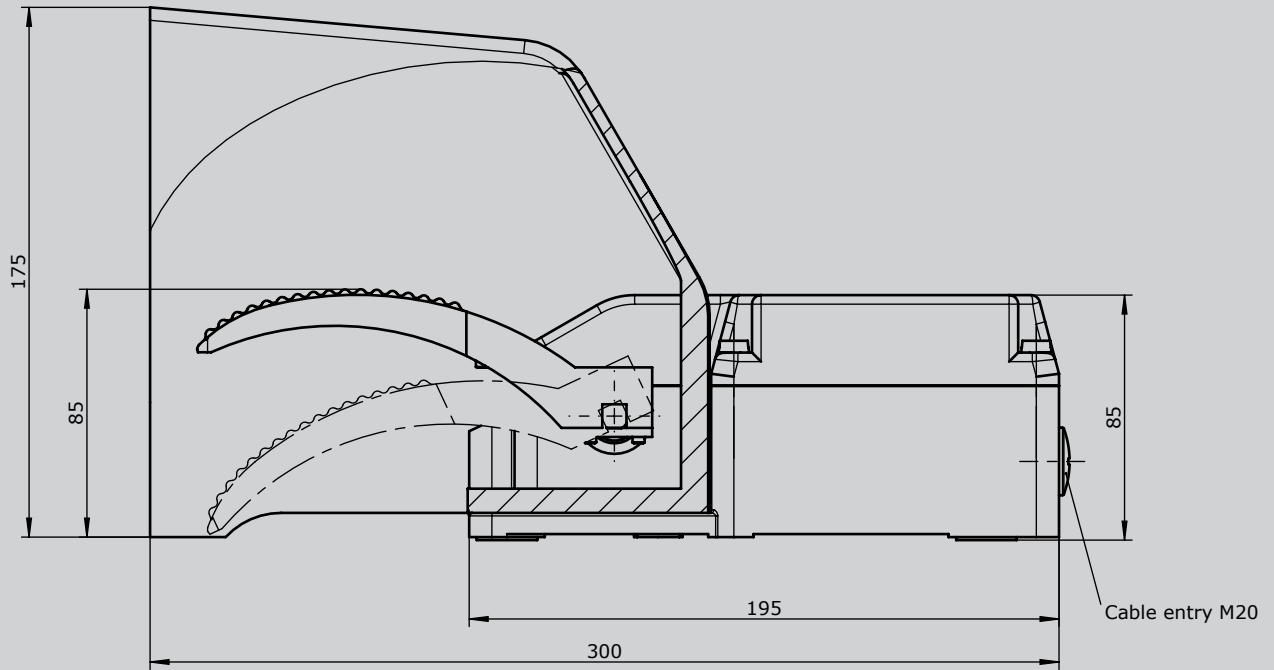
The Foot Pedal P8 / PP8 is a rugged switching devices for footing applications. The Foot Pedal is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

Technical data

| | |
|--------------------------|-----------------------------|
| Mechanical life P8 | 6 million operating cycles |
| Mechanical life PP8 | 10 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection P8 | IP54 |
| Degree of protection PP8 | IP65 |
| Colour | RAL 7032 pebble-grey |



| | | P8 | -1 Z | Example P | -A01 | P124 | -X |
|---------------------------------------|---|--|------|--------------|-------------|------|----|
| Basic unit | | | | | | | |
| P8 | Foot Pedal | | | | | | |
| Reinforced version | | | | | | | |
| PP8 | Foot Pedal | | | | | | |
| Detent | | | | | | | |
| | without | | | | | | |
| R2 | 0-2 | | | | | | |
| R3 | 0-3 | | | | | | |
| R4 | 0-4 | | | | | | |
| Direction 1-2 | | | | | | | |
| 1 | 1 contact | Standard contact - Arrangement see page 122 | | | | | |
| 2 | 2 contacts | z.B. | | | | | |
| 3 | 3 contacts | MS11 | A01 | | | | |
| 4 | 4 contacts* | MS12 | A02 | | | | |
| 5 | 5 contacts* | MS13 | A03 | | | | |
| 6 | 6 contacts* | MS14 | A04 | | | | |
| *Only possible without potentiometer! | | A99 contact - arrangement according customer request | | | | | |
| Z | Spring return | | | | | | |
| R | Friction brake | | | | | | |
| (P) | Mounting options for potentiometer and encoder (Gessmann-types) | | | | | | |
| P | Potentiometer | P121 | T374 | 0,5 kOhm | I max. 1 mA | | |
| | | P122 | T374 | 1 kOhm | I max. 1 mA | | |
| | | P123 | T374 | 2 kOhm | I max. 1 mA | | |
| | | P124 | T374 | 5 kOhm | I max. 1 mA | | |
| | | P125 | T374 | 10 kOhm | I max. 1 mA | | |
| | | More potentiometers on demand! | | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |



The Foot Pedal P7 / PP7 is a rugged switching devices for footing applications. The Foot Pedal is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

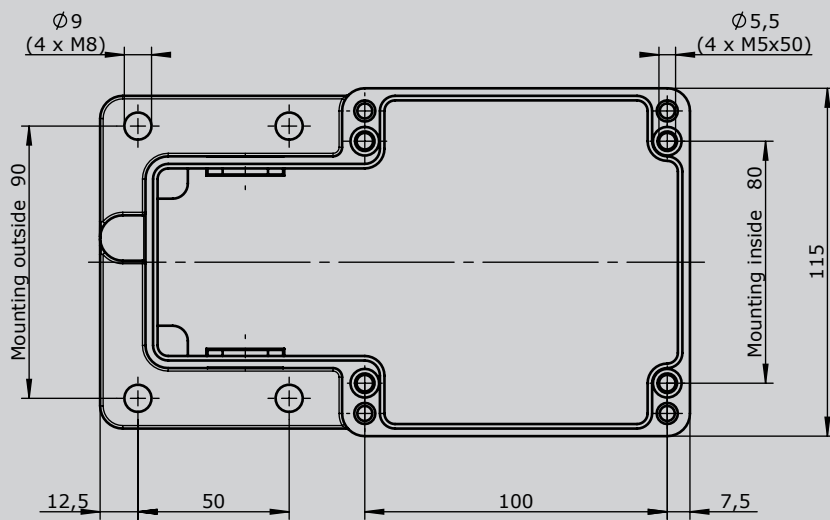
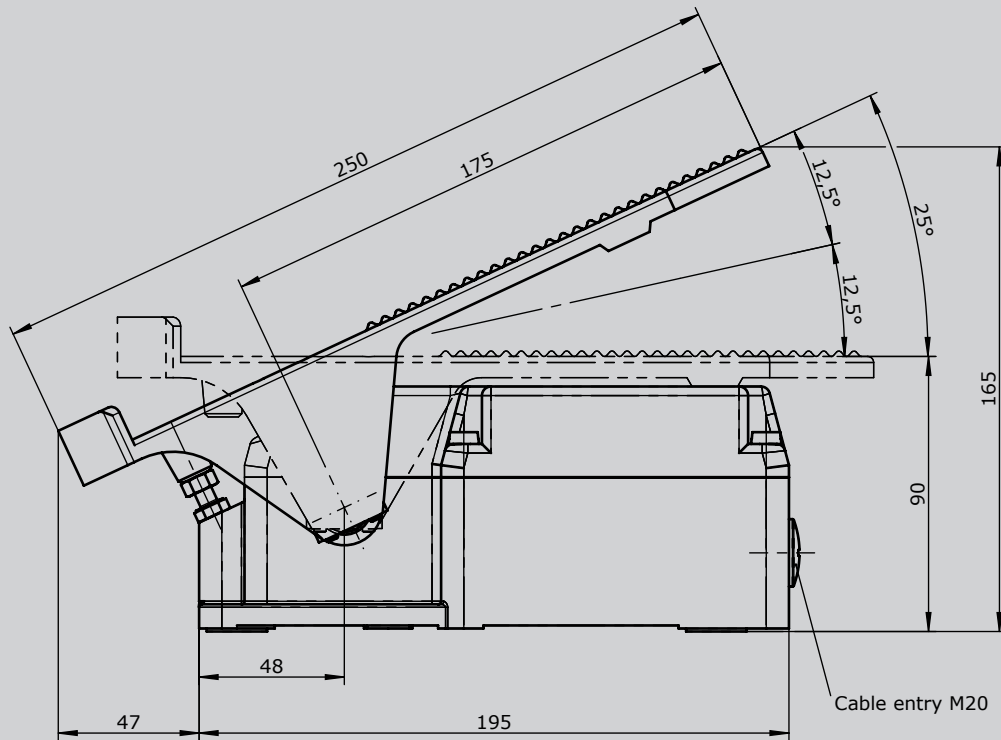
Technical data

| | |
|--------------------------|-----------------------------|
| Mechanical life P7 | 6 million operating cycles |
| Mechanical life PP7 | 10 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection P7 | IP54 |
| Degree of protection PP7 | IP65 |
| Colour | RAL 7032 pebble-grey |



| | | P7 | -1 Z | Example P | -A01 | P124 | -X |
|----------------------|---|--|------|--------------|-------------|------|----|
| Basic unit | | | | | | | |
| P7 | Foot Pedal | | | | | | |
| | Reinforced version | | | | | | |
| PP7 | Foot Pedal | | | | | | |
| Detent | | | | | | | |
| | Without | | | | | | |
| R2 | 0-2 | | | | | | |
| R3 | 0-3 | | | | | | |
| R4 | 0-4 | | | | | | |
| R11 | 1-0-1 | | | | | | |
| R22 | 2-0-2 | | | | | | |
| Direction 1-2 | | | | | | | |
| 1 | 1 contact | Standard contact - Arrangement see page 122 | | | | | |
| 2 | 2 contacts | z.B. | | | | | |
| 3 | 3 contacts | MS11 | A01 | | | | |
| 4 | 4 contacts* | MS12 | A02 | | | | |
| 5 | 5 contacts* | MS13 | A03 | | | | |
| 6 | 6 contacts* | MS14 | A04 | | | | |
| | *Only possible without potentiometer! | MS21 | A05 | | | | |
| | | A99 contact - arrangement according customer request | | | | | |
| Z | Spring return | | | | | | |
| R | Friction brake | | | | | | |
| (P) | Mounting options for potentiometer and encoder (Gessmann-types) | | | | | | |
| P | Potentiometer | P121 | T374 | 0,5 kOhm | I max. 1 mA | | |
| | | P122 | T374 | 1 kOhm | I max. 1 mA | | |
| | | P123 | T374 | 2 kOhm | I max. 1 mA | | |
| | | P124 | T374 | 5 kOhm | I max. 1 mA | | |
| | | P125 | T374 | 10 kOhm | I max. 1 mA | | |
| | | More potentiometers on demand! | | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!



Control Unit KST 31 swiveling



The KST31 is an ergonomically designed swiveling control chair which provides a high degree of comfort. The consoles, mounted to the Driver's Seat, swing with the seat. The consoles can be positioned to perfectly match any person by means of length, height and inclination adjustment.

The standard version includes:

Consoles:

The plastic consoles can be equipped with custom command and indicating devices.

Driver's Seat:

The comfortable Driver's Seat KFS 11 is equipped with a spring loaded hydraulic vibration absorption system, including weight adjustment, air-permeable textile cover, arm rests and head rest.

Cross-member with swivel base:

The cover of the sheet steel cross-member including the Driver's Seat is forward foldable. Thereby all wirings, terminals and bushings are easily accessible during commissioning and maintenance. Swivel base has zero-tolerance bearings and rotation can be locked in 3° steps.

Surface treatment:

Base coat and textured varnish

Standard colour RAL 7035 light grey in combination with RAL 7016 anthracite



Example

KST311 / -U2 / -M1 / -F3 / -LK / KFS 11 / V85 / V85 / KL / X

Basic unit

| | |
|--------|---|
| KST311 | Consoles 160x520 mm with insert plate (flat) variant 1 |
| KST312 | Consoles 160x520 mm with insert plate (with absorption) variant 2 |

Base unit

| | |
|----|---|
| U2 | Swiveling 180° left, 90° right with detent incl. 2-step release |
| U3 | Electric swiveling 180° left, 90° right |
| U4 | Non swiveling |

Attachments

| | |
|-----|---|
| M1 | Monitor mounting with monitor housing |
| M2 | Monitor mounting with monitor mounting bracket |
| M3 | Monitor mounting without monitor housing/ -mounting bracket |
| USB | USB-plug socket 2-fold, 1 x 1,5 A (mounted in the left storage compartment) |
| F3 | Footrest KBF/716 |
| H | Heater 2 x 2 kW with ventilator |
| LK | Plate for horizontal manual adjustment for control units +/- 250 mm |

Driver's Seat

| | |
|--------|-----------------------------|
| KFS11* | (Included in the delivery!) |
| KFS9* | |
| KFS10* | |
| KFS12* | |

*Description see Driver's Seat page 251

Technical details may vary based on configuration or application! Technical data subject to change without notice!

KST311 -U2 -M1 -F3 -LK / KFS 11 / V85 / V85 / KL / X

Mounting for equipment boxes

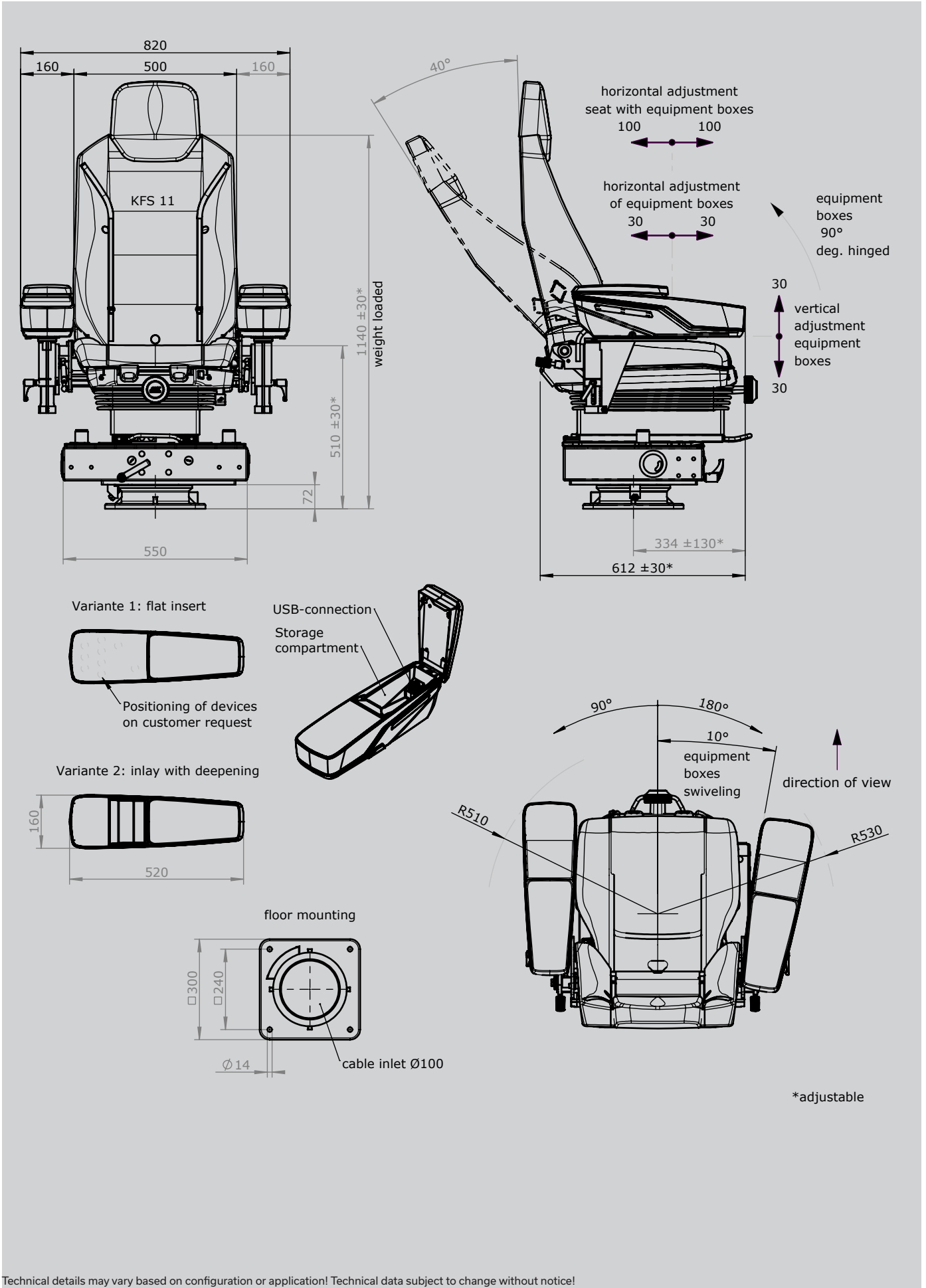
- V... Multi-Axis Controller (see section joysticks)
- S... Single-Axis Controller (see section joysticks)
- D... Double-Handle Controller (see section joysticks)
- N... Control-Switch (see page 113)
- ... More command and indicating devices (see page 137 and 243)

Wiring

- KL Without wiring, but terminal block built in each terminal
- KLV On terminal block 4 mm with single wire 1 mm² each terminal
- KLV On SPS (SPS provision) with single wire 1 mm² each terminal
- KLVA External wiring single wire highly flexible 1,5 mm², 5 m long each terminal
Additional-/ reduction price per meter

Special model

- X Special / customer specified
- X Special painted



Technical details may vary based on configuration or application! Technical data subject to change without notice!

Control Unit

KST 30 swiveling



The KST30 is an ergonomically designed swiveling chair which provides a high degree of comfort. The inner consoles, mounted to the Driver's Seat, swing with the seat. The consoles can be positioned to perfectly match any person by means of length, height and inclination adjustment. For console version 1 the whole control unit can be expanded by additional fixed outer consoles.

The standard version includes:

Inner consoles:

The plastic consoles can be height-adjusted to match joysticks of any size. In addition consoles can be equipped with custom command and indicating devices.

Outer consoles:

The outer metal consoles feature foldable top covers, including mechanical fixation to keep cover in open position. Internal terminal strips can easily be accessed by removeable side covers. Command and indicating devices can be added based on customer's choice. Also special sizes and shapes of outer consoles are available on request.

Driver's Seat:

The comfortable Driver's Seat KFS 11 is equipped with a spring loaded hydraulic vibration absorption system, including weight adjustment, air-permeable textile cover, arm rests and head rest.

Cross-member with swivel base:

The cover of the sheet steel cross-member including the Driver's Seat is forward foldable. Thereby all wirings, terminals and bushings are easily accessible during commissioning and maintenance. Swivel base has zero-tolerance bearings and rotation can be locked in 3° steps.

Surface treatment:

Base coat and textured varnish

Standard colour RAL 7035 light grey in combination with RAL 7015 slate-grey



| | | Example | | | | | | | | | | | | | | |
|---|---|---------|-----|-----|-----|-----|---|--------|---|-----|---|-----|---|----|---|---|
| | | KST3011 | -U2 | -M1 | -F3 | -LK | / | KFS 11 | / | V85 | / | V85 | / | KL | / | X |
| Basic unit | | | | | | | | | | | | | | | | |
| KST3001 | With inner equipment boxes version 1 | | | | | | | | | | | | | | | |
| KST3011 | With inner equipment boxes version 1 and outside equipment boxes 160 mm wide | | | | | | | | | | | | | | | |
| KST3031 | With inner equipment boxes version 1 and outside equipment boxes 270 mm wide | | | | | | | | | | | | | | | |
| KST3041 | With inner equipment boxes version 1 and outside equipment boxes 320 mm wide <i>Special equipment boxes form on request!</i> | | | | | | | | | | | | | | | |
| Base unit | | | | | | | | | | | | | | | | |
| U2 | Swiveling 180° left, 90° right with detent incl. 2-step release | | | | | | | | | | | | | | | |
| U3 | Electric swiveling 180° left, 90° right | | | | | | | | | | | | | | | |
| U4 | Non swiveling | | | | | | | | | | | | | | | |
| Attachments | | | | | | | | | | | | | | | | |
| M1 | Monitor mounting with monitor housing | | | | | | | | | | | | | | | |
| M2 | Monitor mounting with monitor mounting bracket | | | | | | | | | | | | | | | |
| M3 | Monitor mounting without monitor housing/ -mounting bracket | | | | | | | | | | | | | | | |
| F3 | Footrest KBF/716 | | | | | | | | | | | | | | | |
| LK | Plate for horizontal manual adjustment for control units +/- 250 mm | | | | | | | | | | | | | | | |
| Driver's Seat | | | | | | | | | | | | | | | | |
| KFS11* | <i>(Included in the delivery!)</i> | | | | | | | | | | | | | | | |
| KFS9* | | | | | | | | | | | | | | | | |
| KFS10* | | | | | | | | | | | | | | | | |
| KFS12* | | | | | | | | | | | | | | | | |
| *Description see Driver's Seat page 251 | | | | | | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

KST3011 -U2 -M1 -F3 -LK / KFS 11 / V85 / V85 / KL / X

Mounting for equipment boxes

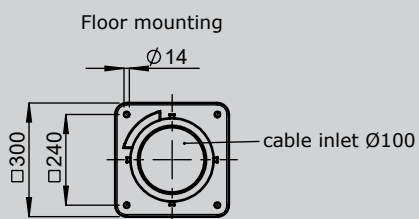
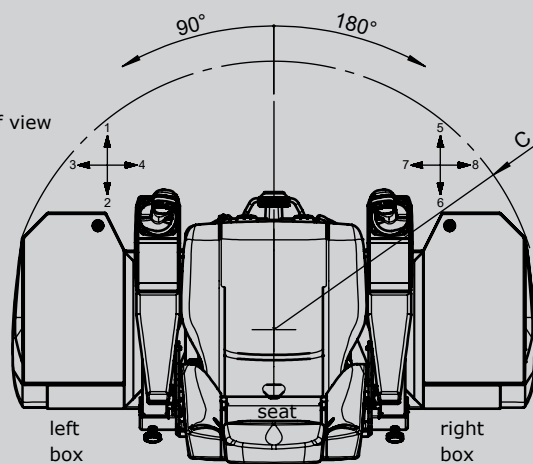
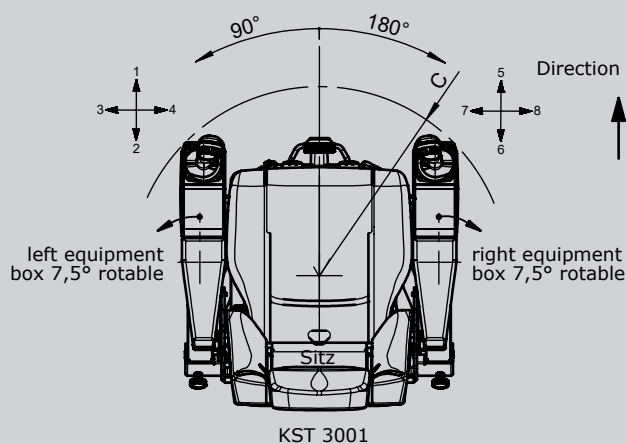
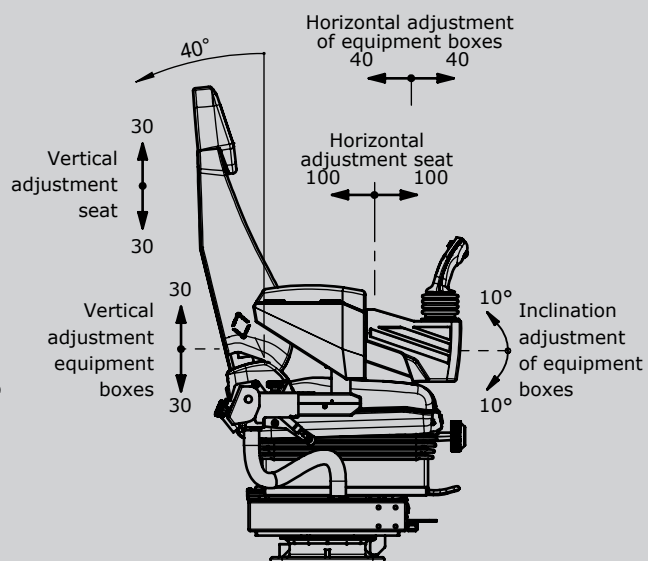
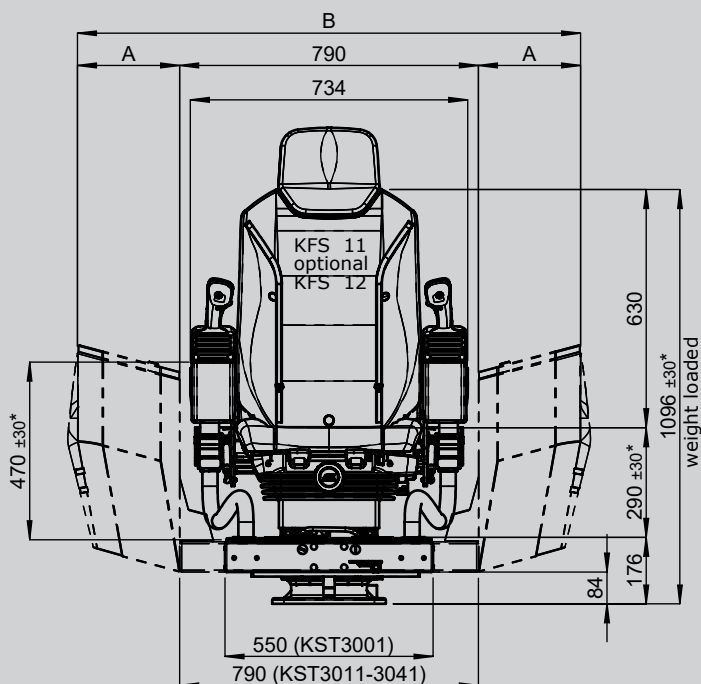
| | |
|------|--|
| V... | Multi-Axis Controller (see section joysticks) |
| S... | Single-Axis Controller (see section joysticks) |
| D... | Double-Handle Controller (see section joysticks) |
| N... | Control-Switch (see page 113) |
| ... | More command and indicating devices (see page 137 and 243) |

Wiring

| | |
|------|--|
| KL | Without wiring, but terminal block built in each terminal |
| KLV | On terminal block 4 mm with single wire 1 mm ² each terminal |
| KLW | On SPS (SPS provision) with single wire 1 mm ² each terminal |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal |
| | <i>Additional-/ reduction price per meter</i> |

Special model

| | |
|---|------------------------------|
| X | Special / customer specified |
| X | Special painted |



* adjustable

| Type | Dim. A | Dim. B | Dim. C |
|----------|--------|--------|--------|
| KST 3001 | - | - | 500 |
| KST 3011 | 160 | 1110 | 610 |
| KST 3031 | 270 | 1330 | 710 |
| KST 3041 | 320 | 1430 | 755 |

Control Unit

KST 19 swiveling



The KST19 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The equipment boxes are vertically and horizontally adjustable. The arrangement of the joysticks, indicators and control devices is customised according to customer specifications. Cabling is carried out through a cross-member in the traverse. (Terminal block)

Driver's Seat:

As standard the KST19 is fitted with a KFS10 seat. The seat itself is fitted with a pneumatic vibration absorption system complete with weight adjustment to ensure that the comfort level is fitted with armrests and a headrest. There is the option to have the seat covered with air-permeable artificial leather.

Cross-member with swivel base:

The swivel base is zero-clearance bearing and can be locked either by a detent (standard) in 3° steps or stepless by a friction brake.

Surface treatment:

Base coat and textured varnish

Standard colour RAL 7035 light grey, equipment boxes RAL 7016 anthracite



Example

KST19 -U1 -M1 -F3 -LK / KFS 10 / V85 / V85 / KL / X

Basic unit

KST19 With equipment boxes

Base unit

U1 Swiveling 180° left, 90° right with friction brake
 U2 Swiveling 180° left, 90° right with detent incl. 2-step release (standard)
 U4 Non swiveling

Attachments

M1 Monitor mounting with monitor housing
 M2 Monitor mounting with monitor mounting bracket
 M3 Monitor mounting without monitor housing/ -mounting bracket
 M4 Monitor mounting (Monitor < 5 kg) with monitor housing
 M5 Monitor mounting (Monitor < 5 kg) with mounting adapter
 F3 Footrest KBF/716
 H Heater 2 x 2 kW with ventilator
 LK Plate for horizontal manual adjustment for control units +/- 250 mm

Driver's Seat

KFS10* (Included in the delivery!)

*Description see Driver's Seat page 251

KST19 -U1 -M1 -F3 -LK / KFS10 / V85 / V85 / KL / X

Mounting for equipment boxes

| | |
|------|--|
| V... | Multi-Axis Controller (see section joysticks) |
| S... | Single-Axis Controller (see section joysticks) |
| D... | Double-Handle Controller (see section joysticks) |
| N... | Control-Switch (see page 113) |
| ... | More command and indicating devices (see page 137 and 243) |

Wiring

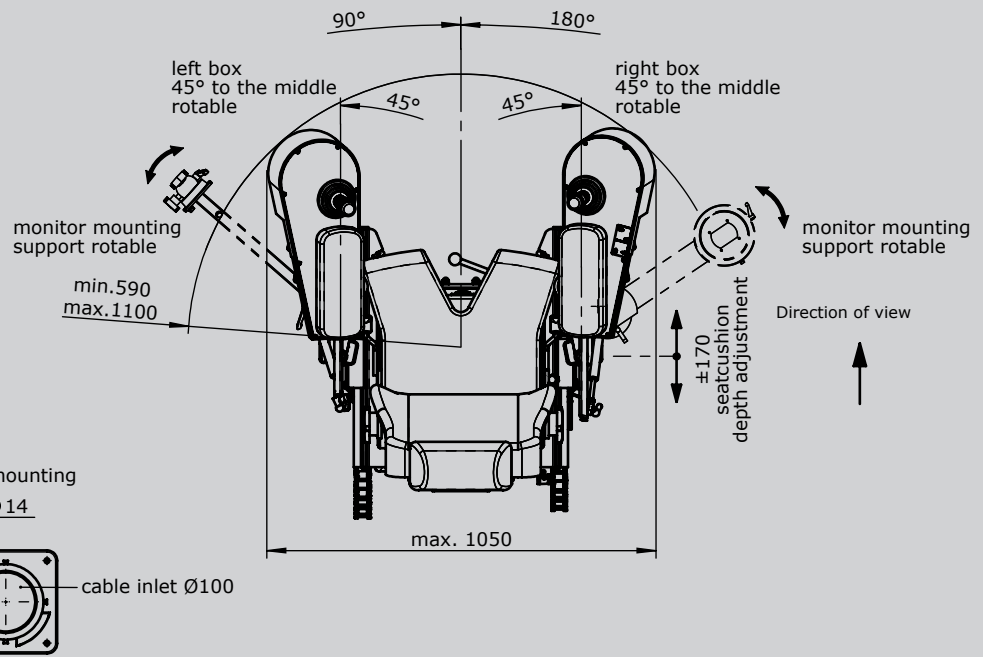
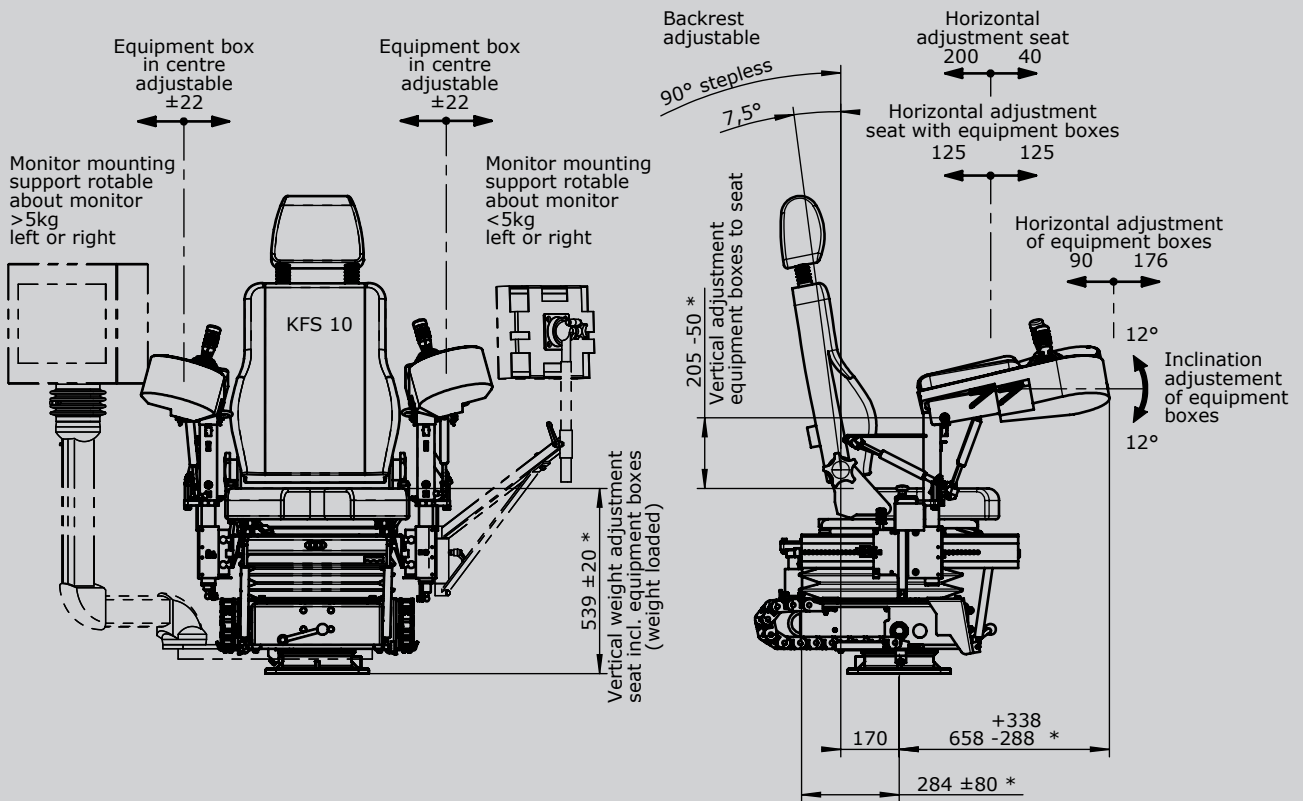
| | |
|------|--|
| KL | Without wiring, but terminal block built in each terminal |
| KLV | On terminal block 4 mm ² with single wire 1 mm ² each terminal |
| KLV | On SPS (SPS provision) with single wire 1 mm ² each terminal |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal |

Special model

| | |
|----------------|------------------------------|
| X | Special / customer specified |
| X ² | Special painted |

Option

| |
|-----------------------------|
| Radio remote control system |
|-----------------------------|



* adjustable

Control Unit KST 10 swiveling



The KST10 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The equipment boxes are vertically and horizontally adjustable. The arrangement of the joysticks, indicators and control devices is customised according to customer specifications. Cabling is carried out through a cross-member in the traverse. (Terminal block)
Special boxes available upon request.

Driver's Seat:

As standard the KST10 is fitted with a KFS11 seat. The seat itself is fitted with a hydraulic vibration absorption system complete with weight adjustment to ensure that the comfort level is fitted with armrests and a headrest. There is the option to have the seat covered with air-permeable artificial leather.

Cross-member with swivel base:

The cover of the sheet steel cross-member including the Driver's Seat is forward foldable. Thereby all wirings, terminals and bushings are easily accessible during commissioning and maintenance. The swivel base is zero-clearance bearing and can be locked either by a detent (standard) in 3° steps or stepless by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 9011 black



| | | Example | | | | | | | | | | | | | | |
|----------------------|---|--|--|-----|-----|-----|---|--------|---|-----|---|-------|---|----|---|---|
| | | KST10 | -U1 | -M1 | -F3 | -LK | / | KFS 11 | / | V85 | / | V85.1 | / | KL | / | X |
| Basic unit | | KST10 | With equipment boxes | | | | | | | | | | | | | |
| Base unit | | U1 | Swiveling 180° left, 90° right with friction brake | | | | | | | | | | | | | |
| | U2 | Swiveling 180° left, 90° right with detent incl. 2-step release (standard) | | | | | | | | | | | | | | |
| | U3 | Electric swiveling 180° left, 90° right | | | | | | | | | | | | | | |
| | U4 | Non swiveling | | | | | | | | | | | | | | |
| | U5 | Without base frame | | | | | | | | | | | | | | |
| Attachments | | M1 | Monitor mounting with monitor housing | | | | | | | | | | | | | |
| | M2 | Monitor mounting with monitor mounting bracket | | | | | | | | | | | | | | |
| | M3 | Monitor mounting without monitor housing/-mounting bracket | | | | | | | | | | | | | | |
| | F3 | Footrest KBF/716 | | | | | | | | | | | | | | |
| | H | Heater 2 x 2 kW with ventilator | | | | | | | | | | | | | | |
| | LK | Plate for horizontal manual adjustment of control units +/- 250 mm | | | | | | | | | | | | | | |
| Driver's Seat | | KFS11* | (Included in the delivery!) | | | | | | | | | | | | | |
| | KFS9* | | | | | | | | | | | | | | | |
| | KFS10* | | | | | | | | | | | | | | | |
| | KFS12* | | | | | | | | | | | | | | | |
| | *Description see Driver's Seat page 251 | | | | | | | | | | | | | | | |

KST10 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

| | |
|------|--|
| V... | Multi-Axis Controller (see section joysticks) |
| S... | Single-Axis Controller (see section joysticks) |
| D... | Double-Handle Controller (see section joysticks) |
| N... | Control-Switch (see page 113) |
| ... | More command and indicating devices (see page 137 and 243) |

Wiring

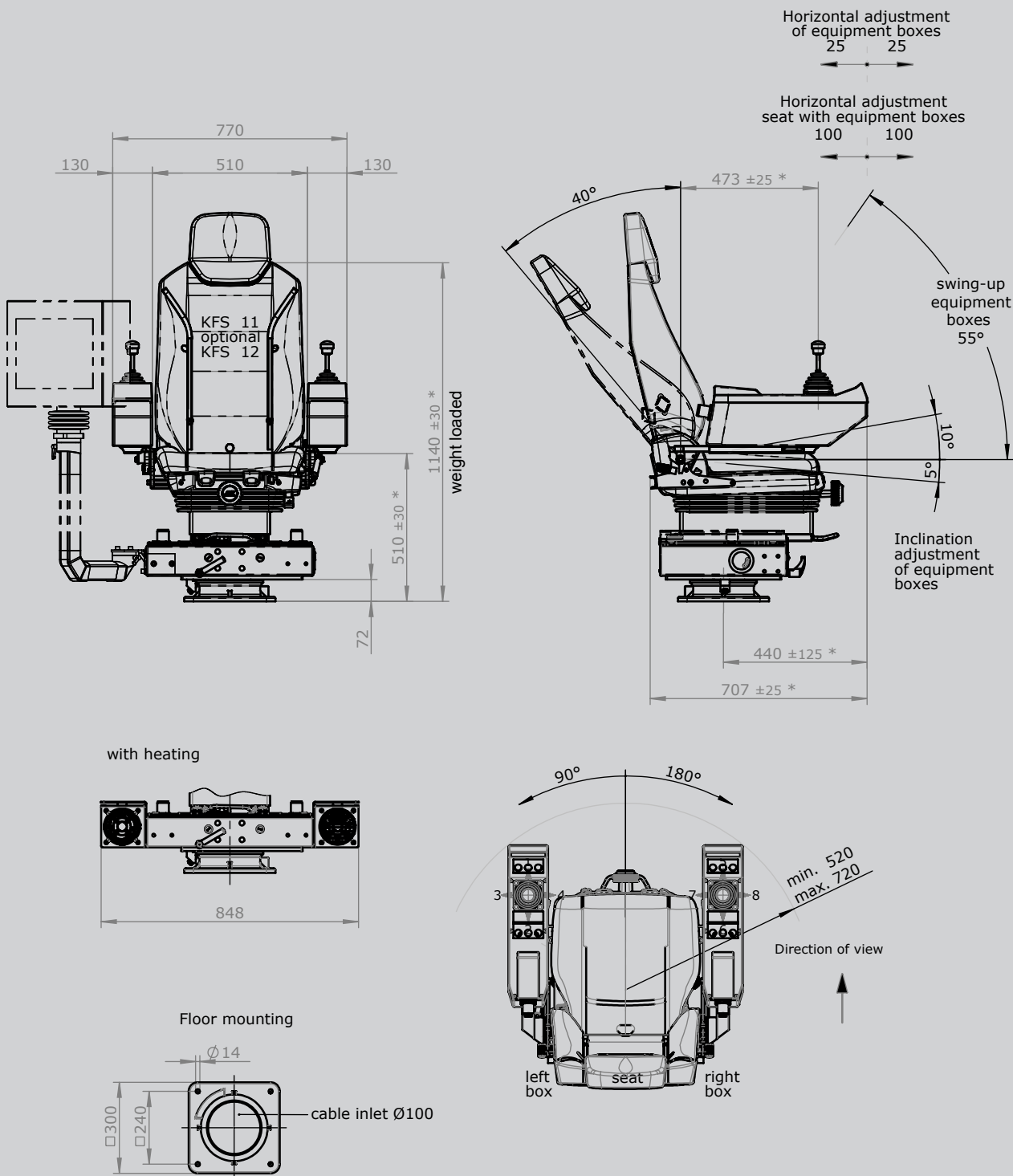
| | |
|------|--|
| KL | Without wiring, but terminal block built in each terminal |
| KLV | On terminal block 4 mm ² with single wire 1 mm ² each terminal |
| KLV | On SPS (SPS provision) with single wire 1 mm ² each terminal |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal |

Special model

| | |
|----------------|------------------------------|
| X | Special / customer specified |
| X ² | Special painted |

Option

Radio remote control system



* adjustable

Control Unit

KST 4 swiveling



The KST4 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The sheet steel equipment boxes are vertically and horizontally adjustable. The arrangement of the joysticks, indicators and control devices is customised according to customer specifications. Cabling is carried out through a cross-member in the traverse. (Terminal block)
Special boxes available upon request.

Driver's Seat:

As standard the KST4 is fitted with a KFS11 seat. The seat itself is fitted with a hydraulic vibration absorption system complete with weight adjustment to ensure that the comfort level is fitted with armrests and a headrest. There is the option to have the seat covered with air-permeable artificial leather.

Cross-member with swivel base:

The cover of the sheet steel cross-member including the Driver's Seat is forward foldable. Thereby all wirings, terminals and bushings are easily accessible during commissioning and maintenance. The swivel base is zero-clearance bearing and can be locked either by a detent (standard) in 3° steps or stepless by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 9011 black



Example

KST41 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Basic unit

- KST41 With equipment boxes 160 x 420 mm
- KST42 With equipment boxes 200 x 420 mm

Base unit

- U1 Swiveling 180° left, 90° right with friction brake
- U2 Swiveling 180° left, 90° right with detent incl. 2-step release (standard)
- U3 Electric swiveling 180° left, 90° right
- U4 Non swiveling
- U5 Without base frame

Attachments

- M1 Monitor mounting with monitor housing
- M2 Monitor mounting with monitor mounting bracket
- M3 Monitor mounting without monitor housing/-mounting bracket
- F3 Footrest KBF/716
- H Heater 2 x 2 kW with ventilator
- LK Plate for horizontal manual adjustment of Control Units +/- 250 mm

Driver's Seat

- KFS11* (Included in the delivery!)
- KFS9*
- KFS10*
- KFS12*

*Description see Driver's Seat page 251

Technical details may vary based on configuration or application! Technical data subject to change without notice!

KST41 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

| | |
|------|--|
| V... | Multi-Axis Controller (see section joysticks) |
| S... | Single-Axis Controller (see section joysticks) |
| D... | Double-Handle Controller (see section joysticks) |
| N... | Control-Switch (see page 113) |
| ... | More command and indicating devices (see page 137 and 243) |

Wiring

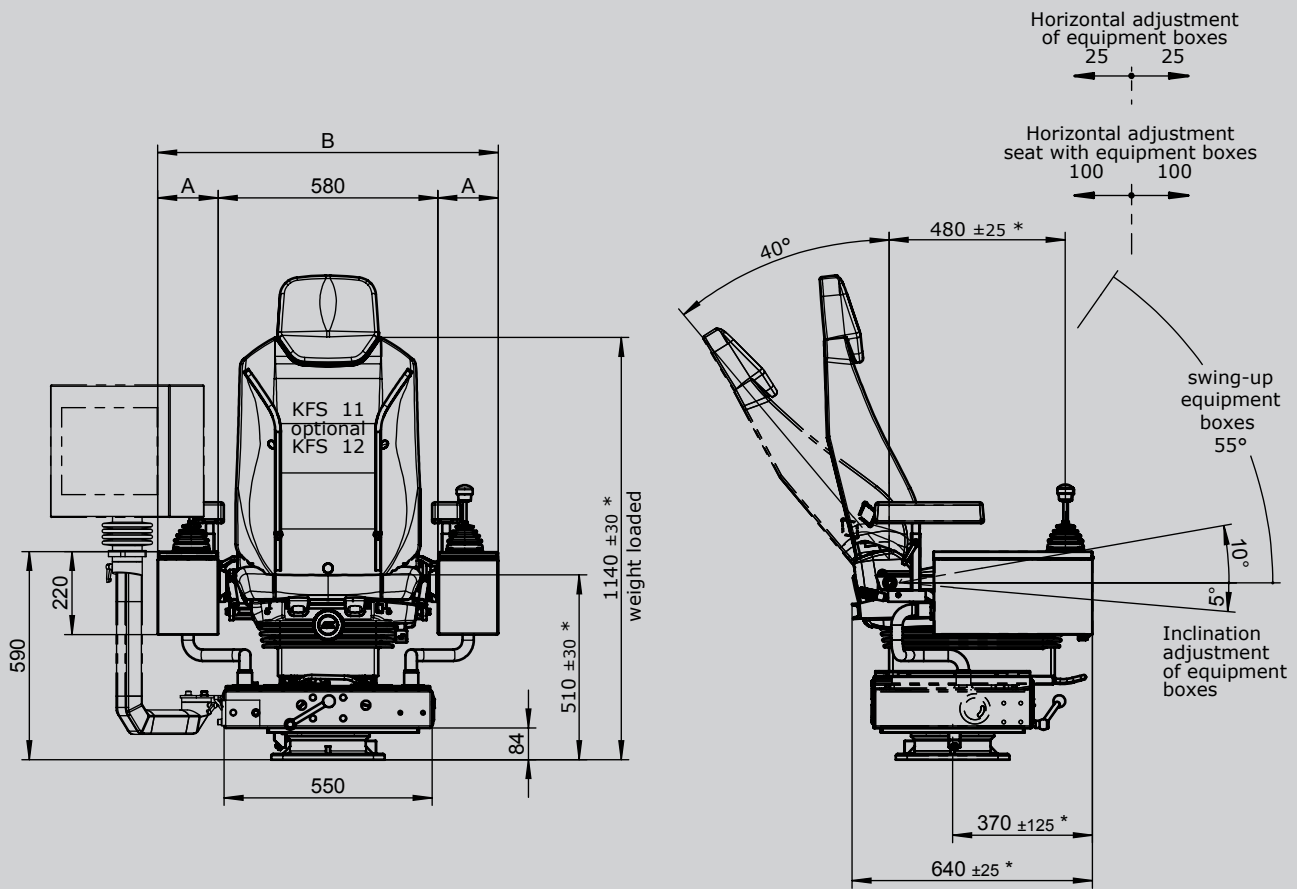
| | |
|------|--|
| KL | Without wiring, each terminal block built in each terminal |
| KLV | On terminal block 4 mm ² with single wire 1 mm ² each terminal |
| KLV | On SPS (SPS provision) with single wire 1 mm ² each terminal |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal |

Special model

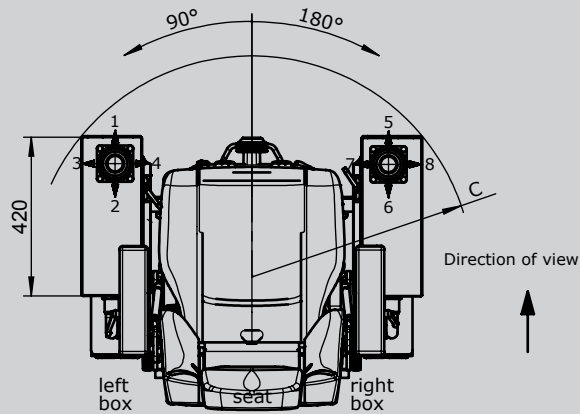
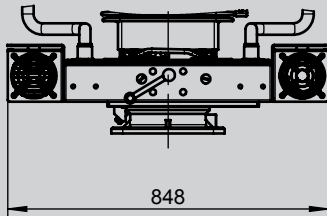
| | |
|----------------|------------------------------|
| X | Special / customer specified |
| X ² | Special painted |

Option

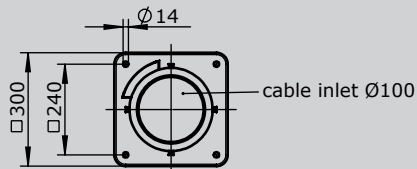
| |
|-----------------------------|
| Radio remote control system |
|-----------------------------|



with heating



Floor mounting



* adjustable

| Type | Dim. A | Dim. B | Dim. C |
|--------|--------|--------|----------------------|
| KST 41 | 160 | 900 | max. 670 min. 570 |
| KST 42 | 200 | 980 | max. 700 min. 600 |

Control Unit KST 5 swiveling



The KST5 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The equipment boxes are made from sheet steel and as standard have a hinged lid with locking feature. This allows for easy inspection and maintenance. The side of the equipment boxes is as standard fitted with an inspection plate which again is lockable. The arrangement of the joystick, indicators and control devices is customised according to customer specifications. This combined with the custom sized and profiled equipment boxes that are available means that the KST5 is very flexible and customisable solution.

Driver's Seat:

As standard the KST5 is fitted with a KFS11 seat. The seat itself is fitted with a hydraulic vibration absorption system complete with weight adjustment to ensure that the comfort level is fitted with armrests and a headrest. There is the option to have the seat covered with air-permeable artificial leather.

Cross-member with swivel base:

The cover of the sheet steel cross-member including the Driver's Seat is forward foldable. Thereby all wirings, terminals and bushings are easily accessible during commissioning and maintenance. The swivel base is zero-clearance bearing and can be locked either by a detent (standard) in 3° steps or stepless by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 7035 light grey



Example

KST51 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Basic unit

- KST51 With equipment boxes 200 x 580 mm
 - KST52 With equipment boxes 270 x 580 mm
 - KST54 With equipment boxes 320 x 580 mm
- Special boxes for request!*

Base unit

- U1 Swiveling 180° left, 90° right with friction brake
- U2 Swiveling 180° left, 90° right with detent incl. 2-step release (standard)
- U3 Electric swiveling 180° left, 90° right
- U4 Non swiveling

Attachments

- M1 Monitor mounting with monitor housing
- M2 Monitor mounting with monitor mounting bracket
- M3 Monitor mounting without monitor housing/-mounting bracket
- F3 Footrest KBF/716
- H Heater 2 x 2 kW with ventilator 240V AC
- LS Plate for horizontal manual adjustment for control units +/- 75 mm
- LK Plate for horizontal manual adjustment for control units +/- 250 mm
- Label without engraving for Multi-axis-/ Single-Axis Controller
- Label with engraving for Multi-axis-/ Single-Axis Controller

KST51 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Driver's Seat

KFS11* *(Included in the delivery!)*

KFS9*

KFS10*

KFS12*

*Description see *Driver's Seat* page 251

Mounting for equipment boxes

V... Multi-Axis Controller *(see section joysticks)*

S... Single-Axis Controller *(see section joysticks)*

D... Double-Handle Controller *(see section joysticks)*

N... Control-Switch *(see page 113)*

... *More command and indicating devices (see page 137 and 243)*

Wiring

KL Without, but terminal block built each terminal

KLV On terminal block 4 mm² with single wire 1 mm² each terminal

KLV On SPS (SPS provision) with single wire 1 mm² each terminal

KLVA External wiring single wire highly flexible 1,5 mm², 5 m long each terminal

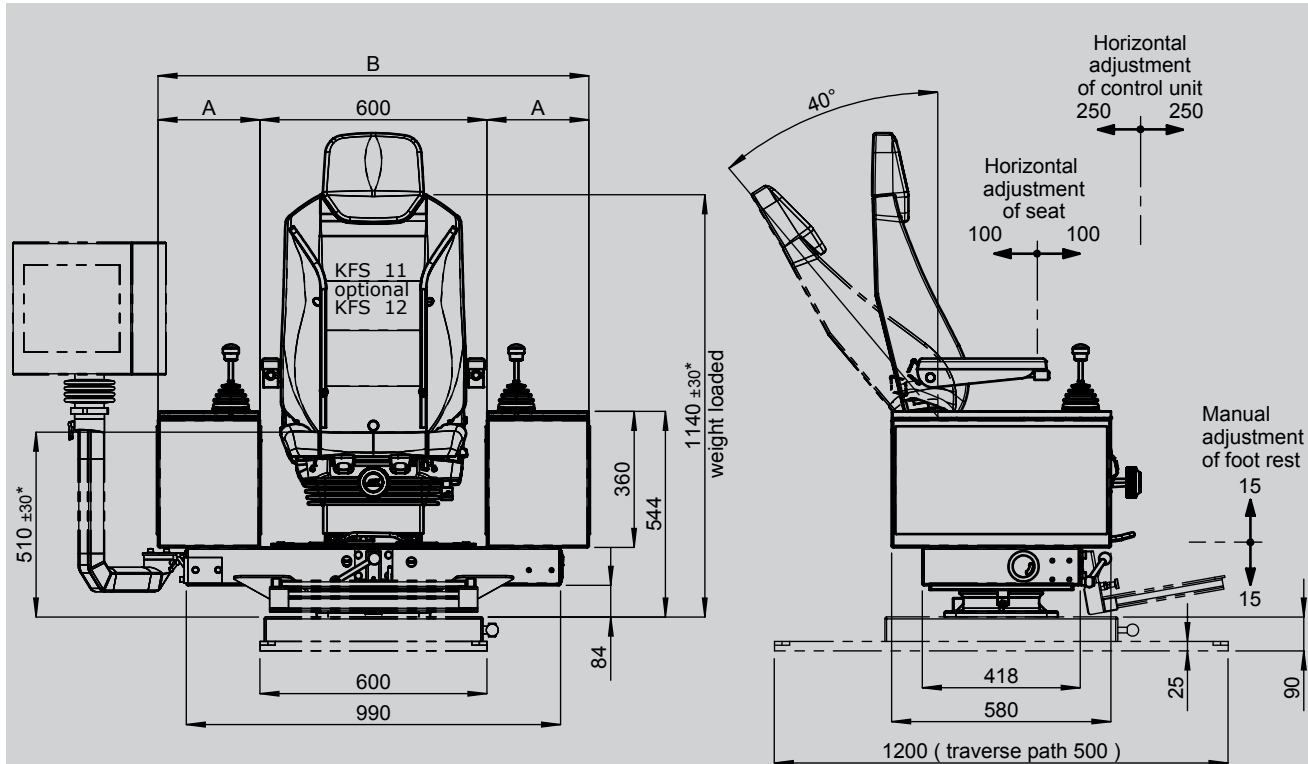
Special model

X Special / customer specified

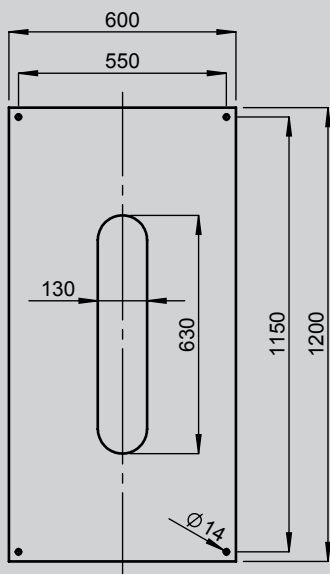
X1 Special painted

Option

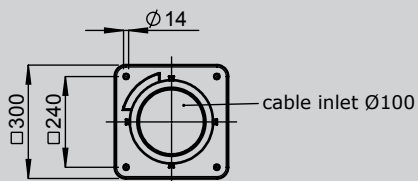
Radio remote control system



Floor mounting



Floor mounting



* adjustable

| Type | Dim. A | Dim. B | Dim. C |
|--------|--------|--------|--------|
| KST 51 | 200 | 1000 | 580 |
| KST 52 | 270 | 1140 | 640 |
| KST 54 | 320 | 1240 | 690 |

Control Unit

KST 6 swiveling



The KST6 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The equipment boxes are vertically and horizontally adjustable. The arrangement of the joysticks, indicators and control devices is customised according to customer specifications. Cabling is carried out through a cross-member in the traverse. (Terminal block)

Driver's Seat:

As standard the KST6 is fitted with a KFS11 seat. The seat itself is fitted with a hydraulic vibration absorption system complete with weight adjustment to ensure that the comfort level is fitted with armrests and a headrest. There is the option to have the seat covered with air-permeable artificial leather.

Cross-member with swivel base:

The cover of the sheet steel cross-member including the Driver's Seat is forward foldable. Thereby all wirings, terminals and bushings are easily accessible during commissioning and maintenance. The swivel base is zero-clearance bearing and can be locked either by a detent (standard) in 3° steps or stepless by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 9011 black



| | | Example | | | | | | | | | | | | | | |
|---|--|---------|-----|-----|-----|-----|---|--------|---|-----|---|-------|---|----|---|---|
| | | KST6 | -U2 | -M1 | -F3 | -LK | / | KFS 11 | / | V64 | / | V64.1 | / | KL | / | X |
| Basic unit | | | | | | | | | | | | | | | | |
| KST6 | With equipment boxes | | | | | | | | | | | | | | | |
| Base unit | | | | | | | | | | | | | | | | |
| U1 | Swiveling 180° left, 90° right with friction brake | | | | | | | | | | | | | | | |
| U2 | Swiveling 180° left, 90° right with detent incl. 2-step release (standard) | | | | | | | | | | | | | | | |
| U3 | Electric swiveling 180° left, 90° right | | | | | | | | | | | | | | | |
| U4 | Non swiveling | | | | | | | | | | | | | | | |
| U5 | Without base frame | | | | | | | | | | | | | | | |
| Attachments | | | | | | | | | | | | | | | | |
| M1 | Monitor mounting with monitor housing | | | | | | | | | | | | | | | |
| M2 | Monitor mounting with monitor mounting bracket | | | | | | | | | | | | | | | |
| M3 | Monitor mounting without monitor housing/-mounting bracket | | | | | | | | | | | | | | | |
| F3 | Footrest KBF/716 | | | | | | | | | | | | | | | |
| H | Heater 2 x 2 kW with ventilator | | | | | | | | | | | | | | | |
| LK | Plate for horizontal manual adjustment for control units +/- 250 mm | | | | | | | | | | | | | | | |
| Driver's Seat | | | | | | | | | | | | | | | | |
| KFS11* | (Included in the delivery!) | | | | | | | | | | | | | | | |
| KFS9* | | | | | | | | | | | | | | | | |
| KFS10* | | | | | | | | | | | | | | | | |
| KFS12* | | | | | | | | | | | | | | | | |
| *Description see Driver's Seat page 251 | | | | | | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

KST6 -U2 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

| | |
|------|--|
| V... | Multi-Axis Controller (see section joysticks) |
| S... | Single-Axis Controller (see section joysticks) |
| D... | Double-Handle Controller (see section joysticks) |
| N... | Control-Switch (see page 113) |
| ... | More command and indicating devices (see page 137 and 243) |

Wiring

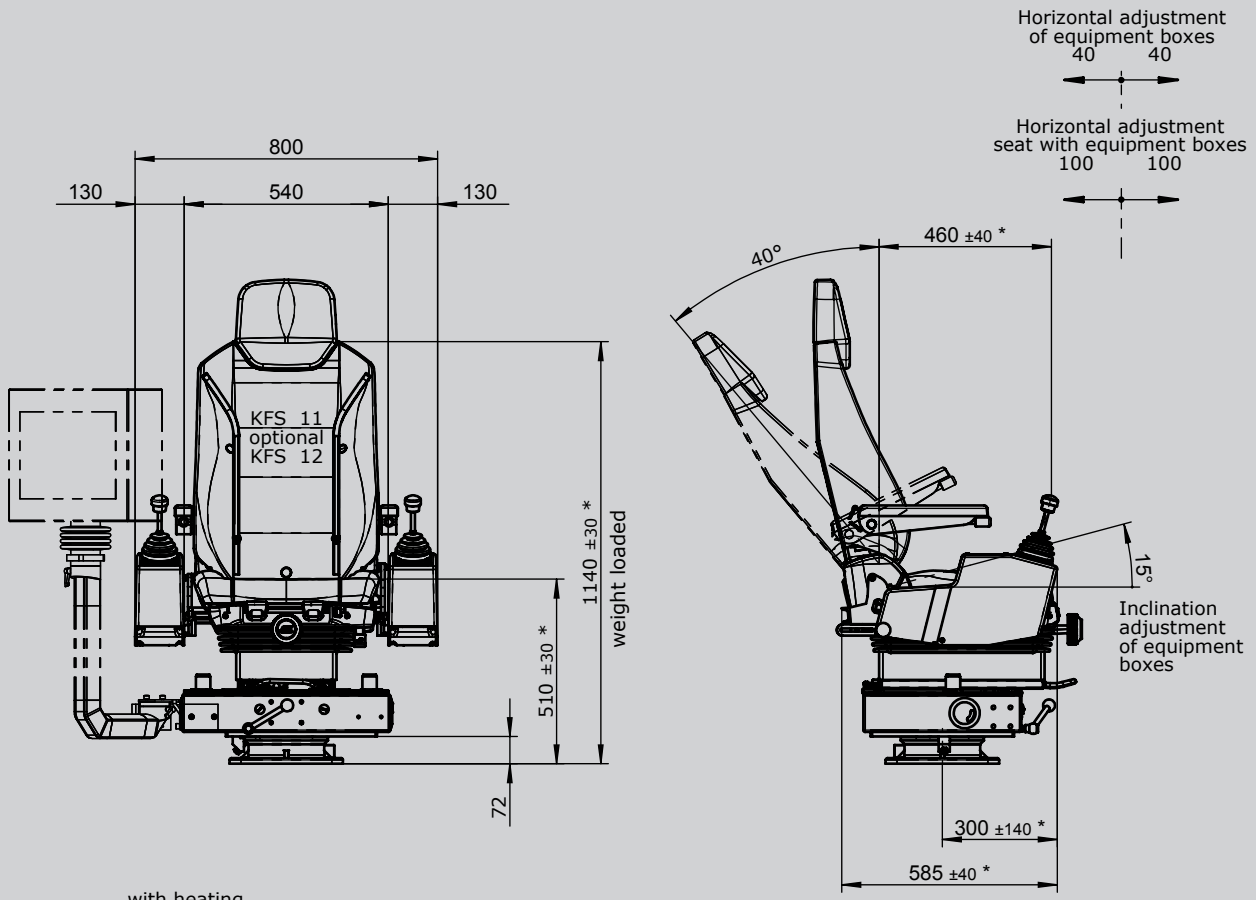
| | |
|------|--|
| KL | Without, but terminal block built each terminal |
| KLV | On terminal block 4 mm ² with single wire 1 mm ² each terminal |
| KLV | On SPS (SPS provision) with single wire 1 mm ² each terminal |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal |

Special model

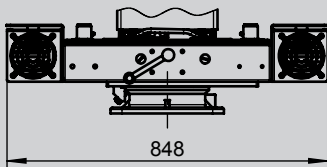
| | |
|----------------|------------------------------|
| X | Special / customer specified |
| X ² | Special painted |

Option

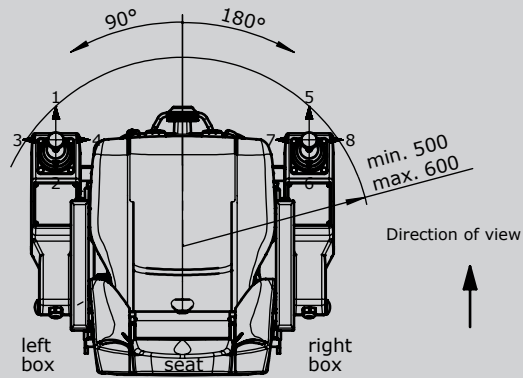
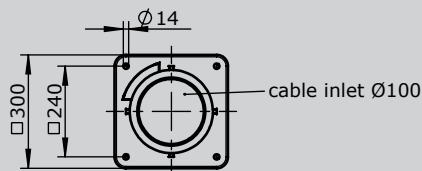
| |
|-----------------------------|
| Radio remote control system |
|-----------------------------|



with heating



Floor mounting



* adjustable

Control Unit KST 8 swiveling



The KST8 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The equipment boxes are vertically and horizontally adjustable. The arrangement of the joysticks, indicators and control devices is customised according to customer specifications. Cabling is carried out through a cross-member in the traverse. (Terminal block)
Special boxes available upon request.

Driver's Seat:

As standard the KST8 is fitted with a KFS11 seat. The seat itself is fitted with a hydraulic vibration absorption system complete with weight adjustment to ensure that the comfort level is fitted with armrests and a headrest. There is the option to have the seat covered with air-permeable artificial leather.

Cross member with swivel base:

The cover of the sheet steel cross-member including the Driver's Seat is forward foldable. Thereby all wirings, terminals and bushings are easily accessible during commissioning and maintenance. The swivel base is zero-clearance bearing and can be locked either by a detent (standard) in 3° steps or stepless by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 9011 black



| | | Example | | | | | | | | | | | | | | |
|---|--|---------|-----|-----|-----|-----|---|--------|---|-----|---|-------|---|----|---|---|
| | | KST8 | -U1 | -M1 | -F3 | -LK | / | KFS 11 | / | V64 | / | V64.1 | / | KL | / | X |
| Basic unit | | | | | | | | | | | | | | | | |
| KST8 | With equipment boxes | | | | | | | | | | | | | | | |
| Base unit | | | | | | | | | | | | | | | | |
| U1 | Swiveling 180° left, 90° right with friction brake | | | | | | | | | | | | | | | |
| U2 | Swiveling 180° left, 90° right with detent incl. 2-step release (standard) | | | | | | | | | | | | | | | |
| U3 | Electric swiveling 180° left, 90° right | | | | | | | | | | | | | | | |
| U4 | Non swiveling | | | | | | | | | | | | | | | |
| U5 | Without base frame | | | | | | | | | | | | | | | |
| Attachments | | | | | | | | | | | | | | | | |
| M1 | Monitor mounting with monitor housing | | | | | | | | | | | | | | | |
| M2 | Monitor mounting with monitor mounting bracket | | | | | | | | | | | | | | | |
| M3 | Monitor mounting without monitor housing/-mounting bracket | | | | | | | | | | | | | | | |
| F3 | Footrest KBF/716 | | | | | | | | | | | | | | | |
| H | Heater 2 x 2 kW with ventilator | | | | | | | | | | | | | | | |
| LK | Plate for horizontal manual adjustment of control units +/- 250 mm | | | | | | | | | | | | | | | |
| Driver's Seat | | | | | | | | | | | | | | | | |
| KFS11* | (Included in the delivery!) | | | | | | | | | | | | | | | |
| KFS9* | | | | | | | | | | | | | | | | |
| KFS10* | | | | | | | | | | | | | | | | |
| KFS12* | | | | | | | | | | | | | | | | |
| *Description see Driver's Seat page 251 | | | | | | | | | | | | | | | | |

KST8 -U1 -M1 -F3 -LK / KFS11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

| | |
|------|--|
| V... | Multi-Axis Controller (see section joysticks) |
| S... | Single-Axis Controller (see section joysticks) |
| D... | Double-Handle Controller (see section joysticks) |
| N... | Control-Switch (see page 113) |
| ... | More command and indicating devices (see page 137 and 243) |

Wiring

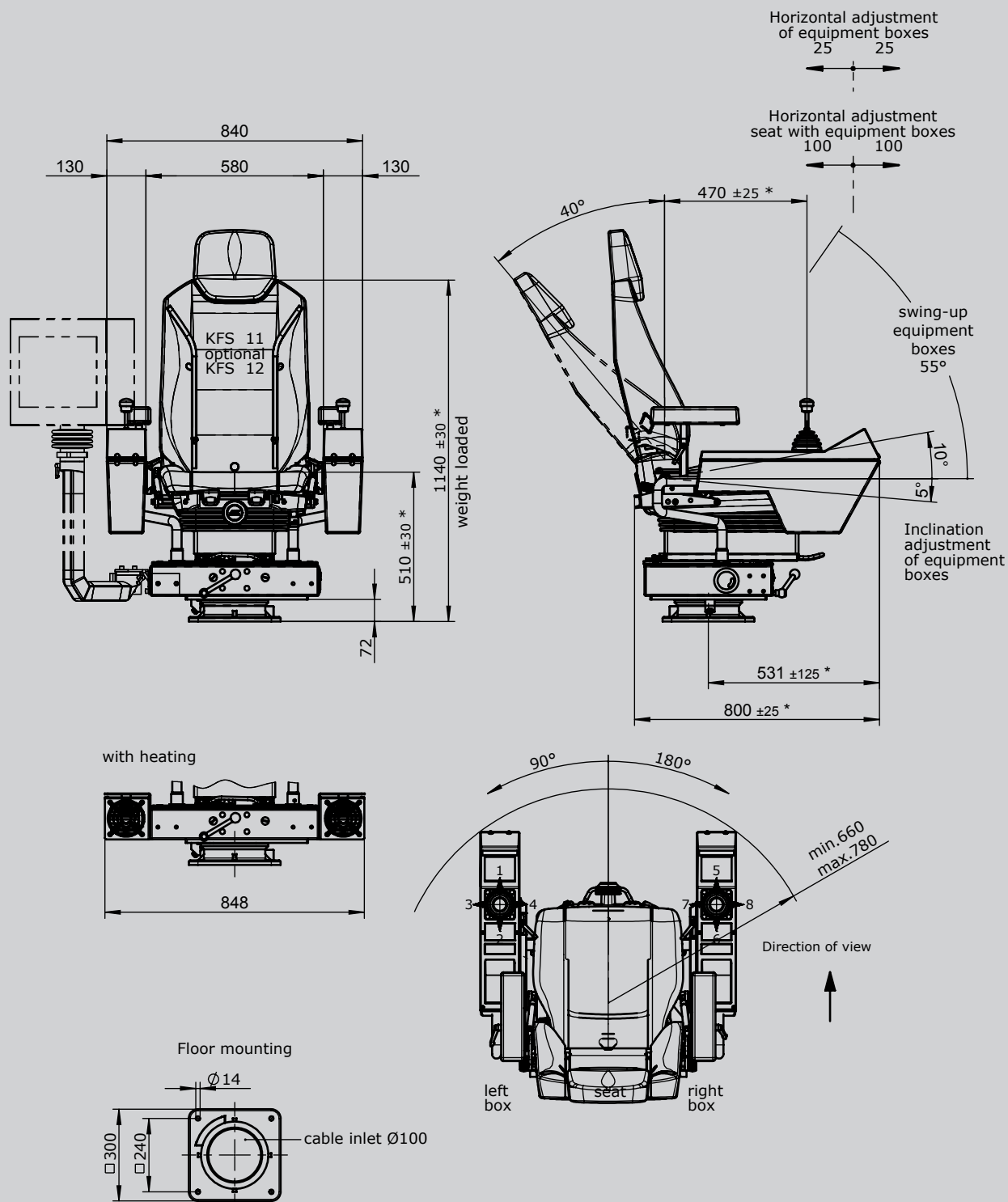
| | |
|------|--|
| KL | Without wiring, but terminal block built each terminal |
| KLV | On terminal block 4 mm ² with single wire 1 mm ² each terminal |
| KLV | On SPS (SPS provision) with single wire 1 mm ² each terminal |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal |

Special model

| | |
|----------------|------------------------------|
| X | Special / customer specified |
| X ² | Special painted |

Option

| |
|-----------------------------|
| Radio remote control system |
|-----------------------------|



* adjustable

Control Unit

KST 85



The KST85 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The equipment boxes are vertically and horizontally adjustable. The arrangement of the joysticks, indicators and control devices is customised according to customer specifications. Cabling is carried out through a cross-member in the traverse. (Terminal block)

Special boxes available upon request.

Driver's Seat:

The comfortable spring mounted seat KFS14 with roller-bearing swivel systems.

Heating console:

Cover with 2 steps heating (2x2kW 400V AC) with integrated ventilator. The cover of the heating cover can be tilted forward to reach the terminal block of the heating and cable execution.

Surface treatment:

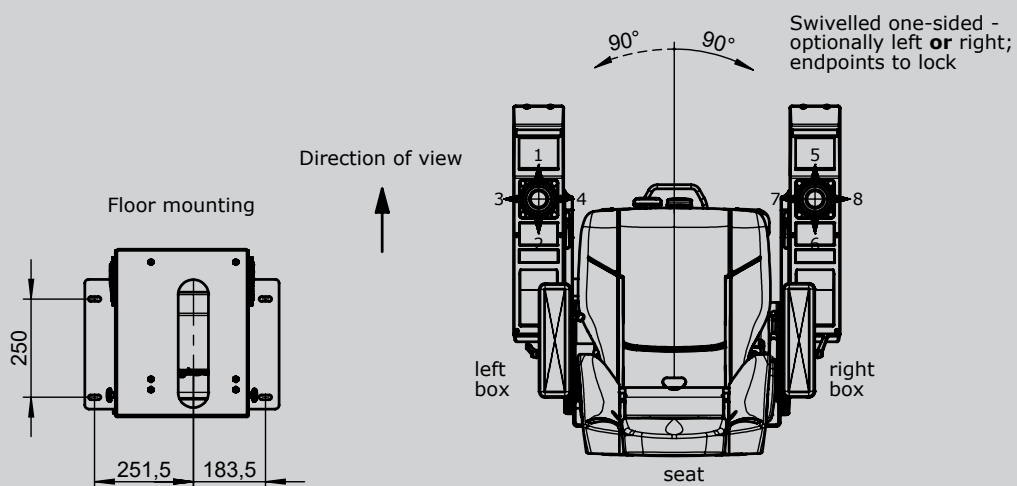
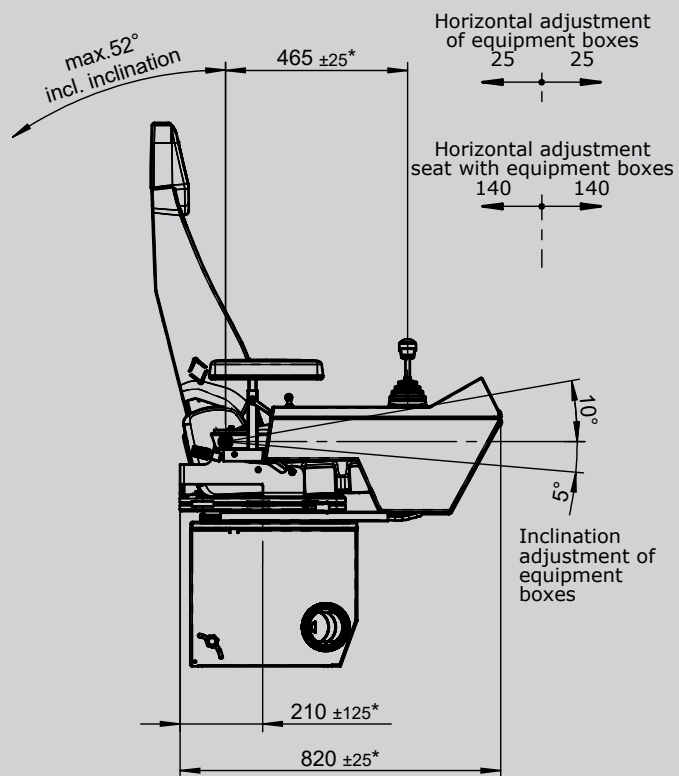
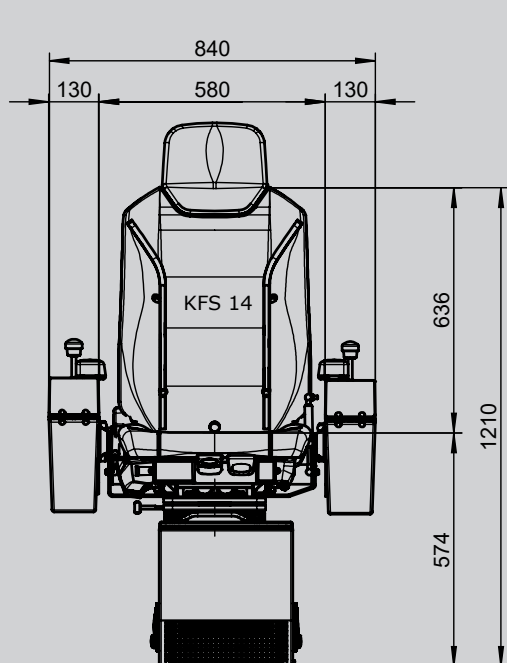
Base coat and textured varnish
Standard colour RAL 9011 black



| | KST85 | Example -M1 | / | KFS14 | / | V64 | / | V64.1 | / | KL | / | X |
|-------------------------------------|--|----------------|---|-------|---|-----|---|-------|---|----|---|---|
| Basic unit | | | | | | | | | | | | |
| KST85 | With heating in the console base | | | | | | | | | | | |
| KST87 | With console base without heating | | | | | | | | | | | |
| Attachments | | | | | | | | | | | | |
| M1 | Monitor mounting with monitor housing | | | | | | | | | | | |
| M2 | Monitor mounting with monitor mounting bracket | | | | | | | | | | | |
| M3 | Monitor mounting without monitor housing/-mounting bracket | | | | | | | | | | | |
| Driver's Seat | | | | | | | | | | | | |
| KFS14* | (Included in the delivery!) | | | | | | | | | | | |
| Mounting for equipment boxes | | | | | | | | | | | | |
| V... | Multi-Axis Controller (see section joysticks) | | | | | | | | | | | |
| S... | Single-Axis Controller (see section joysticks) | | | | | | | | | | | |
| D... | Double-Handle Controller (see section joysticks) | | | | | | | | | | | |
| N... | Control-Switch (see page 113) | | | | | | | | | | | |
| | More command and indicating devices (see page 137 and 243) | | | | | | | | | | | |
| Wiring | | | | | | | | | | | | |
| KL | Without wiring, but with terminal block built each terminal | | | | | | | | | | | |
| KLV | On terminal block 4 mm ² with single wire 1 mm ² each terminal | | | | | | | | | | | |
| KLV | On SPS (SPS provision) with single wire 1 mm ² each terminal | | | | | | | | | | | |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal | | | | | | | | | | | |
| Special model | | | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | | | |
| X ² | Special painted | | | | | | | | | | | |

| Option | |
|-----------------------------|--|
| Radio remote control system | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!



* adjustable



The KST7 is an ergonomically designed swiveling control chair which provides a high degree of comfort.

Equipment boxes:

The equipment boxes are made from sheet steel and as standard have a hinged lid with locking feature. This allows for easy inspection and maintenance. The side of the equipment boxes is as standard fitted with an inspection plate which again is lockable. The arrangement of the joystick, indicators and control devices is customised according to customer specifications. This combined with the custom sized and profiled equipment boxes that are available means that the KST7 is very flexible and customisable solution.

Driver's Seat:

The tipped spring mounted seat KFS4 is fit with an hydraulic vibration absorption system incl. weight adjustment. With the folding spring mounted seat you can also arrive your workplace in small cabins.

Base plate:

The crane control unit is available with or without base plate.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 7035 light grey



Example

KST7 -1 / KFS11 / V64 / V64.1 / KL / X

Basic unit

KST7 With equipment boxes 290 x 500 mm
KST175 With equipment boxes 210 x 500 mm
Special boxes for request!

Base plate

1 With base plate prepare for Driver's Seat KFS4
2 With base plate prepare for Driver's Seat KFS2
3 With base plate with apron for Driver's Seat KFS9, KFS11...
4 Without base plate

Driver's Seat

KFS 4* *(Included in the delivery!)*
KFS 2*
KFS 11*
KFS 9*
**Description see Driver's Seat page 251*

Mounting for equipment boxes

V... Multi-Axis Controller *(see section joysticks)*
S... Single-Axis Controller *(see section joysticks)*
D... Double-Handle Controller *(see section joysticks)*
N... Control-Switch *(see page 113)*
... *More command and indicating devices (see page 137 and 243)*

KST 7 -1 / KFS 11 / V64 / V64.1 / KL / X

Wiring

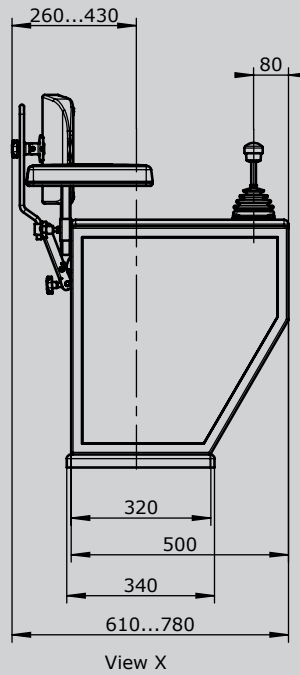
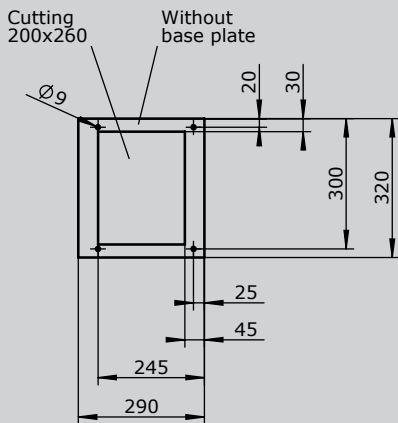
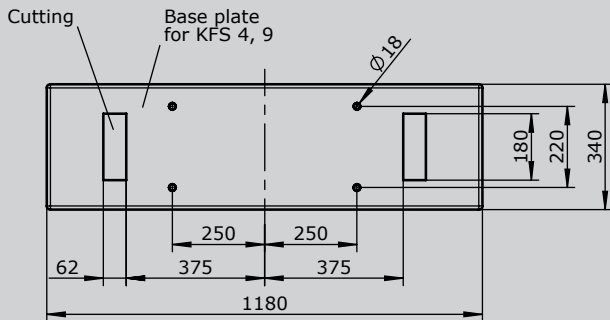
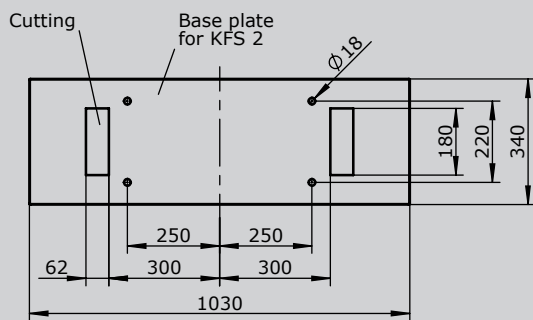
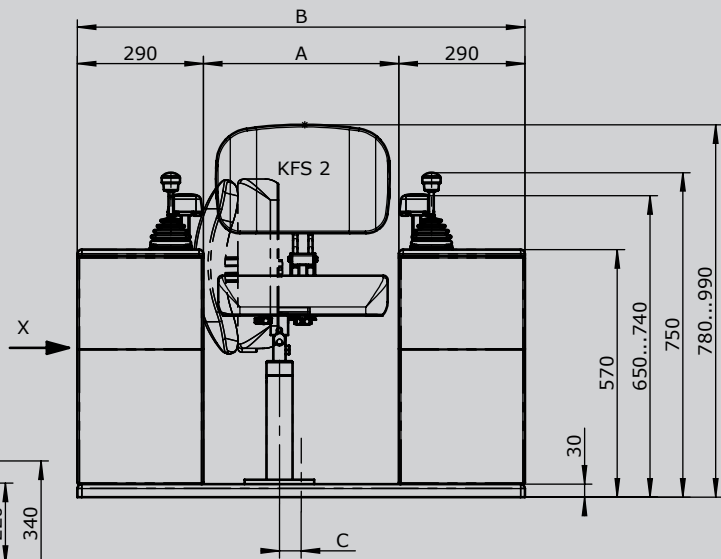
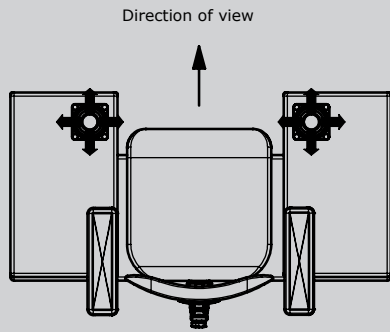
| | |
|------|--|
| KL | Without wiring, but terminal block built each terminal |
| KL V | On terminal block 4 mm ² with single wire 1 mm ² each terminal |
| KL V | On SPS (SPS provision) with single wire 1 mm ² each terminal |
| KLVA | External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal |

Special model

| | |
|----------------|------------------------------|
| X | Special / customer specified |
| X ² | Special painted |

Option

Radio remote control system



| Type | Dim. A | Dim. B | Dim. C |
|-------|--------|--------|--------|
| KFS 2 | 450 | 1030 | 50 |
| KFS 4 | 600 | 1180 | 25 |
| KFS 9 | 600 | 1180 | 25 |

| Dimension outside in mm (BxLxH) | Dimension inside in mm (BxLxH) | Remarks | Weight KG | Form |
|--|--------------------------------------|---|--------------|-------------|
| Steel sheet housing material thickness 1/1,5 mm | | | | |
| Protection IP54 painting RAL 7032 pebble-grey textured varnish | | | | |
| 200 x 200 x 92 | 166 x 166 x 90 | | 1,3 | B 200 |
| 230x 230 x 105 | 196 x 196 x 102 | | 1,4 | B 230 |
| 230 x 340 x 105 | 196 x 306 x 102 | | 1,5 | B 230 x 340 |
| 230 x 440 x 105 | 196 x 406 x 102 | | 1,6 | B 230 x 440 |
| 250 x 250 x 150 | 216 x 216 x 147 | | 1,6 | B 250 x 250 |
| 150 x 400 x 105 | 116 x 366 x 102 | | 3,2 | B 150 x 400 |
| 150 x 500 x 105 | 116 x 466 x 102 | | 3,5 | B 150 x 500 |
| 150 x 600 x 105 | 116 x 566 x 102 | | 3,8 | B 150 x 600 |
| 260 x 500 x 105 | 226 x 466 x 102 | | 3,8 | B 260 x 500 |
| 260 x 600 x 105 | 226 x 566 x 102 | | 4,2 | B 260 x 600 |
| dimensions special | | On enquiry | | |
| Plastic housing polycarbonat | | | | |
| Protection IP65 colour RAL 7035 fair-grey | | | | |
| 120 x 122 x 105 | 113 x 115 x 98 | | 0,35 | I 120 x 122 |
| 120 x 160 x 140 | 113 x 134 x 133 | | 0,6 | I 120 x 160 |
| 160 x 240 x 120 | 153 x 215 x 114 | | 0,8 | I 160 x 240 |
| 160 x 360 x 100 | 153 x 352 x 94 | | 1,0 | I 160 x 360 |
| 230 x 300 x 110 | 223 x 293 x 103 | | 1,15 | I 230 x 300 |
| Plastic housing polyester | | | | |
| Protection IP65 colour RAL 7000 grey | | | | |
| 220 x 335 x 115 | 200 x 292 x 108 | Colour altern. RAL 9011 black | 1,65 | I 220 x 335 |
| 220 x 465 x 115 | 200 x 432 x 108 | Colour altern. RAL 9011 black | 2,24 | I 220 x 465 |
| 250 x 255 x 120 | 236 x 243 x 110 | | 2,65 | I 250 x 255 |
| 250 x 400 x 120 | 236 x 386 x 110 | | 3,65 | I 250 x 400 |
| 250 x 600 x 120 | 236 x 586 x 110 | | 5,24 | I 250 x 600 |
| Accessory parts | | | | |
| Hinges each housing (2 pcs.) | | | 0,2 | |
| Armrest with clamp adjustable straps | | | 0,5 | |
| Cable entry M20 cable 7 - 13 mm | | With anti-kink predection and strain relief | 0,15 | |
| Cable entry M32 cable 11 - 21 mm | | With anti-kink predection and strain relief | 0,2 | |
| Cable entry M40 cable 19 - 28 mm | | With anti-kink predection and strain relief | 0,25 | |
| Pillar with flange 100 x 100 x 535 mm high | | Flange 150 x 150 mm | 14,0 | |
| Indicating labels not engraved for Multi-axis / Single-Axis Controller | | | | |
| Indicating labels with engraving for Multi-axis / Single-Axis Controller | | Character | | |

Attachment for Control Unit, portable control units and housings



| Command and indicating devices 22 mm (Siemens Typ 3SU) incl. indicating label | | Contact-complement | Weight KG | Type |
|---|-------------|--------------------|-----------|------|
| Push button | | 1 S + 1 Ö | 0,040 | D |
| Selector switch 0-1 | 2 positions | 1 S + 1 Ö | 0,050 | W |
| Selector switch 1-0-2 | 3 positions | 2 S + 2 Ö | 0,060 | W |
| Key switch 0-1 | 2 positions | 1 S + 1 Ö | 0,130 | S |
| Key switch 1-0-2 | 3 positions | 2 S + 2 Ö | 0,140 | S |
| Mushroom key switch latching | | 1 S + 1 Ö | 0,080 | PS |
| Mushroom head push button latching | | 1 Ö | 0,060 | PV |
| Illuminated push button diode 24 V DC/AC | | 1 S + 1 Ö | 0,040 | LD |
| Illuminated push button diode 230 V AC | | 1 S + 1 Ö | 0,040 | LD |
| Indicator light diode 24 V DC/AC | | | 0,040 | L |
| Indicator light diode 230 V AC | | | 0,040 | L |
| Coordinate switch 2 positions horizontal T-O-T 3SU1030-7AC10 | | 2 S | 0,102 | K |
| Coordinate switch 2 positions vertical T-O-T 3SU1030-7AD10 | | 2 S | 0,102 | K |
| Coordinate switch 4 positions T-O-T / T-O-T 3SU1030-7AF10 | | 4 S | 0,112 | K |
| Switching element in addition | | 1S + 1Ö | 0,010 | |
| Other command and indicating devices | | | | |
| Summer | | | 0,250 | |
| Knee button FAK-S/KC/I | | 1 S + 1 Ö | 0,350 | |
| Foot button | | 1 S + 1 Ö | 0,450 | |
| Attachments | | | | |
| Drilling 22 mm | | | | |
| Blind plug 22 mm | | | | |
| Cutouts for display devices | | | | |
| Microphone with gooseneck | | | | |
| Power supply 230 V/24 V DC for Driver's Seat | | | | |

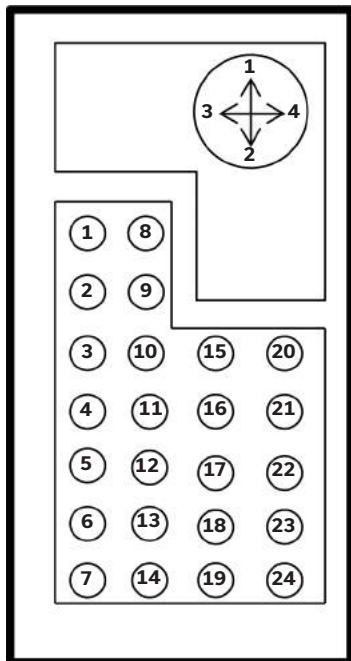
Ordering information



Customer _____

Order No. _____

| Equipment box left | Pos. No. | Type | Colour | Label text (max. 2 x 12 characters) | Plant ref. | Destination | Notes |
|--------------------|----------|-------|--------|-------------------------------------|------------|-------------|-------|
| | 1 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 2 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 3 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 4 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 5 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 6 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 7 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 8 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 9 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 10 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 11 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 12 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 13 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 14 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 15 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 16 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 17 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 18 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 19 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 20 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 21 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 22 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 23 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 24 | _____ | _____ | _____ | _____ | _____ | _____ |



Maximum installation of command and indicating devices 22 (see p.137 & 243) in our control units and housings if our Multi-Axis Controllers V62 (see p.71) are used. Additional command and indicating devices can be installed if Multi-Axis Controllers V64 or V11 (see p.71 or p.88) are used. (please enquire)

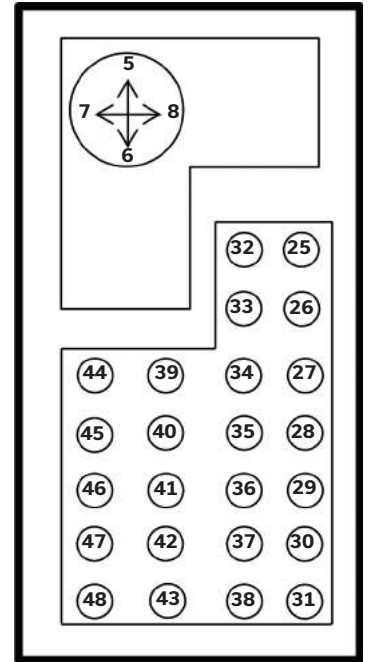
| Control unit (see p. 213) Type | | No. of pieces max. |
|-----------------------------------|----------------------------------|--------------------|
| KST3 | 1 - 6, 8 - 13, 15 - 18 | 16 |
| KST41/181 | 1 - 5, 10 - 12 | 8 |
| KST42/182 | 1 - 5, 8 - 12, 15 - 17 | 13 |
| KST51/122 | 3 - 7, 10 - 14, 15 - 19, 20 - 24 | 20 |
| KST52/53/54/152/154 | 1 - 24 | 24 |
| KST6 | 3 - 4, 10 - 11, 15 - 16 | 6 |
| KST7 | 1 - 24 | 24 |
| KST75 | 1 - 19 | 19 |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Customer _____

Order No. _____

| Pos. No. | Type | Colour | Label text (max). 2 x 12 characters | Plant ref. | Desti- nation | Notes | Equipment box right |
|----------|-------|--------|--|------------|------------------|-------|---------------------|
| 1 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 2 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 3 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 4 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 5 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 6 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 7 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 8 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 9 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 10 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 11 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 12 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 13 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 14 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 15 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 16 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 17 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 18 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 19 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 20 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 21 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 22 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 23 | _____ | _____ | _____ | _____ | _____ | _____ | |
| 24 | _____ | _____ | _____ | _____ | _____ | _____ | |



Maximum installation of command and indicating devices 22 (see p.137 & 243) in our control units and housings if our Multi-Axis Controllers V62 (see p.71) are used. Additional command and indicating devices can be installed of Multi-Axis Controllers V64 or V11 (see p.71 or p.88) are used. (please enquire)

| | No. of pieces max. | Control unit (see p.213) Type |
|------------------------------------|-----------------------|----------------------------------|
| 25 - 30, 32 - 37, 39 - 42 | 16 | KST3 |
| 25 - 29, 34 - 36 | 8 | KST41/181 |
| 25 - 29, 32 - 36, 39 - 41 | 13 | KST42/182 |
| 27 - 31, 34 - 38, 39 - 43, 44 - 48 | 20 | KST51/122 |
| 25 - 48 | 24 | KST52/53/54/152/154 |
| 27 - 28, 34 - 35, 39 - 40 | 6 | KST6 |
| 25 - 48 | 24 | KST7 |
| 25 - 43 | 19 | KST75 |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Ordering information

KST8, 85



Customer _____

Order No. _____

| Equipment box left | Pos. No. | Type | Colour | Lable text (max). 2 x 12 characters | Plant ref. | Desti- nation | Notes |
|--------------------|----------|------|--------|--|------------|------------------|-------|
| | 1 | | | | | | |
| | 2 | | | | | | |
| | 3 | | | | | | |
| | 4 | | | | | | |
| | 5 | | | | | | |
| | 6 | | | | | | |
| | 7 | | | | | | |
| | 8 | | | | | | |
| | 9 | | | | | | |
| | 10 | | | | | | |
| | 11 | | | | | | |
| | 12 | | | | | | |

Max. 6 pcs.
installation
of command
and indicating
devices 22 (see
p.137 & 243) or
1 pcs. monito-
ring device
72 x 72mm

Multi-Axis Con-
troller V64 (see
p.71) or V11
(see p.88)

Max. 3 pcs.
installation
of command
and indicating
devices 22 (see
p.137 & 243)

Place to put on
devices

| Equipment box right | Pos. No. | Type | Colour | Lable text (max). 2 x 12 characters | Plant ref. | Desti- nation | Notes |
|---------------------|----------|------|--------|--|------------|------------------|-------|
| | 13 | | | | | | |
| | 14 | | | | | | |
| | 15 | | | | | | |
| | 16 | | | | | | |
| | 17 | | | | | | |
| | 18 | | | | | | |
| | 19 | | | | | | |
| | 20 | | | | | | |
| | 21 | | | | | | |
| | 22 | | | | | | |
| | 23 | | | | | | |
| | 24 | | | | | | |

Max. 6 pcs.
installation
of command
and indicating
devices 22 (see
p.137 & 243) or
1 pcs. monito-
ring device
72 x 72mm

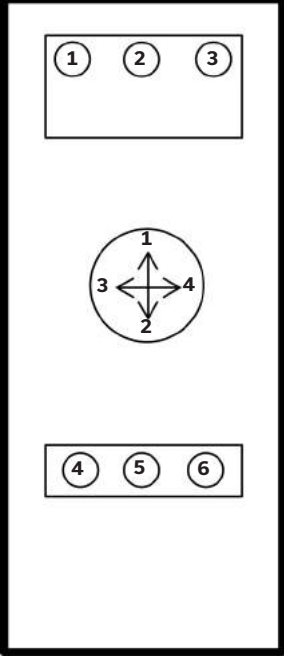
Multi-Axis Con-
troller V64 (see
p.71) or V11
(see p.88)

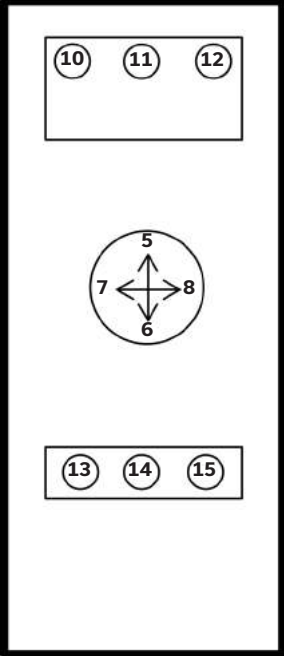
Max. 3 pcs.
installation
of command
and indicatin
devices 22 (see
p.137 & 243)

Place to put on
devices

Customer _____

Order No. _____

| Equipment box left | Pos. No. | Type | Colour | Label text (max. 2 x 12 characters) | Plant ref. | Desti-nation | Notes |
|---|----------|-------|--------|-------------------------------------|------------|--------------|-------|
|  <p>Max. 3 pcs. installation of command and indicating devices 22 (see p.137 & 243)</p> <p>Multi-axis Controller V11, V14, V25, V85</p> <p>Max. 3 pcs. installation of command and indicating devices 22 (see p.137 & 243)</p> | 1 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 2 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 3 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 4 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 5 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 6 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 7 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 8 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 9 | _____ | _____ | _____ | _____ | _____ | _____ |

| Equipment box right | Pos. No. | Type | Colour | Label text (max. 2 x 12 characters) | Plant ref. | Desti-nation | Notes |
|--|----------|-------|--------|-------------------------------------|------------|--------------|-------|
|  <p>Max. 3 pcs. installation of command and indicating devices 22 (see p.137 & 243)</p> <p>Multi-axis Controller V11, V14, V25, V85</p> <p>Max. 3 pcs. installation of command and indicating devices 22 (see p.137 & 243)</p> | 13 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 14 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 15 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 16 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 17 | _____ | _____ | _____ | _____ | _____ | _____ |
| | 18 | _____ | _____ | _____ | _____ | _____ | _____ |
| | | _____ | _____ | _____ | _____ | _____ | _____ |
| | | _____ | _____ | _____ | _____ | _____ | _____ |
| | | _____ | _____ | _____ | _____ | _____ | _____ |

Ordering information

KST19



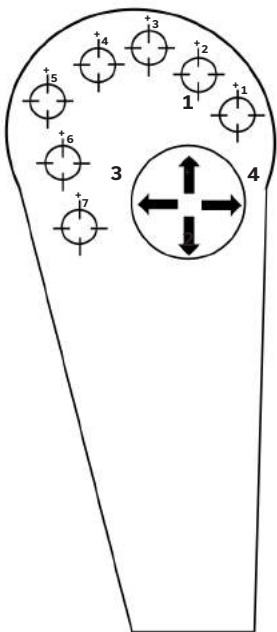
Customer _____

Order No. _____

Equipment box left

Multi-Axis Controller V11, V14, V25, V85
see p. 63, 50, 25, 10

max. 7 installations of command and indicating devices 22 (see p.137 & 243)

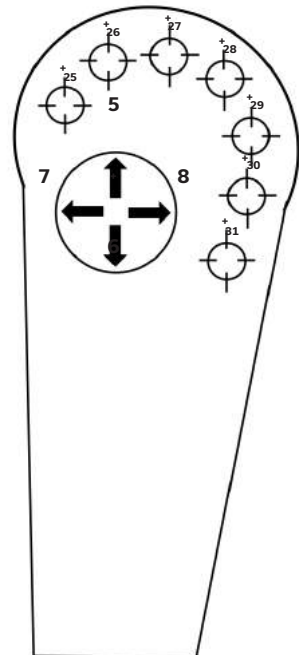


| Pos. No. | Type | Colour | Label text (max. 2 x 12 characters) | Plant-ref. | Destination | Notes |
|----------|-------|--------|-------------------------------------|------------|-------------|-------|
| 1 | _____ | _____ | _____ | _____ | _____ | _____ |
| 2 | _____ | _____ | _____ | _____ | _____ | _____ |
| 3 | _____ | _____ | _____ | _____ | _____ | _____ |
| 4 | _____ | _____ | _____ | _____ | _____ | _____ |
| 5 | _____ | _____ | _____ | _____ | _____ | _____ |
| 6 | _____ | _____ | _____ | _____ | _____ | _____ |
| 7 | _____ | _____ | _____ | _____ | _____ | _____ |
| 8 | _____ | _____ | _____ | _____ | _____ | _____ |
| 9 | _____ | _____ | _____ | _____ | _____ | _____ |

Equipment box right

Multi-Axis Controller V11, V14, V25, V85
see p. 63, 50, 25, 10

max. 7 installations of command and indicating devices 22 (see p.137 & 243)



| | | | | | | |
|----|-------|-------|-------|-------|-------|-------|
| 25 | _____ | _____ | _____ | _____ | _____ | _____ |
| 26 | _____ | _____ | _____ | _____ | _____ | _____ |
| 27 | _____ | _____ | _____ | _____ | _____ | _____ |
| 28 | _____ | _____ | _____ | _____ | _____ | _____ |
| 29 | _____ | _____ | _____ | _____ | _____ | _____ |
| 30 | _____ | _____ | _____ | _____ | _____ | _____ |
| 31 | _____ | _____ | _____ | _____ | _____ | _____ |

Ordering information

KST30

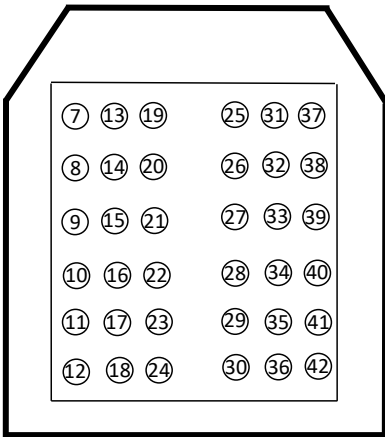
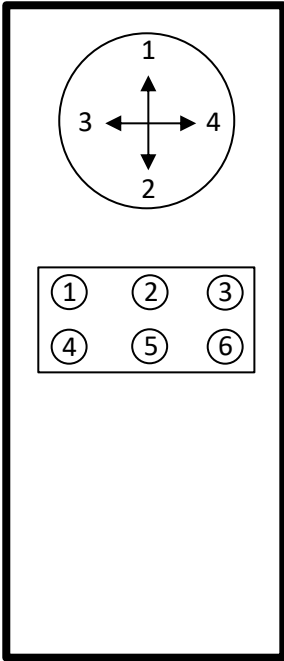


Customer _____

Order No. _____

Equipment box left

| Pos. No. | Type | Colour | Lable text (max). 2 x 12 characters | Plant ref. | Desti- nation | Notes |
|----------|-------|--------|--|------------|------------------|-------|
| 1 | _____ | _____ | _____ | _____ | _____ | _____ |
| 2 | _____ | _____ | _____ | _____ | _____ | _____ |
| 3 | _____ | _____ | _____ | _____ | _____ | _____ |
| 4 | _____ | _____ | _____ | _____ | _____ | _____ |
| 5 | _____ | _____ | _____ | _____ | _____ | _____ |
| 6 | _____ | _____ | _____ | _____ | _____ | _____ |
| 7 | _____ | _____ | _____ | _____ | _____ | _____ |
| 8 | _____ | _____ | _____ | _____ | _____ | _____ |
| 9 | _____ | _____ | _____ | _____ | _____ | _____ |
| 10 | _____ | _____ | _____ | _____ | _____ | _____ |
| 11 | _____ | _____ | _____ | _____ | _____ | _____ |
| 12 | _____ | _____ | _____ | _____ | _____ | _____ |
| 13 | _____ | _____ | _____ | _____ | _____ | _____ |
| 14 | _____ | _____ | _____ | _____ | _____ | _____ |
| 15 | _____ | _____ | _____ | _____ | _____ | _____ |
| 16 | _____ | _____ | _____ | _____ | _____ | _____ |
| 17 | _____ | _____ | _____ | _____ | _____ | _____ |
| 18 | _____ | _____ | _____ | _____ | _____ | _____ |
| 19 | _____ | _____ | _____ | _____ | _____ | _____ |
| 20 | _____ | _____ | _____ | _____ | _____ | _____ |
| 21 | _____ | _____ | _____ | _____ | _____ | _____ |
| 22 | _____ | _____ | _____ | _____ | _____ | _____ |
| 23 | _____ | _____ | _____ | _____ | _____ | _____ |
| 24 | _____ | _____ | _____ | _____ | _____ | _____ |
| 25 | _____ | _____ | _____ | _____ | _____ | _____ |
| 26 | _____ | _____ | _____ | _____ | _____ | _____ |
| 27 | _____ | _____ | _____ | _____ | _____ | _____ |
| 28 | _____ | _____ | _____ | _____ | _____ | _____ |
| 29 | _____ | _____ | _____ | _____ | _____ | _____ |
| 30 | _____ | _____ | _____ | _____ | _____ | _____ |
| 31 | _____ | _____ | _____ | _____ | _____ | _____ |
| 32 | _____ | _____ | _____ | _____ | _____ | _____ |
| 33 | _____ | _____ | _____ | _____ | _____ | _____ |
| 34 | _____ | _____ | _____ | _____ | _____ | _____ |
| 35 | _____ | _____ | _____ | _____ | _____ | _____ |
| 36 | _____ | _____ | _____ | _____ | _____ | _____ |
| 37 | _____ | _____ | _____ | _____ | _____ | _____ |
| 38 | _____ | _____ | _____ | _____ | _____ | _____ |
| 39 | _____ | _____ | _____ | _____ | _____ | _____ |
| 40 | _____ | _____ | _____ | _____ | _____ | _____ |
| 41 | _____ | _____ | _____ | _____ | _____ | _____ |
| 42 | _____ | _____ | _____ | _____ | _____ | _____ |



Maximum occupancy of the various control stations

Control Unit (see p. 216)

| Form | Pos. | No. of pieces max. |
|---------|--------|-----------------------|
| KST3011 | 1 - 24 | 24 |
| KST3031 | 1 - 36 | 36 |
| KST3041 | 1 - 42 | 42 |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

Ordering information

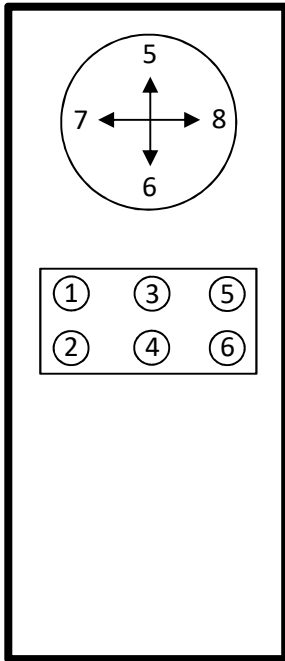
KST30



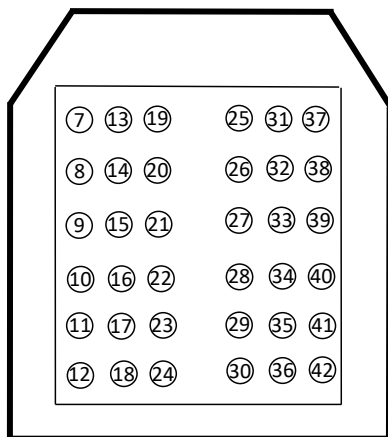
Customer _____

Order No. _____

Equipment box right



| Pos. No. | Type | Colour | Lable text (max). 2 x 12 characters | Plant ref. | Desti- nation | Notes |
|----------|------|--------|--|------------|------------------|-------|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
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| 27 | | | | | | |
| 28 | | | | | | |
| 29 | | | | | | |
| 30 | | | | | | |
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| 32 | | | | | | |
| 33 | | | | | | |
| 34 | | | | | | |
| 35 | | | | | | |
| 36 | | | | | | |
| 37 | | | | | | |
| 38 | | | | | | |
| 39 | | | | | | |
| 40 | | | | | | |
| 41 | | | | | | |
| 42 | | | | | | |



Driver's Seat KFS12



The Driver's Seat KFS12 is ergonomically designed and provides a high grade of comfort. The Driver's Seat is equipped with an air-sprung vibration system. The weight adjustment is infinitely. Heated seats 24V, lumbar support, seat cushion adjustment, seat allocation recognition and headrest are included in the standard delivery. All adjustment controls are positioned ergonomically within easy access. The metal parts are protected against corrosion and painted black.

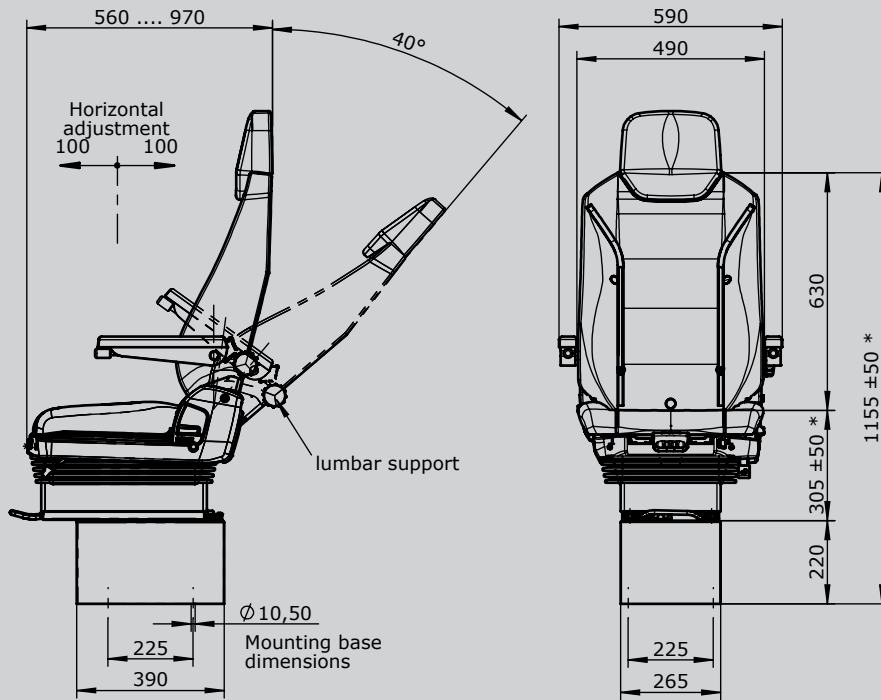
Technical data:

| | |
|-----------------------------|-------------|
| Suspension stroke | 80 mm |
| Weight adjustment | 50 - 150 kg |
| Horizontal adjustment | 200 mm |
| Inclination of the backrest | -12°/+40° |
| Slope adjustment | -2°/+14° |
| Height adjustment | 100 mm |
| Seat cushion adjustment | 60 mm |

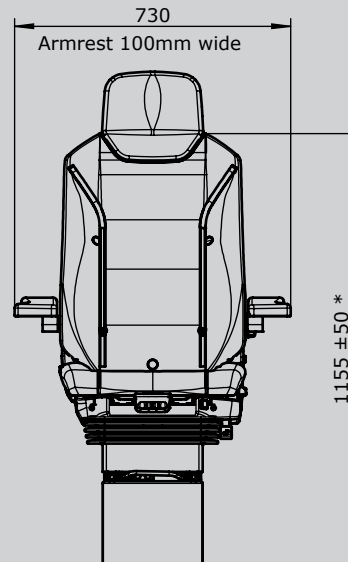
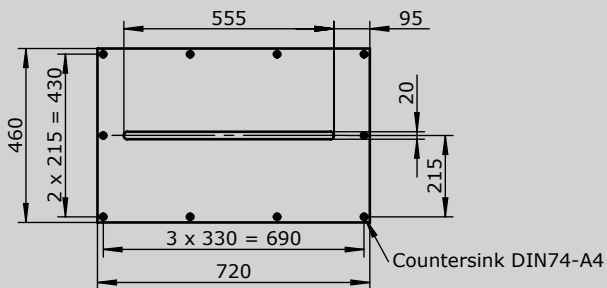
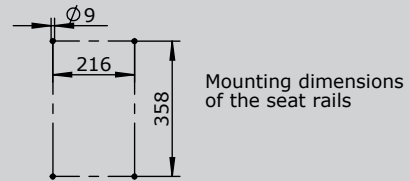
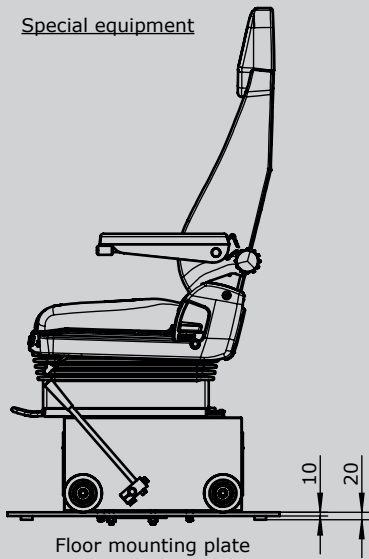


Example

| | KFS12 | -A1 | -S1 |
|--|-------|-----|-----|
| Driver's Seat | | | |
| KFS12 Driver's Seat with textile cover black | | | |
| Attachments | | | |
| A1 Armrest adjustable (2 pieces) 50 mm wide | | | |
| A2 Armrest continuously adjustable (2 pieces) 100 mm wide | | | |
| S1 Safety belt 2 point fixing (automatic) | | | |
| S3 Safety belt 2 point fixing (static) | | | |
| LK Plate for horizontal manual adjustment of seat adjustable +/-250 mm | | | |
| C4 Loose cover for Driver's Seat KFS 11 / KFS 12 | | | |
| U Console (base) | | | |
| Z1 Mating connectors with 3 m connection cable | | | |



Special equipment



* adjustable

Driver's Seat KFS11



The Driver's Seat KFS11 is ergonomically designed and provides a high grade of comfort. The Driver's Seat is a low level mechanical suspension seat with an oil-hydraulic vibration absorption system with weight adjustment. All adjustment controls are positioned ergonomically within easy access. The metal parts are protected against corrosion and painted black.

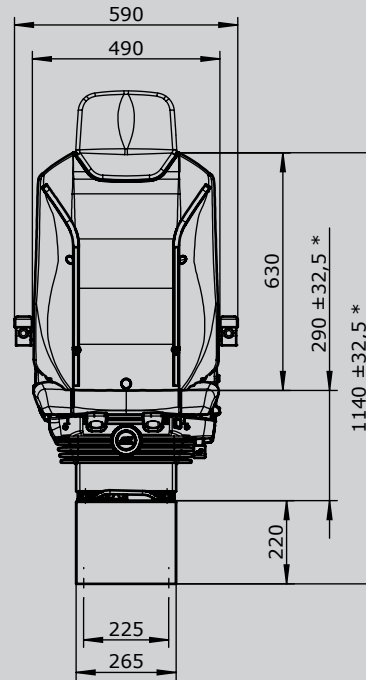
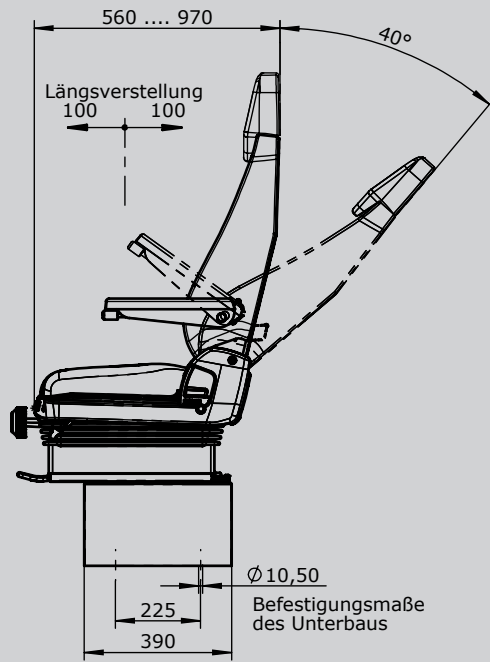
Technical data

| | |
|-----------------------------|-------------|
| Suspension stroke | 80 mm |
| Weight adjustment | 50 - 150 kg |
| Horizontal adjustment | 200 mm |
| Inclination of the backrest | -12°/+40° |
| Slope adjustment | -10°/+12° |
| Height adjustment | 65 mm |

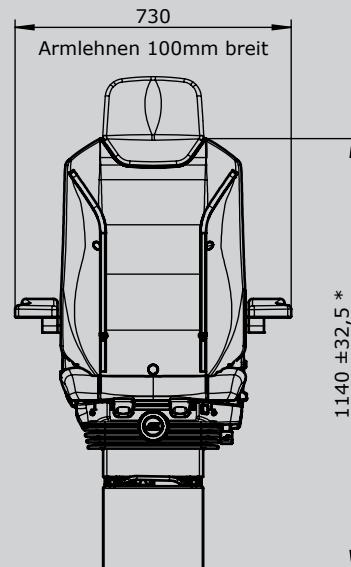
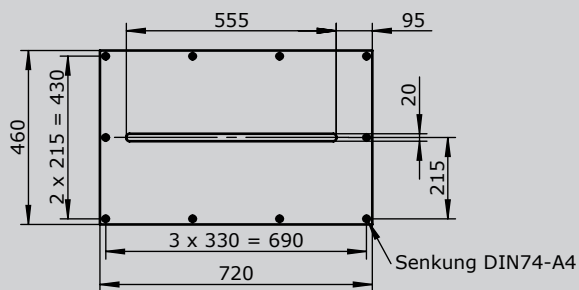
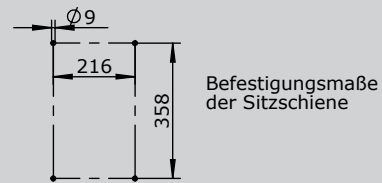
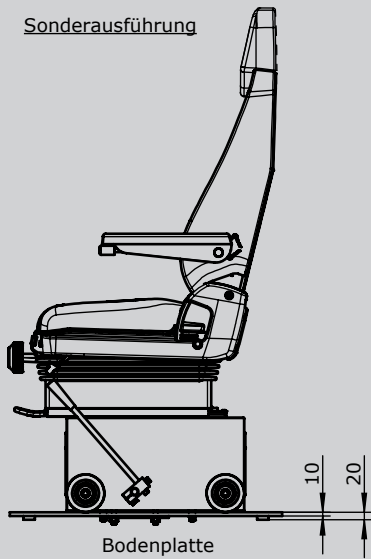


Example

| | | KFS11 | -A1 | -S1 |
|----------------------|---|-------|-----|-----|
| Driver's Seat | | | | |
| KFS11 | Driver's Seat with textile cover black | | | |
| Attachments | | | | |
| K | Headrest | | | |
| A1 | Armrest adjustable (2 pieces) 50 mm wide | | | |
| A2 | Armrest continuously adjustable (2 pieces) 100 mm wide | | | |
| H | Seat cushion and backrest with heating element 24V DC 75W | | | |
| S1 | Safety belt 2 point fixing (automatic) | | | |
| S3 | Safety belt 2 point fixing (static) | | | |
| LK | Plate for horizontal manual adjustment of seat adjustable +/-250 mm | | | |
| C4 | Loose cover for Driver's Seat KFS 11 / KFS 12 | | | |
| U | Console (base) | | | |



Sonderausführung



* einstellbar

Driver's Seat KFS10



The Driver's Seat KFS10 is ergonomically designed and provides a high grade of comfort. The Driver's Seat has a pneumatic vibration absorption system with weight adjustment by compressor (24V DC 8 Ampere) and a standard seat cushion V-cut. Through its three horizontal adjustment, it can be flexibly adapted to very many applications. All adjustment controls are positioned ergonomically within easy access. The metal parts are protected against corrosion and painted black.

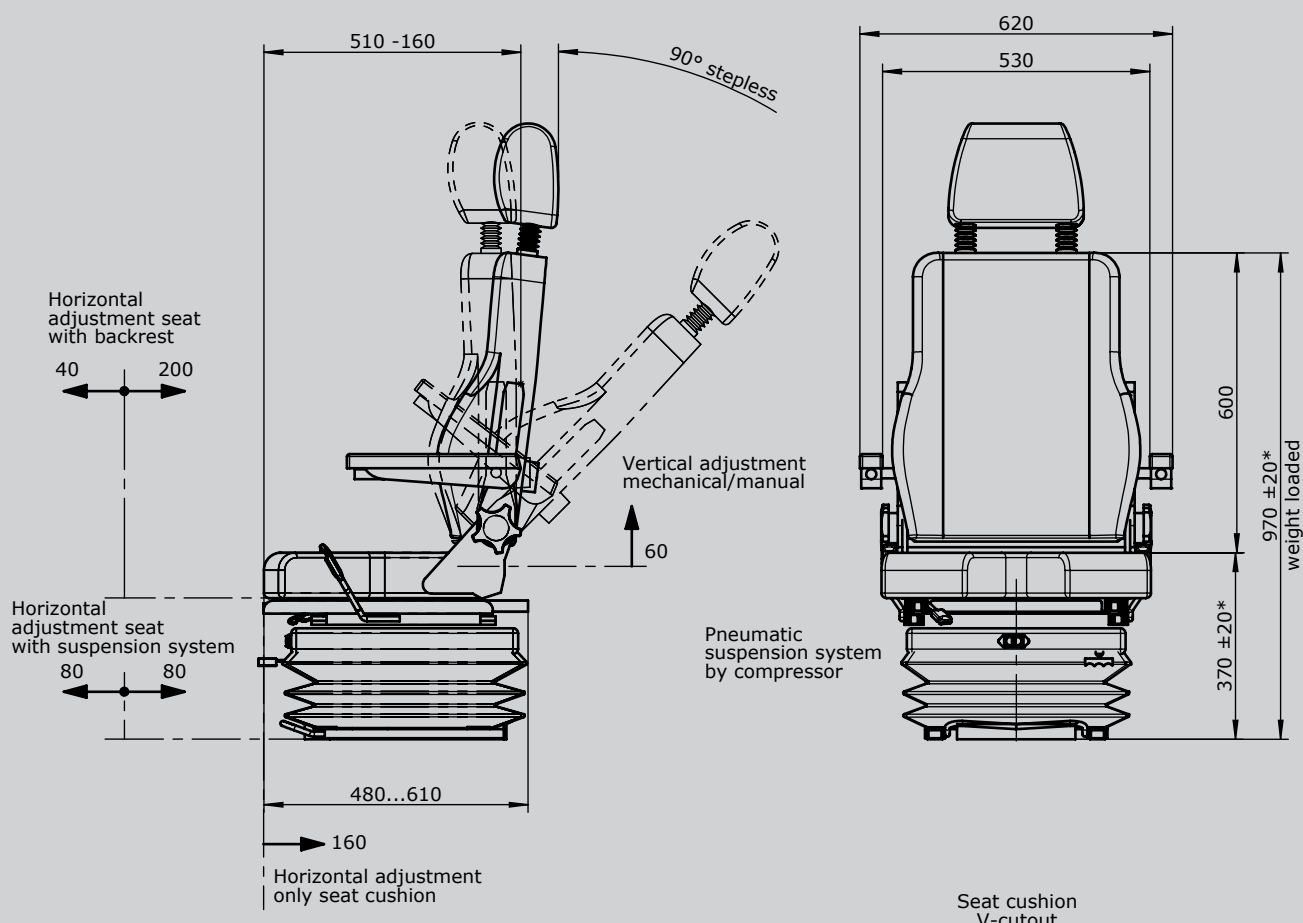
Technical data:

| | |
|-----------------------------|---|
| Suspension stroke | 80 mm |
| Weight adjustment | 50 - 150 kg (pneumatic) 50 - 130 kg (mechanical) |
| Horizontal adjustment | |
| Seat with suspension system | 160 mm |
| Seat part individual | 240 mm |
| Seat cushion | 160 mm |
| Inclination of the backrest | max. 90° |
| Height and slope adjustment | 40 mm |

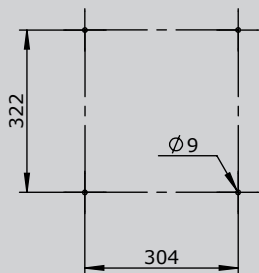


Example

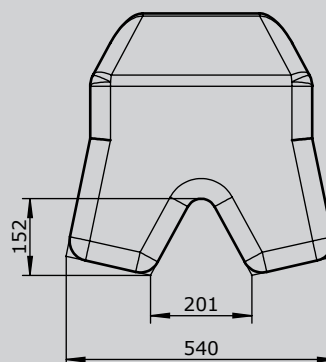
| | | KFS102 | -A1 | -L2 | -S2 | -R1 |
|----------------------|--|--------|-----|-----|-----|-----|
| Driver's Seat | | | | | | |
| KFS101 | Driver's Seat with air-permeable artificial leather cover black with V-cut | | | | | |
| KFS102 | Driver's Seat with textile cover black with V-cut | | | | | |
| Attachments | | | | | | |
| K | Headrest | | | | | |
| A1 | Armrest adjustable (2 pieces) 50 mm wide | | | | | |
| A2 | Armrest continuously adjustable (2 pieces) 100 mm wide | | | | | |
| L1 | Lumbar support manual adjustment - 2 movement | | | | | |
| L2 | Lumbar support manual adjustment - 4 movement | | | | | |
| B | Seat allocation recognition | | | | | |
| H | Seat cushion and backrest with heating element 24 V DC 47W | | | | | |
| S1 | Safety belt 2 point fixing (automatic) | | | | | |
| S2 | Safety belt 4 point fixing (headrest required) | | | | | |
| S3 | Safety belt 2 point fixing (static) | | | | | |
| U | Console (base) | | | | | |
| C3 | Loose cover for Driver's Seat KFS10 with V-cut | | | | | |
| R1 | Price reduction pneumatic vibration absorption system | | | | | |
| R2 | Seat cushion without V-cut | | | | | |



Mounting dimensions seat



Seat cushion V-cutout



* adjustable



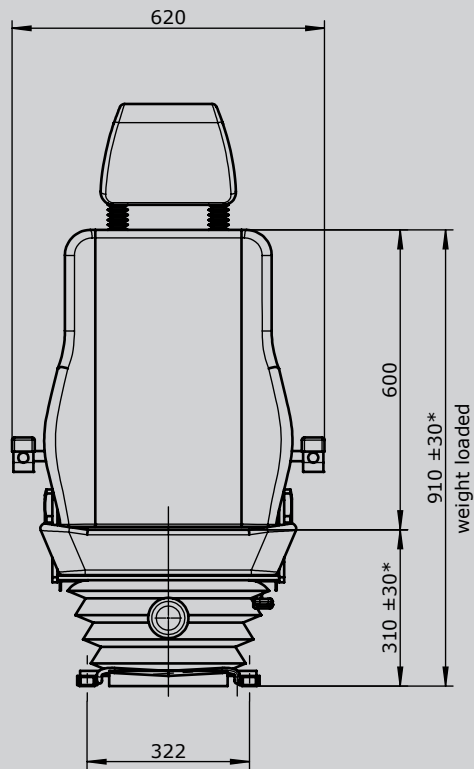
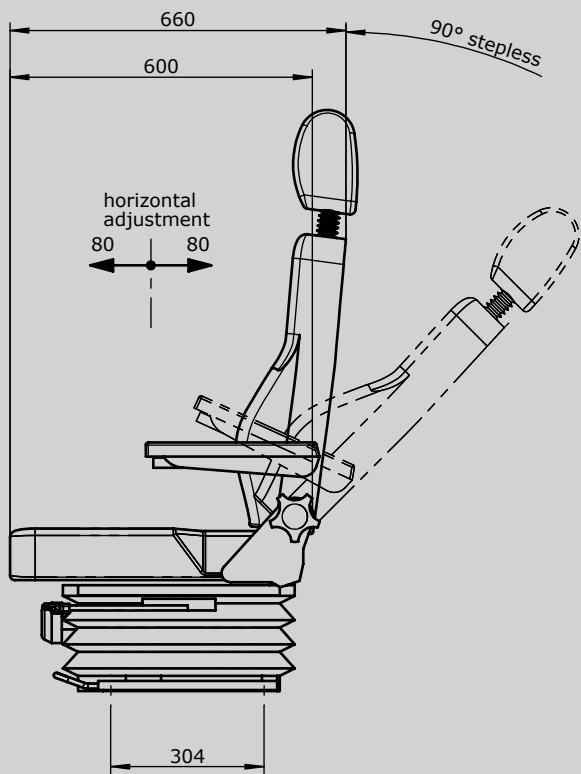
The Driver's Seat KFS9 is ergonomically designed and provides a high grade of comfort. The Driver's Seat is a low level mechanical suspension seat with an oil-hydraulic vibration absorption system with weight adjustment. Upon request, a pneumatic vibrating system with weight adjustment is available. All adjustment controls are positioned ergonomically within easy access. The metal parts are protected against corrosion and painted black.

Technical data

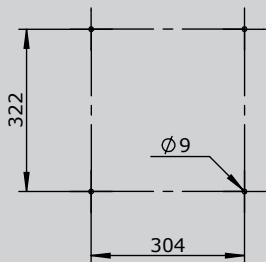
| | |
|-----------------------------|--------------------------|
| Suspension stroke | 80 mm |
| Weight adjustment | 50 - 150 kg (pneumatic) |
| | 50 - 130 kg (mechanical) |
| Horizontal adjustment | 160 mm |
| Inclination of the backrest | max. 90° |
| Height and slope adjustment | 60 mm |



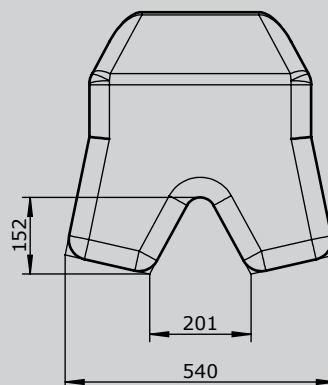
| | | Example | | | | |
|----------------------|---|---------|-----|-----|-----|----|
| | | KFS 92 | -A1 | -L2 | -S1 | -P |
| Driver's Seat | | | | | | |
| KFS91 | Driver's Seat with air-permeable artificial leather cover black | | | | | |
| KFS92 | Driver's Seat with textile cover black | | | | | |
| Attachments | | | | | | |
| K | Headrest rain | | | | | |
| A1 | Armrest adjustable (2 pieces) 50 mm wide | | | | | |
| A2 | Armrest continuously adjustable (2 pieces) 100 mm wide | | | | | |
| L1 | Lumbar support manual adjustment - 2 movement | | | | | |
| L2 | Lumbar support manual adjustment - 4 movement | | | | | |
| B | Seat allocation recognition | | | | | |
| H | Seat cushion and backrest standard with heating element 24 V DC 47W | | | | | |
| S1 | Safety belt 2 point fixing (automatic) | | | | | |
| S2 | Safety belt 4 point fixing (headrest required) | | | | | |
| S3 | Safety belt 2 point fixing (static) | | | | | |
| V | Seat cushion with V-cut (LD required!) | | | | | |
| LD | Horizontal adjustment dual (seat height +30 mm!) | | | | | |
| P | Pneumatic vibration absorption system with weight adjustment (incl. compressor) | | | | | |
| LK | Plate for horizontal manual adjustment of seat adjustable +/-250 mm | | | | | |
| C1 | Loose cover for Driver's Seat KFS 9 | | | | | |
| C2 | Loose cover for Driver's Seat KFS 9 with V-cut | | | | | |
| U | Console (base) | | | | | |



Mounting dimensions
of the seal rails



Seat cushion
v-cutout



* adjustable

Driver's Seat KFS14



The Driver's Seat KFS14 is a static seat with ergonomically designed and provides a high grade of comfort. The Driver's Seat is equipped with roller-bearing swivel system. All adjustment controls are positioned ergonomically within easy access. The metal parts are protected against corrosion and painted black.

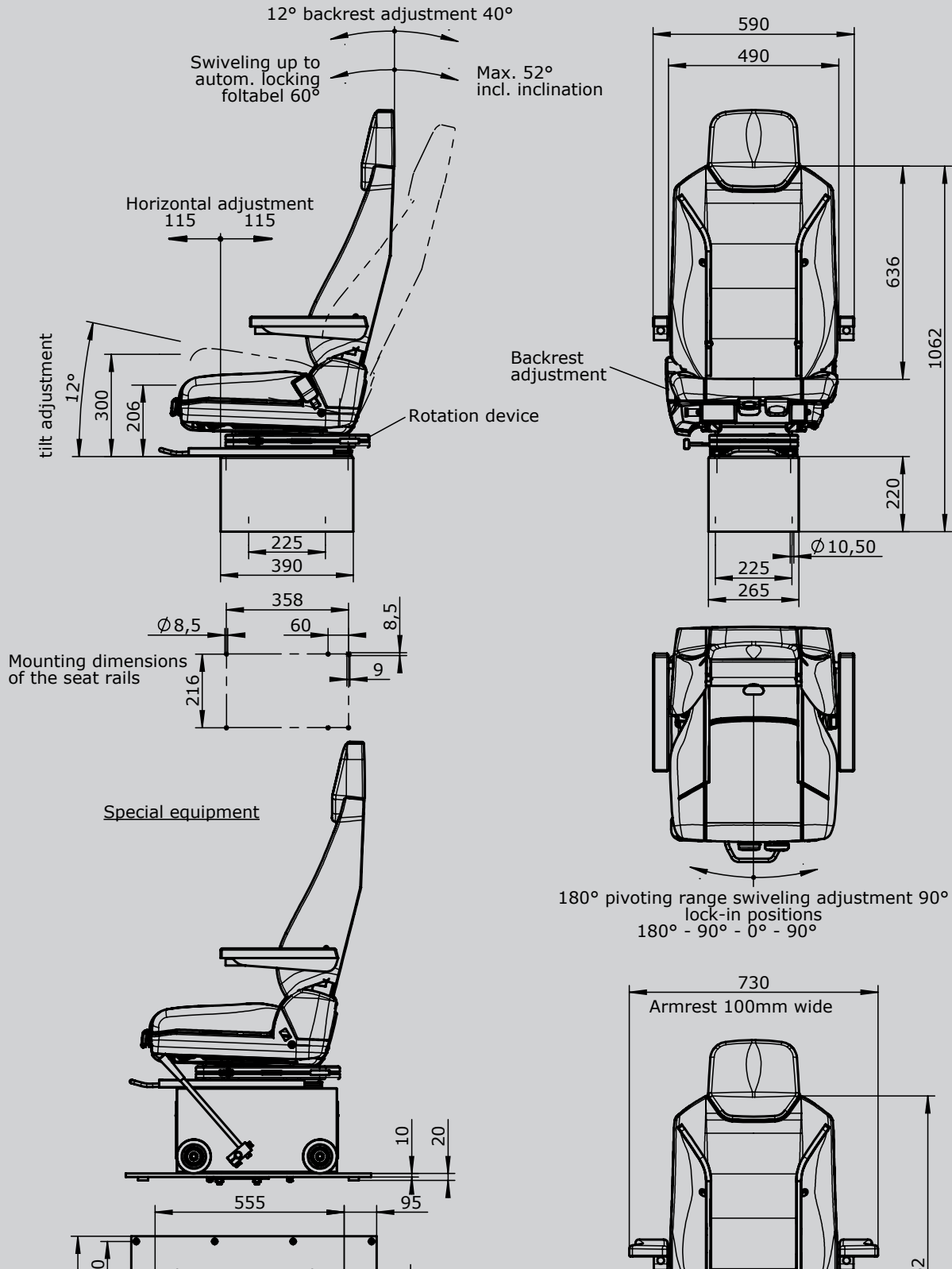
Technical data:

| | |
|-----------------------------|----------|
| Horizontal adjustment | 150 mm |
| Inclination of the backrest | max. 28° |
| Height adjustment | 65 mm |



Example

| | | KFS 14 | -A1 | -S1 | -U |
|----------------------|---|--------|-----|-----|----|
| Driver's Seat | | | | | |
| KFS14 | Driver's Seat with textile cover black | | | | |
| Attachments | | | | | |
| K | Headrest | | | | |
| A1 | Armrest fully adjustable (2 pieces) 50 mm wide | | | | |
| A2 | Armrest fully adjustable (2 pieces) 100 mm wide | | | | |
| S1 | Safety belt 2-point mounting (automatic) | | | | |
| S3 | Safety belt 2-point mounting (static) | | | | |
| U | Base frame (Apron) | | | | |



Driver's Seat KFS4



The Driver's Seat KFS4 has stepless high adjustment by means of a gas-loaded spring and an oil-hydraulic vibration absorption system with weight adjustment. The backrest can be tilted, forwards into the cushion, which in turn can then be tilted 90° sideways. All functions are performed by a simple lever operation. The metal parts are protected against corrosion and painted black.

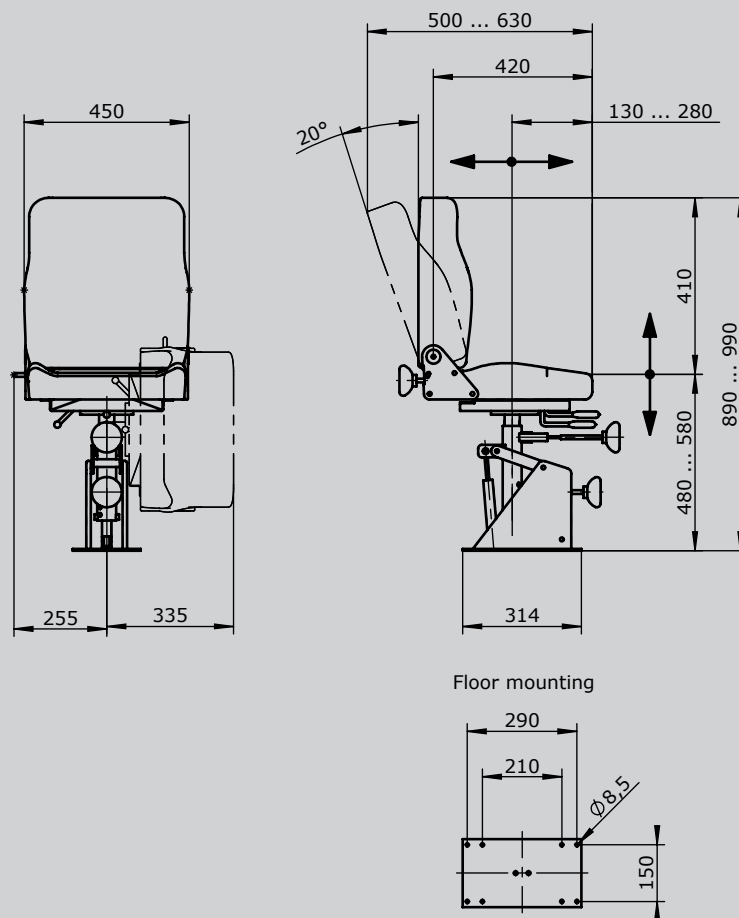
Technical data:

| | |
|-----------------------------|-------------|
| Suspension stroke | 80 mm |
| Weight adjustment | 50 - 130 kg |
| Horizontal adjustment | 100 mm |
| Inclination of the backrest | max. 20° |
| Height adjustment | 100 mm |



Example

| | | KFS 42 | -A1 |
|----------------------|---|--------|-----|
| Driver's Seat | | | |
| KFS41 | Driver's Seat with air-permeable artificial leather cover black | | |
| KFS42 | Driver's Seat with textile cover grey / black | | |
| Attachments | | | |
| A1 | Armrest fully adjustable (2 pieces) 50 mm wide | | |
| A2 | Armrest fully adjustable (2 pieces) 100 mm wide | | |



Driver's Seat KFS2



The Driver's Seat KFS2 has stepless high adjustment by means of a gas-loaded spring. The backrest can be tilted, forwards onto the cushion, which in turn can then be tilted 90° sideways. All these functions are performed easily via levers.

Technical data

| | |
|-----------------------------|----------|
| Horizontal adjustment | 100 mm |
| Inclination of the backrest | max. 10° |
| Height adjustment | 120 mm |

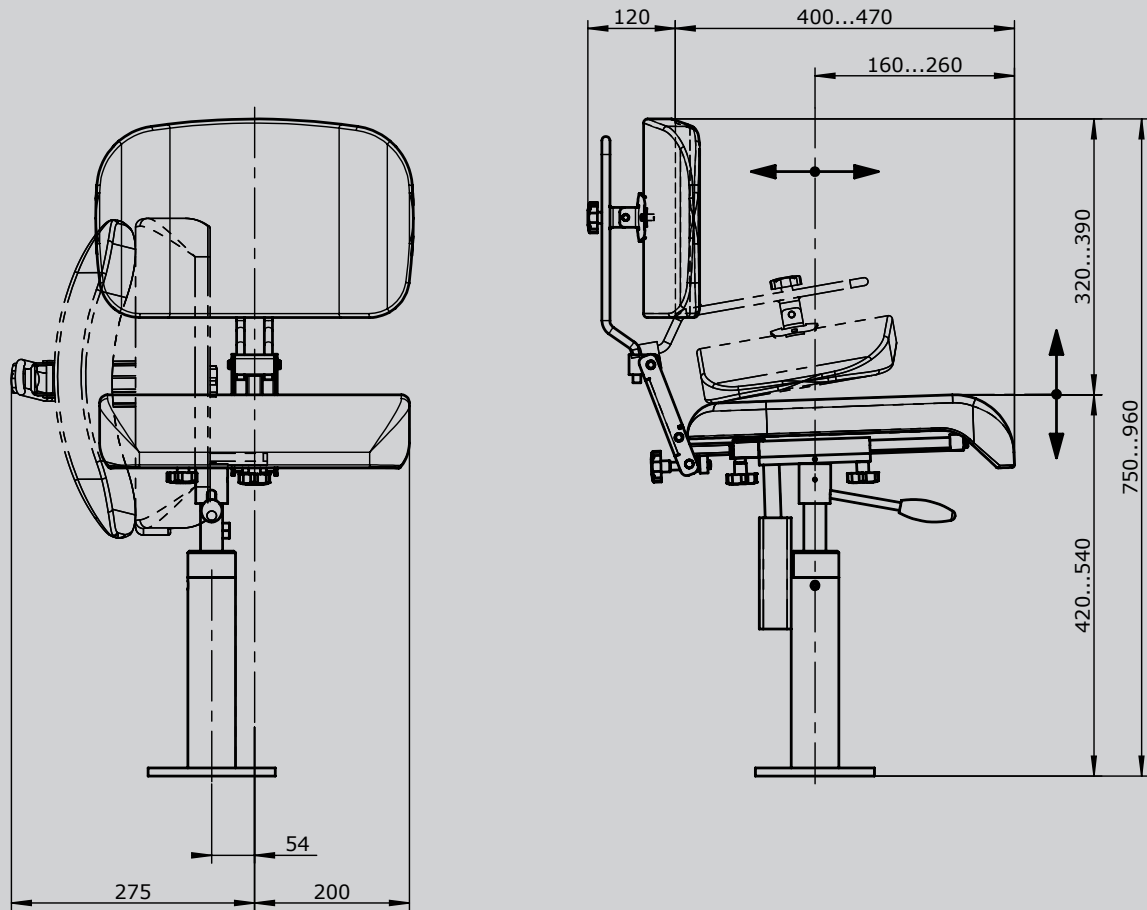


Example

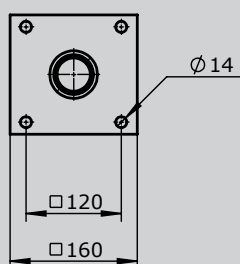
KFS 22

Driver's Seat

| | |
|-------|---|
| KFS21 | With air-permeable artificial leather cover black |
| KFS22 | With textile cover grey / black |



Floor mounting



Portable Control Unit TS1



The Portable Control Unit TS1 is used for controlling and monitoring the necessary equipment. The chest panel and straps enable the operator to carry it without becoming tired. An adjustable carrying strap can also be fitted for use without the chest plate.

Surface treatment:
Priming and structure-finishing paint
Standard colour RAL 7032 pebble-grey

Technical data:

| | |
|-----------------------|----------------|
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP54 |

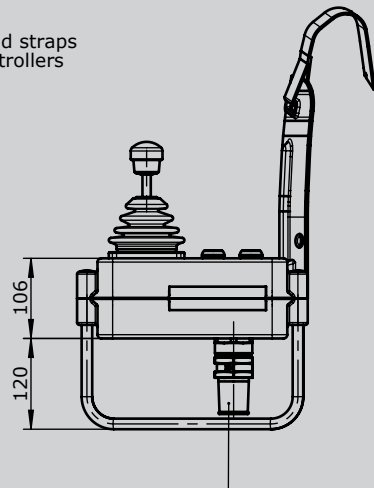


Example

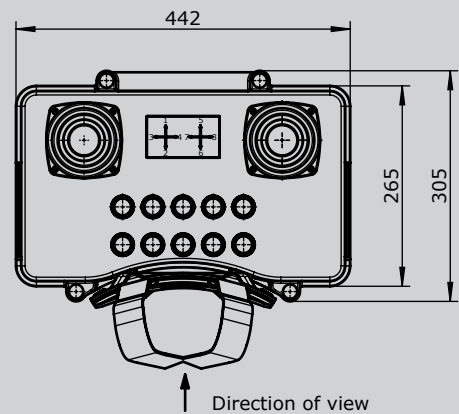
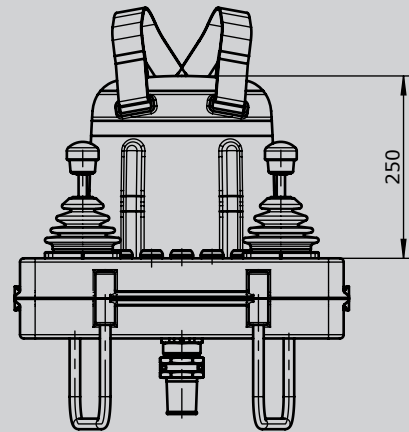
| | | TS1 | -SB 1 | -RH 1 | -K 3 | -HS 1 | / | V... | / | KLS | / | X |
|---|--|-----------|----------------|------------|------|------------------------|---|------|---|-----|---|---|
| Basic unit | | | | | | | | | | | | |
| TS1 | With chest plate and straps | | | | | | | | | | | |
| TS11 | With straps | | | | | | | | | | | |
| Attachment | | | | | | | | | | | | |
| SB 1 | Legs for control unit alu-tube 2 pieces | | | | | | | | | | | |
| SB 2 | Legs for control unit stainless steel-tube V2 A 2 pieces | | | | | | | | | | | |
| RH 1 | Reeling hooks for control unit stainless steel V2 A | | | | | | | | | | | |
| K 1 | Cable entry M32 cable 11 - 21 mm | | | | | | | | | | | |
| K 2 | Cable entry M40 cable 19-28 mm | | | | | | | | | | | |
| K 3 | Cable entry 180° swiveling M32 cable 11-21 mm | | | | | | | | | | | |
| HS 1 | Plug in socket 16-pole male insert | | | | | HAN 16E without wiring | | | | | | |
| HB 1 | Connector 16-pole female insert | | | | | HAN 16E without wiring | | | | | | |
| HS 2 | Plug in socket 24-pole female insert | | | | | HAN 24E without wiring | | | | | | |
| HB 2 | Connector 24-pole female insert | | | | | HAN 24E without wiring | | | | | | |
| HS 3 | Plug in socket 32-pole male insert | | | | | HAN 32E without wiring | | | | | | |
| HB 3 | Connector 32-pole female insert | | | | | HAN 32E without wiring | | | | | | |
| <i>Indicating labels not engraved for multi-axis-/ Single-Axis Controller</i> | | | | | | | | | | | | |
| Mounting for equipment boxes | | | | | | | | | | | | |
| V | Multi-Axis Controller (see page 1) | | | | | | | | | | | |
| N | Control-Switch (see page 113) | | | | | | | | | | | |
| <i>More command and indicating devices (see page 137 and 243)</i> | | | | | | | | | | | | |
| Cable and wiring | | | | | | | | | | | | |
| Cable Ölflex Classic FD 810 P | 18 x 1 mm ² | 13,9 mm Ø | -5°C to +70°C | each meter | | | | | | | | |
| Cable Ölflex Classic FD 810 P | 25 x 1 mm ² | 16,4 mm Ø | -5°C to +70°C | each meter | | | | | | | | |
| Cable Ölflex Classic FD 810 P | 34 x 1 mm ² | 18,9 mm Ø | -5°C to +70°C | each meter | | | | | | | | |
| Cable Ölflex Crane | 18 x 1 mm ² | 19,2 mm Ø | -25°C to +80°C | each meter | | | | | | | | |
| Cable Ölflex Crane | 24 x 1 mm ² | 22,1 mm Ø | -25°C to +80°C | each meter | | | | | | | | |
| Cable Ölflex Crane | 36 x 1 mm ² | 26,1 mm Ø | -25°C to +80°C | each meter | | | | | | | | |
| KLS | Wired on connector / plug in socket per core | | | | | | | | | | | |
| KLK | Wiring for cable per core | | | | | | | | | | | |
| Special model | | | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | | | |
| X1 | Housing antistatic design < 10 ⁹ Ohm/cm | | | | | | | | | | | |
| X2 | Finishing colour yellow RAL 1021 | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

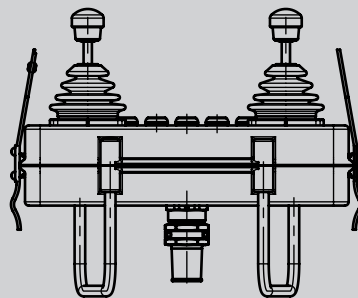
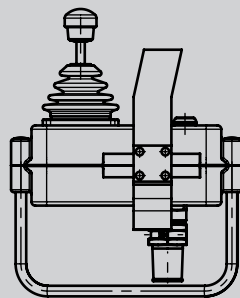
With chest plate and straps
with multi-axis controllers



Cable entry
with anti-kink protection
and strain relief or connectors



With adjustable carrying strap
with multi-axis controllers



Portable Control Unit TS2



The Portable Control Unit TS2 is used for controlling and monitoring the necessary equipment. The chest panel and straps enable the operator to carry it without becoming tired. An adjustable carrying strap can also be fitted for use without the chest plate.

Surface treatment:
Priming and structure-finishing paint
Standard colour RAL 7032 pebble-grey

Technical data:

Operation temperature -40°C to +85°C
Degree of protection IP65



| | | TS2 | -SB 1 | -RH 1 | -K 3 | -HS 1 | / | V... | / | KLS | / | X |
|---|--|-----|-------|-------|------|------------------------|---|------|---|-----|---|---|
| Basic unit | | | | | | | | | | | | |
| TS2 | With chest plate, straps | | | | | | | | | | | |
| TS21 | With straps | | | | | | | | | | | |
| TS22 | With bracket and straps | | | | | | | | | | | |
| Attachment | | | | | | | | | | | | |
| SB 1 | Legs for control unit alu-tube 2 pieces | | | | | | | | | | | |
| SB 2 | Legs for control unit stainless steel-tube V2 A 2 pieces | | | | | | | | | | | |
| RH 1 | Reeling hooks for control unit stainless steel V2 A | | | | | | | | | | | |
| K 1 | Cable entry M32 cable 11 - 21 mm | | | | | | | | | | | |
| K 2 | Cable entry M40 cable 19 - 28 mm | | | | | | | | | | | |
| K 3 | Cable entry 180° swiveling M32 cable 11-21 mm | | | | | | | | | | | |
| HS 1 | Plug in socket 16-pole male insert | | | | | HAN 16E without wiring | | | | | | |
| HB 1 | Connector 16-pole female insert | | | | | HAN 16E without wiring | | | | | | |
| HS 2 | Plug in socket 24-pole female insert | | | | | HAN 24E without wiring | | | | | | |
| HB 2 | Connector 24-pole female insert | | | | | HAN 24E without wiring | | | | | | |
| HS 3 | Plug in socket 32-pole male insert | | | | | HAN 32E without wiring | | | | | | |
| HB 3 | Connector 32-pole female insert | | | | | HAN 32E without wiring | | | | | | |
| <i>Indicating labels not engraved for multi-axis-/ Single-Axis Controller</i> | | | | | | | | | | | | |
| <i>Indicating labels engraved for multi-axis-/ Single-Axis Controller</i> | | | | | | | | | | | | |
| Mounting for equipment boxes | | | | | | | | | | | | |
| V | Multi-Axis Controller (see page 1) | | | | | | | | | | | |
| N | Control-Switch (see page 113) | | | | | | | | | | | |
| <i>More command and indicating devices (see page 137 and 243)</i> | | | | | | | | | | | | |

TS 2 -SB 1 -RH 1 -K 3 -HS 1 / V... / KLS / X

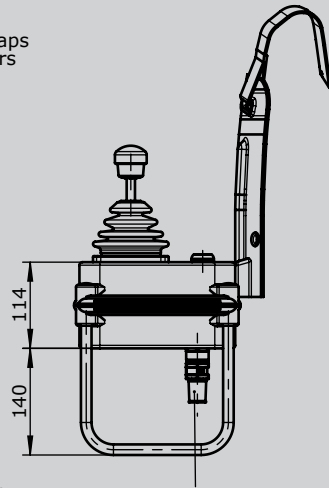
Cable and wiring

| | | | | |
|--------------------------------|--|-----------|----------------|------------|
| Cable Oelflex Classic FD 810 P | 18 x 1 mm ² | 13,9 mm Ø | -5°C to +70°C | each meter |
| Cable Oelflex Classic FD 810 P | 25 x 1 mm ² | 16,4 mm Ø | -5°C to +70°C | each meter |
| Cable Oelflex Classic FD 810 P | 34 x 1 mm ² | 18,9 mm Ø | -5°C to +70°C | each meter |
| Cable Ölflex Crane | 18 x 1 mm ² | 19,2 mm Ø | -25°C to +80°C | each meter |
| Cable Ölflex Crane | 24 x 1 mm ² | 22,1 mm Ø | -25°C to +80°C | each meter |
| Cable Ölflex Crane | 36 x 1 mm ² | 26,1 mm Ø | -25°C to +80°C | each meter |
| KLS | Wired on connector / plug in socket per core | | | |
| KLK | Wiring for cable per core | | | |

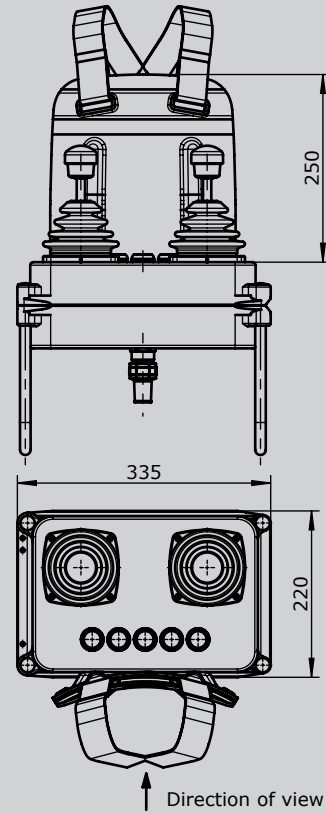
Special model

| | |
|----|--|
| X | Special / customer specified |
| X1 | Housing antistatic design < 10 ⁹ Ohm/cm |
| X2 | Finishing color yellow RAL 1021 |

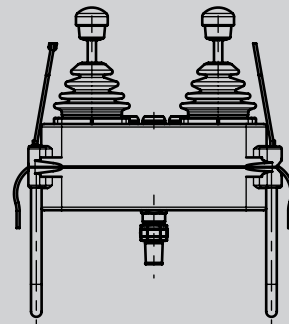
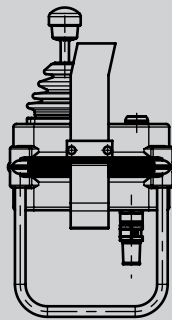
With chest plate and straps
with multi-axis controllers



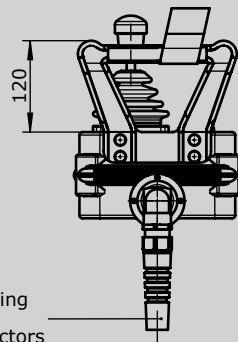
Cable entry
with anti-kink protection
and stain relief or connectors



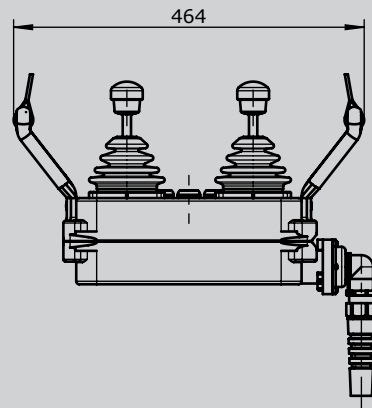
With adjustable carrying strap
with multi-axis controllers



With bracket and cable entry swivelling
with multi-axis controllers



Cable entry 180° swivelling
with anti-kink protection
and stain relief or connectors



Portable Control Unit TS3



The Portable Control Unit TS3 is used for controlling and monitoring the equipment. The abdominal belt enable the operator to carry it without becoming tired. The equipment can be individually designed.

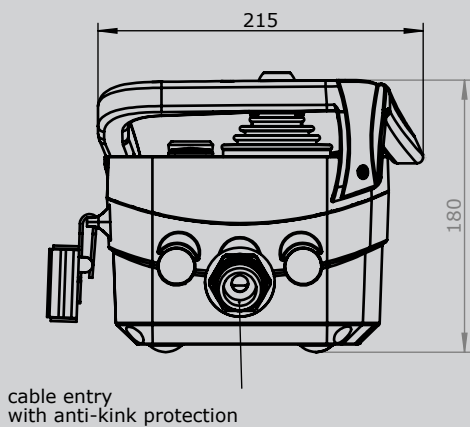
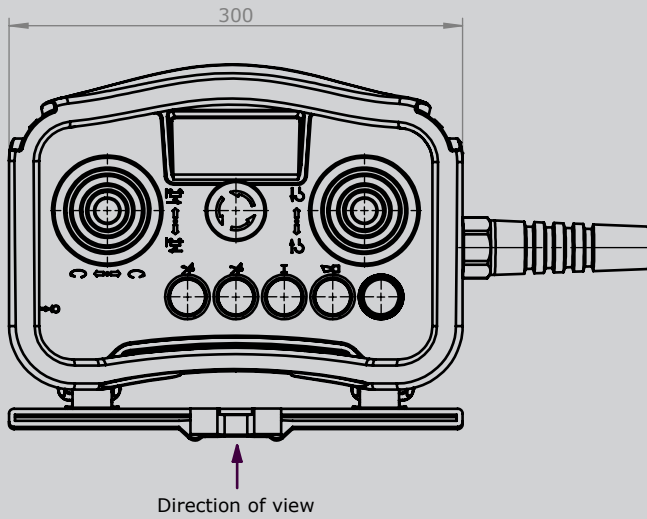
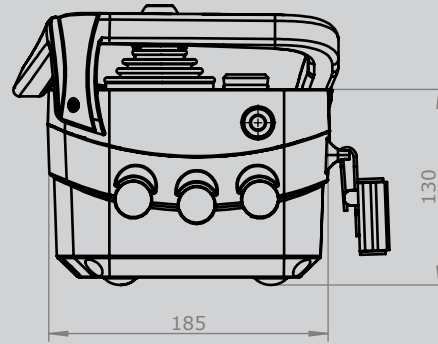
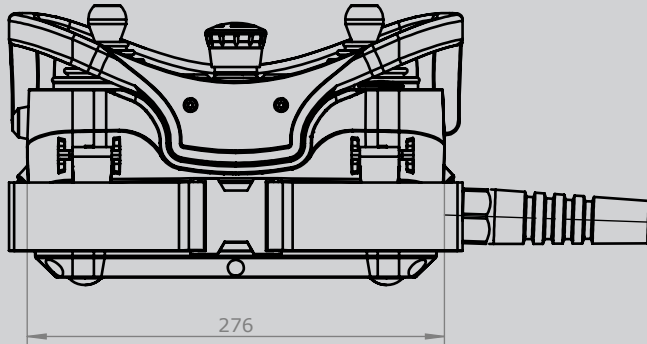
Technical data:

| | |
|-----------------------|----------------|
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP65 |



| | | Example | | | | | | | | | |
|---|--|-----------|-----------------|-----|-----|---|------------|---|-----|---|---|
| | | TS3 | -1 | -K1 | -G1 | / | V... | / | KLS | / | X |
| Basic unit | | | | | | | | | | | |
| TS3 | Portable Control Unit with abdominal belt | | | | | | | | | | |
| Colour | | | | | | | | | | | |
| 1 | red / black | | | | | | | | | | |
| 2 | gray / black | | | | | | | | | | |
| Attachment | | | | | | | | | | | |
| K 1 | Cable entry M25 cable 11 - 21 mm with bend protection | | | | | | | | | | |
| K 2 | Cable entry M32 cable 19 - 28 mm with bend protection | | | | | | | | | | |
| G1 | Engraving plate <i>Indicating labels engraved for Multi-axis-/ Single-Axis Controller</i> | | | | | | | | | | |
| Mounting for equipment boxes | | | | | | | | | | | |
| V | Multi-Axis Controller (see page 1) | | | | | | | | | | |
| N | Control-Switch (see page 113) | | | | | | | | | | |
| <i>More command and indicating devices (see page 137 and 243)</i> | | | | | | | | | | | |
| Cable and wiring | | | | | | | | | | | |
| Cable Ölflex Classic FD 810 P | 18 x 1 mm ² | 13,9 mm Ø | -5°C bis +70°C | | | | each meter | | | | |
| Cable Ölflex Classic FD 810 P | 25 x 1 mm ² | 16,4 mm Ø | -5°C bis +70°C | | | | each meter | | | | |
| Cable Ölflex Classic FD 810 P | 34 x 1 mm ² | 18,9 mm Ø | -5°C bis +70°C | | | | each meter | | | | |
| Cable Ölflex Crane | 18 x 1 mm ² | 19,2 mm Ø | -25°C bis +80°C | | | | each meter | | | | |
| Cable Ölflex Crane | 24 x 1 mm ² | 22,1 mm Ø | -25°C bis +80°C | | | | each meter | | | | |
| Cable Ölflex Crane | 36 x 1 mm ² | 26,1 mm Ø | -25°C bis +80°C | | | | each meter | | | | |
| KLS | Wired on connector / plug in socket per core | | | | | | | | | | |
| KLK | Wiring for cable per core | | | | | | | | | | |
| Special model | | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | | |

with straps and reling
Protection IP 65
with multi-axis-controllers IP 54



Signal-Cam Controller NU1



The Signal-Cam Controller NU 1 is used as a signal and annunciation switch in HV systems. This rugged switching device has cam discs made of insulation material that can be set at 10° intervals. The Signal-Cam Controllers are designed to permit series assembly, which can be operated simultaneously.

Technical data

| | |
|-----------------------|------------------------------------|
| Mechanical life NU1 | 2 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP40 / IP65 with aluminium housing |

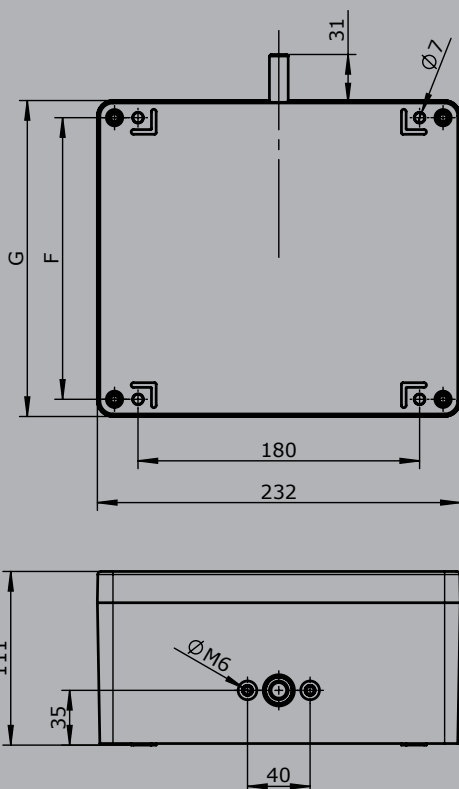
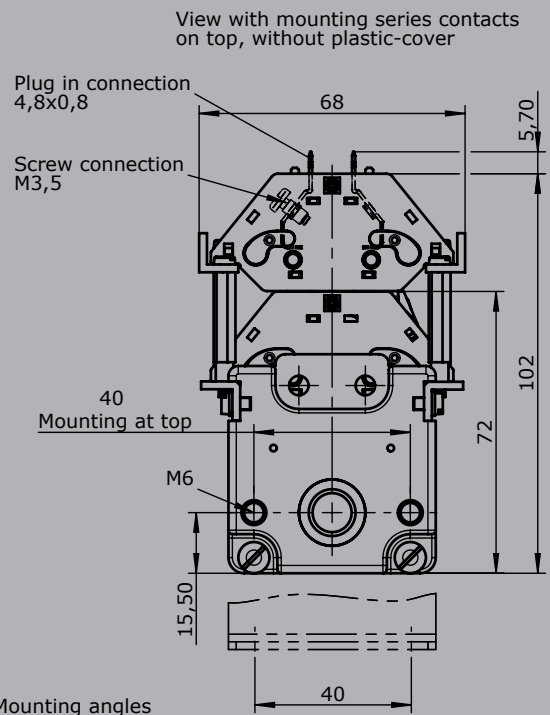
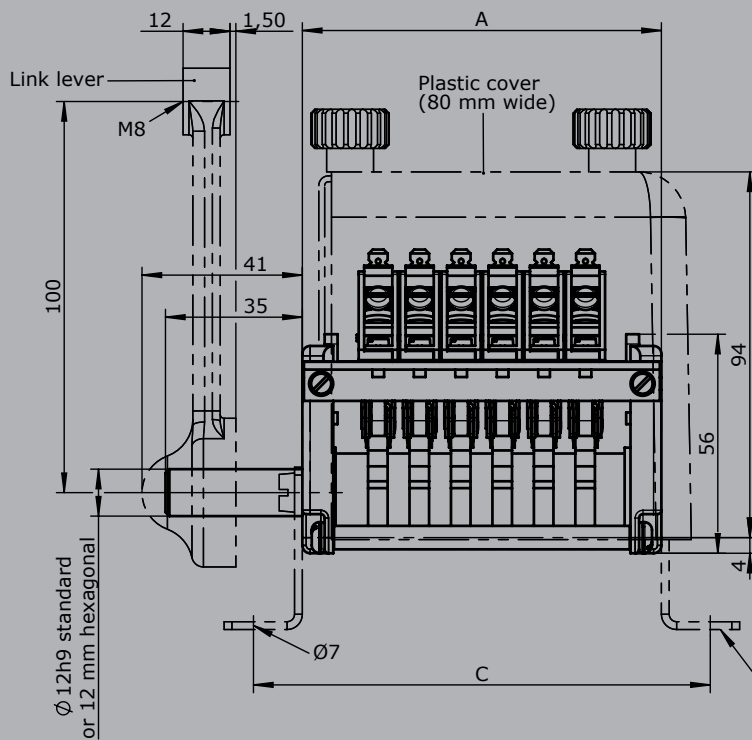


| Switching capacity | NC | NO | Time constant |
|--------------------|-----|-----|---------------|
| 250 V DC | 2A | 1A | 20 ms |
| 125 V DC | 4A | 3A | 20 ms |
| 50 V DC | 6A | 6A | 20 ms |
| 30 V DC | 10A | 10A | 20 ms |
| 250 V DC15 | 6A | 6A | |

| | NU1 | -4 | -4 | -F2 | Example -Z | -W | -A | -X |
|----------------------------|----------------------------|----|----|-----|---------------|----|----|----|
| Basic unit | NU 1 Signal-Cam Controller | | | | | | | |
| Contacts (1. range) | | | | | | | | |
| 2 | 2 contacts | | | | | | | |
| 4 | 4 contacts | | | | | | | |
| 6 | 6 contacts | | | | | | | |
| 8 | 8 contacts | | | | | | | |
| 10 | 10 contacts | | | | | | | |
| 12 | 12 contacts | | | | | | | |
| 14 | 14 contacts | | | | | | | |
| 16 | 16 contacts | | | | | | | |
| Contacts (2. range) | | | | | | | | |
| 2 | 2 contacts | | | | | | | |
| 4 | 4 contacts | | | | | | | |
| 6 | 6 contacts | | | | | | | |
| 8 | 8 contacts | | | | | | | |
| 10 | 10 contacts | | | | | | | |
| 12 | 12 contacts | | | | | | | |
| 14 | 14 contacts | | | | | | | |
| 16 | 16 contacts | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

| | NU1 | -4 | -4 | -F2 | -Z | -W | -A | | -X |
|--------------------------|---|----|----|-----|----|----|----|--|----|
| Option | | | | | | | | | |
| F1 | 1 free shaft-end with hexagonal 12 mm | | | | | | | | |
| F2 | 2 free shaft-end diameter 12 mm | | | | | | | | |
| F3 | 2 free shaft-end with hexagonal 12 mm | | | | | | | | |
| Z | Spring return | | | | | | | | |
| W | Mounting angles (2 pieces) | | | | | | | | |
| GH | Link lever | | | | | | | | |
| A | Cover housing off Astralon | | | | | | | | |
| | Til installation size 4 contacts | | | | | | | | |
| | Til installation size 8 contacts | | | | | | | | |
| | Til installation size 12 contacts | | | | | | | | |
| | Til installation size 16 contacts | | | | | | | | |
| B | Shock protection KEG 142 for single contact | | | | | | | | |
| Aluminium housing | | | | | | | | | |
| U11 | U23/20 232 x 202 mm (max. 10 contacts) | | | | | | | | |
| U12 | U23/28 232 x 280 mm (max. 16 contacts) | | | | | | | | |
| | <i>Housing only possible with single-row version contacts</i> | | | | | | | | |
| Special model | | | | | | | | | |
| X | Special / customer specified | | | | | | | | |



Aluminum housing protection IP 65

| Type | No. of contacts | Dim. A | Dim. C | Housing | Dim. F | Dim. G |
|------|-----------------|--------|--------|---------|--------|--------|
| 2 | 2 | 7 | 74 | U 23/20 | 180 | 202 |
| 4 | 4 | 70 | 95 | | | |
| 6 | 6 | 91 | 117 | | | |
| 8 | 8 | 113 | 138 | | | |
| 10 | 10 | 134 | 159 | U 23/28 | 260 | 280 |
| 12 | 12 | 155 | 180 | | | |
| 14 | 14 | 176 | 201 | | | |
| 16 | 16 | 197 | 222 | | | |

DC Contact

SO 1.10 Normally open (NO)
SS 1.10 Normally closed (NC)



The DC Contact is used for signalling and annunciation applications. The snap-action mechanism prevents slow contact opening when the plunger is operated slowly. Quenching of the arc that occurs with DC is supported by two-capacity permanent magnets.

These are arranged so that the polarity can be ignored when connecting +/- cabling. However, the polarity of the quenching magnets must be noted when installing the contacts to prevent the magnets adversely affecting each other. Contacts in four different colours are available for polarity identification of the magnets when fitted.

The contact may only be installed on non-magnetisable materials with screw, etc. made of non-ferrous metal.

The self-cleaning silver contacts are designed for low switching frequency, low currents and voltages. Gold coated contacts can be supplied (approx 0,2µ), less than 42 Volt required. The screw connection M3.5 at the side is suitable for 2 conductors max. 2,5 mm². The plug-in connection at the top 4.8 x 0.8 mm DIN 46247.



Several contacts can be plugged on the top of each other and operated jointly. The plug-type terminals are then only accessible on the top unit. The contacts can be provided with shock protection to DIN VDE 0106 Part 100.

| | Switching capacity | | Time constant |
|--------------------|--------------------|-----|---------------|
| | NC | NO | |
| 250 V DC | 2A | 1A | 20 ms |
| 125 V DC | 4A | 3A | 20 ms |
| 50 V DC | 6A | 6A | 20 ms |
| 30 V DC | 10A | 10A | 20 ms |
| 250 V AC 15 | 6A | 6A | |

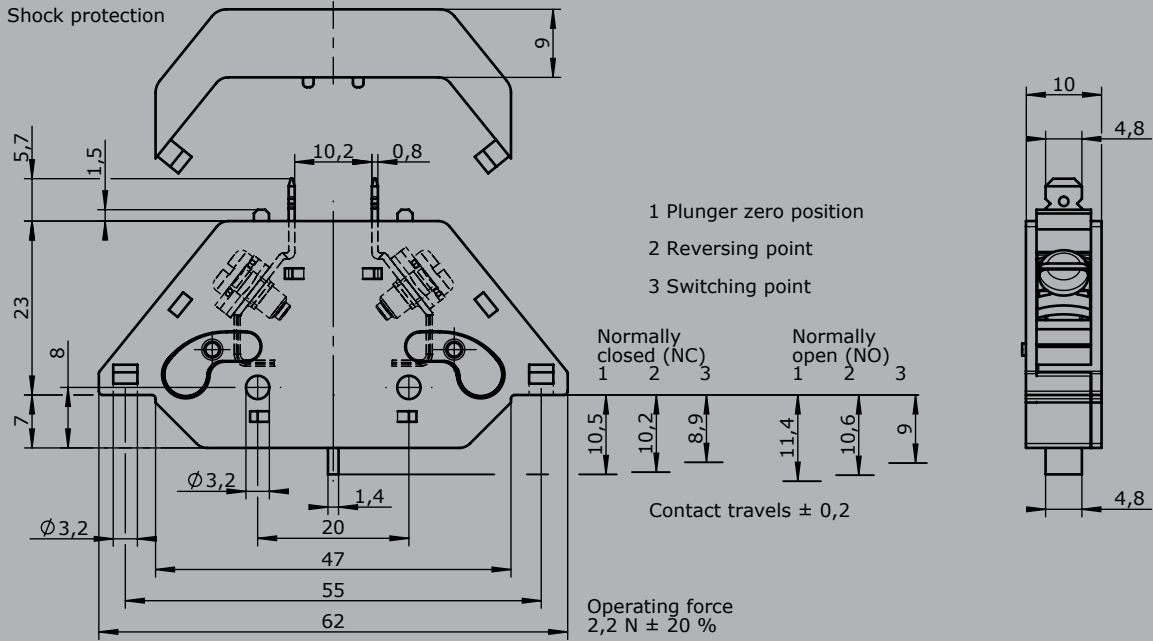
Technical data

| | |
|-------------------------|--|
| Mechanical life | 2 million operating cycles |
| Electrical service life | 50.000 operating cycles (at 2A 250 V DC L/R 20 ms) |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP40 |

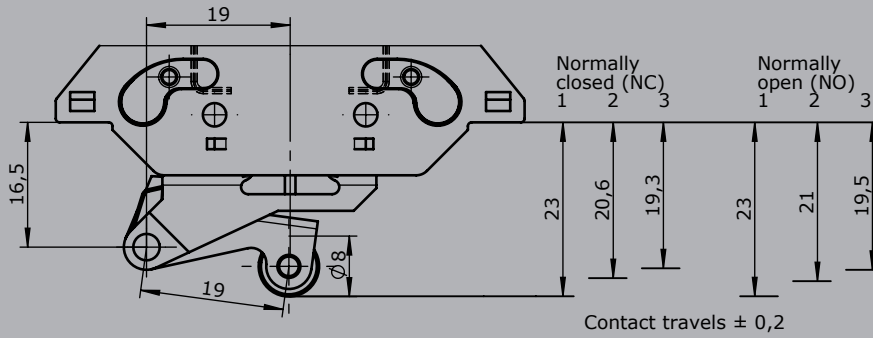
| | SO 1.10 | -B | -R | -F | -X |
|----------------------|--|----|----|----|----|
| Basic unit | | | | | |
| SO1.10 | DC-Contact normally closed (NC) | | | | |
| | Colour code grey or blue | | | | |
| SS1.10 | DC-Contact normally open (NO) | | | | |
| | Colour code yellow or green | | | | |
| Attachment | | | | | |
| B | Shock protection KEG 142 to DIN VDE 0106 part 100 | | | | |
| R | Roller lever | | | | |
| K | Toggle lever (switching is one direction only) | | | | |
| F | Plug-in connection at side 4,8 x 0,8 mm (2 pieces) | | | | |
| AU | Contacts gold-coated approx. 0,5 | | | | |
| Special model | | | | | |
| X | Special / customer specified | | | | |
| X1 | Contact without quenching magnets | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

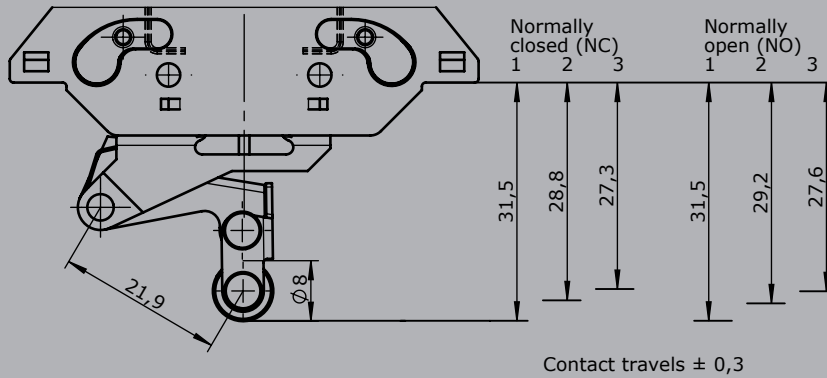
DC Contact
 SO 1.10 Normally open (NO)
 SS 1.10 Normally closed (NC)



with roller lever



with toggle lever



Technical details may vary based on configuration or application! Technical data subject to change without notice!

Gear Limit Switch

GE1 / GE2



The Gear Limit Switch GE1 / GE2 is a rugged switching device designed for hoisting applications. The modular micro changeover contacts with positive opening operation. The device is programmed by means of stepless adjustment of double cam discs, which can be provided from 18° to 192° contact discs according to the switching program required. The type GE 1 includes a double cam disc conjointly lockable. The type GE 2 includes a double cam disc conjointly lockable.



Technical data

| | |
|-------------------------|-----------------------------|
| Mechanical life GE1/GE2 | 10 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP65 |
| Colour | RAL 7032 pebble grey |

| | GE 1 | -10 | -4 | -P | -U7 | -P | -18 | -30 | -60 | -90 | -X | | | | | | | | | | |
|--|--|------|-------|---------------------|--------------|------|------|--------|--------------|------|------|--------|--------------|------|------|--------|--------------|------|------|---------|--------------|
| Basic unit | | | | | | | | | | | | | | | | | | | | | |
| GE 1 | Gear Limit Switch GE 1 with mounting flange | | | | | | | | | | | | | | | | | | | | |
| GE 2 | Gear Limit Switch GE 2 with mounting flange | | | | | | | | | | | | | | | | | | | | |
| Gearing | | | | | | | | | | | | | | | | | | | | | |
| Ratios: | 2:1 | to | 10:1 | example: 10:1 => 10 | | | | | | | | | | | | | | | | | |
| | 11:1 | to | 20:1 | | | | | | | | | | | | | | | | | | |
| | 21:1 | to | 40:1 | | | | | | | | | | | | | | | | | | |
| | 41:1 | to | 80:1 | | | | | | | | | | | | | | | | | | |
| | 81:1 | to | 160:1 | | | | | | | | | | | | | | | | | | |
| | 161:1 | to | 320:1 | | | | | | | | | | | | | | | | | | |
| Limit switch | | | | | | | | | | | | | | | | | | | | | |
| 2 | 2 contacts | | | | | | | | | | | | | | | | | | | | |
| 3 | 3 contacts | | | | | | | | | | | | | | | | | | | | |
| 4 | 4 contacts | | | | | | | | | | | | | | | | | | | | |
| 5 | 5 contacts | | | | | | | | | | | | | | | | | | | | |
| 6 | 6 contacts | | | | | | | | | | | | | | | | | | | | |
| 7 | 7 contacts | | | | | | | | | | | | | | | | | | | | |
| 8 | 8 contacts | | | | | | | | | | | | | | | | | | | | |
| 9 | 9 contacts | | | | | | | | | | | | | | | | | | | | |
| 10 | 10 contacts | | | | | | | | | | | | | | | | | | | | |
| 11 | 11 contacts | | | | | | | | | | | | | | | | | | | | |
| 12 | 12 contacts | | | | | | | | | | | | | | | | | | | | |
| 13 | 13 contacts | | | | | | | | | | | | | | | | | | | | |
| 14 | 14 contacts | | | | | | | | | | | | | | | | | | | | |
| 15 | 15 contacts | | | | | | | | | | | | | | | | | | | | |
| 16 | 16 contacts | | | | | | | | | | | | | | | | | | | | |
| (P) | Possibility of mounting potentiometer (Gessmann-types) | | | | | | | | | | | | | | | | | | | | |
| P | Potentiometer | P451 | PW70 | 0,5 kOhm | I max. 30 mA | P452 | PW70 | 1 kOhm | I max. 30 mA | P453 | PW70 | 2 kOhm | I max. 30 mA | P454 | PW70 | 5 kOhm | I max. 30 mA | P455 | PW70 | 10 kOhm | I max. 30 mA |
| <i>More potentiometers on request!</i> | | | | | | | | | | | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

GE 1 -10 -4 -P -U7 -P -18 -30 -60 -90 -X

Aluminium housing

| | |
|----|---|
| U5 | U17/13 170 x 130 mm (max. 8 contacts GE 1) |
| U6 | U16/16 160 x 160 mm (max. 12 contacts GE 1/ max. 6 contacts GE 2) |
| U7 | U16/20 160 x 200 mm (max. 16 contacts GE 1/max. 10 v GE 2) |
| U8 | U16/26 160 x 260 mm (max. 16 contacts GE2) |
| U9 | U16/35 160 x 350 mm |

Program-disc

Following program-discs are available :

18°, 24°, 30°, 36°, 45°, 60°, 75°, 90°, 110°, 120°, 176°, 192°

Example:

Contact 1: program-discs pair 18° (adjustment range 18°-36°)

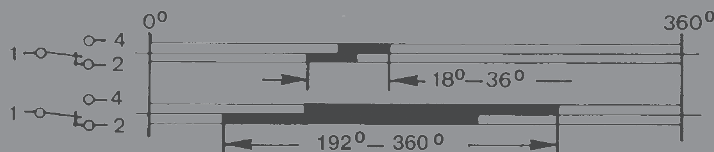
Contact 2: program-discs pair 30° (adjustment range 30°-60°)

Contact 3: program-discs pair 60° (adjustment range 60°-120°)

Contact 4: program-discs pair 90° (adjustment range 90°-180°)

Contact n:

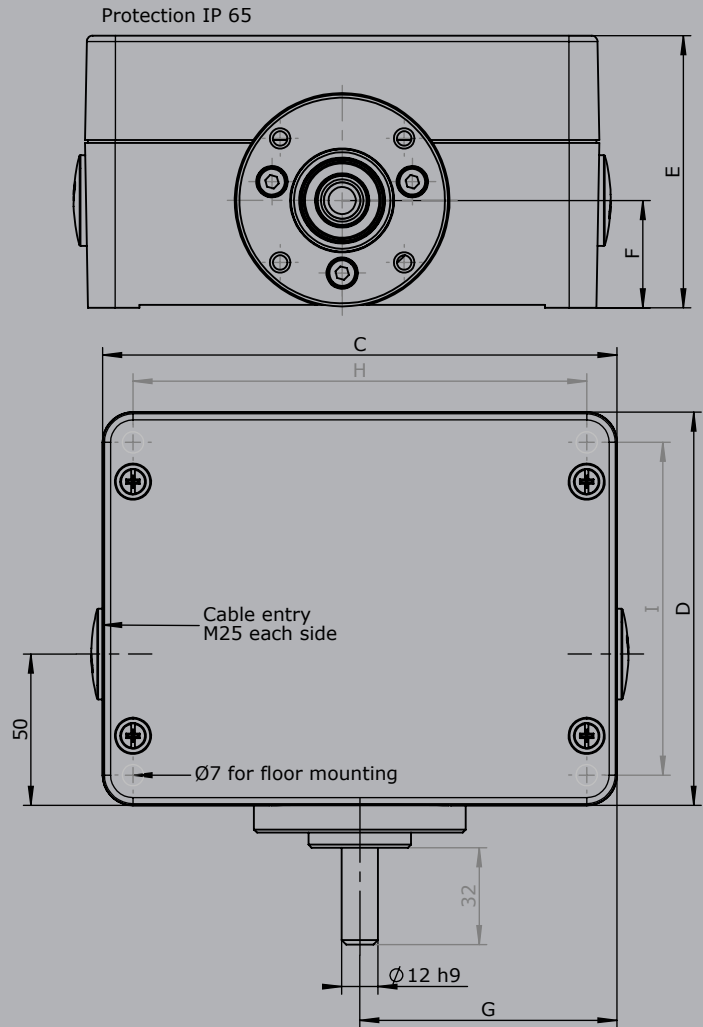
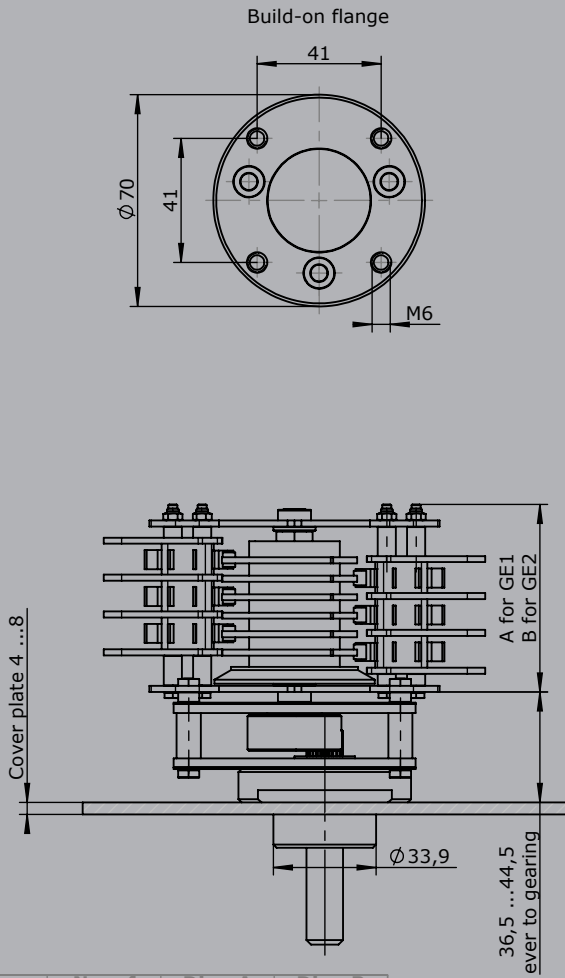
Illustration



The programm-discs are infinitely adjustable within 360°

Special model

X Special / customer specified



| Type | No. of contacts | Dim. A (GE1) | Dim. B (GE2) |
|------|-----------------|--------------|--------------|
| 1 | 1 | 32 | 35,5 |
| 2 | 2 | 38,5 | 42 |
| 3 | 3 | 44,5 | 48 |
| 4 | 4 | 50,5 | 54 |
| 5 | 5 | 56,5 | 60 |
| 6 | 6 | 63 | 66,5 |
| 7 | 7 | 69 | 72,5 |
| 8 | 8 | 75 | 78,5 |
| 9 | 9 | 81 | 84,5 |
| 10 | 10 | 87 | 90,5 |
| 11 | 11 | 93 | 96,5 |
| 12 | 12 | 99 | 102,5 |
| 13 | 13 | 105,5 | 109 |
| 14 | 14 | 111,5 | 115 |
| 15 | 15 | 117,5 | 121 |
| 16 | 16 | 123,5 | 127 |

| Type | Dim. C | Dim. D | Dim. E | Dim. F | Dim. G | Dim. H | Dim. I |
|--------|--------|--------|--------|--------|--------|--------|--------|
| U17/13 | 170 | 130 | 90 | 35,5 | 75 | 150 | 110 |
| U16/16 | 160 | 160 | 91 | 45 | 70 | 140 | 140 |
| U16/20 | 160 | 200 | 100 | 45 | 70 | 140 | 180 |
| U16/26 | 160 | 260 | 91 | 45 | 70 | 140 | 240 |
| U16/35 | 160 | 350 | 100 | 45 | 70 | 140 | 330 |

The Naval Cruise Controller AZ1 is a rugged switching device. The modular design enables the switching device to be used universally.

The design includes:

The mechanical control-system for the engine speed 0-max. rpm. switching angle 60 degrees with pressure print at 7 degrees and friction brake direction 0-2. The mechanical control-system for the steering left/right direction 13-14, 360 degrees with pressure points 4x90 degrees and friction brake.

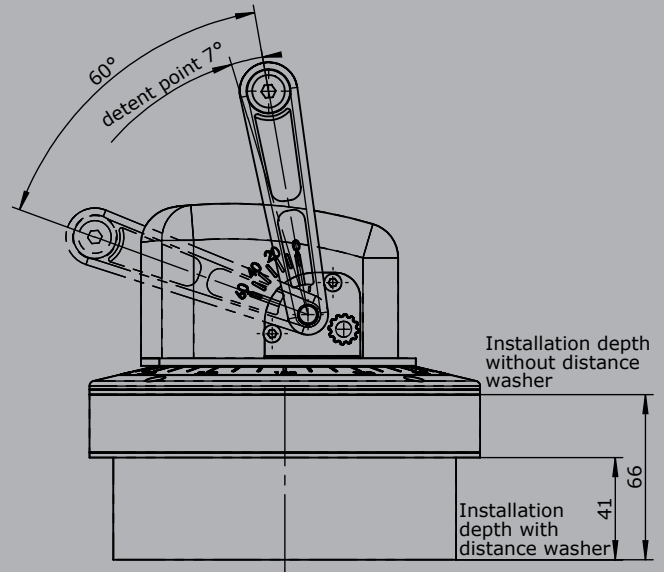
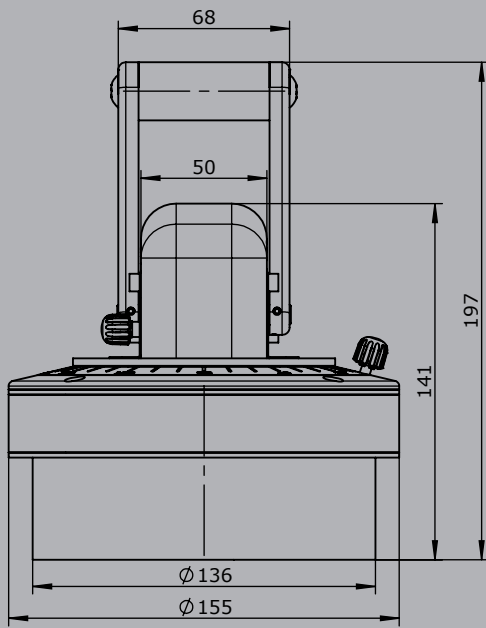
The AZ1 is resistant to oil, maritime climate, ozone and UV radiation.



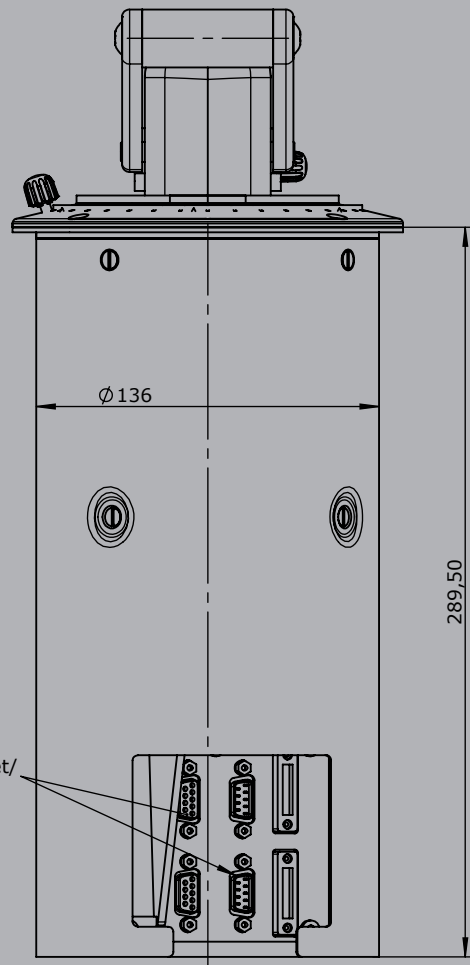
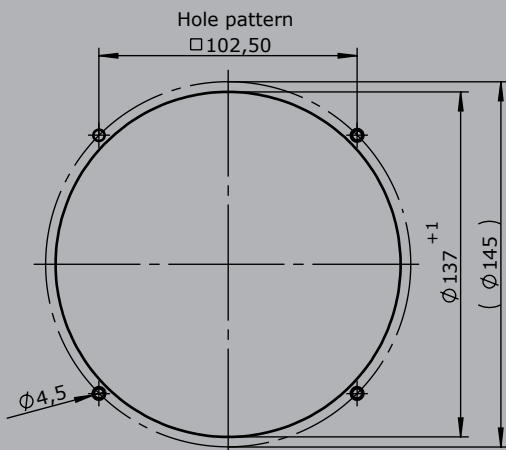
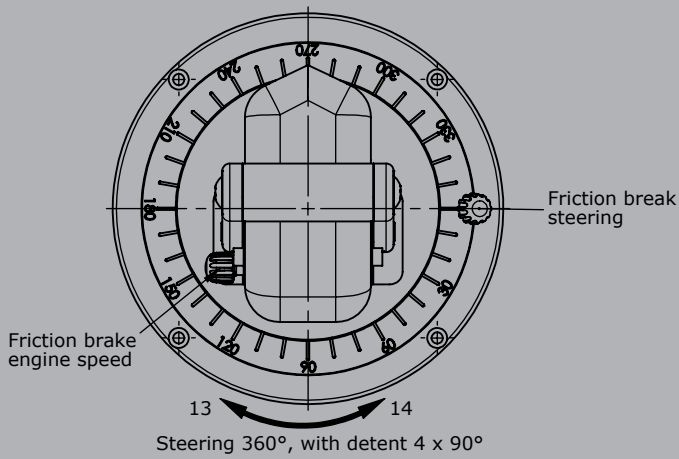
Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life AZ 1 | 12 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP66 |

| | AZ1 | -L | E2112 | -X |
|--|--|--------|--------|----|
| Basic unit | | | | |
| AZ1 Naval cruise controller | | | | |
| Options | | | | |
| L Scale illuminated (LED) 24 V dimmable | | | | |
| Interface | | | | |
| Voltage output (not stabilized) | | | | |
| Supply voltage 4,75 - 5,25 V DC | | | | |
| | Characteristic: <input type="checkbox"/> = Inverse dual, <input type="checkbox"/> = Dual | | | |
| 0,5...2,5...4,5 V redundant per axis | | 1 axis | E103 1 | |
| | | 2 axis | 2 | |
| Voltage output | | | | |
| Supply voltage 9 - 32 V DC (*11,5 - 32 V DC) | | | | |
| | Characteristic: <input type="checkbox"/> = Inverse dual, <input type="checkbox"/> = Dual | | | |
| 0,5...2,5...4,5 V redundant per axis | | 1 axis | E111 1 | |
| | | 2 axis | 2 | |
| Output power | | | | |
| Supply voltage 9-32 V DC | | | | |
| | Characteristic: <input type="checkbox"/> = Inverse dual, <input type="checkbox"/> = Dual | | | |
| 4...12...20 mA redundant per axis | | 1 axis | E211 1 | |
| | | 2 axis | 2 | |
| Special model | | | | |
| X Special / customer specified | | | | |



Edition:
with motor rossetting control system



Double-Handle Controller D3




The Double-Handle Controller D3 is a robust switching device for nautical navigation applications. The modular design enables the switching device to be used universally. The Double-Handle Controller is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life D3 | 12 million operating cycles |
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP66 front |



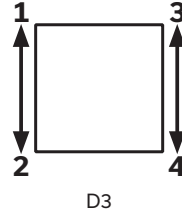
| | D3 | S5 | Q / Q | -2 RP | +3 RP | Example | | -B | -A05 P484 | +A05 P484 | -E1292 | -S... | -X |
|---|-------|---|-------|-------|-------|---------|--|----|-----------|-----------|--------|-------|----|
| Basic unit | D3 | | | | | | | | | | | | |
| Control-handle extended | S5 | -20 mm | | | | | | | | | | | |
| Grip- control handle left | Q | T-grip | | | | | | | | | | | |
| Grip- control handle right | Q | T-grip | | | | | | | | | | | |
| Axis 1 (direction 1-2) | 2 | 2 contacts (1,5A 24 V DC13) | | | | | | | | | | | |
| R | | Friction brake | | | | | | | | | | | |
| P | | Potentiometer | | | | | | | | | | | |
| Axis 2 (direction 3-4) | 3 | 3 contacts (1,5A 24 V DC13) | | | | | | | | | | | |
| R | | Friction brake | | | | | | | | | | | |
| P | | Potentiometer | | | | | | | | | | | |
| Cover housing | B | Cover housing | | | | | | | | | | | |
| Description axis 1 (direction 1-2) | A05 | Arrangement MSP21 | | | | | | | | | | | |
| P484 | | Potentiometer T318 2 x 5 kOhm | | | | | | | | | | | |
| Description axis 2 (direction 3-4) | A050 | Arrangement MSP21-0 | | | | | | | | | | | |
| P484 | | Potentiometer T318 2 x 5 kOhm | | | | | | | | | | | |
| Interface | E1292 | Voltage output 0...5...10 V | | | | | | | | | | | |
| Plug connectors | S... | Standard plug connectors (see page 120) | | | | | | | | | | | |
| Special model | X | Special / customer specified | | | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

D3 S5 Q / Q - 2 RP + 3 RP - B - A05 P484 + A050 P484 - E1292 - X

| Basic unit | |
|--|------------------------------|
| D3 | |
| Control-handle extended* | |
| | Standard 148 mm* |
| S5 | -20 mm |
| S8 | +20 mm |
| <i>*Only available in combination with handle!</i> | |
| Grip-control-handle left | |
| | Knob |
| D | Push button |
| Q | T-grip |
| QD | T-grip with push button side |
| Grip-control-handle right | |
| | Knob |
| D | Push button |
| Q | T-grip |
| QD | T-grip with push button side |

Identification of the installation variants with switching directions:



D3 S5 Q / Q - 2 RP + 3 RP - B - A05 P484 + A050 P484 - E1292 - X

| Axis 1: direction 1-2 left | |
|----------------------------|---|
| 1 | 1 contact |
| 2 | 2 contacts |
| 3 | 3 contacts |
| | Standard contact- arrangement see page 122 |
| | e.g. |
| | A98 MS0 |
| | A05 MS21 |
| | A050 MS21-0 |
| | <i>A99 contact - arrangement according customer request</i> |
| R | Friction brake |
| (P) | Mounting options for potentiometer and (Gessmann-types) |
| P | Potentiometer |
| | P484 T318 2 x 5 kOhm I max. 1 mA |
| | <i>More potentiometers on request!</i> |
| H | Hall-Potentiometer |
| | E14811 0,5...2,5...4,5 V / 4,5...2,5...0,5 V |

D3 S5 Q/Q - 2 RP + 3 RP - B - A05 P484 + A050 P484 - E1292 - X

Axis 2: direction 3-4 left

| | | | | |
|-----|---|--|---------------------------------------|-------------|
| 1 | 1 contact | Standard contact- arrangement see page 122 | | |
| 2 | 2 contacts | e.g. | | |
| 3 | 3 contacts | A98 | MS0 | |
| | | A05 | MS21 | |
| | | A050 | MS21-0 | |
| | | A99 contact - arrangement according customer request | | |
| R | Friction brake | | | |
| (P) | Mounting options for potentiometer (Gessmann-types) | | | |
| P | Potentiometer | P484 | T318 2 x 5 kOhm | I max. 1 mA |
| | | | More potentiometers on request! | |
| H | Hall-Potentiometer | E14811 | 0,5...2,5...4,5 V / 4,5...2,5...0,5 V | |

D3 S5 Q/Q - 2 RP + 3 RP - B - A05 P484 + A050 P484 - E1292 - X

Cover housing

B Cover housing

Interface (description the following pages)

Potentiometer output
 E1xx Voltage output
 E2xx Current output

Special model

X Special / customer specified

Voltage outputs

| | | | |
|--------------------------|--|--------|--------|
| Supply voltage | 11,5-32 V DC | | |
| Wiring | Cable 300 mm long without plug connector | | |
| | Optional with plug connector (standard plug connectors see page 120) | | S |
| 0...5...10 V per axis | | 1 axis | E129 1 |
| | | 2 axis | 2 |
| 10...0...10 V per axis | | 1 axis | E141 1 |
| | | 2 axis | 2 |
| -10...0...+10 V per axis | | 1 axis | E140 1 |
| | | 2 axis | 2 |

Voltage output with other value on request!

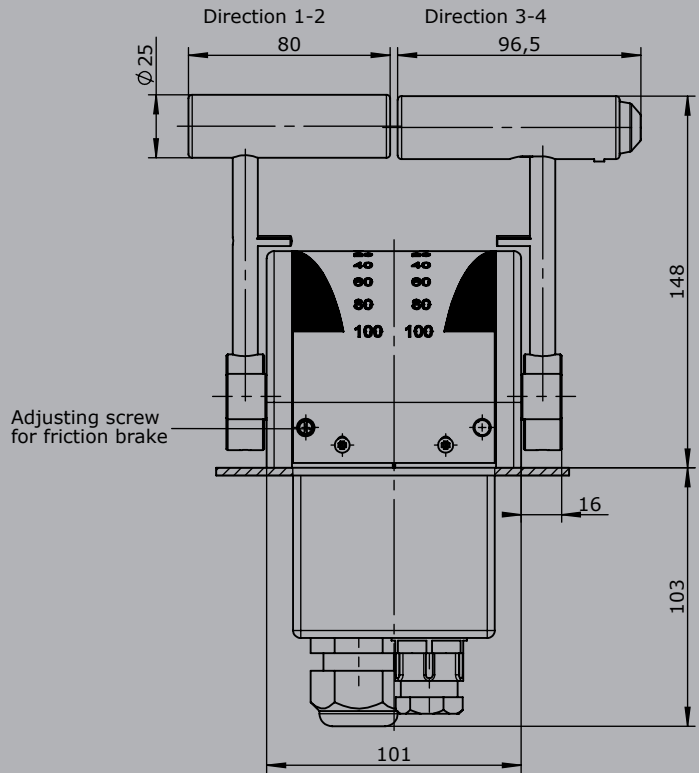
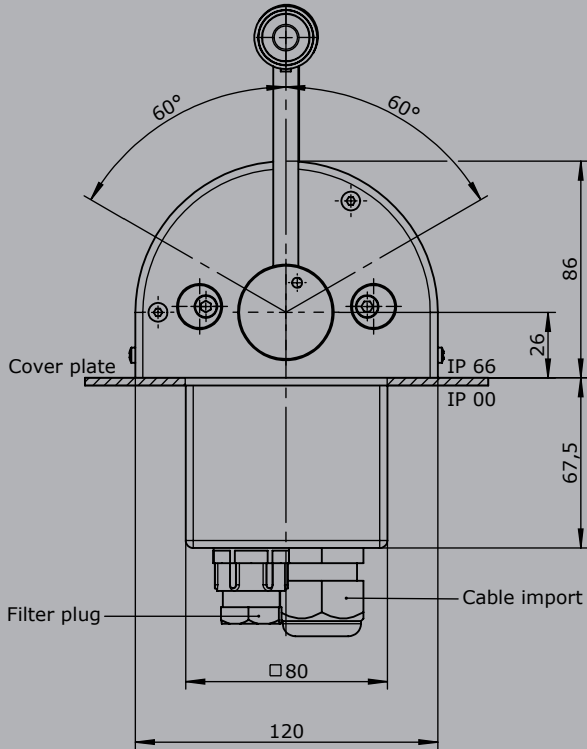
Current outputs

| | | | |
|-------------------------|--|--------|--------|
| Supply voltage | 18-36 V DC | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (standard plug connectors see page 120) | | S |
| 4...12...20 mA per axis | | 1 axis | E209 1 |
| | | 2 axis | 2 |
| 20...4...20 mA per axis | | 1 axis | E217 1 |
| | | 2 axis | 2 |

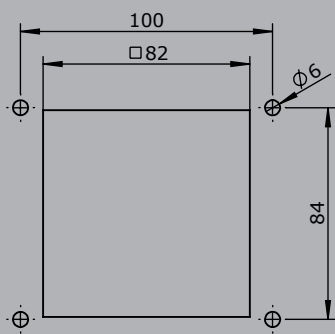
Double-Handle Controller D3



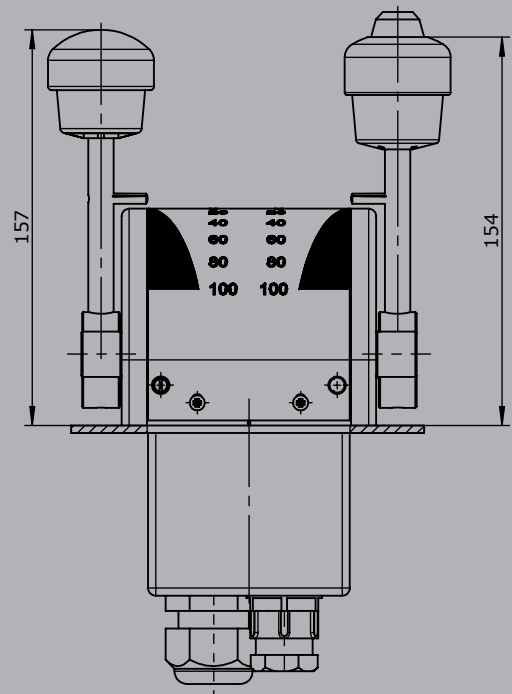
T- grip
D=Push button



Hole pattern



Knob solid
D= Push button



Single-Axis Controller S3




The Single-Axis Controller S3 is a rugged switching device for hoisting applications. The modular design enables the switching device to be used universally. The Single-Axis Controller is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun

Technical data

| | |
|-----------------------|-----------------------------|
| Mechanical life S3 | 12 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP66 front |

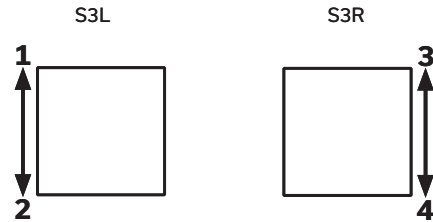


| | S3L | S5 | Q | -2 R P | -B | -A05 P484 | -E1291 | -S... | -X |
|---|-----|----|---|--------|----|-----------|--------|-------|----|
| Basic unit | | | | | | | | | |
| S3L Single-Axis Controller left | | | | | | | | | |
| Control-handle extended | | | | | | | | | |
| S5 -20 mm | | | | | | | | | |
| Grip- control-handle left | | | | | | | | | |
| Q T-grip | | | | | | | | | |
| Axis 1 | | | | | | | | | |
| 2 2 contacts (1,5A 24 V DC13) | | | | | | | | | |
| R Friction brake | | | | | | | | | |
| P Potentiometer | | | | | | | | | |
| Cover housing | | | | | | | | | |
| B Cover housing | | | | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | | | | |
| A05 Arrangement MSP21 | | | | | | | | | |
| P484 Potentiometer T318 2 x 5 kOhm | | | | | | | | | |
| Interface | | | | | | | | | |
| E1291 Voltage output 0...5...10 V | | | | | | | | | |
| Plug connectors | | | | | | | | | |
| S.. Standard plug connectors (see page 120) | | | | | | | | | |
| Special model | | | | | | | | | |
| X Special / customer specified | | | | | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

| | S3L | S5 | Q | -2 R P | -B | -A05 | P484 | -E1291 | -S... | -X |
|--------------------------------|--|----|---|--------|----|------|------|--------|-------|----|
| Basic unit | | | | | | | | | | |
| S3L | Single-Axis Controller, control-handle left | | | | | | | | | |
| S3R | Single-Axis Controller, control-handle right | | | | | | | | | |
| Control-handle extended | | | | | | | | | | |
| | Standard 148 mm* | | | | | | | | | |
| S5 | -20 mm | | | | | | | | | |
| S8 | +20 mm | | | | | | | | | |
| | *Only possible in combination with handle! | | | | | | | | | |
| Grip | | | | | | | | | | |
| | Knob | | | | | | | | | |
| D | Push button | | | | | | | | | |
| Q | T-grip | | | | | | | | | |
| QD | T-grip with push button side | | | | | | | | | |

**Identification of the installation variants
with switching directions:**



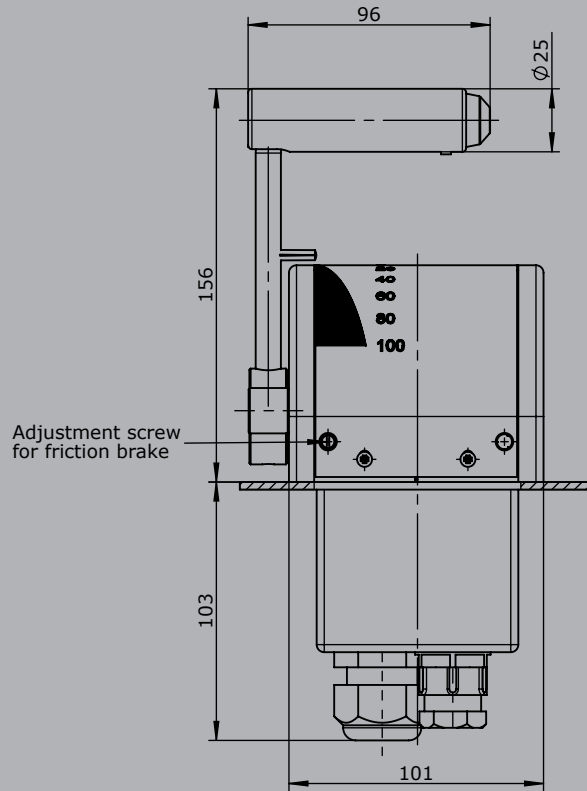
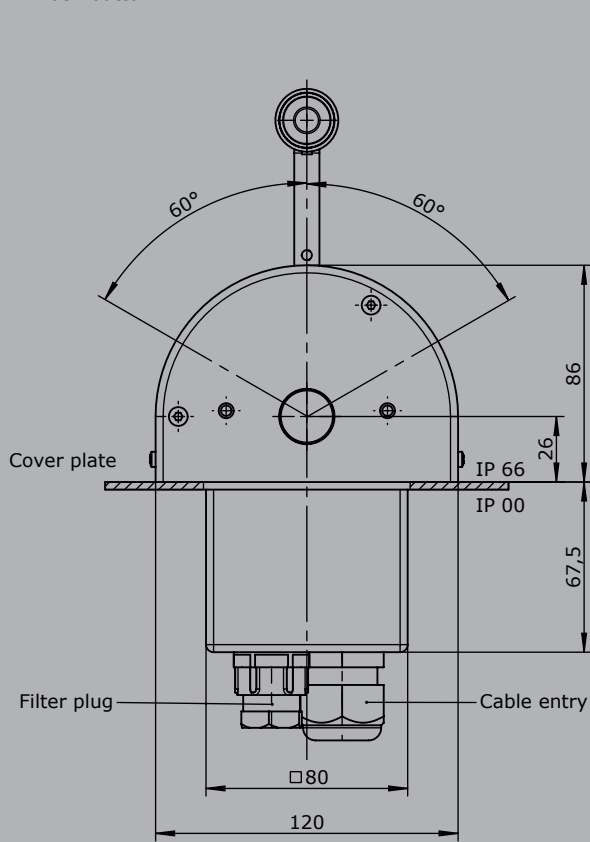
| | S3L | S5 | Q | -2 R P | -B | -A05 | P484 | -E1291 | -S... | -X |
|-----------------------------------|--|--------|---------------|---------------------------------------|----|------|------|--------|-------|----|
| Axis 1: direction 1-2 left | | | | | | | | | | |
| 1 | 1 contact | | | | | | | | | |
| 2 | 2 contacts | | | | | | | | | |
| 3 | 3 contacts | | | | | | | | | |
| | Standard contact - arrangement see page 122 | | | | | | | | | |
| | z.B. | | | | | | | | | |
| | A98 | | | | | | | | | |
| | A05 | | | | | | | | | |
| | A050 | | | | | | | | | |
| | A99 contact - arrangement according customer request | | | | | | | | | |
| R | Friction brake | | | | | | | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | | | | | | | |
| P | Potentiometer | P484 | T318 2x5 kOhm | I max. 1 mA | | | | | | |
| | More potentiometers on request! | | | | | | | | | |
| H | Hall-Potentiometer | E14811 | | 0,5...2,5...4,5 V / 4,5...2,5...0,5 V | | | | | | |

| | S3L | S5 | Q | -2 R P | -B | -A05 | P484 | -E1291 | -S... | -X |
|---|------------------------------|----|---|--------|----|------|------|--------|-------|----|
| Cover housing | | | | | | | | | | |
| B | Cover housing | | | | | | | | | |
| Interface (description on the following pages) | | | | | | | | | | |
| | Potentiometer output | | | | | | | | | |
| E1xx | Voltage output | | | | | | | | | |
| E2xx | Current output | | | | | | | | | |
| Special model | | | | | | | | | | |
| X | Special / customer specified | | | | | | | | | |

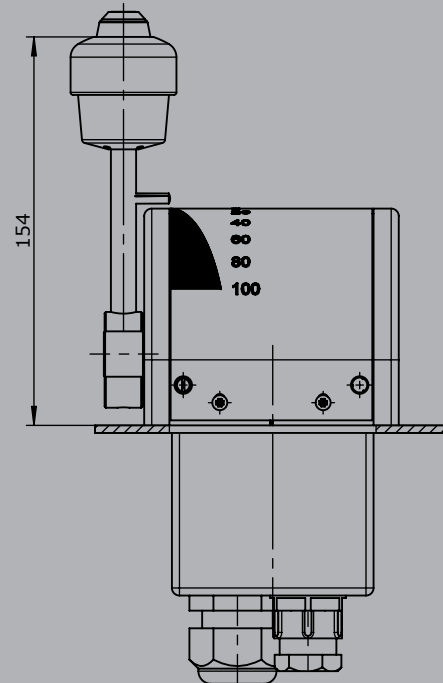
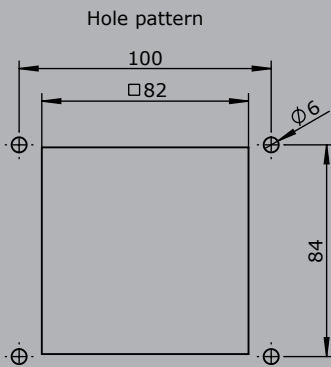
| Voltage output | | | |
|---|---|--------|---|
| Supply voltage | 11,5-32 V DC | | |
| Wiring | Cable 500 mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| 0...5...10V | 1 axis | E112 1 | S |
| 10...0...10V | 1 axis | E141 1 | |
| -10...0...+10V | 1 axis | E140 1 | |
| Voltage output with other value on request! | | | |

| Current output | | | |
|----------------|---|--------|---|
| Supply voltage | 18-36 V DC | | |
| Wiring | Cable 500mm long without plug connector | | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | | |
| 4...12...20 mA | 1 axis | E209 1 | S |
| 20...4...20 mA | 1 axis | E217 1 | |

T - grip
D= Push button



Knob solid
D= Push button



Single-Axis Controller S23



The Single-Axis Controller S23 is a robust switching device for shipbuilding and electro-hydraulic applications. The modular design of the switching device is universally applicable. The Single-Axis Controller is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

Technical data

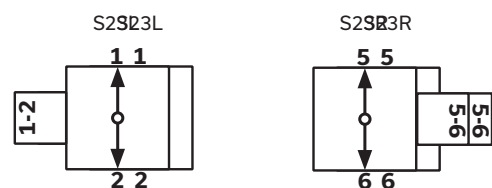
| | |
|-----------------------|----------------------------|
| Mechanical life S23 | 6 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | IP65 |



| | S23L | S5 | M | - 3 Z P | - A050 P134 | - X |
|---|------|----|---|---------|-------------|-----|
| Basic unit | | | | | | |
| S23L left | | | | | | |
| Control-handle extended | | | | | | |
| S5 -20 mm | | | | | | |
| Grip / palm grip | | | | | | |
| M Mechanical zero interlock | | | | | | |
| Axis 1 (direction 1-2) | | | | | | |
| 3 3 contacts (2A 250 V AC15) | | | | | | |
| Z Spring return | | | | | | |
| P Potentiometer | | | | | | |
| Description axis 1 (direction 1-2) | | | | | | |
| A050 Arrangement MSP21-0 | | | | | | |
| P134 Potentiometer T396 2 x 5 kOhm | | | | | | |
| Special model | | | | | | |
| X Special / customer specified | | | | | | |

| | S23L | S5 | M | - 3 Z P | - A050 P134 | - X |
|--------------------------------|------|----|---|---------|-------------|-----|
| Basic unit | | | | | | |
| S23L left | | | | | | |
| S23R right | | | | | | |
| Control-handle extended | | | | | | |
| Standard 140 mm | | | | | | |
| S5 -20 mm | | | | | | |
| S8 +20 mm | | | | | | |

Identification of the installation variants with switching directions:



S23L S5 M - 3 Z P - A050 P134 - X

Grip / palm grip

- Knob (standard)
- M Mechanical zero interlock
- Q T-grip
- QM T-grip with mechanical zero interlock

S23L S5 M - 3 Z P - A050 P134 - X

Axis 1: direction 1-2 left / direction 5-6 right

| | | | | |
|-----|--|---|-------------------|-------------|
| 1 | 1 contact | Standard contact - arrangement see page 122 | | |
| 2 | 2 contacts | z.B. | | |
| 3 | 3 contacts | A98 | MS0 | |
| 4 | 4 contacts | A05 | MS21 | |
| | | A0500 | MS21-00 | |
| | | <i>A99 contact - arrangement according customer request</i> | | |
| Z | Spring return | | | |
| R | Friction brake | | | |
| (P) | Possibility of mounting potentiometer and encoder (Gessmann-types) | | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA |
| | | <i>More potentiometers on request!</i> | | |
| C | Encoder | C... Encoder see page 130 | | |

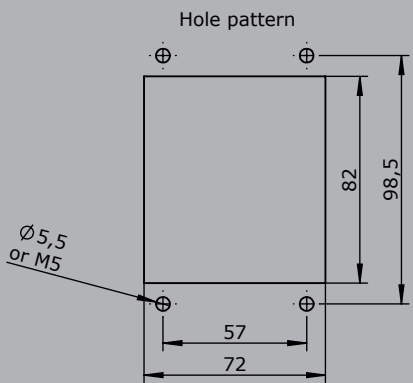
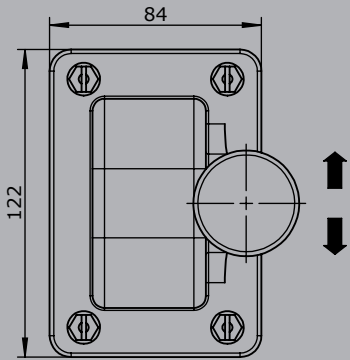
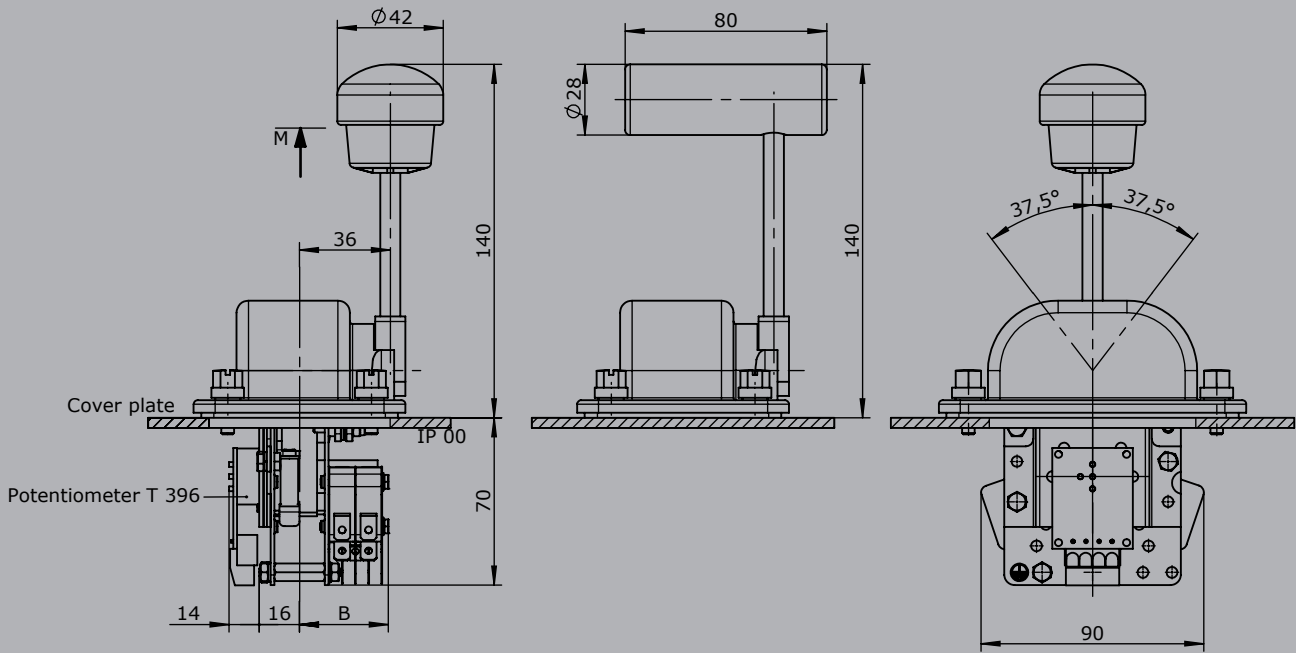
S23L S5 M - 3 Z P - A050 P134 - X

Special model

- X Special / customer specified

M = Latch for mechanical zero interlock

T - grip



| Type | No. of contacts | Dim. B |
|------|-----------------|--------|
| 1 | 1 | 25 |
| 2 | 2 | 31 |
| 3 | 3 | 36 |
| 4 | 4 | 42 |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

The Single-Axis Controller S27 is a hall sensor switching device designed for electro-hydraulic and remote controlled hydraulic. The modular design of the switching device is universally applicable. The Single-Axis Controller is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

Technical data

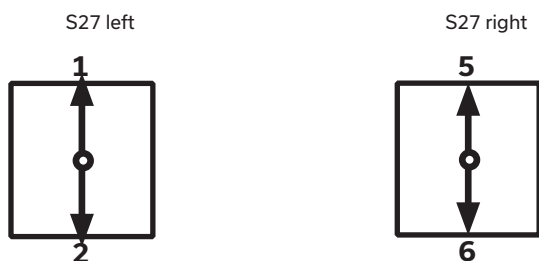
| | |
|-----------------------|--|
| Mechanical life S27 | 6 million operating cycles |
| Operating temperature | -40°C to +85°C |
| Degree of protection | up to IP65, electronic assembly IP67 |
| Functional safety | PLd compatible (EN ISO 13849, complies SIL2 to DIN EN IEC 61508) |



| | S27L | M | Example - Z | - E... | - S... | - X |
|---|------|---|----------------|--------|--------|-----|
| Basic unit | | | | | | |
| S27L left | | | | | | |
| S27R right | | | | | | |
| Grip / palm grip | | | | | | |
| Knob (standard) | | | | | | |
| M Mechanical zero interlock | | | | | | |
| Q T-grip | | | | | | |
| Z Spring return | | | | | | |
| R Friction brake | | | | | | |
| Interface (description on the following pages) | | | | | | |
| E0xx Digital output | | | | | | |
| E1xx Voltage output | | | | | | |
| E2xx Current output | | | | | | |
| Plug connectors | | | | | | |
| S.. Standard plug connectors (see page 120) | | | | | | |
| Special model | | | | | | |
| X Special / customer specific | | | | | | |

Identification of the installation variants

with switching directions:



Digital Output

| | | |
|--|---|--------|
| Supply voltage | 9-32 V DC | |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA | |
| Wiring | Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| 2 direction signals + 1 zero position signal (galvanically isolated) | | |
| | 1 axis | E001 1 |

Voltage output (not stabilized)

| | | |
|---|---|--------|
| Supply voltage | 4,75-5,25 V DC | |
| Current carrying capacity | Direction signal 8 mA | |
| Wiring | Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| 0,5...2,5...4,5 V redundant + 2 direction signals | | |
| | 1 axis | E104 1 |
| Output options | | |
| Characteristic: | | |
| Inverse dual | | 1 |
| Dual | | 2 |
| Inverse dual with dead zone +/- 3° (standard) | | 3 |
| Dual with dead zone +/- 3° | | 4 |

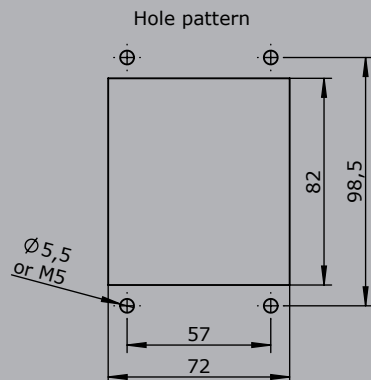
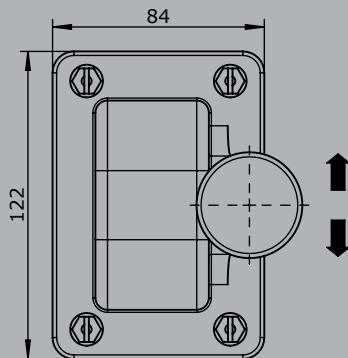
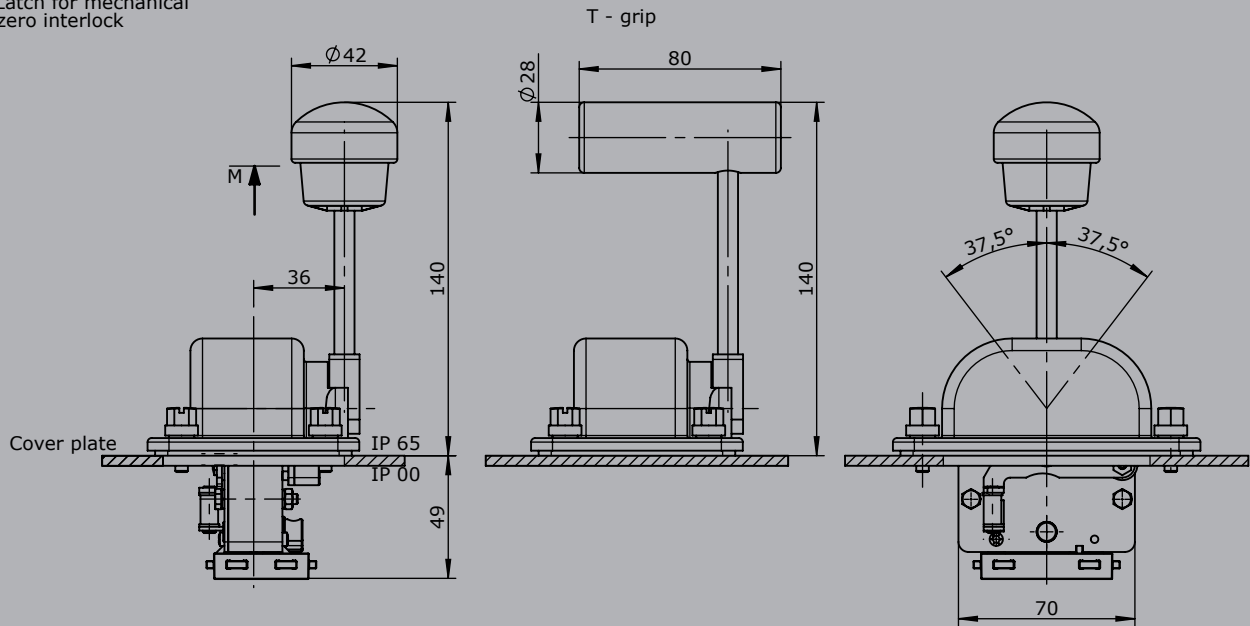
Voltage output

| | | |
|--|---|--------|
| Supply voltage | 9-32 V DC (*11,5-32 V) | |
| Current carrying capacity | Direction signal 150 mA Zero position signal 500 mA | |
| Wiring | Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 120</i>) | S |
| 0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) | | |
| | 1 axis | E112 1 |
| 0...5...10 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC | | |
| | 1 axis | E132 1 |
| 10...0...10 V + 2 direction signals + 1 zero position signal (galvanically isolated), supply voltage 11,5 - 32 V DC, sensor redundant with error monitoring and error signal | | |
| | 1 axis | E136 1 |
| Output options | | |
| Characteristic: | | |
| Inverse dual *1 | | 1 |
| Dual *1 | | 2 |
| Inverse dual with dead zone +/- 3° *1 (standard) | | 3 |
| Dual with dead zone +/- 3° *1 | | 4 |
| *1 not combinable with output E136X | | |
| Single *2 | | 5 |
| Single with dead zone *2 (standard) | | 6 |
| *2 not combinable with output E112X and E132X | | |

Voltage output with other value on request!

| Current output | | |
|--|---|--------|
| Supply voltage | 9-32 V DC | |
| Current carrying capacity | Direction signal 150 mA | |
| | Zero position signal 500 mA | |
| Wiring | Cable 500 mm long without plug connector | |
| | Optional with plug connector (<i>standard plug connectors see page 120</i>) | |
| 0...10...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E206 1 |
| 20...0...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E208 1 |
| 4...12...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E214 1 |
| 20...4...20 mA + 2 direction signals + 1 zero position signal (galvanically isolated), sensor redundant with error monitoring and error signal | | |
| | 1 axis | E216 1 |
| Output options | | |
| | Single | 5 |
| | Single with dead zone +/-3° (standard) | 6 |
| Current output with other value on request! | | |

M = Latch for mechanical zero interlock





The Control Pedestal U22/32 accommodate the devices necessary for control and monitoring. Ready wired, it can be quickly and easily installed on the sea deck. The housing (pedestal head) is made of seawater-resistant aluminium.

Surface treatment:
Priming and structure-finishing paint
Standard colour RAL 7032 pebble-grey



Technical data:

| | |
|-----------------------|----------------|
| Operation temperature | -40°C to +85°C |
| Degree of protection | IP66 |

| | | Example | | | | | | | | | | |
|---|--|--|-------------------|----------------|------|-------------|---|----|---|-----|---|---|
| | | U22/32 | / | N61.../ N62... | / | H / PW / 2D | / | PQ | / | KLV | / | X |
| Housing | | | | | | | | | | | | |
| U22/32 | With 1 narrow side-plate with pillar-gasket | | | | | | | | | | | |
| FD | Side-plate narrow gasket | | | | | | | | | | | |
| HD | Side-plate wide gasket (required for command and indicating devices) | | | | | | | | | | | |
| KD | Hinged side-plate with gasket that can be locked in position | | | | | | | | | | | |
| IA | Monitoring devices cover with gasket for max. 2 monitors 72 x 72 mm or 4 monitors 72 x 36 mm and max. 6 indicating devices pos. 28, 29 | | | | | | | | | | | |
| RS | Pillar 108 mm Ø 670 mm height with flange quadratic or round | | | | | | | | | | | |
| Masterswitch / Control-Switch | | | | | | | | | | | | |
| N61 | HG Masterswitch with ball handle and indicating labels | | | | | | | | | | | |
| N62 | KN Control-Switch with knob and indicating label | | | | | | | | | | | |
| | | -HG | -01 Z P | -A05 | P134 | -X | | | | | | |
| Axis 1: direction 3-4 | | | | | | | | | | | | |
| (Standard contacts gold-plated 2A 250 V AC15) | | | | | | | | | | | | |
| 01 | 2 contacts | Standard contact - arrangement see page 122 | | | | | | | | | | |
| 02 | 4 contacts | z.B. | | | | | | | | | | |
| 03 | 6 contacts | A05 | | MS21 | | | | | | | | |
| 04 | 8 contacts | A0500 | | MS21-00 | | | | | | | | |
| | | A99 contact - arrangement according customer request | | | | | | | | | | |
| Z | Spring return | | | | | | | | | | | |
| R | Friction brake | | | | | | | | | | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA | | | | | | | | |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA | | | | | | | | |
| | | P133 | T396 2 x 2 kOhm | I max. 1 mA | | | | | | | | |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA | | | | | | | | |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA | | | | | | | | |
| | | More potentiometers on request! | | | | | | | | | | |

U22/32 / N61.../N62... / H / PW / 2D / PQ / KLV / X

Command and indicating devices

| | | | |
|----|------------------------------------|-----------------------------------|-------------------------------|
| H | Heating | 20 Watt 220 or 110V 50/60 Hz | |
| PV | Mushroom head push button latching | 22 latching with indicating label | 1 NC |
| P | Mushroom head push button | 22 with indicating label | 1 NO |
| D | Push button | 22 with indicating label | 1 NO |
| W | Selector switch 0-1 | 22 with indicating label | 1 NO |
| L | Indicator light | 22 with indicating label | Diode 24 Volt |
| L | Indicator light | 22 with indicating label | Diode 230 Volt AC |
| | Contact block additional | | 1 S or 1 Ö |
| L | Indicator light | 22 with indicating label | Diode 24 Volt protection IP65 |
| L | Indicator light | 10 with indicating label | Diode 24 Volt protection IP65 |

Display devices

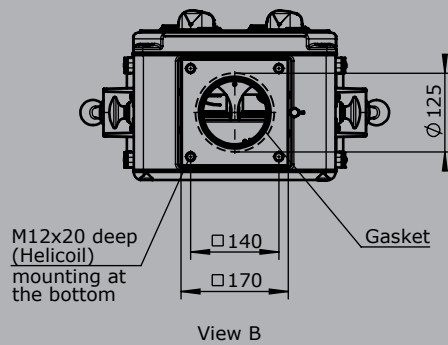
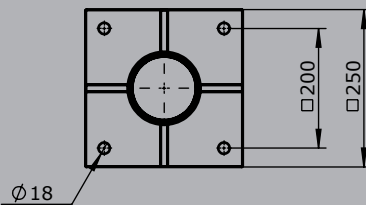
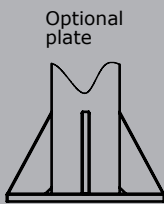
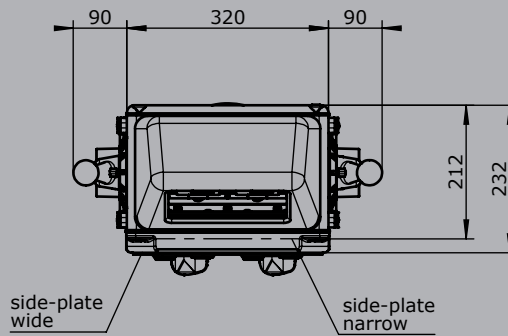
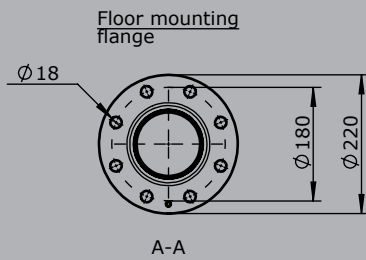
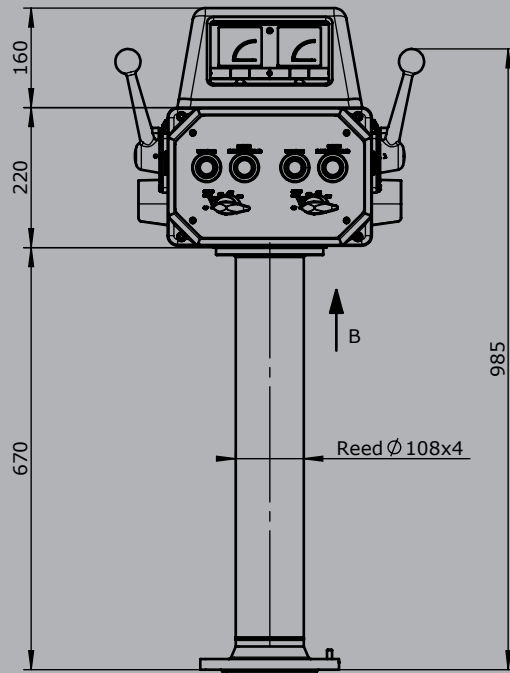
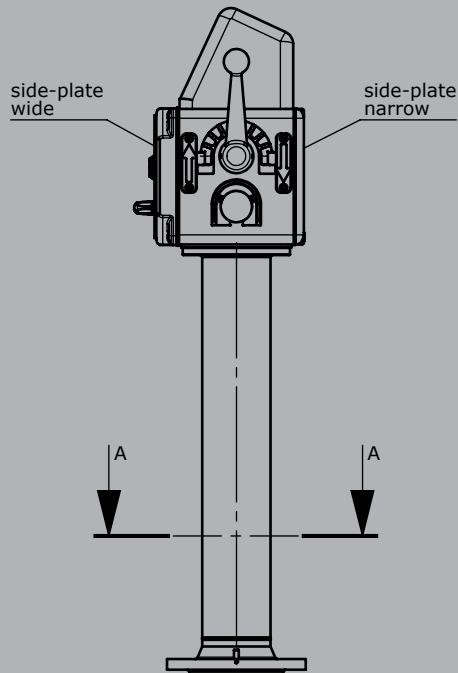
| | | |
|-----|---|----------------------------|
| PQ | Powermeter PQ 72 1 mA DC | Engraved your instructions |
| PQI | Powermeter PQ 72 1 mA DC illuminated 24 Volt | Engraved your instructions |
| PQ | Powermeter PQ 72 x 36 1 mA DC | Engraved your instructions |
| PQI | Powermeter PQ 72 x 36 1 mA DC illuminated 24 Volt | Engraved your instructions |
| EQ | Amperemeter EQ 72 100/200/1A | Engraved your instructions |
| EQI | Amperemeter EQ 72 100/200/1A illuminated 24 Volt | Engraved your instructions |
| EQ | Amperemeter EQ 72 x 36 100/200/1A | Engraved your instructions |
| EQI | Amperemeter EQ 72 x 36 100/200/1A illuminated 24 Volt | Engraved your instructions |

Wiring

KLV on terminal block 2,5mm² with wire line 0,75 mm²

Special model

X Special / customer specified



The Control Pedestal U23/23 accommodate the devices necessary for control and monitoring. Ready wired, it can be quickly and easily installed on the sea deck. The housing (pedestal head) is made of seawater-resistant aluminium.

Surface treatment:
Priming and structure-finishing paint
Standard colour RAL 7032 pebble-grey

Technical data:

Operation temperature -40°C to +85°C
Degree of protection IP66

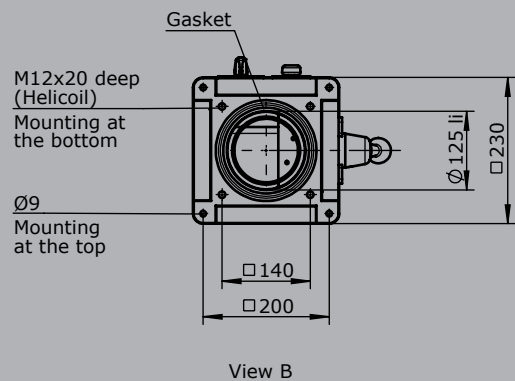
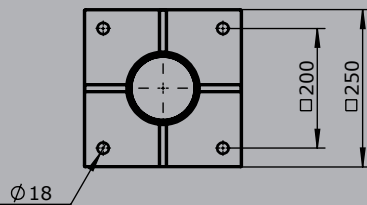
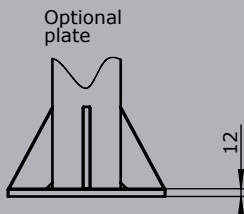
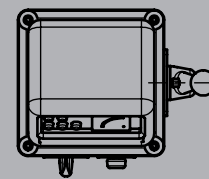
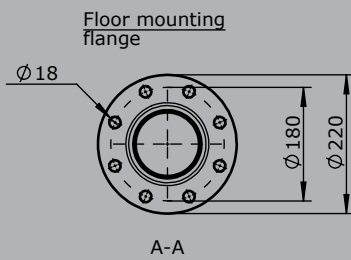
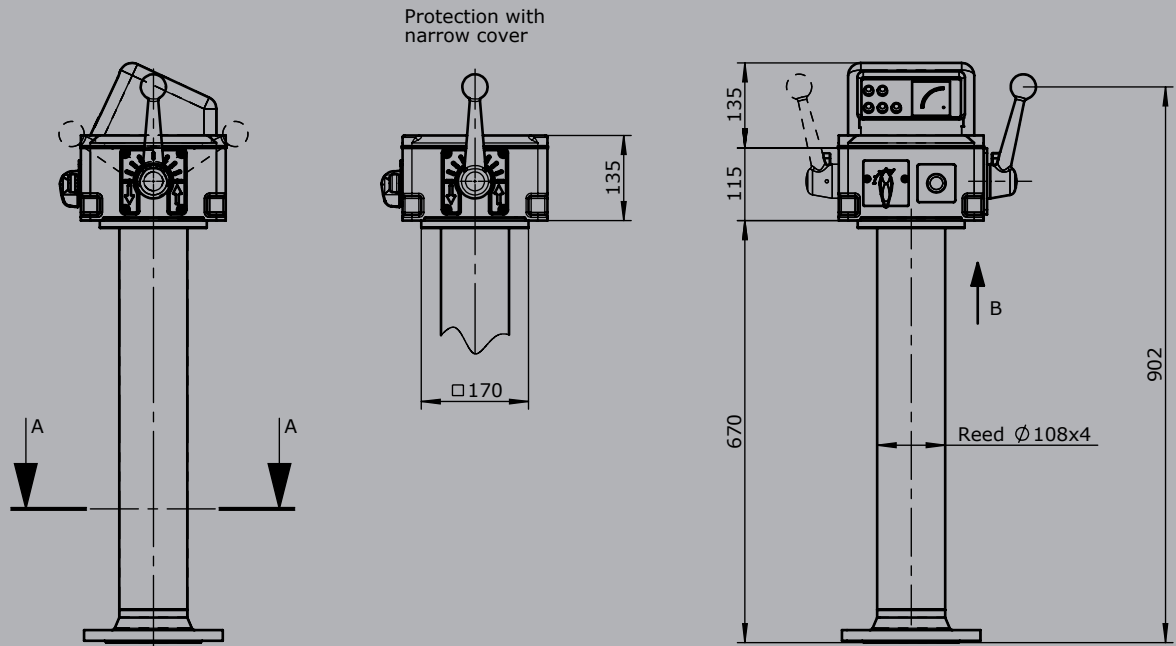


| | | U23/23 | N61.../N62... | H / PW / 2D | PQ | KLV | X |
|--------------------------------------|--|--|-------------------|-------------|------|-----|---|
| Housing | | | | | | | |
| U23/23 | With 1 narrow cover with pillar-gasket | | | | | | |
| U23/23A | With 1 narrow cover without drilling in the housing | | | | | | |
| IA | Monitoring devices cover with gasket for max. 2 monitors 72 x 72 mm or 4 monitors 72 x 36 mm and max. 6 indicating devices pos. 28, 29 | | | | | | |
| RS | Pillar 108mm Ø 670 mm height with flange quadratic or round | | | | | | |
| Masterswitch / Control-Switch | | | | | | | |
| N61 | HG Masterswitch with ball handle and indicating labels | | | | | | |
| N62 | KN Control-Switch with knob and indicating label | | | | | | |
| | | -HG | -01 Z P | -A05 | P134 | -X | |
| Axis 1: direction 3-4 | | | | | | | |
| | | (Standard contacts gold-plated 2A 250 V AC15) | | | | | |
| 01 | 2 contacts | Standard contact - arrangement see page 122 | | | | | |
| 02 | 4 contacts | z.B. | | | | | |
| 03 | 6 contacts | A05 | MS21 | | | | |
| 04 | 8 contacts | A0500 | MS21-00 | | | | |
| | | A99 contact - arrangement according customer request | | | | | |
| Z | Spring return | | | | | | |
| R | Friction brake | | | | | | |
| P | Potentiometer | P131 | T396 2 x 0,5 kOhm | I max. 1 mA | | | |
| | | P132 | T396 2 x 1 kOhm | I max. 1 mA | | | |
| | | P133 | T396 2 x 2kOhm | I max. 1 mA | | | |
| | | P134 | T396 2 x 5 kOhm | I max. 1 mA | | | |
| | | P135 | T396 2 x 10 kOhm | I max. 1 mA | | | |
| | | More potentiometers on request! | | | | | |

Technical details may vary based on configuration or application! Technical data subject to change without notice!

U23/23 / N61.../N62... / H / PW / 2D / PQ / KLV / X

| Command and indicating devices | | | | | | | |
|--------------------------------|---|---|-------------------------------|--|--|--|--|
| H | Heating | 20 Watt 220 or 110V 50/60 Hz | | | | | |
| PV | Mushroom head push button latching | 22 latching with indicating label | 1 Ö | | | | |
| P | Mushroom head push button | 22 with indicating label | 1 S | | | | |
| D | Push button | 22 with indicating label | 1 S | | | | |
| W | Selector switch 0-1 | 22 with indicating label | 1 S | | | | |
| L | Indicator light | 22 with indicating label | Diode 24 Volt | | | | |
| L | Indicator light | 22 with indicating label | Diode 230 Volt AC | | | | |
| | Contact block additional | | 1 S or 1 Ö | | | | |
| L | Indicator light | 22 with indicating label | Diode 24 Volt protection IP65 | | | | |
| L | Indicator light | 10 with indicating label | Diode 24 Volt protection IP65 | | | | |
| Display devices | | | | | | | |
| PQ | Powermeter PQ 72 1 mA DC | | Engraved your instructions | | | | |
| PQI | Powermeter PQ 72 1 mA DC illuminated 24 Volt | | Engraved your instructions | | | | |
| PQ | Powermeter PQ 72 x 36 1 mA DC | | Engraved your instructions | | | | |
| PQI | Powermeter PQ 72 x 36 1 mA DC illuminated 24 Volt | | Engraved your instructions | | | | |
| EQ | Amperemeter EQ 72 100/200/1A | | Engraved your instructions | | | | |
| EQI | Amperemeter EQ 72 100/200/1A illuminated 24 Volt | | Engraved your instructions | | | | |
| EQ | Amperemeter EQ 72 x 36 100/200/1A | | Engraved your instructions | | | | |
| EQI | Amperemeter EQ 72 x 36 100/200/1A illuminated 24 Volt | | Engraved your instructions | | | | |
| Wiring | | KLV on terminal block 2,5 mm ² with wire line 0,75 mm ² | | | | | |
| Special model | | | | | | | |
| X | Special / customer specified | | | | | | |



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