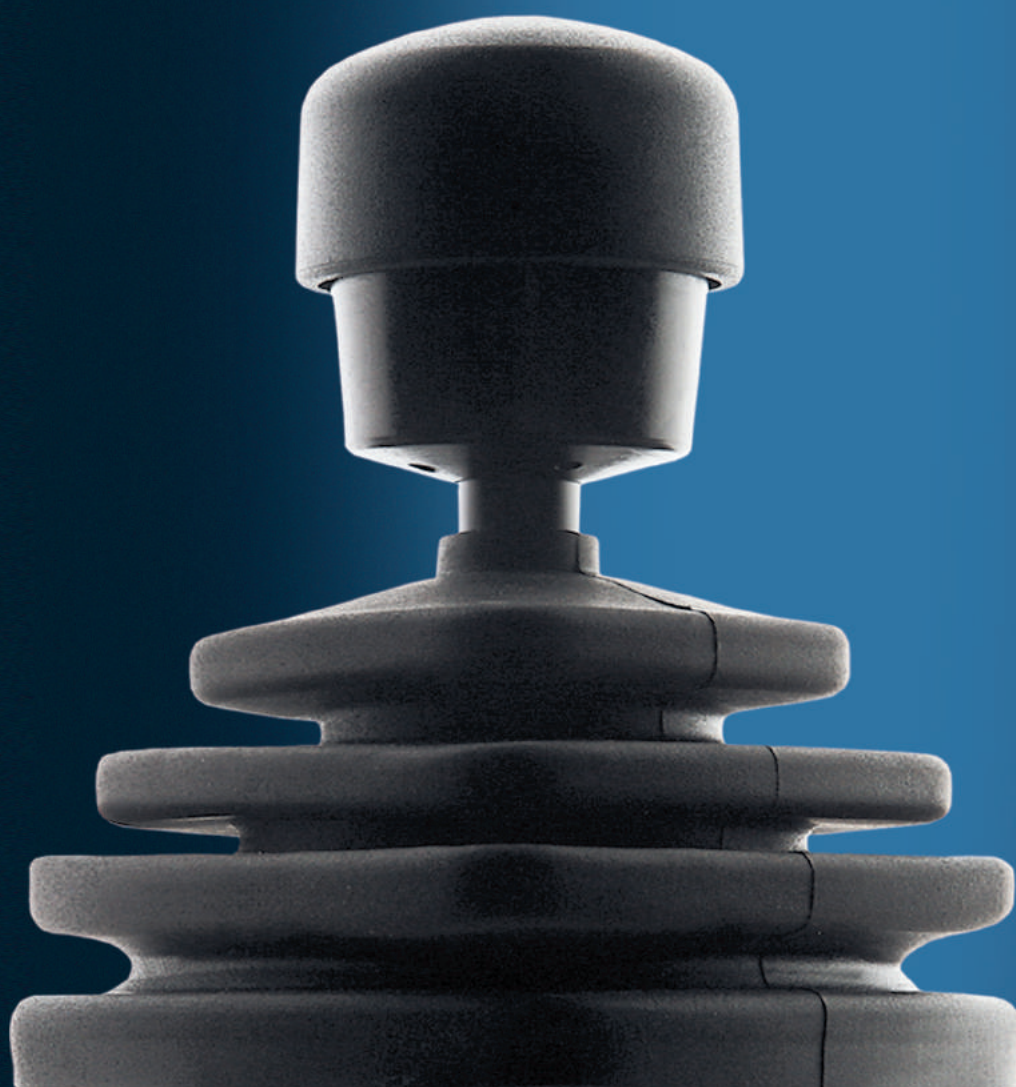


**Setting big things
into motion.**

**Industrial Controllers
Catalog 2018**



GESSMANN®

Industrial Controllers





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.

Product range

Multi-axis controller
Double-handle controller
Single-axis controller
Control switch
Standard contact-arrangement
Technical data

Potentiometer
HG 2
OEC 2
OEC 4
Electronic control unit
MATRIX grip
Hall-push button
Palm grip
Housing

Crane control unit
Driver seat
Ordering information
Portable control unit
Control pedestal for offshore

Naval cruise controller
Pedal-controller
Gear limit switch
DC-contact
Signal-cam controller

As of
2018

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:

- Multi-axis controller, double-handle controller, control switch (master-switch), gear limit switch for hoisting, electro-hydraulic application, material-handling technology and remote control
- Geared 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:

Contents

Multi-axis controller	V27	p. 1-9
	V85 / VV85	p. 10-20
	V8 / VV8	p. 21-24
	V25	p. 25-32
	V24	p. 33-36
	V26	p. 37-41
	V21	p. 42-43
	V22	p. 44-45
	V23	p. 46-47
	V20	p. 48-49
	V14	p. 50-53
	V6 / VV6	p. 54-58
	VA6	p. 59-62
	V11	p. 63-66
Double-handle controller	D85	p. 67-75
	D8	p. 76-79
	D64 / DD64	p. 80-84
	D3	p. 85-89
Single-axis controller	S11	p. 90-93
	S1	p. 94-69
	S12	p. 97-98
	S9	p. 99-100
	S26	p. 101-104
	S27	p. 105-108
	S2 / SS2 / S21	p. 109-113
	S22 / SS22	p. 114-117
	S23	p. 118-120
	S14	p. 121-123
	S3	p. 124-127
Control switch	N6	p. 128-130
	N9	p. 131-132
Standard plug connector		p. 133-134
Standard contact-arrangement		p. 135
Technical data		p. 136-137
Potentiometer		p. 138
HG 2		p. 139-140
OEC 2		p. 141-143
OEC 4		p. 144
Electronic control unit	ES/43	p. 145-146
MATRIX grip		p. 147
Hall-push button		p. 148-150
Palm grip	B25	p. 151-152
	B30	p. 153-154
	B3	p. 155-157
	B31	p. 158-159
	B32	p. 160-161
	B33	p. 162-163
	B34	p. 164-165
	B23	p. 166-167
	B20	p. 168-169
	B22	p. 170-171
	B24	p. 172-173
	B9	p. 174-175

	B7 / B8	p. 176-178
	B1	p. 179-180
	B2	p. 181-182
	B5	p. 183-184
	B6	p. 185-186
	B28	p. 187-188
	B29	p. 189-190
	B10	p. 191-192
	B14 / B15	p. 193-194
Housing		p. 195-196
Crane control unit	KST 30	p. 197-199
	KST 19	p. 200-202
	KST 10	p. 203-205
	KST 4	p. 206-208
	KST 5	p. 209-211
	KST 6	p. 212-214
	KST 8	p. 215-217
	KST 85	p. 218-219
	KST 7 / KST 75	p. 220-222
Driver seat	KFS 12	p. 223-224
	KFS 11	p. 225-226
	KFS 10	p. 227-228
	KFS 9	p. 229-230
	KFS 82	p. 231-232
	KFS 4	p. 233-234
	KFS 2	p. 235-236
Ordering information		p. 237-243
Portable control unit	TS 1	p. 244-246
	TS 2	p. 247-249
Control pedestal for offshore	U 22/32	p. 250-252
	U 23/23	p. 253-255
Naval cruise controller	AZ 1	p. 256-257
Pedal-controller	P20	p. 258-261
	P10 / P11 / P12	p. 262-263
	P8 / PP8	p. 264-265
	P7 / PP7	p. 266-267
Gear limit switch	GE 1/2	p. 268-270
DC-contact	SO / SS	p. 271-272
Signal-cam controller	NU 1	p. 273-275



General Terms and Conditions



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

Please also note:

Our catalog prices do not include value added tax, which is added separately.

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.

W. Gessmann GmbH

**P/O Box 11 51
74207 Leingarten
GERMANY**

**Eppinger Straße 221
74211 Leingarten
GERMANY**

Phone +49 (0) 7131 40 67-722

Fax +49 (0) 7131 40 67-10

sales@gessmann.com

www.gessmann.com

Bank details

Deutsche Bank Heilbronn

SWIFT-Code: DEUT DE 33 05 30 · IBAN-Code: DE 14 620 700 81 0019460500

Kreissparkasse Heilbronn

SWIFT-Code: HEIS DE 33 05 30 · IBAN-Code: DE 22 620 500 000 00004776

Landesbank Baden-Württemberg

SWIFT-Code: SOLA DE 33 05 30 · IBAN-Code: DE 09 600 501 01 74 06 50 56 07

Tax No.: 65205/74401 Finanzamt Heilbronn

Sale tax ID No.: DE 145786508

Commercial Register

Stuttgart HRB 100312

Managing Director:

Alwin Ehrensperger

Multi-axis controller V27



The multi-axis controller V27 is available in either single-axis or multi-axis options and is a robust controller used commonly in electro-hydraulic applications. The compact design allows for use in the smallest installation spaces. It can be integrated with detents and a very robust friction brake. With many output options including voltage, amperage and switching contacts and many handle options the V27 series is flexible and customisable. The multi-axis controller is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

NEW
available from June 2018



1

Technical data

Mechanical life V27	10 million operating cycles
Supply voltage	See interface
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP56 (electronic grouted IP67)
Functional safety	PLd (EN ISO 13849) possible

		Example									
		V27	S8	P	T	-R11	+Z	-B	-E...	-S...	-X
Basic unit											
V27.1	1-axis										
V27	2-axis										
Control-handle extended											
	Standard 160 mm										
S5	-20 mm										
S8	+20 mm										
<i>*Only available in combination with grip!</i>											
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 151)										

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

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
55	5-0-5
08	end-position latching SR2
19	1-0-1 + end-position latching SR2
80	end-position latching SR1
91	1-0-1 + end-position latching SR1
88	end-position latching SR1 + SR2
99	1-0-1 + end-position latching SR1 + SR2

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

Plug connectors

S..	Standard plug connectors (see page 133)
-----	---

Special model

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

Multi-axis controller

V27

Combination possibilities with our handles

B1  p. 179	B2  p. 181	B3  p. 155	B5  p. 183	B6  p. 185	B7 B8  p. 176	B9  p. 174	B10  p. 191	B14 B15  p. 193
B20  p. 168	B22  p. 170	B23  p. 166	B24  p. 172	B25  p. 151	B28  p. 187	B29  p. 189	B30  p. 153	B31  p. 158
B32  p. 160	B33  p. 162	B34  p. 164						

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 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (for axis 3-4 or grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 133</i>)	S
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 (for axis 3-4 or grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 133</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°		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 (for axis 3-4 or grip function) 500 mm long without plug connector Optional with plug connector (standard plug connectors see page 133)	S

0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated) per axis

1 axis
2 axis
3 axis*
4 axis*

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
2 axis
3 axis*
4 axis*

2
3
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
2 axis
3 axis*
4 axis*

2
3
4

Output options

Characteristic:

Inverse dual *1	1
Dual *1	2
Inverse dual with dead zone +/- 3° *1	3
Dual with dead zone +/- 3° *1	4

*1 not combinable with output E136X

Single *2	5
Single with dead zone *2	6

*2 not combinable with output E112X and E132X

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

Voltage output with other value on request!

Current output

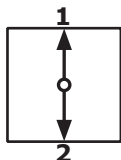
Supply voltage	9-32 V DC		
Current carrying capacity	Direction signal 150 mA		
	Zero position signal 500 mA		
Mounting depth A	45 mm (60 mm from 3 axis)		
Wiring	1. cable 14 x 0,25 mm² 500 mm long without plug connector		
	2. cable 14 x 0,25 mm² (for axis 3-4 or grip function) 500 mm long without plug connector		
	Optional with plug connector (standard plug connectors see page 133)		
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°		6

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

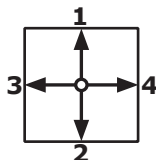
Current output with other value on request!

Identification of the installation variants with switching directions:

V27.1



V27



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
Baud rate	20 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 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 133</i>)	

S

CAN V27 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 V27 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 in the grip for LEDs

CAN V27 expansion stage 3

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

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

E306 1

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

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

With additional analog outputs on request!

3

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)
Output value	255...0...255
Mounting depth	45 mm (Expansion stage 1) 60 mm (Expansion stage 2) 80 mm (Expansion stage 3)
Protocol	CANopen Safety CIA 304
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 133</i>)

S

CANopen Safety expansion stage 1

- 4 analog joystick axis
- 15 digital joystick functions
- Input for capacitive sensor

E404 1

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

- 2 direction signals per main axis

1

CANopen safety expansion stage 2

- 7 analog joystick axis
- 15 digital joystick functions
- 2 inputs for capacitive sensors

E405 1

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

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

2

3

CANopen safety expansion stage 3

E406 1

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

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 in the grip for LEDs

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

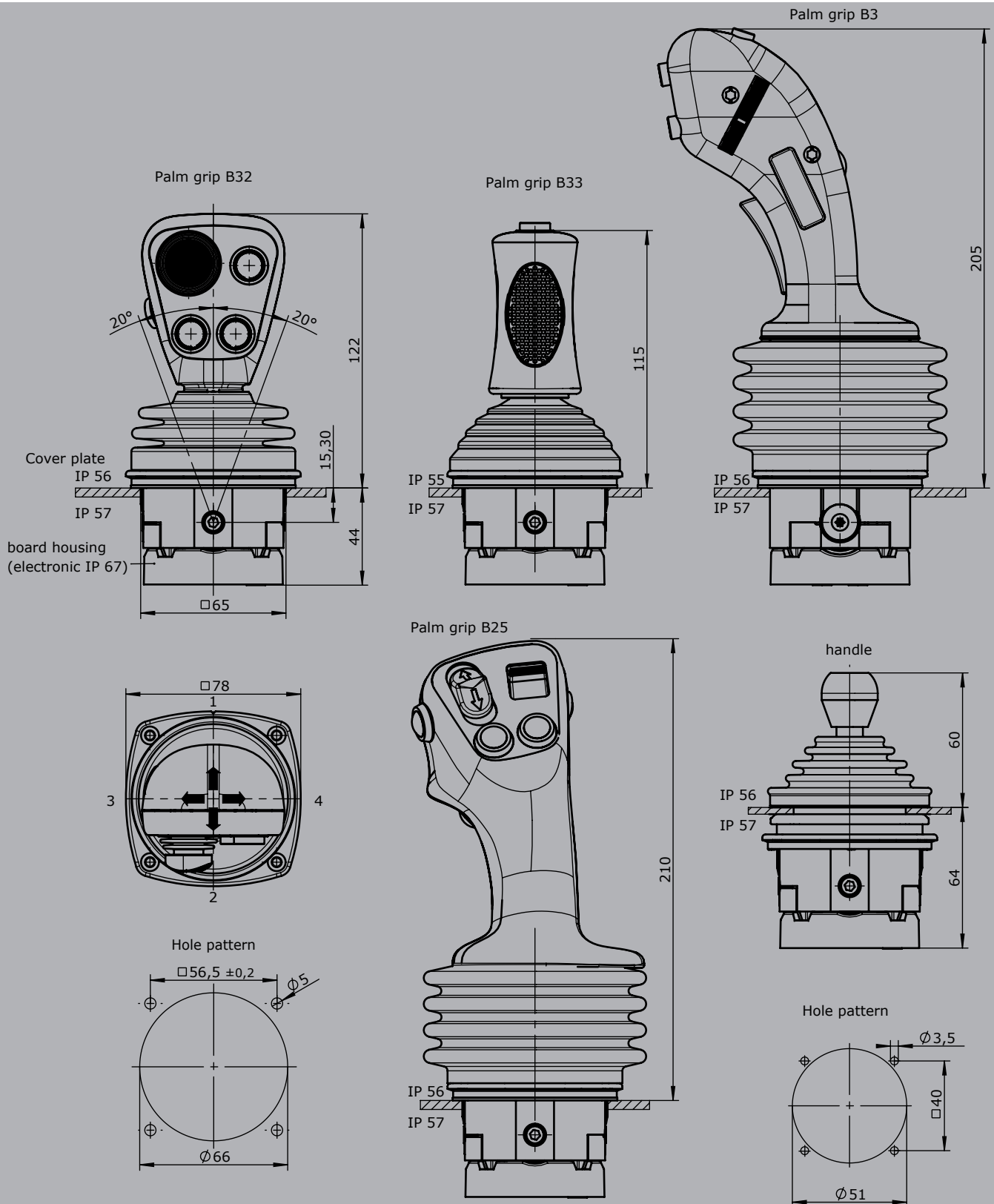
- 2 direction signals + 1 zero position signal (potential-free) per axis

3

With additional analog outputs on request!

Attachments

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



Multi-axis controller V85 / VV85



The multi-axis controller V85/VV85 is available in either single-axis or multi-axis options and is a robust controller used commonly in electro-hydraulic applications. With many output options including voltage, amperage and switching contacts and many handle options the V85/VV85 series is flexible and customisable. The V85/VV85 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.



1

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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54 (optional IP67)
Functional safety	PLd (EN ISO 13849) possible

		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										
<i>*Only available in combination with grip!</i>											
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 151)										

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 <i>(not applied for V/VV85.1)</i>											
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										
19	1-0-1 + end-position latching SR2										
80	end-position latching SR1										
91	1-0-1 + end-position latching SR1										
88	end-position latching SR1+SR2										
99	1-0-1 + end-position latching SR1+SR2										
*Maximum deflection angle +/- 25 degree!											
Cover housing											
B	Cover housing <i>(included in basic unit!)</i>										
Interface <i>(description see on the following pages)</i>											
E0xx	Switching output										
E1xx	Voltage output										
E2xx	Current output										
E3xx	CAN-interface										
E4xx	CANOpen safety interface										
E5xx	Profibus DP-interface										
E6xx	Profinet										
E7xx	Profinet safe										
Plug connectors											
S..	Standard plug connectors <i>(see page 133)</i>										
Special model											
X	Special / customer specified										

Multi-axis controller

V85 / VV85

Combination possibilities with our handles

 B1 p. 179	 B2 p. 181	 B3 p. 155	 B5 p. 183	 B6 p. 185	 B7 B8 p. 176	 B9 p. 174	 B10 p. 191	 B14 B15 p. 193
 B20 p. 168	 B22 p. 170	 B23 p. 166	 B24 p. 172	 B25 p. 151	 B28 p. 187	 B29 p. 189	 B30 p. 153	 B31 p. 158
 B32 p. 160	 B33 p. 162	 B34 p. 164						

Digital output

Supply voltage	9-32 V DC	
Current carrying capacity	Direction signal 150 mA Zero position signal 500 mA	
Mounting depth A	65 mm	
Wiring	1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (for axis 3-4 or grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 133</i>)	S
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	65 mm	
Wiring	1. cable 14 x 0,25 mm ² 500 mm long without plug connector 2. cable 14 x 0,25 mm ² (for axis 3-4 or grip function) 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 133</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°		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		
Wiring	1. cable 14 x 0,25 mm ² 500 mm long without plug connector		
	2. cable 14 x 0,25 mm ² (for axis 3-4 or grip function) 500 mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</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	3	
	Dual with dead zone +/- 3° * ¹	4	
* ¹ not combinable with output E136X			
	Single * ²	5	
	Single with dead zone * ²	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	
+10...0...-10 V + 2 direction contacts (galvanically isolated) per axis, supply voltage 18 - 30 V DC, redundant sensor with error monitoring			
	1 axis	E139 1	
	2 axis	2	
	3 axis*	3	
	4 axis*	4	

*Axis for handle 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		
Wiring	1. cable 14 x 0,25 mm² 500 mm long without plug connector		
	2. cable 14 x 0,25 mm² (for axis 3-4 or grip function) 500 mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		
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°		6
Digital output signals:			
Output signals standard:			
	Direction signals and zero position signals 1,5A 24 V DC		

*Axis for handle 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: 65 mm E3091X: 85 mm E3101X - E3103X: 85 mm E3104X - E3105X: 105 mm
Protocol	CANopen CiA DS 301 or SAE J1939
Baud rate	20 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 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 133</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 (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

2

3

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

**With the use of capacitive sensor, the external digital inputs reduce 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 (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

2

3

4

5

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

**With the use of two capacitive sensors, the external digital inputs reduce 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: 65 mm E4091X: 85 mm E4101X - E4103X: 85 mm E4104X - E4105X: 105 mm
Protocol	CANopen Safety CIA 304
Baud rate	20 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 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 133</i>)

S

CANopen safety expansion stage 1

- 7 analog joystick axis
- 16 digital joystick functions
- Input for capacitive sensor

E409 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 in the grip for LEDs*

**With the use of capacitive sensor, the external digital inputs reduce 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
- 16 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs
- 24 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 24 external digital inputs
- 32 external LED-outputs (dimnable optional), 1 switching output (potential-free, 100 mA), 32* external digital inputs

2

3

4

5

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

**With the use of two capacitive sensors, the external digital inputs reduce 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!

Profibus DP

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 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 18 x 0,25 mm ² 300 mm long without plug connector
	External in-/outputs (additional at 16E/16A) cable 18 x 0,25 mm ² 300 mm long without plug connector
	Optional with plug connector (<i>standard plug connectors see page 133</i>)

S

Profibus DP

- 4 analog joystick axis
- 16 digital joystick functions
- Input for capacitive sensor

E501 1

With additional external in-/outputs

- 8 external LED-outputs, 8 external digital inputs
- 16 external LED-outputs, 16 external digital inputs

2

3

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

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 zero position contact (potential-free) per main-axis

1

2

Profinet

Supply voltage	18-30 V DC
Baud rate	to 100 MBit/s
Output value	0...512...1023
Mounting depth A	85 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 18 x 0,25 mm ² 300 mm long without plug connector
	External in-/outputs (additional at 16E/16A) cable 18 x 0,25 mm ² 300 mm long without plug connector
	Optional with plug connector (<i>standard plug connectors see page 133</i>)

S

Profinet

- 4 analog joystick axis
- 16 digital joystick functions
- Input for capacitive sensor

E601 1

With with additional external in-/outputs

- 8 external LED-outputs, 8 external digital inputs
- 16 external LED-outputs, 16 external digital inputs

2

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

1

Profinet safe

Supply voltage	18-30 V DC		
Baud rate	to 100 MBit/s		
Output value	0...512...1023		
Mounting depth A	85 mm		
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 18 x 0,25 mm ² 300 mm long without plug connector		
	External in-/outputs (additional at 16E/16A) cable 18 x 0,25 mm ² 300 mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</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	
<i>*External LED-outputs can be used in the grip for LEDs</i>			
Main-axis with additional signals separately wired (not via profinet safe)			
- 2 direction signals + zero position signal (potential-free) per main-axis			3

Other outputs

Voltage output for PVG32	0,25...0,5...0,75Us, power supply 9-32 V DC		
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 (for axis 3+4 or grip function)		
	Optional with plug connector (<i>standard plug connectors see page 133</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 contacts per main-axis			4
8 Bit Gray-Code with direction signals per main-axis, supply voltage 9-36 V DC			
Wiring:	1. cable 37 x 0,14 mm ² 300 mm long without plug connector (axis 1+2)		
	2. cable 37 x 0,14 mm ² 300 mm long without plug connector (axis 3+4)		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		S
	1 axis	E903 1	
	2 axis	2	
	3 axis	3	
	4 axis	4	

Multi-axis controller

V85 / VV85

8 Bit Binär-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 (axis 3+4)

Optional with plug connector (*standard plug connectors see page 133*)

S

1 axis	E904 1
2 axis	2
3 axis	3
4 axis	4

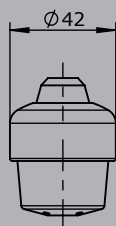
Attachments

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

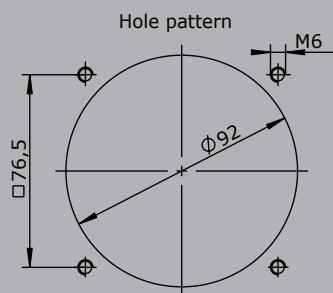
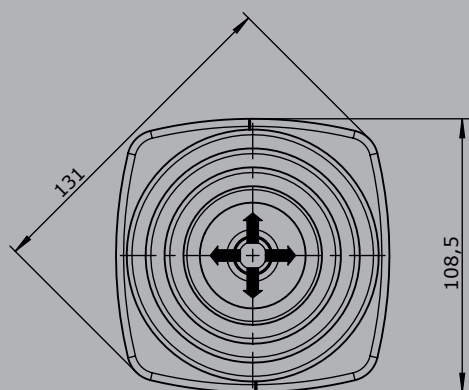
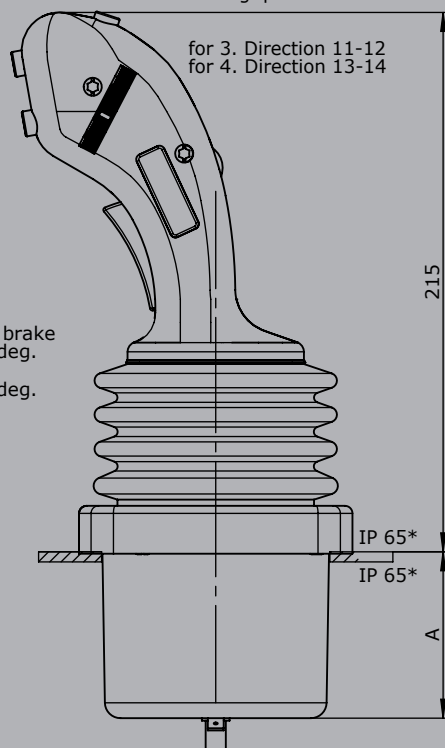
Knob solid
D= Push button

Palm grip B3

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

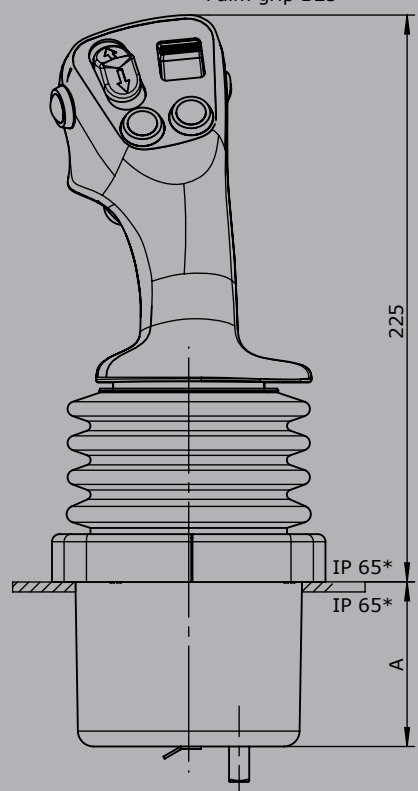


- * Type with friction brake deflection max. 25 deg.
- * Type with detent deflection max. 25 deg.



* Optional IP 67

Palm grip B25



Multi-axis controller

V8 / VV8



The multi-axis controller V8/VV8 is available in either single-axis or multi-axis options and is a robust controller used commonly in electro-hydraulic applications. With many output options including voltage, amperage and switch contacts and many handle options the V8 / VV8 series is hugely customisable. The V8 / VV8 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

Mechanical life V8	10 million operating cycles
Mechanical life VV8	20 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54



1

		Example										
		VV8	S5	P	T	-2RP	+3ZP	-B	-A05 P184	+A050 P184	E9012	-X
Basic unit												
VV8	2-axis, reinforced version											
Control-handle extended												
	Standard											
S5	-20 mm											
S8	+20 mm											
*Only available in combination with handle!												
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!

Multi-axis controller V8 / VV8

Combination possibilities with our handles

B1  p. 179	B2  p. 181	B3  p. 155	B5  p. 183	B6  p. 185	B7 B8  p. 193	B9  p. 174	B10  p. 191	B14 B15  p. 193
B20  p. 168	B22  p. 170	B23  p. 166	B24  p. 172	B25  p. 151	B28  p. 187	B29  p. 189	B30  p. 153	B31  p. 158
B32  p. 160	B33  p. 162	B34  p. 164						

		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 <i>(included in basic unit!)</i>																
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... <i>(see page palm grip 151)</i>																
Axis 1: direction 1-2																	
1	1 contact	Standard contact - arrangement see page 135															
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 possible with 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
		More potentiometers on request!		
H	Hall-Potentiometer	E14811	0,5...2,5...4,5 V / 4,5 V...2,5...0,5	

If both axis identical, it's enough to describe one axis!

Example: ...A05P43 + A05P43 => A05P43

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 135		
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 possible with 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
		More potentiometers on request!		
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

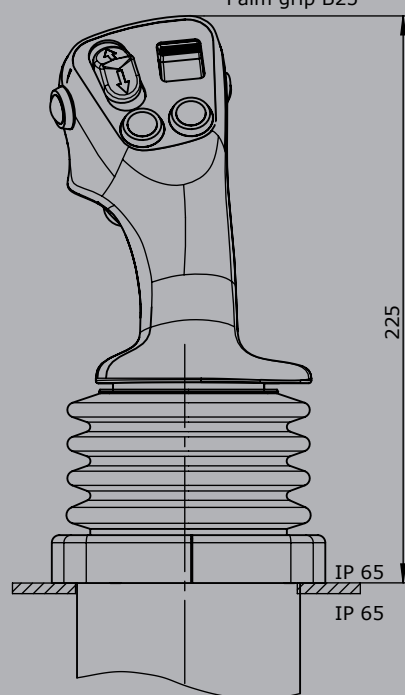
Interface

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



page 24

Multi-axis controller V25



The multi-axis controller V25 is available in either single-axis or multi-axis options and is a robust controller used commonly in electro-hydraulic applications. With many output options including voltage, amperage and switching contacts and many handle options the V25 series is hugely customisable. The V25 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data



Mechanical life V25	8 million operating cycles
Supply voltage	See interface
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54 (optional IP67)
Functional safety	PLd (EN ISO 13849) possible

	V25	S8	P	Example T	-Z	-B	-E...	-S...	-X
Basic unit									
V25.1 1-axis									
V25 2-axis									
Control-handle long									
Standard 100 mm									
S8 +20 mm									
<i>*Only available in combination with grip!</i>									
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 151)									
Spring return (included in basic unit!)									
Z Spring return									
Cover housing (description see page 195)									
B Cover housing									
Interface (description see on the following page)									
E0xx Switching output									
E1xx Voltage output									
E2xx Current output									
E3xx CAN-interface									
E4xx CANOpen Safety interface									
Plug connectors									
S.. Standard plug connectors (see page 133)									
Special model									
X Special / customer specified									

Multi-axis controller

V25

Combination possibilities with our handles

B1  p. 179	B2  p. 181	B3  p. 155	B5  p. 183	B6  p. 185	B7 B8  p. 176	B9  p. 174	B10  p. 191	B14 B15  p. 193
B20  p. 168	B22  p. 170	B23  p. 166	B24  p. 172	B25  p. 151	B28  p. 187	B29  p. 189	B30  p. 153	B31  p. 158
B32  p. 160	B33  p. 162	B34  p. 164						

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 mm² 500 mm long without plug connector	
	2. cable 14 x 0,25 mm² (for axis 3-4 or grip function) 500 mm long without plug connector	
	Optional with plug connector (<i>standard plug connectors see page 133</i>)	S
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 mm² 500 mm long without plug connector	
	2. cable 14 x 0,25 mm² (for axis 3-4 or grip function) 500 mm long without plug connector	
	Optional with plug connector (<i>standard plug connectors see page 133</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°		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	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 (for axis 3-4 or grip function) 500 mm long without plug connector	
	Optional with plug connector (<i>standard plug connectors see page 133</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		3
Dual with dead zone +/- 3° * ¹		4
* ¹ not combinable with output E136X		
Single * ²		5
Single with dead zone * ²		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 handle functions, interface can vary depending upon actuation element!

Voltage output with other value on request!

1

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 mm² 500 mm long without plug connector			
	2. cable 14 x 0,25 mm² (for axis 3-4 or grip function) 500 mm long without plug connector			
Optional with plug connector (<i>standard plug connectors see page 133</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°		6
Digital output signals:				
Output signals standard:				
		Direction signals and zero position signals 1,5A 24 V DC		1
*Axis for handle 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)	
	75 mm (Expansion stage 2)	
	95 mm (Expansion stage 3)	
Protocol	CANOpen CiA DS 301 or SAE J1939	
Baud rate	20 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 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 133</i>)	S
CAN V25 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 V25 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
<i>External LED-outputs can be used in the grip for LEDs</i>		

CAN V25 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
- 16 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 16 external digital inputs
- 24 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 24 external digital inputs
- 32 external LED-outputs (dimmable optional), 2 switching outputs (potential-free, 100 mA), 32 external digital inputs

2
3
4
5

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

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)
Output value	255...0...255
Mounting depth	60 mm (Expansion stage 1) 75 mm (Expansion stage 2) 95 mm (Expansion stage 3)
Protocol	CANopen Safety CIA 304
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 133</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
- 16 external LED-outputs (dimmable optional), 1 switching output (potential-free, 100 mA), 16 external digital inputs

2
3

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

CANopen safety expansion stage 3

E406 1

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

With additional external in-/outputs

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

2
3
4
5

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

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

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

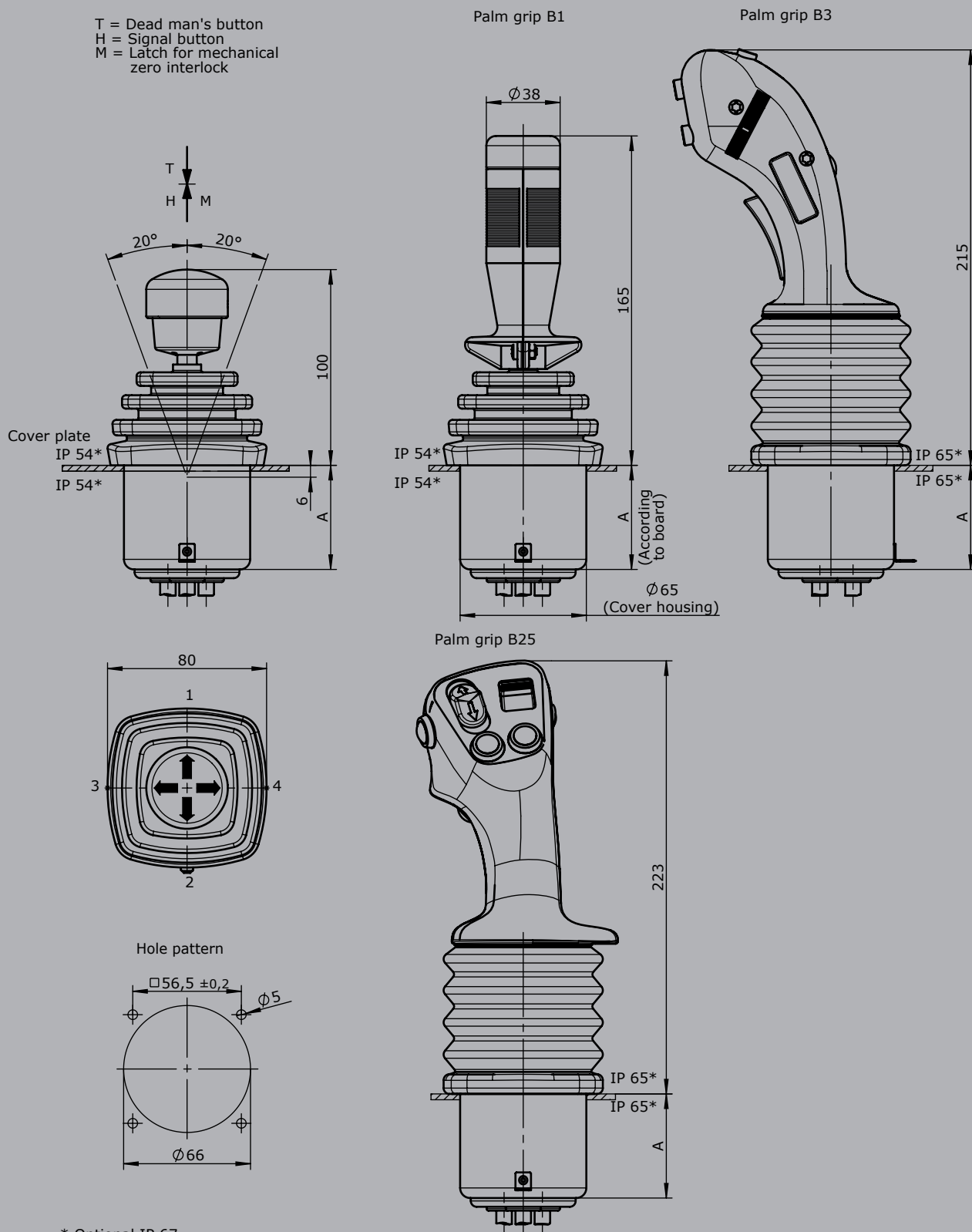
3

With additional analog outputs on request!

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



Multi-axis controller V24



The association drive 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. Through its various interfaces and the many possibilities of combination with our numerous ball handles the V24 is very flexible.



Technical data

Mechanical life V24	20 million operating cycles
Supply voltage	See interface
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54, electronic assembly IP67
Functional safety	PLd (EN ISO 13849) possible

		Example					
		V24	P1	T	-R	-E...	-S... -X
Basic unit							
V24.1	Multi-axis controller, 1-axis						
V24L	Multi-axis controller, 1-axis with parking position left						
V24R	Multi-axis controller, 1-axis parking position right						
Gate							
P1	T-gate main axis axial <i>(included in basic unit!)</i>						
P2	T-gate main axis right outside						
P3	T-gate main axis left outside						
PX	Special gate						
Grip / Palm grip							
	Knob <i>(included in basic unit!)</i>						
T	Dead man						
H	Signal button						
D	Push button						
B...	Palm grip B... <i>(see page palm grip 151)</i>						
Main axis							
R	Friction brake adjustable <i>(included in basic unit!)</i>						
Interface <i>(description see on the following pages)</i>							
E3xx	CAN-interface						
E4xx	CANOpen Safety interface						
Plug connectors							
S..	Standard plug connectors <i>(see page 133)</i>						
Special model							
X	Special / customer specified						

Multi-axis controller V24

Combination possibilities with our handles

 p. 179	 p. 181	 p. 155	 p. 183	 p. 185	 p. 176	 p. 174	 p. 191	 p. 193
 p. 168	 p. 170	 p. 166	 p. 172	 p. 151	 p. 187	 p. 189	 p. 153	 p. 158
 p. 160	 p. 162	 p. 164						

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		
Baud rate	125 kBit/s to 1 Mbit/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 long without plug connector		
Optional with plug connector (standard plug connectors see page 133)			S
CAN V24		E312 1	
- 7 analog joystick axis			
- 15 digital joystick functions			
*With the use of external inputs, the joystickfunctions reduce by 7 pieces!			
- 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
Additional analog outputs on request!			

CANOpen safety

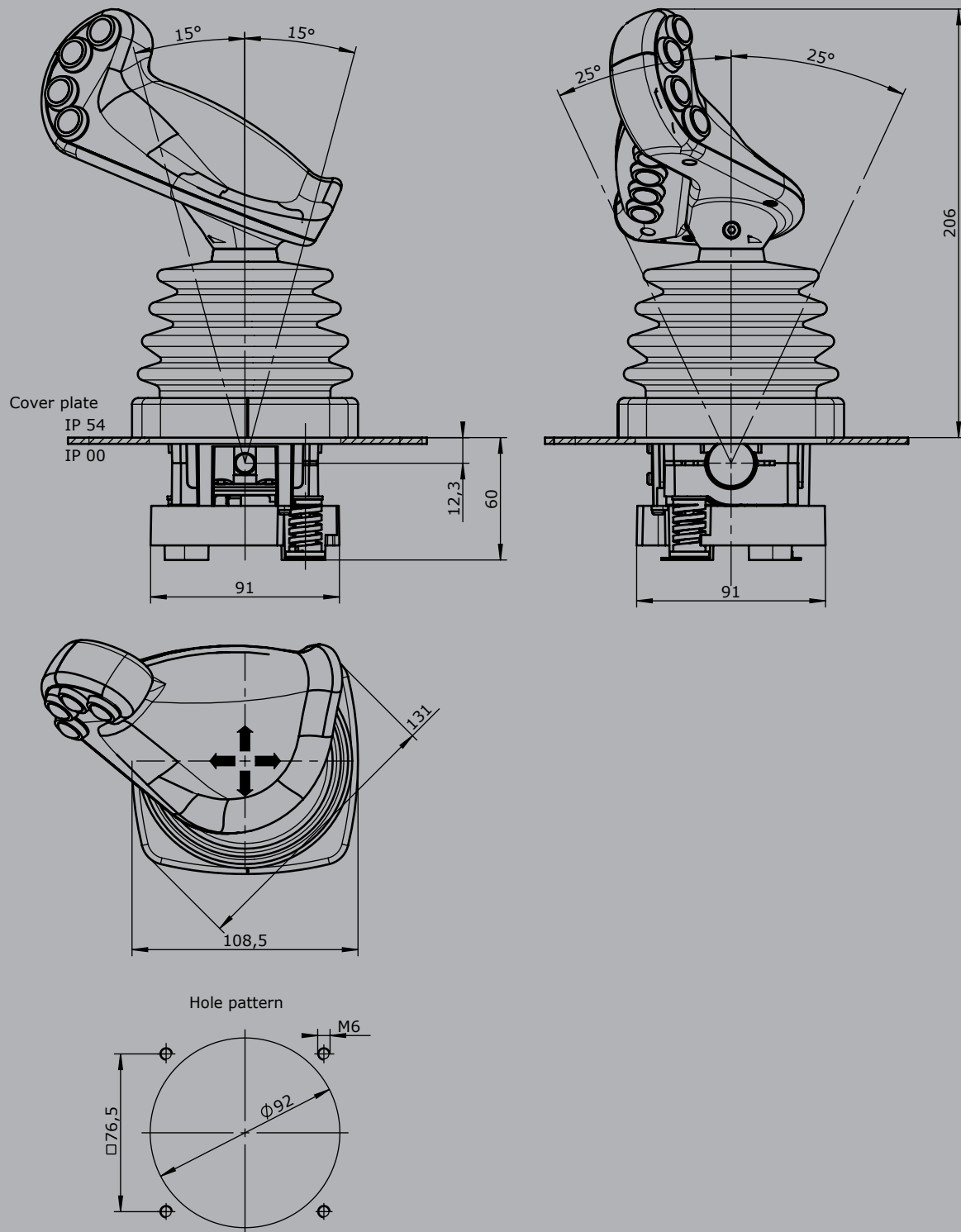
Supply voltage	9-36 V DC	
Idle current consumption	120 mA	
Mounting depth A	60 mm	
Protocol	CANOpen safety CIA 304	
Baud rate	125 kBit/s to 1 Mbit/s	
Output value	255...0...255	
Wiring	CAN (IN) cable 300 mm with plug connector M12 (male)	
	CAN (OUT) cable 300 mm with plug connector M12 (female)	
	External in-/outputs cable 300 mm long without plug connector	
	Optional with plug connector (<i>standard plug connectors see page 133</i>)	S

CANopen Safety V24

- 7 analog joystick axis		E411 1	
- 15 digital joystick functions			
<i>*With the use of external inputs, the joystickfunctions reduce 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>			

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 V26



The multi-axis controller V26 is a robust controller used commonly in electro-hydraulic applications. With many output options including voltage, amperage and switching contacts and many handle 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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP22



1

	V26	T	-R	+R	-B	-E...	-S...	-X
Basic unit								
V26	2-axis							
Grip / palm grip								
	Knob <i>(included in basic unit!)</i>							
T	Dead man							
H	Signal button							
D	Push button							
B...	Palm grip B... <i>(see page palm grip 151)</i>							
Axis 1								
R	Friction brake							
Axis 2								
R	Friction brake							
Cover housing <i>(description see on page 195)</i>								
B	Cover housing <i>(included in basic unit!)</i>							
Interface <i>(description see on the following pages)</i>								
E0xx	Switching output							
E1xx	Voltage output							
E2xx	Current output							
E3xx	CAN-interface							
E4xx	CANOpen safety interface							
Plug connectors								
S..	Standard plug connectors <i>(see page 133)</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		
Mounting depth A	105 mm		
Wiring	Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 133</i>)		S
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 133</i>)		S
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°			3
Dual with dead zone +/- 3°			4

Voltage output

Supply voltage	9-32 V DC (*11,5-32)		
Mounting depth A	105 mm		
Wiring	Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 133</i>)		S
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°			3
Dual with dead zone +/- 3°			4

Voltage output with other value on request!

Current output

Supply voltage	9-32 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 133</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°		6

Current output with other value on request!

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		
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)		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		

CAN expansion stage 1

- 7 analogue Joystickachsen	E309 1
- 16 digitale Joystickfunktionen	
- Input for capacitive sensor	
With additional external in-/outputs	
- 8 external LED-outputs (dimmbable optional), 1 switching output (potential-free, 100 mA), 8 external digital inputs	2
- 16 external LED-outputs (dimmbable optional), 1 switching output (potential-free, 100 mA), 16* external digital inputs	3

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

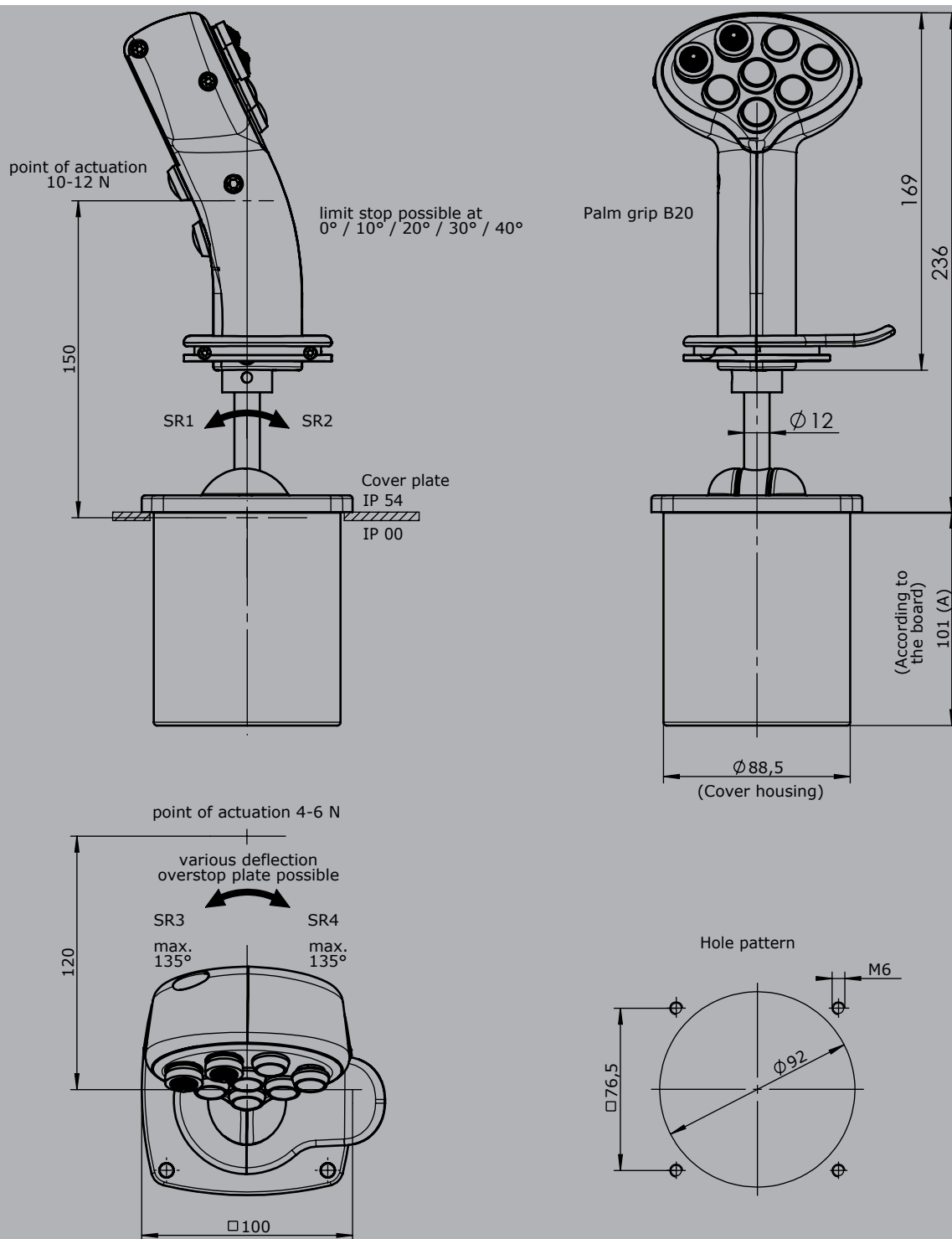
**With the use of capacitive sensor, the external digital inputs reduce by one input!*

1

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 LED`s)		
	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	CAN Safety CIA 304		
Baud rate	125 kBit/s to 1 MBit/s (Standard 250 kBits)		
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)		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		
CANOpen safety expansion stage 1			S
- 7 analog joystick axis		E409	1
- 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
<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!			

Other outputs			
Voltage output for PVG32 0,25...0,5...0,75Us, power supply 9-32V DC			
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 (for axis 3+4 or grip function)		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		
	2 axis	E907	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		



Multi-axis controller V21



The multi-axis controller V21 is a robust hallsensor switching device for electro-hydraulic applications. The V21 is especially suitable for installation in our ball handles. The multi-axis controller is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

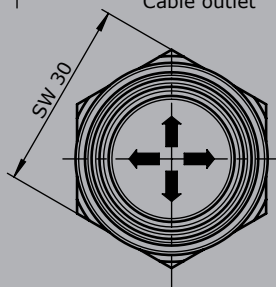
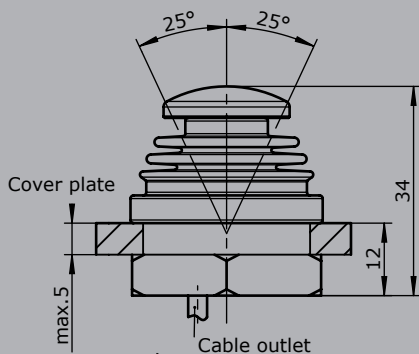
Mechanical life	5 million operating cycles
Operating force	1,6 to 3,5N
Supply voltage	5V DC stabilized
Operation temperature	-40°C to +80°C
Degree of protection	IP67



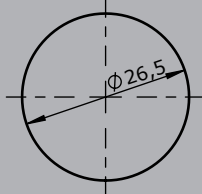
Example

	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				
V21.1H13	1-axis with additional rotating axis, installation from below				
V21H13	2-axis with additional rotating axis, installation from below				
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 at Ub= 5 V					
	1 axis	E103 1			
	2 axis	2			
	3 axis	3			
	Characteristic:				
	Inverse dual	1			
	Dual	2			
Special model					
X	Special / customer specified				

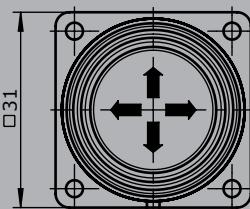
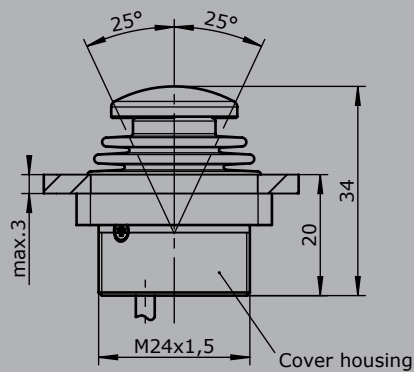
Standard
installed from the top



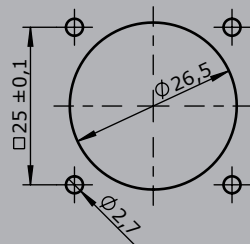
Hole pattern



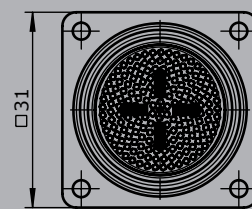
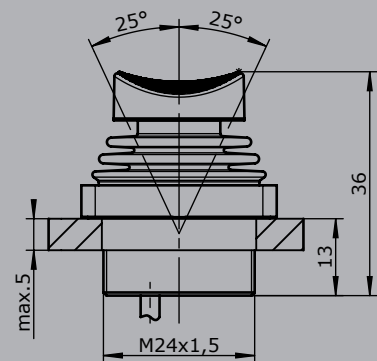
Version A with flange
installed from below



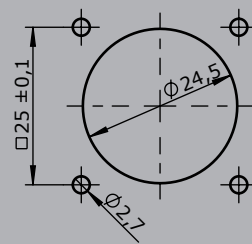
Hole pattern



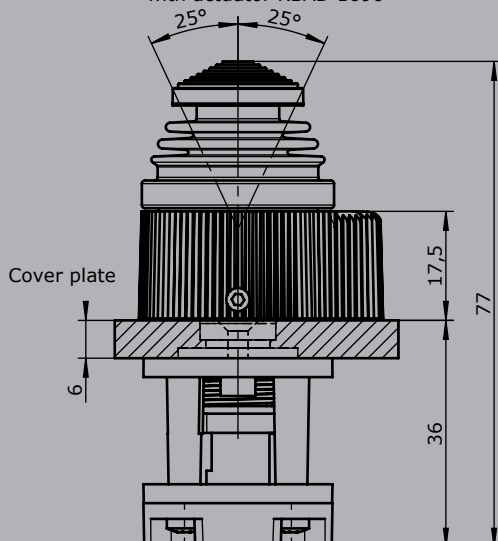
Version B with flange
installed from the top
with actuator KBAD 980



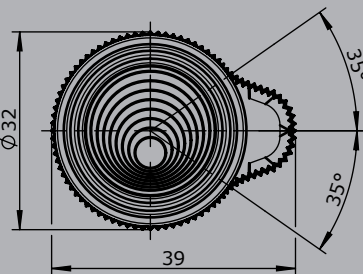
Hole pattern



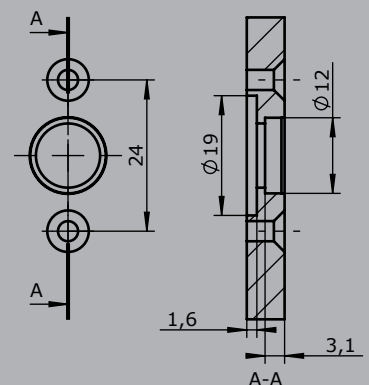
Version
with actuator KBAD 1690



View from the top



Hole pattern



Multi-axis controller V22



The multi-axis controller V22 is a robust switching device for remote control. The multi-axis controller is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

Mechanical life V22	3 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP67 front

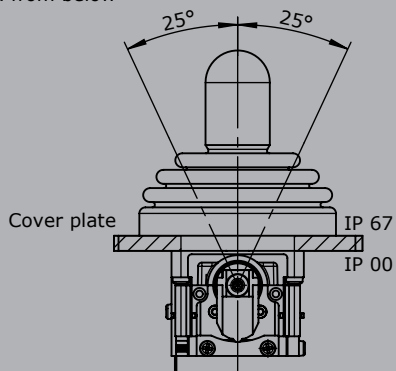


				Example				
				V22A	-P	D	-E10321	-X
Basic unit								
V22.1A	1-axis with spring return, installation from below							
V22A	2-axis with spring return, installation from below							
V22.1B	1-axis with spring return, installation from top							
V22B	2-axis with spring return, installation from top							
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								
E103	1	☐	0,5...2,5...4,5 V redundant at Ub=5 V	1 axis				
	2	☐		2 axis				
Characteristic: ☐ = Inverse dual, ☒ = Dual								
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			

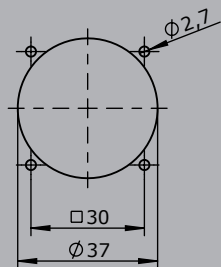
Technical details may vary based on configuration or application! Technical data subject to change without notice!

V22A

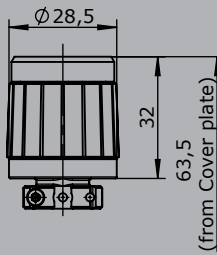
Installed from below



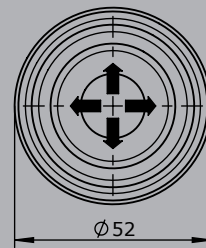
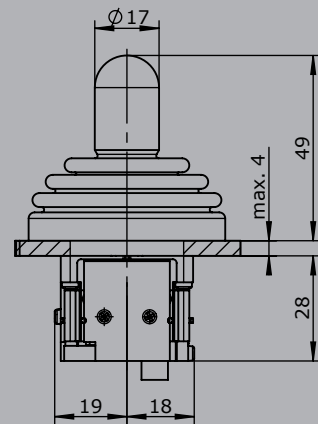
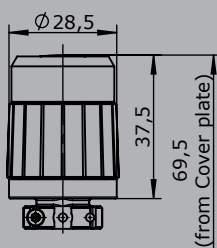
Hole pattern
(installed from below)



Twist grip

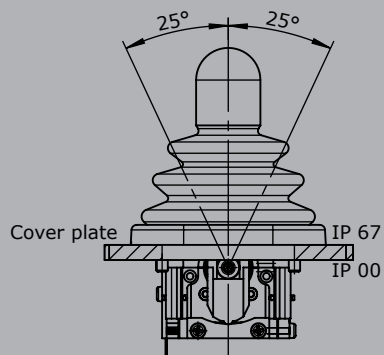


Twist grip
with Push button

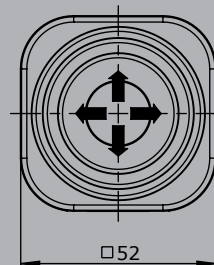
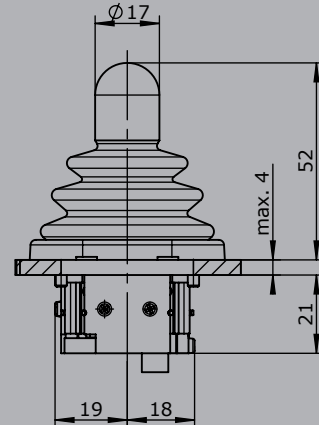
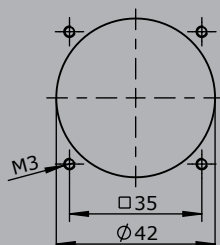


V22B

Installed from the top



Hole pattern
(installed from the top)



Multi-axis controller V23



The multi-axis controller V23 is a robust switching device for remote control applications. The multi-axis controller is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

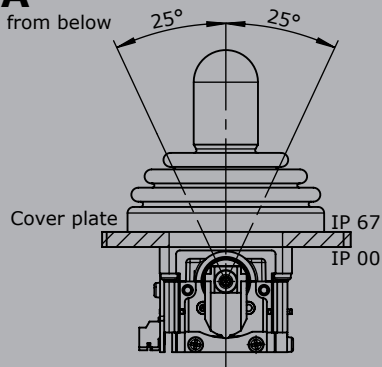
Mechanical life V23	3 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP67 front



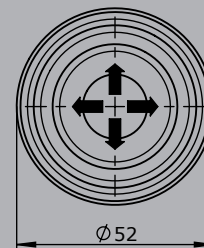
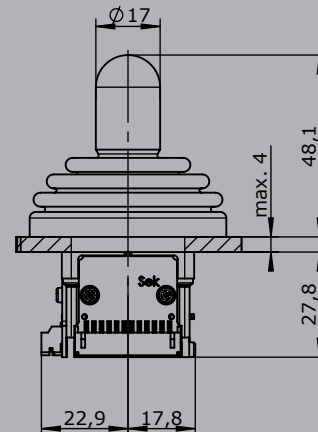
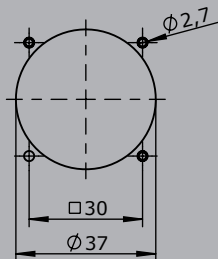
		V23A	-P	-C80	+C80	-X
Basic unit						
V23.1A	1-axis with spring return, installation from below					
V23A	2-axis with spring return, installation from below					
V23.1B	1-axis with spring return, installation from top					
V23B	2-axis with spring return, installation from top					
Gate						
P	Cross 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					
Axis 2: direction 3-4 (not applied for V23.1)						
See description axis 1!						
Special model						
X	Special / customer specified					
Attachments						
Mating connector JST 12-polig (included in delivery!)						
Mating connector JST 12-pole with single wire 500 mm long						

V23A

Installed from below

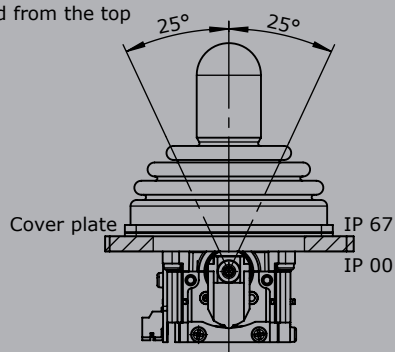


Hole pattern
(installed from below)

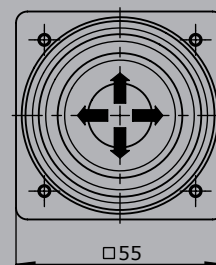
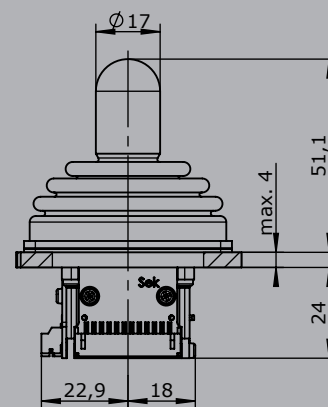
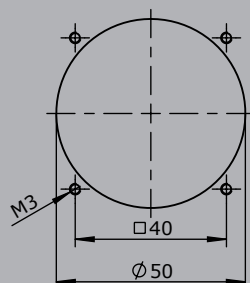


V23B

Installed from the top



Hole pattern
(installed from the top)



Multi-axis controller V20



The multi-axis controller V20 is a rugged switching device for remote control. The multi-axis controller is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

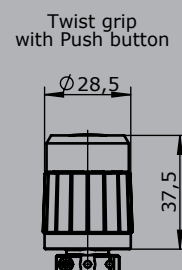
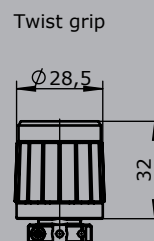
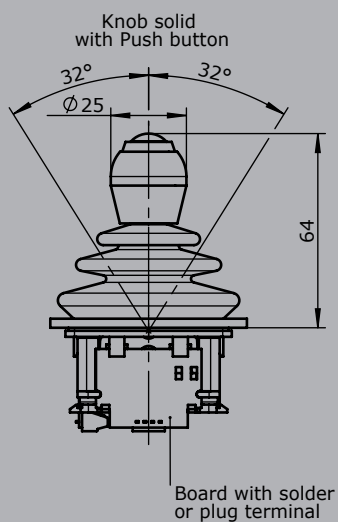
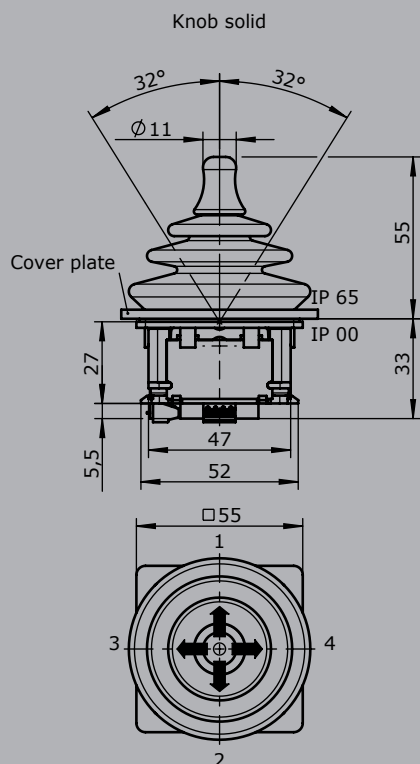
Mechanical life V20	3 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65 (optional IP67)



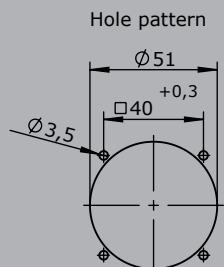
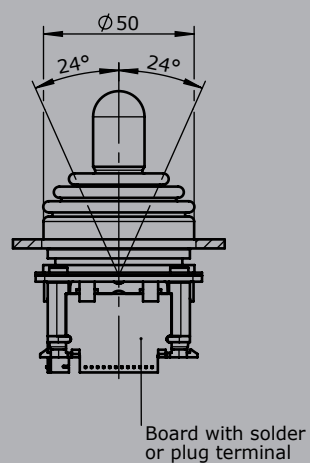
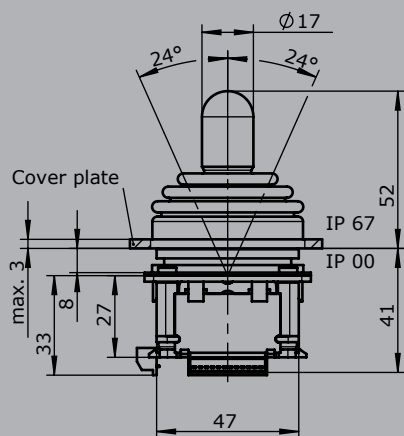
		Example						
		V20	-P	D	-C71	+C71	-B	-X
Basic unit								
V20.1	1-axis with spring return							
V20	2-axis with spring return							
V20.1A	1-axis with spring return, IP67 front							
V20A	2-axis with spring return, IP67 front							
Gate								
p	Cross gate							
P X	Special gate							
Grip								
	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							
	Potentiometer track							
	Direction track							
C71	Mechanical encoder							
	MEC 2-2							
	EA/11-10							
	Potentiometer track							
	Direction track							
C72	Mechanical encoder							
	MEC 2-5							
	EA/21-10							
	Potentiometer track							
	Direction track							
Axis 2: direction 3-4								
See description axis 1!								
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



V20 Degree of protection front IP 67



Multi-axis controller V14



The multi-axis controller V14 is a robust switching device for remote control and electro-hydraulic applications. The modular design enables the switching device to be used universally. The V14 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

Mechanical life V14	6 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65



	V14L	S8	P	T	Example -01 Z C	+03 R	-A05 C61	+A110	-X
Basic unit									
V14L 2-axis left									
Control-handle extended									
Standard									
S8 +20 mm									
<i>*Only available in combination with handle!</i>									
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									
C Mechanical encoder									
Axis 2 (direction 3-4)									
03 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!

Multi-axis controller

V14

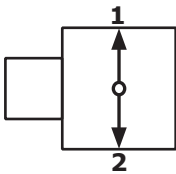
Combination possibilities with our handles



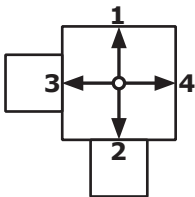
	V14L	S8	P	T	-	01 Z C	+	03 R	-	A05	C61	+	A110	-	X
Basic unit															
V14.1L	1-axis left														
V14.1R	1-axis right														
V14L	2-axis left														
V14R	2-axis right														
Control-handle extended															
	Standard														
S8	+20 mm														
Gate															
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 151)														

*Attention! The multi-axis controller V14 is not suitable for large palm grips (B3, B7/B8, B9...)

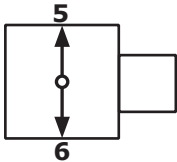
Identification of the installation variants with switching directions:



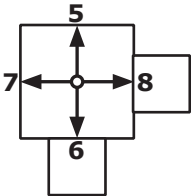
V14.1L



V14L



V14.1R



V14R

	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 135													
02	4 contacts	e.g.													
03	6 contacts	A05 MS21													
		A0500 MS21-00													
		A110 MS24-0													
		A99 contact - arrangement according customer request													

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

Multi-axis controller V14

V14L S8 P T - 01 Z 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
C66	MEC 1-10	
	EA/17-10	I max. 10 mA
	Potentiometer track	2 x 1,5 kOhm
	Direction track	Arrangement MS21-0+MS21
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

If both axis identical, it`s enough to describe one axis!

Example: ...A05C61 + A05C61 => A05C61

V14L S8 P T - 01 Z 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!

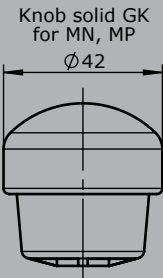
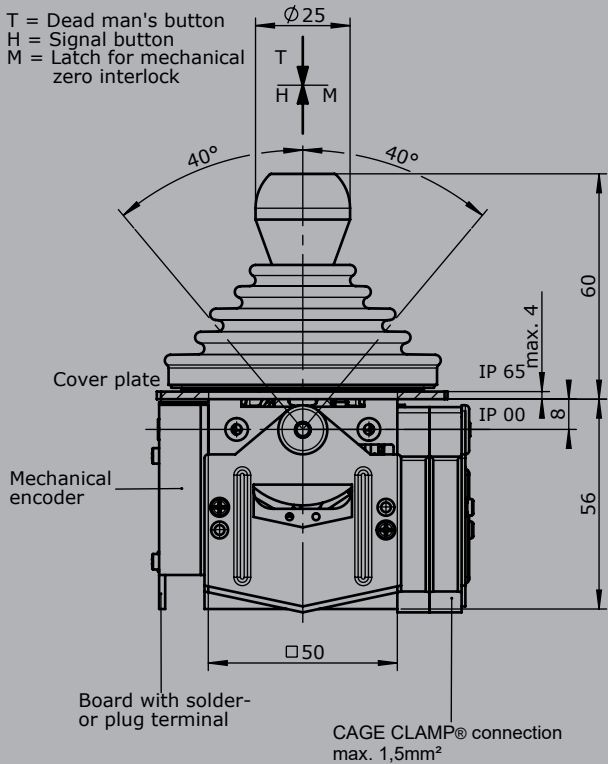
Special model

X Special / customer specified

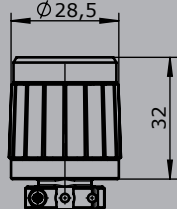
Multi-axis controller

V14

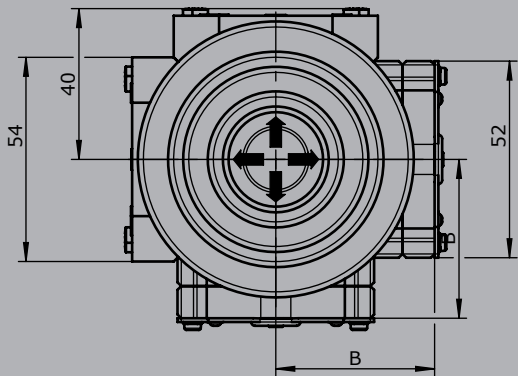
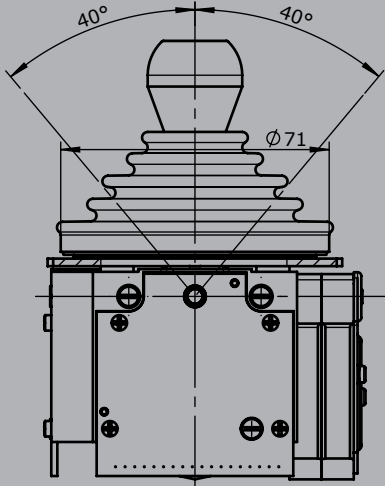
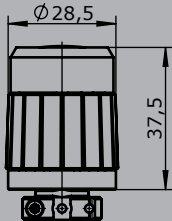
T = Dead man's button
H = Signal button
M = Latch for mechanical
zero interlock



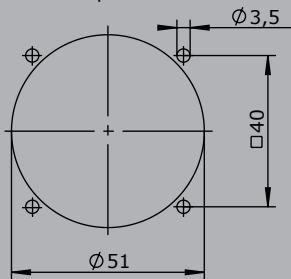
Knob solid GK
for MN, MP



Twist grip
with Push button



Hole pattern



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

Multi-axis controller V6 / VV6



The multi-axis controller V6 / VV6 is available in either single-axis or multi-axis options and is a robust controller used commonly in crane and hoisting applications. The modular design and many possibilities of combination with our handles enables the switching device to be used universally. The V6 / VV6 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.



1 Technical data

Mechanical life V6	10 million operating cycles
Mechanical life VV6	20 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54 front

Example

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

Multi-axis controller V6 / VV6

Combination possibilities with our handles



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

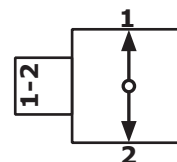
S3	-40 mm
S5	-20 mm
S8	+20 mm

**Only available in combination with handle!*

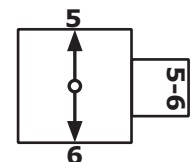
Gate

P	Cross gate
P X	Special gate

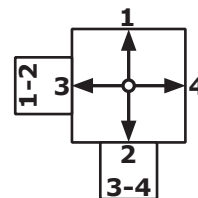
Identification of the installation variants with switching directions:



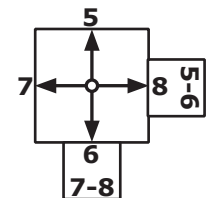
V61L/VV61L



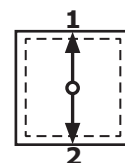
V61R/VV61R



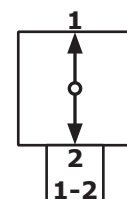
V62L/VV62L



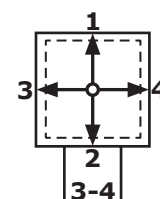
V62R/VV62R



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 151)

Attention! When usage some handles reduces the deflection angle to 28 degrees!

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	☐ 2 contacts	Standard contact - arrangement see page 135	
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
	☒ = 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 141

If both axis identical, it's enough to describe one axis!
Example A05P134 + A05P134 => A05P134

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	☐	2 contacts	Standard contact - arrangement see page 135	
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
		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 150

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

Special model

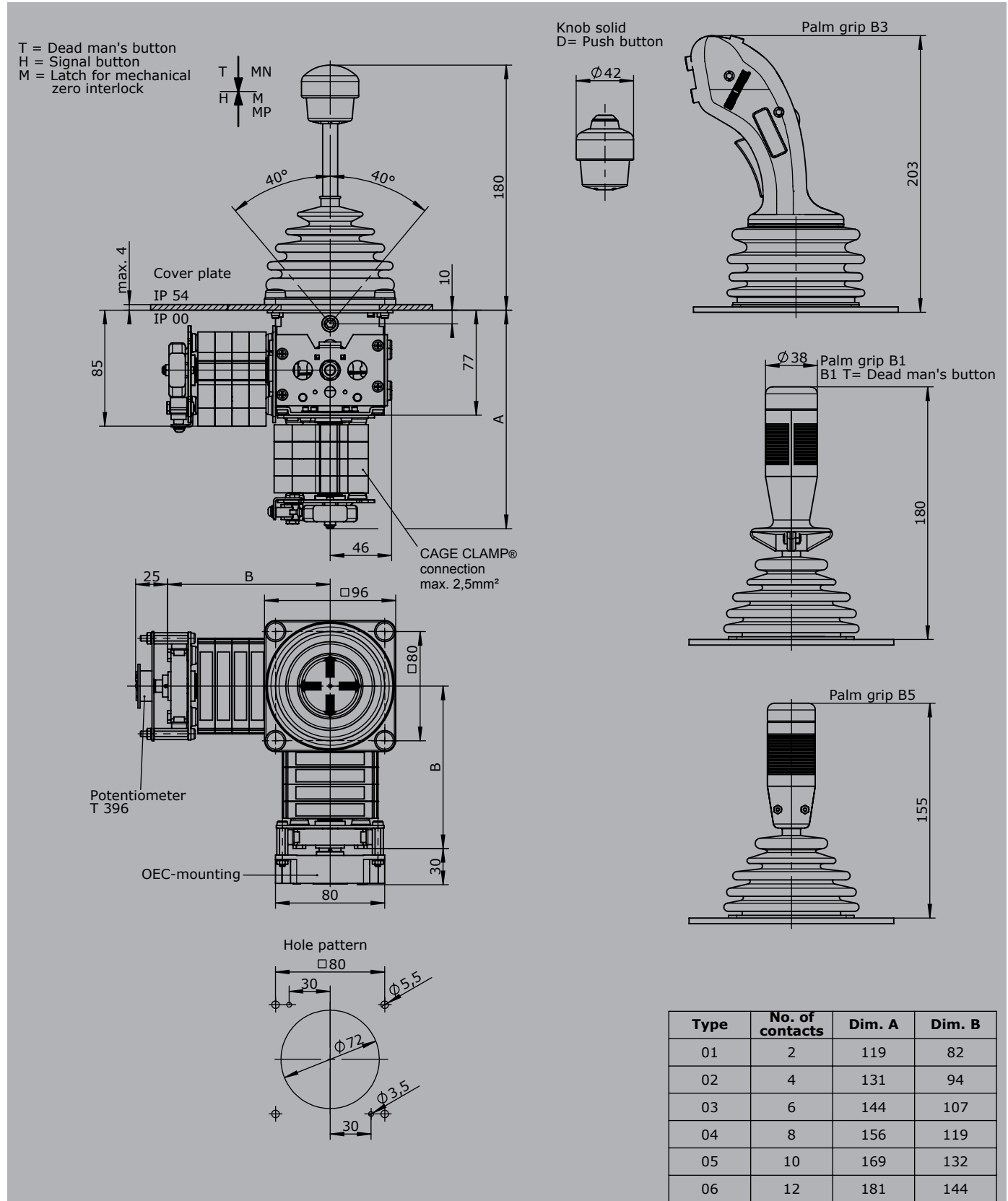
X Special /customer specified

Attachments

Indicating labels

Indicating labels with engraving

1



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 used commonly in crane and hoisting applications. The modular design enables the switching device to be used universally. The VA6 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

Mechanical life VA6	10 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°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



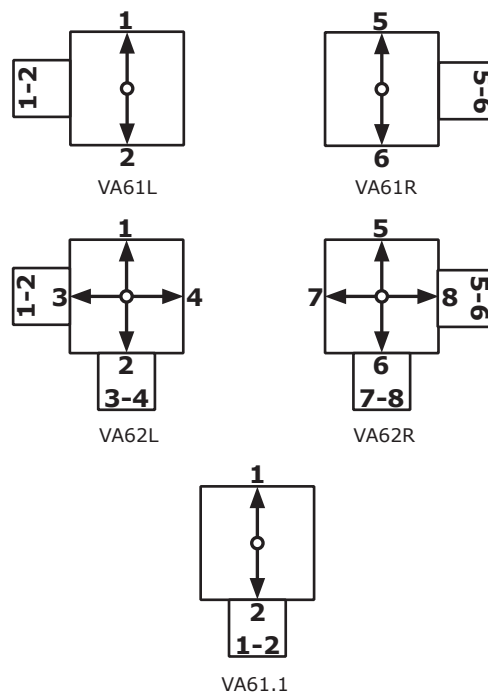
1

	VA62L	S5	P	T	-01 Z P	+03 R	-A05 P144	+A110
Basic unit								
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)								
01 2 contacts								
Z Spring return								
P Potentiometer								
Axis 2 (direction 3-4)								
03 6 contacts								
R Friction brake								
Description axis 1 (direction 1-2)								
A05 Arrangement MS21								

Multi-axis controller VA6

	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 135							
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							

If both axis identical, it's enough to describe one axis!

Example A05P134 + A05P134 => A05P134

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	2 contacts	Standard contact - arrangement see page 135	
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
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 141

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

Special model

X Special /customer specified

Attachments

Indicating labels

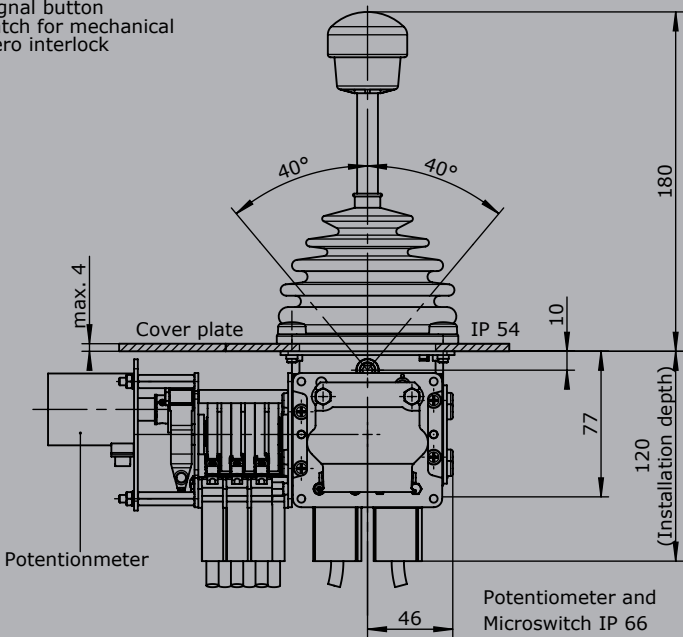
Indicating labels with engraving

Multi-axis controller

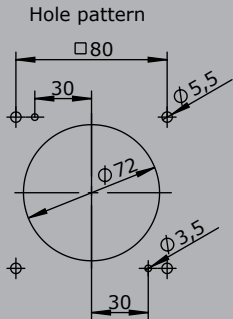
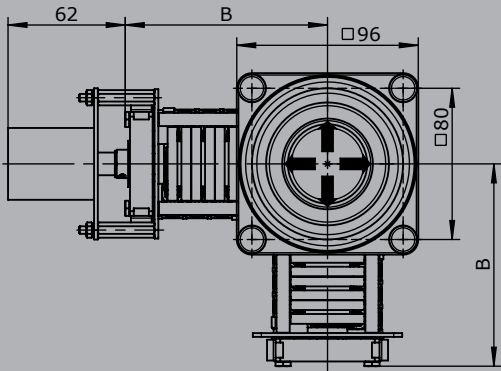
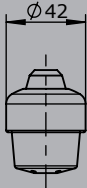
VA6

1

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

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. The V11 is resistant to oil, maritime conditions e.g. offshore / vessels, UV radiation typically from the sun.

Technical data

Mechanical life	10 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54 front



1

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

Multi-axis controller

V11

Combination possibilities with our handles

B1  p. 179	B5  p. 183	B6  p. 185	B10  p. 191	B14 B15  p. 193	B22  p. 170	B24  p. 172	B28  p. 187	B30  p. 153
B32  p. 160	B33  p. 162	B34  p. 164						

		V11L	S5	P	T	-	01 Z P	+	03A R P	-	A05 P324	+	A110 P325	-	X
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														
<i>*Only available in combination with handle!</i>															
Gate															
P	Cross gate														
P X	Special gate														
Grip / palm grip															
	Knob <i>(included in basic unit!)</i>														
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... <i>(see page palm grip 151)</i>														

Identification of the installation variants
with switching directions:

V11.1

V11

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	☐	2 contacts	Standard contact - arrangement see page 135	
02	☐	4 contacts	e.g.	
03	☐	6 contacts	A980	MS00
			A05	MS21
			A0500	MS21-00
			A110	MS24-0
		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	P324	T365 2 x 5 kOhm	I max. 1 mA
		P325	T365 2 x 10 kOhm	I max. 1 mA
More potentiometers on request!				

C Encoder C... Encoder see page 141

If both axis identical, it's enough to describe one axis!

example: ...A05P324 + A05P324 => A05P324

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	☐	2 contacts (2A 250V AC15)	Standard contact - arrangement see page 135	
02	☐	4 contacts (2A 250V AC15)	z.B.	
03	☐	6 contacts (2A 250V AC15)	A980	MS00
			A05	MS21
			A0500	MS21-00
			A110	MS24-0
		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	P324	T365 2 x 5 kOhm	I max. 1 mA
		P325	T365 2 x 10 kOhm	I max. 1 mA
More potentiometers on request!				

C Encoder C... Encoder see page 150

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

Special model

X Special / customer specified

Attachments

Indicating labels

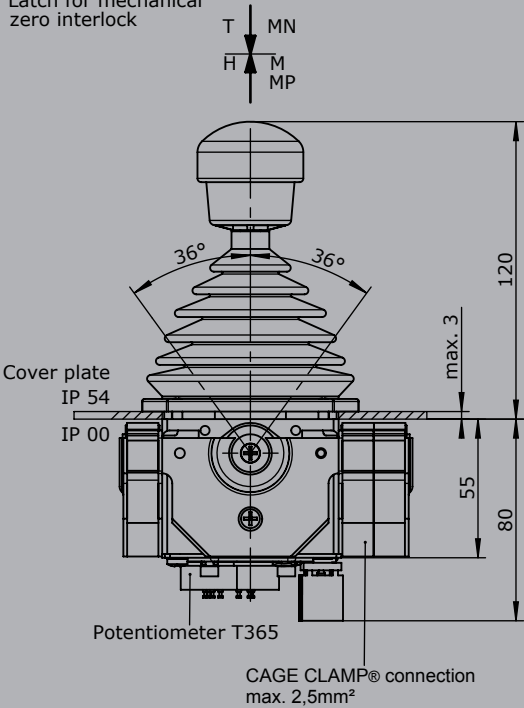
Indicating labels with engraving

Multi-axis controller

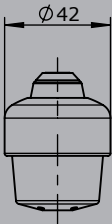
V11

1

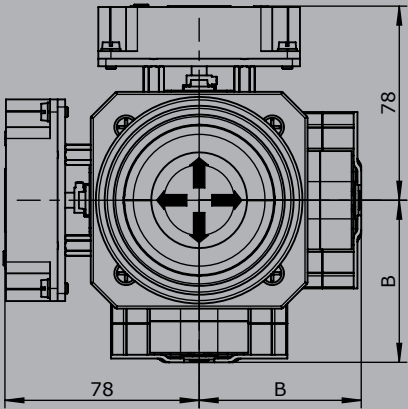
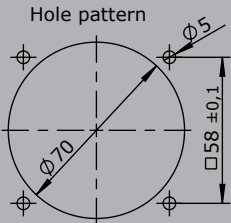
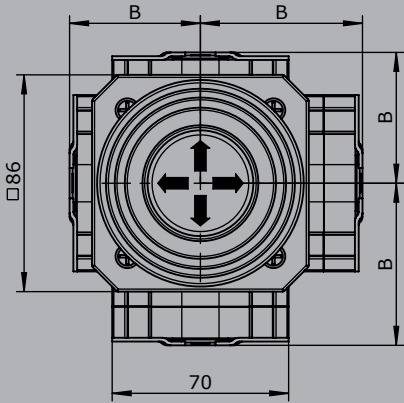
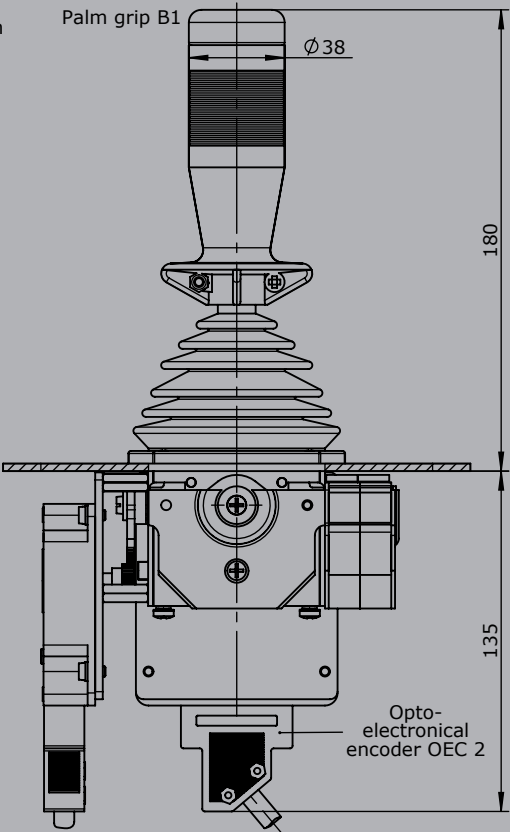
T = Dead man's button
 H = Signalbutton
 M = Latch for mechanical zero interlock



Knob solid
 D= Push button



Palm grip B1



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

Double-handle controller

D85



The double-handle controller D85 is a robust switching device for hoisting 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 D85	8 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54 front



1

	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 191)											
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!

Double-handle controller

D85



1

	D85	S5	Q	/	Q	-Z	+R	-B	-E...	-S...	-X
Cover housing											
B	Cover housing										
Interface <i>(description see following pages)</i>											
E1xx	Voltage output										
E2xx	Current output										
E3xx	CAN-interface										
E4xx	CANOpen Safety										
E5xx	Profibus DP interface										
E6xx	Profinet										
E7xx	Profinet safe										
Plug connectors											
S..	Standard plug connectors <i>(see page 133)</i>										
Special model											
X	Special/ customer specified										

Double-handle controller D85

1

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 (<i>standard plug connectors see page 133</i>)		S
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 (<i>standard plug connectors see page 133</i>)		S
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°			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		
Wiring	Cable 500 mm long without plug connector Optional with plug connector (<i>standard plug connectors see page 133</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
Output options			
Characteristic:			
Inverse dual *1			1
Dual *1			2
Inverse dual with dead zone +/- 3° *1			3
Dual with dead zone +/- 3° *1			4
*1 not combinable with output E136X			
Single *2			5
Single with dead zone *2			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
Voltage output with other value on request!			

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

Double-handle controller D85

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			
Wiring	Cable 500 mm long without plug connector			
	Optional with plug connector (<i>standard plug connectors see page 133</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				
	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	
Output options				
	Single			5
	Single with dead zone +/- 3°			6
Digital output signals:				
Output signals standard:				
	Direction signals and zero position signals 1,5A 24 V DC			1

Current output with other value on request!

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 LED`s)			
	Digital switching output (potential-free) 100 mA			
Mounting depth A	E3091: 85 mm			
	E3091X: 105 mm			
	E3101X - E3103X: 105 mm			
	E3104X - E3105X: 125 mm			
Protocol	CANOpen CiA DS 301 or SAE J 1939			
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)			

Optional with plug connector (standard plug connectors see page 133)		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 (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	
<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>		
CAN expansion stage 2		E310 1
- 10 analog joystick axis - 16 digital joystick functions - 2 inputs 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	
- 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	
<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		
<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 LED`s)
	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 CIA 304
Baud rate	125 kBit/s to 1 MBit/s (Standard 250 kBits)
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)

Double-handle controller D85

1

Optional with plug connector (standard plug connectors see page 133)		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
External LED-outputs can be used in the grip for LEDs		
*With the use of capacitive sensor, the external digital inputs reduce by one input!		
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
External LED-outputs can be used in the grip for LEDs		
*With the use of capacitive sensor, the external digital inputs reduce 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!		

Profibus DP		
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 18 x 0,25 mm ² 300 mm long without plug connector	
	External in-/outputs (additional at 16E/16A) cable 18 x 0,25 mm ² 300 mm long without plug connector	
Optional with plug connector (standard plug connectors see page 133)		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
External LED-outputs can be used in the grip for LEDs		
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

Double-handle controller D85

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 18 x 0,25 mm ² 300 mm long without plug connector
	External in-/outputs (additional at 16E/16A) cable 18 x 0,25 mm ² 300 mm long without plug connector
	Optional with plug connector (<i>standard plug connectors see page 133</i>)

S

Profinet

- 4 analog joystick axis
- 16 digital joystick functions
- Input for capacitive sensor

E601 1

With additional external in-/outputs

- 8 external LED-outputs, 8 external digital inputs
- 16 external LED-outputs, 16 external digital inputs

2

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

Profinet Safe

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 18 x 0,25 mm ² 300 mm long without plug connector
	External in-/outputs (additional at 16E/16A) cable 18 x 0,25 mm ² 300 mm long without plug connector
	Optional with plug connector (<i>standard plug connectors see page 133</i>)

S

- 4 analog joystick axis
- 16 digital joystick functions
- Input for capacitive sensor

E701 1

With additional external in-/outputs

- 8 external LED-outputs, 8 external digital inputs
- 16 external LED-outputs, 16 external digital inputs

2

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

Double-handle controller D85

Other outputs

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

- 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 (for axis 3+4 or grip function)

Optional with plug connector (*standard plug connectors see page 133*)

S

2 axis

E907 2

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:
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 (axis 3+4)

Optional with plug connector (*standard plug connectors see page 133*)

S

2 axis

E903 2

8 Bit Binär-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 (axis 3+4)

Optional with plug connector (*standard plug connectors see page 133*)

S

2 axis

E904 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
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

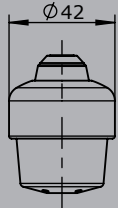
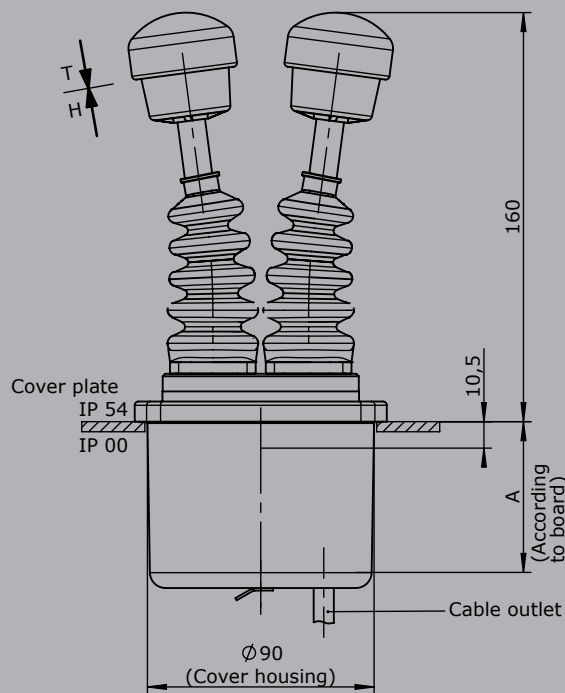
Double-handle controller

D85

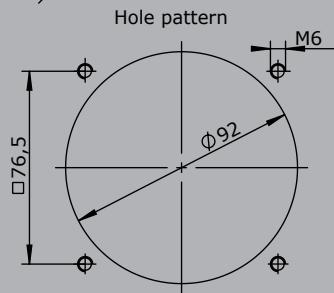
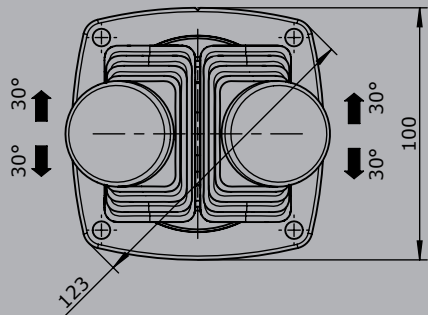
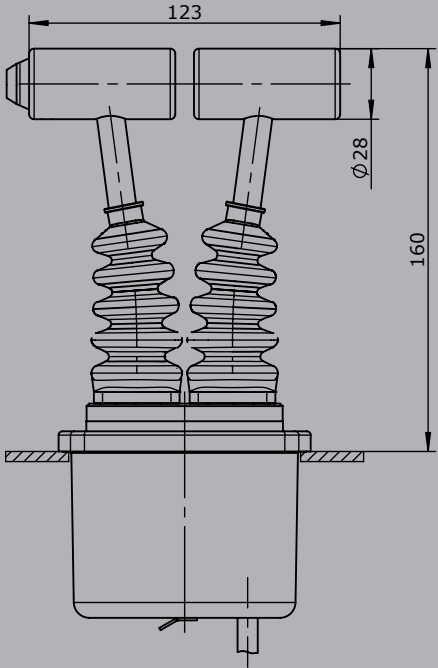
T = Dead man's button
H = Signal button

Knob solid
D = Push button

T - grip
D = Push button



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



Double-handle controller D8



The double-handle controller D8 is a robust switching device for the hoisting 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 D8	8 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54 front

	D8	S5	Q / Q	-2ZP	+3 RP	Example -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 133)											
Special model											
X Special / customer specified											

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

GESSMANN
Industrial Controllers

A square representing a D8 brane. The left vertical edge has an upward arrow labeled '1' and a downward arrow labeled '2'. The right vertical edge has an upward arrow labeled '3' and a downward arrow labeled '4'. The label 'D8' is centered below the square.

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

Double-handle controller

D8

Combination possibilities with our handles



If both axis identical, it's enough to describe one axis!
Example:...A05P184 + A05P184 => A05P184

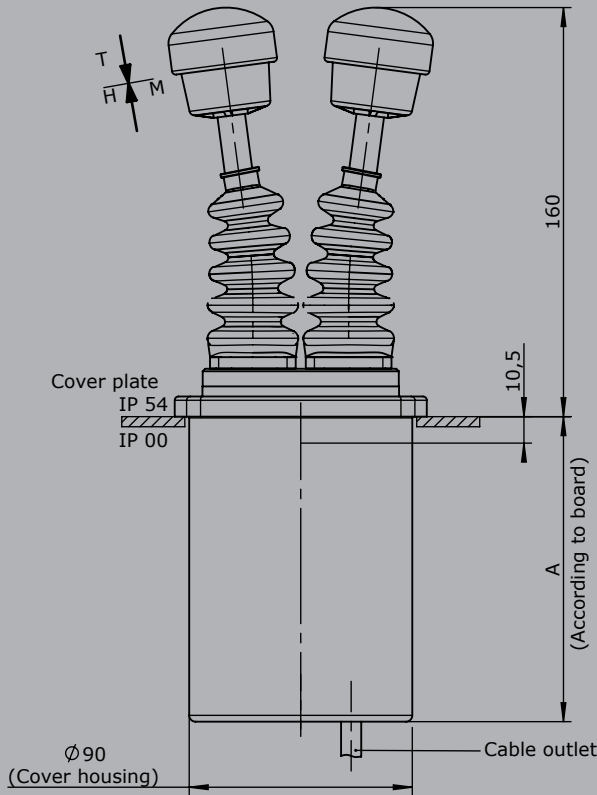
D8				S5	Q / Q	-2 Z P	+3 R P	-B	A05 P184	+A050	P184	-E9012	-X
Axis 2: direction 3-4													
1	1 contacts	Standard contact - arrangement see page 135											
2	2 contacts	e.g.											
3	3 contacts	A98											
		A05											
		A050											
		A99 contact - arrangement for customer request											
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!											
H	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										
Interface											
E901	1	Potentiometer output for proportional valve PVG32 0,25...0,5...0,75 Us						1 axis			
	2							2 axis			
Special model											
X	Special / customer specified										

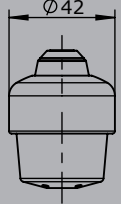
Double-handle controller

D8

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

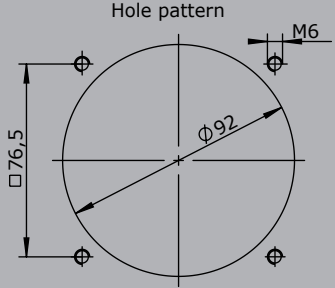
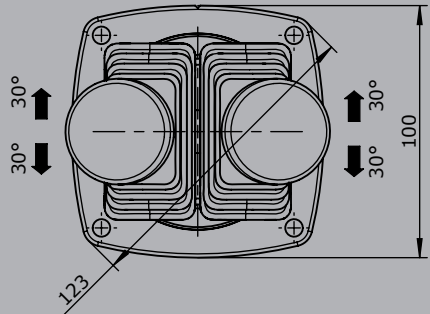
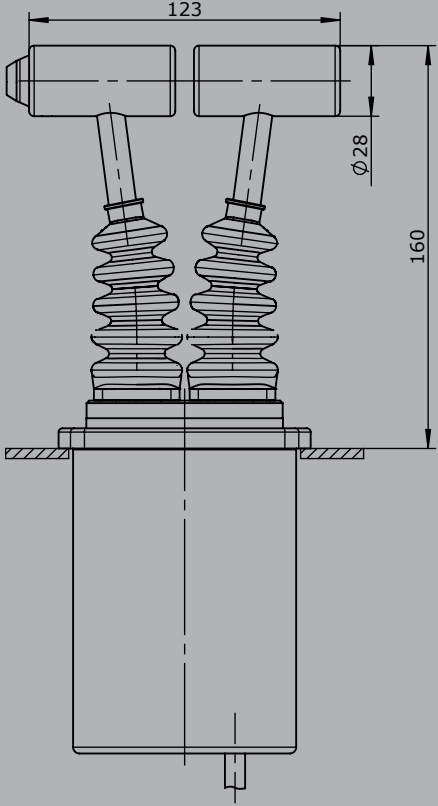


Knob solid
D = Push button



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

T - grip
D = Push button



Double-handle controller D64 / DD64



The double-handle controller D64/DD64 is available in either single-axis or multi-axis options and is a robust controller used commonly in electro-hydraulic 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 D64	10 million operating cycles
Mechanical life DD64	20 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54 front

Example

	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										

Double-handle controller

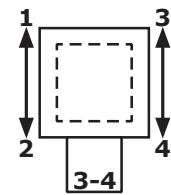
D64 / DD64

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										
<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										
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 191)										
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 191)										

Identification of the installation variants with switching directions:



D64 / DD64

Double-handle controller

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	☐	2 contacts	Standard contacts - see arrangement page 135	
02	☐	4 contacts	e.g.	
03	☐	6 contacts	A980	MS00
04	☐	8 contacts	A05	MS21
05	☐	10 contacts	A0500	MS21-00
06	☐	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
		More potentiometers on request!		

C Encoder C... Encoder see page 141

If both axis identical, it's enough to describe one axis!

Example: A05P134 + A05P134 => A05P134

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	☐	2 contacts	Standard contact - see arrangement on page 144	
02	☐	4 contacts	e.g.	
03	☐	6 contacts	A980	MS00
04	☐	8 contacts	A05	MS21
05	☐	10 contacts	A0500	MS21-00
06	☐	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
		More potentiometers on request!		

C Encoder C... Encoder see page 141

Double-handle controller
D64 / DD64



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

Special model

X Special / customer specified

Attachments

Indicating labels
Indicating labels engraved

1

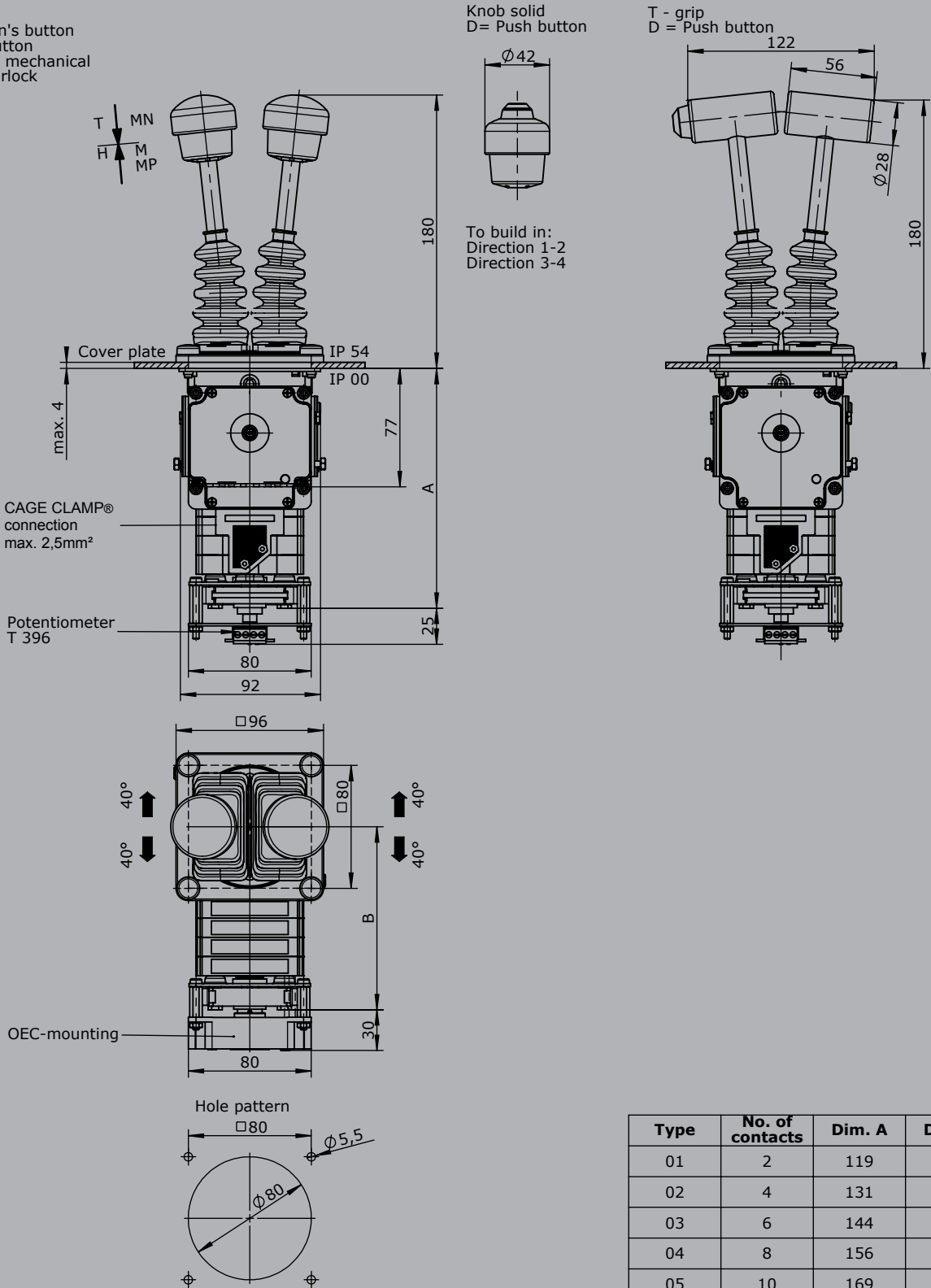
Double-handle controller

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



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

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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP66 front



1

		D3	S5	Q / Q	-2 R P	+3 R P	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 133)													
Special model														
X	Special / customer specified													

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

Double-handle controller

D3

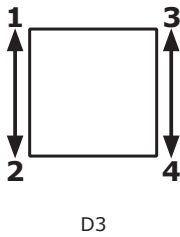
Combination possibilities with our handles



1

	D3	S5	Q / Q	-	2 R P	+	3 R P	-	B	-	A05	P484	+	A050	P484	-	E1292	-	X
Basic unit																			
D3																			
Control-handle extended*																			
Standard 148 mm																			
S5 -20 mm																			
S8 +20 mm																			
*Only available in combination with handle!																			
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 R P	+	3 R P	-	B	-	A05	P484	+	A050	P484	-	E1292	-	X
Axis 1: direction 1-2 left																			
1 1 contact																			
2 2 contacts																			
3 3 contacts																			
R Friction brake																			
(P) Mounting options for potentiometer and (Gessmann-types)																			
P Potentiometer																			
H Hall-Potentiometer																			

Double-handle controller

D3

If both axis identical, it's enough to describe one axis!
Example: ...A05P214 + A05P214 => A05P214

D3 S5 Q / Q - 2 R P + 3 R P - B - A05 P484 + A050 P484 - E1292 - X

Axis 2: direction 3-4 left

1	1 contact	Standard contact- arrangement see page 135			
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 R P + 3 R P - 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 133)			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!				

Double-handle controller

D3



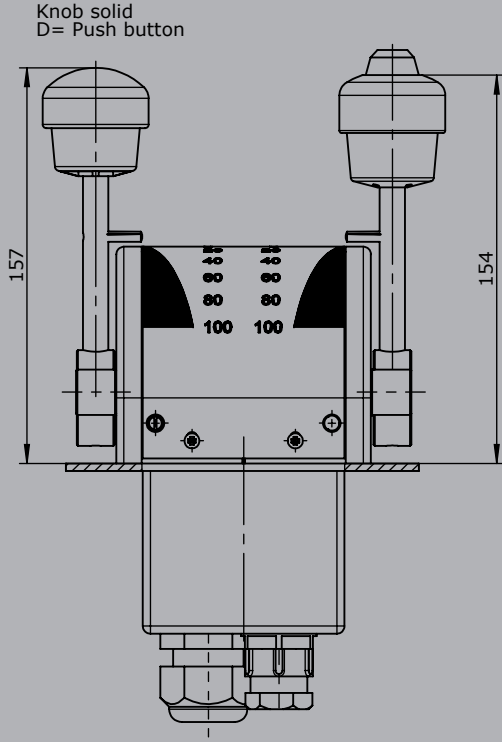
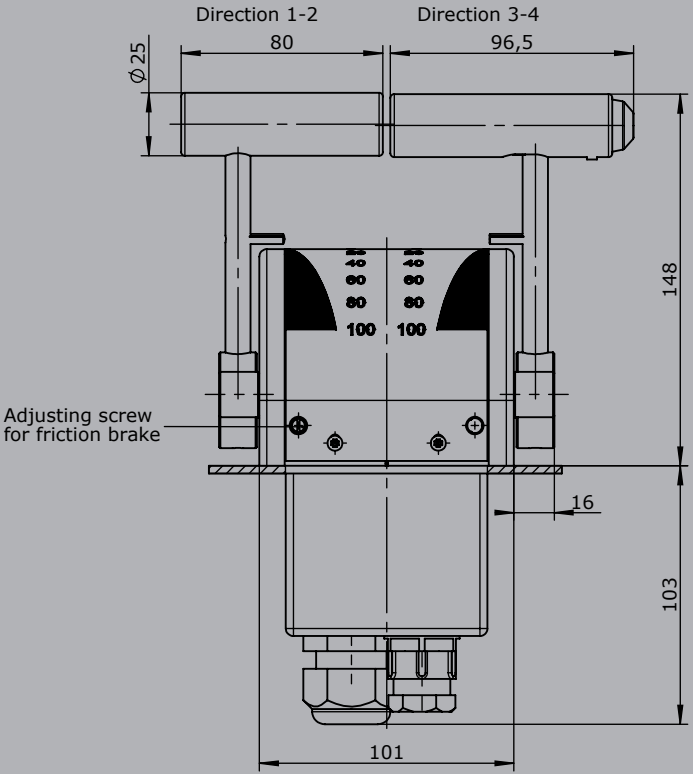
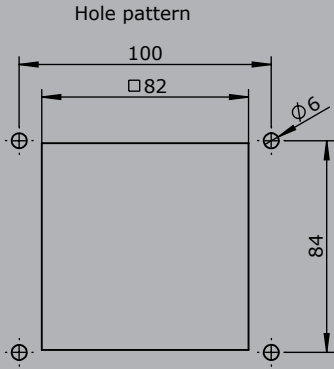
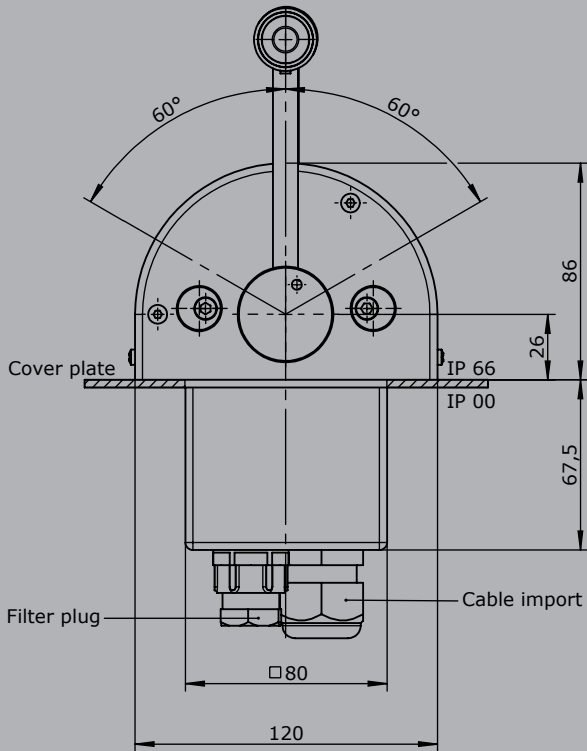
Current outputs			
Supply voltage	18-36 V DC		
Wiring	Cable 500 mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		
4...12...20 mA per axis			S
	1 axis	E209 1	
	2 axis	2	
20...4...20 mA per axis			
	1 axis	E217 1	
	2 axis	2	

1

Double-handle controller

D3

T= grip
D= Push button



1

Single-axis controller S11



The single-axis controller S11 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.

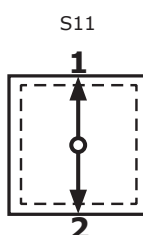
Technical data

Mechanical life S11	6 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65, electronic assembly IP67



	S11	T	- 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 (included in basic unit!)						
R Friction brake						
Interface (description on the following page)						
E0xx Digital output						
E1xx Voltage output						
E2xx Current output						
Plug connectors						
S.. Standard plug connectors (see page 133)						
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 133</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 133</i>)	S
0,5...2,5...4,5V redundant + 2 direction signals		
	1 axis	E104 1
	2 axis	2
Output options		
Characteristic:		
Inverse dual		1
Dual		2
Inverse dual with dead zone +/- 3°		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 133</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		3
Dual with dead zone +/- 3° *1		4
*1 not combinable with output E136X		
Single *2		5
Single with dead zone *2		6
*2 not combinable with output E112X and E132X		
Voltage output with other value on request!		

Single-axis controller

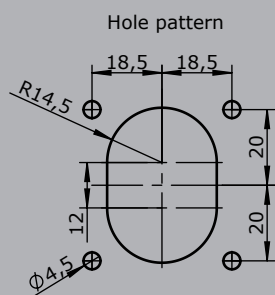
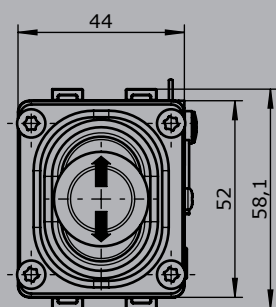
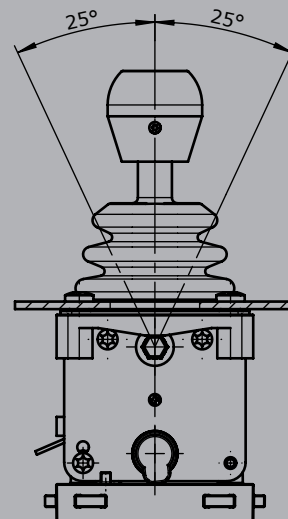
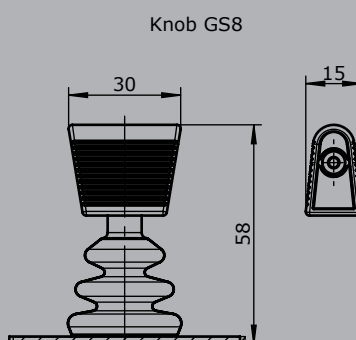
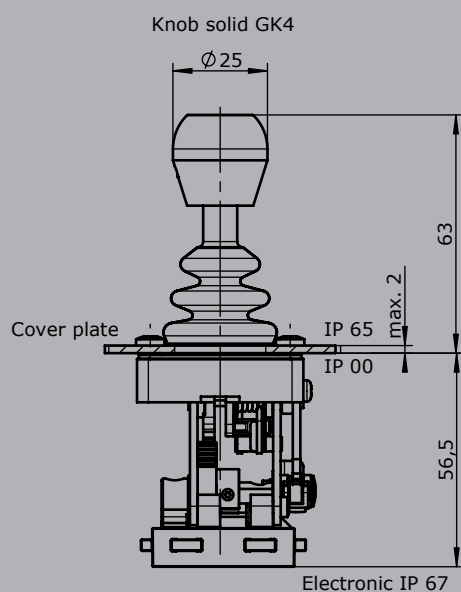


Current output

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 133</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°		6
Voltage output with other value on request!				

S11

T = Dead man's button



Single-axis controller S1



The single-axis controller S1 is a robust switching device for remote control and eletro-hydraulic applications. The modular design of the switching device is universally applicab-
le. The single-axis controller is resistant to oil, maritime conditions e.g. offshore /vessels,
UV radiation typically from the sun.



Technical data

Mechanical life S1	6 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65

		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					

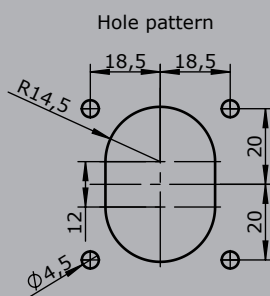
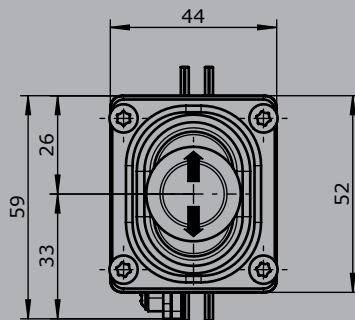
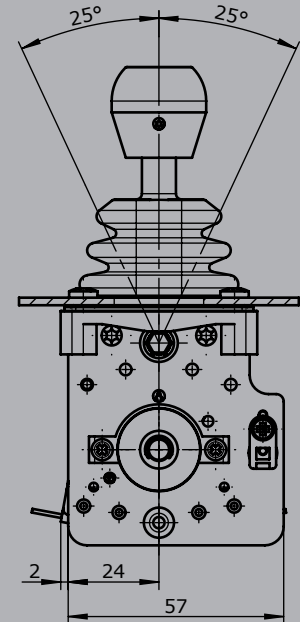
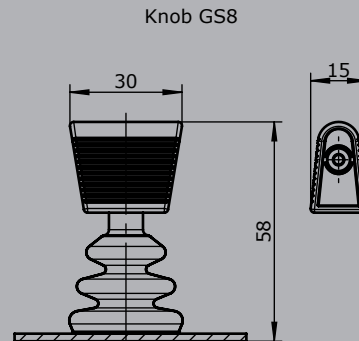
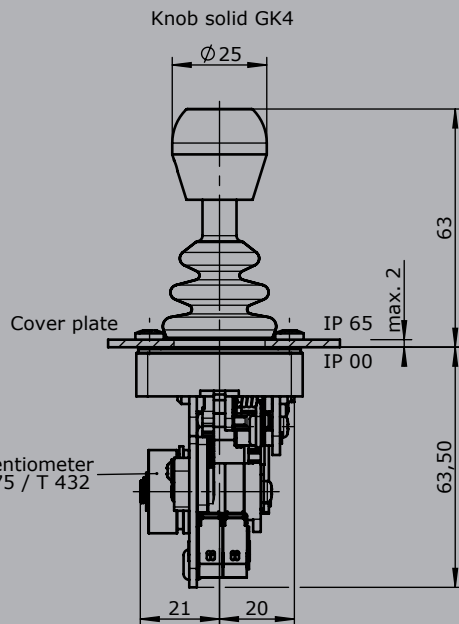
Single-axis controller

S1

		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 135				
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					

Single-axis controller S1

T = Dead man's button



Thumbwheel S12

The thumbwheel S12 is designed for electro-hydraulic applications. By the combination of different 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 (EN ISO 13849) possible



1

	S12	- 2	- 1	-1	-E1031	-X
Basic unit						
S12	Thumbwheel S12					
S12A	Thumbwheel S12 with 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					
Actuator colour						
1	Black					
2	Grey					
3	Blue					
4	Red					
5	Yellow					
6	orange					
Mechanical function						
1	T-0-T					
2	R-0-R					
3	T-0-R					
4	R-0-T					
5	R-R					
6	R-R-0-R-R					
Interface						
E1031	0,5...2,5...4,5 redundant by Ub= 5 V					
1	Output option inverse dual					
2	Output option dual					
Special model						
X	Special / customer specified					

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

Single-axis controller S9



The single-axis controller S9 is a hallsensor switching device designed for electro-hydraulic applications. Due to its small size, the S9 is particularly suitable for installation in our ball handles. The single-axis controller is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

Technical data

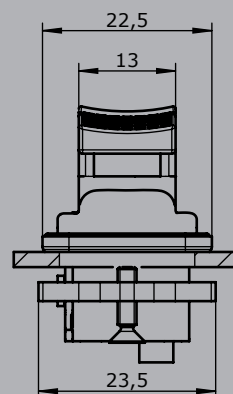
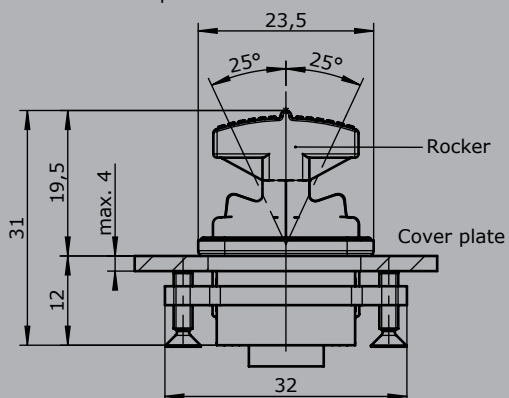
Mechanical life S9	5 million operating cycles
Operating force	1,6 to 3,5N
Supply voltage	5V DC stabilized
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP67



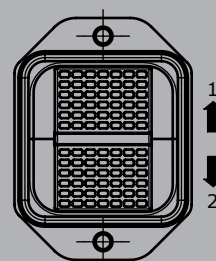
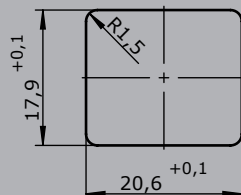
1

		Example		
		S9	- E10311	- X
Basic unit				
S9				
Interface				
Voltage output				
E	1031 ☐	0,5...2,5...4,5 V redundant at Ub= 5 V	1 axis	
		characteristic: ☐ = Inverse dual, ☐ = Dual		
Special model				
X Special / customer specified				

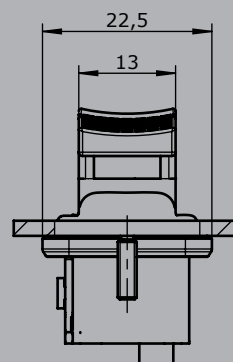
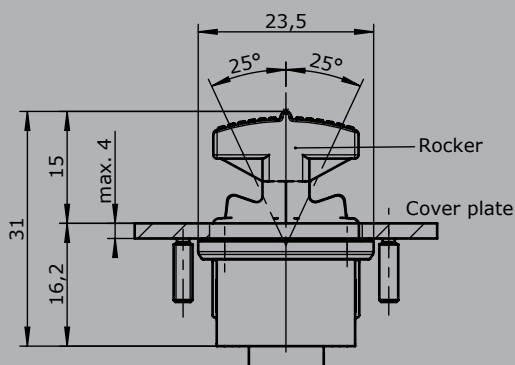
Installed from the top



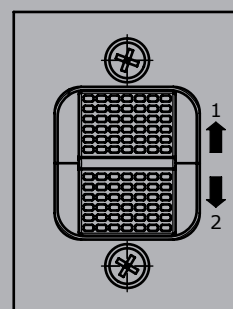
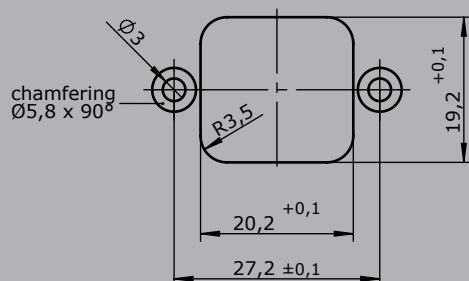
Hole pattern
(installed from the top)



Installed from below



Hole pattern
(installed from below)



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. The single-axis controller is resistant to oil, maritime conditions e.g. offshore /vessels, UV radiation typically from the sun.

Technical data

Mechanical life S26	6 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54, electronic assembly IP67

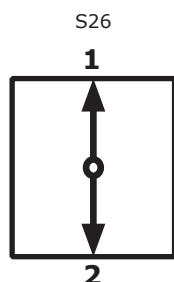


1

	S26	T	- Z	- E...	- S...	- X
<i>Example</i>						
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... (see page palm grip 151)						
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 133)						
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!

Single-axis controller S26

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		
Wiring	Cable 500 mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</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 133</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°		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 133</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		3
	Dual with dead zone +/- 3° *1		4
*1 not combinable with output E136X			
	Single *2		5
	Single with dead zone *2		6
*2 not combinable with output E112X and E132X			
Voltage output with other value on request!			

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

Single-axis controller



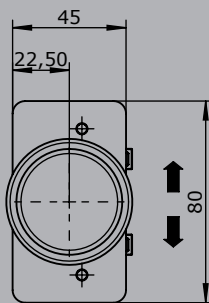
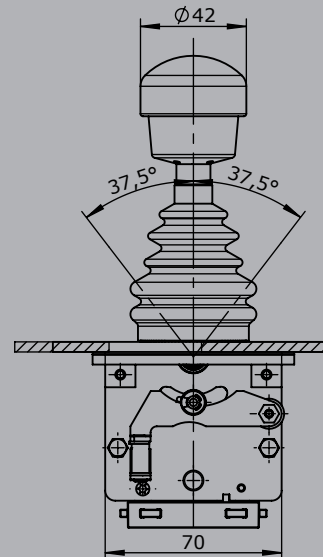
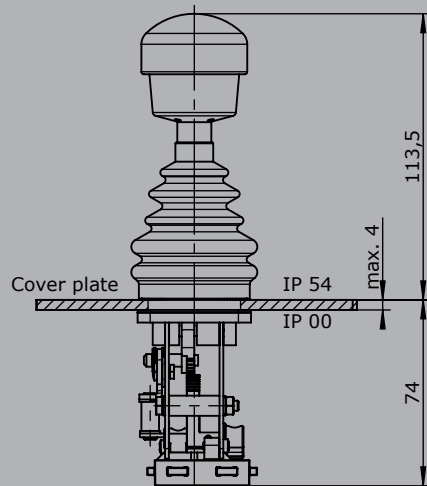
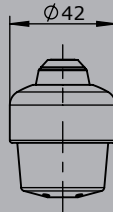
Current output		
Supply voltage	9-32 V DC	
Current carrying capacity	Direction signal 150 mA	
	Zero position signal 500 mA	
Wiring	Cable 500 mm long without plug connector	
	Optional with plug connector (<i>standard plug connectors see page 133</i>)	
0...10...20 mA + 2 direction signals + 1 zero position 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°	6
Current output with other value on request!		

Single-axis controller S26

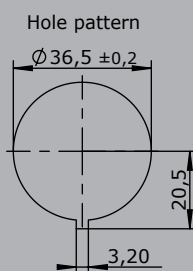
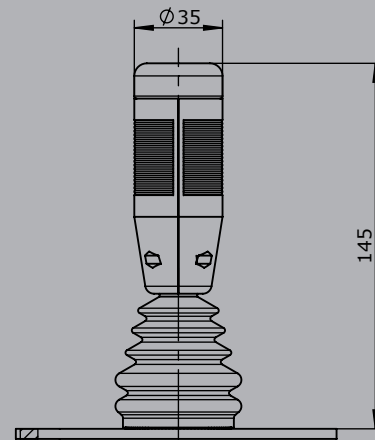
T = Dead man's button
H = Signal button
M = Latch for mechanical
zero interlock



Knob solid
D= Push button



Palm grip B5
B5 T = Dead man's button



Single-axis controller S27



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65, electronic assembly IP67

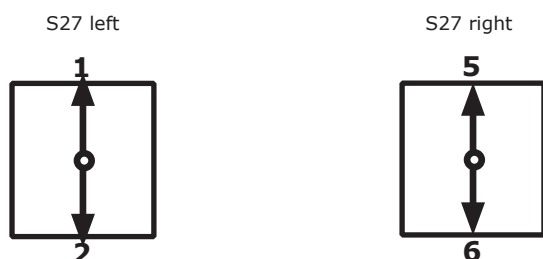


1

	S27L	M	- 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 133)						
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 133</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 133</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°		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 133</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		3
Dual with dead zone +/- 3° *1		4
*1 not combinable with output E136X		
Single *2		5
Single with dead zone *2		6
*2 not combinable with output E112X and E132X		

Voltage output with other value on request!

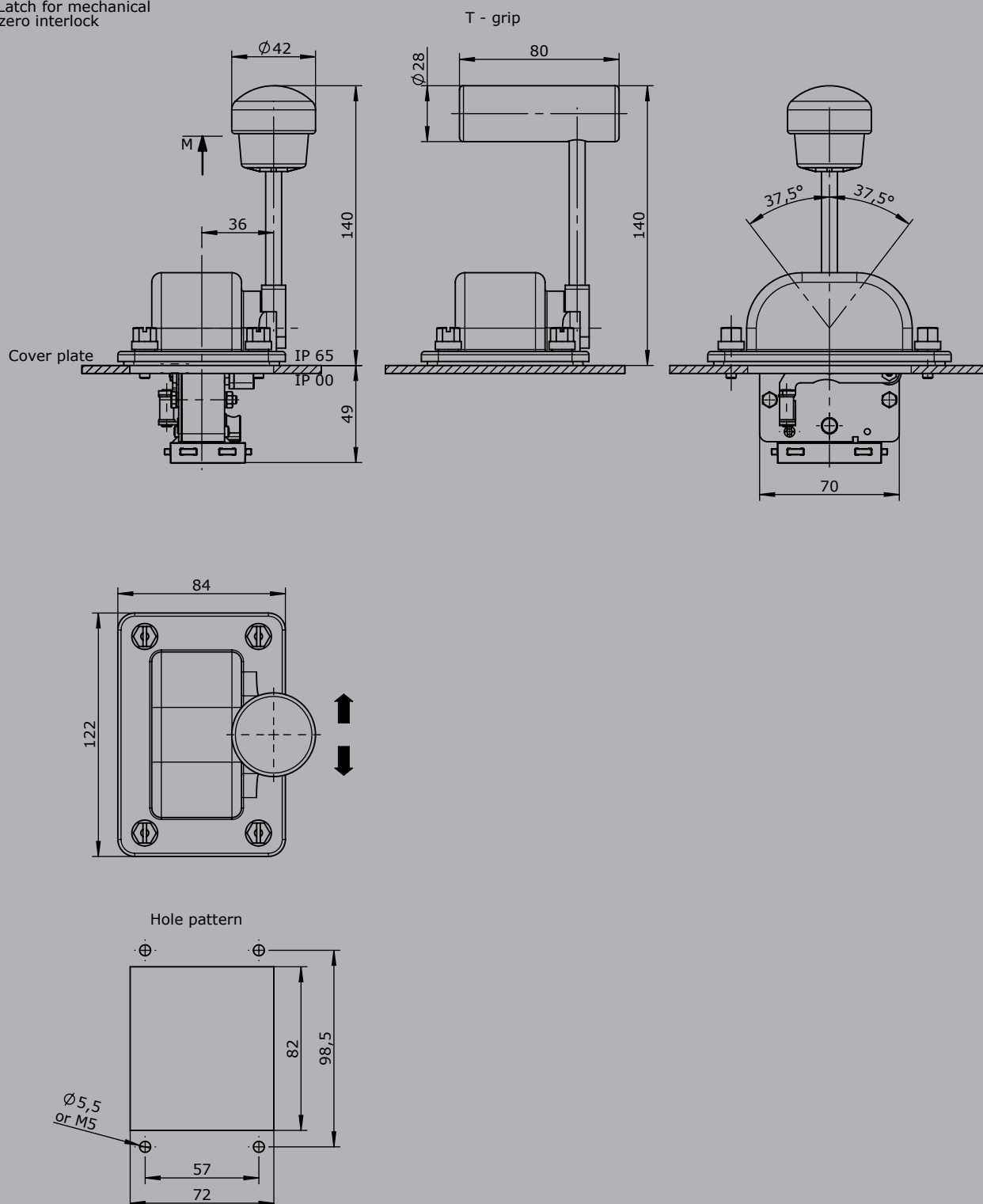
Single-axis controller

S27

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 (standard plug connectors see page 133)		
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°		6
Current output with other value on request!			

Single-axis controller S27

M = Latch for mechanical zero interlock



Single-axis controller

S2 / SS2 / S21



The single-axis controller S2/SS2 is a robust switching device for remote controlled and electrohydraulic 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 S2 / S21	6 million operating cycles
Mechanical life SS2	10 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54

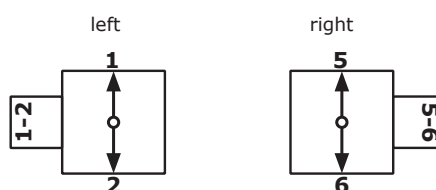


1

	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						
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						

Identification of the installation variants with switching directions:



Single-axis controller

S2 / SS2 / S21

Combination possibilities with our handles



S2L

S5

T

- 02 Z P

- A050 P134

- X

Control-handle extended

Standard

S5 -20 mm

S8 +20 mm

**Only possible in combination with handle!*

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 151)

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 135

03 5 contacts

z.B.

04 7 contacts

A98

MS0

05 9 contacts

A05

MS21

A0500

MS21-00

A110

MS24-0

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 141

Single-axis controller
S2 / SS2 / S21



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	

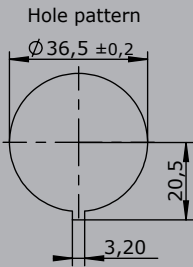
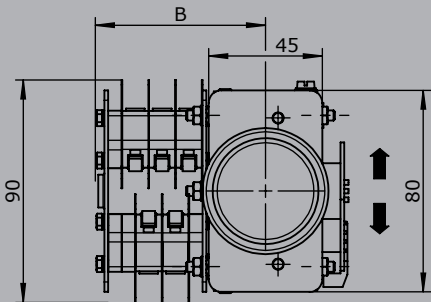
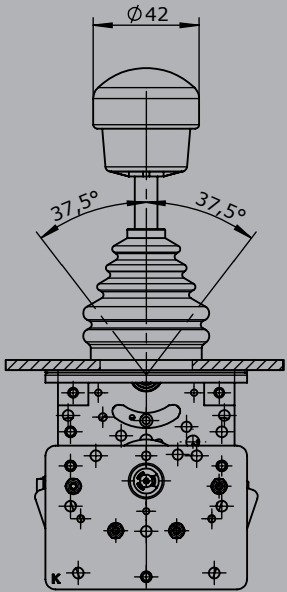
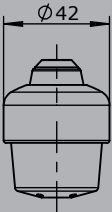
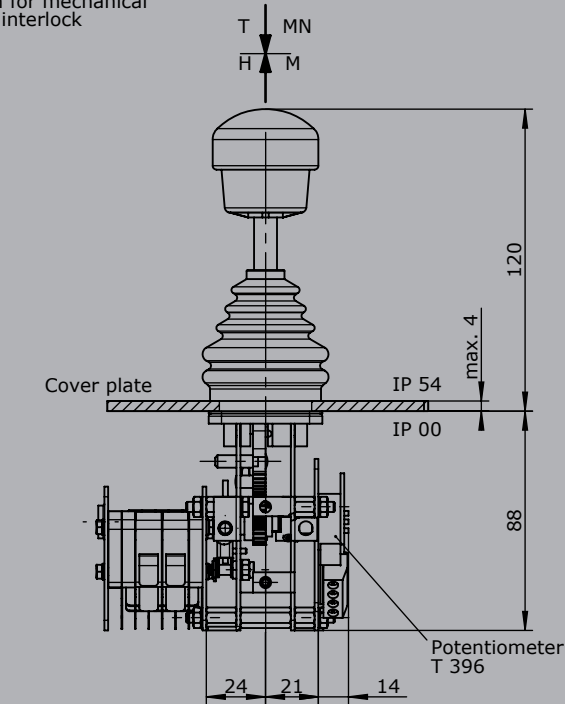
1

Single-axis controller

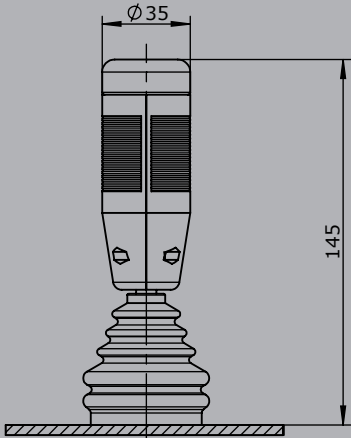
S2 / SS2

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

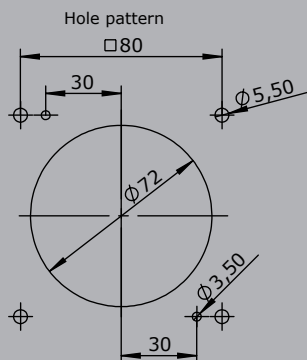
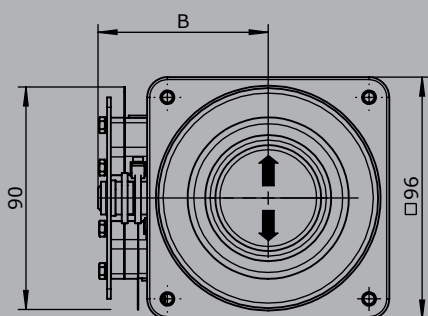
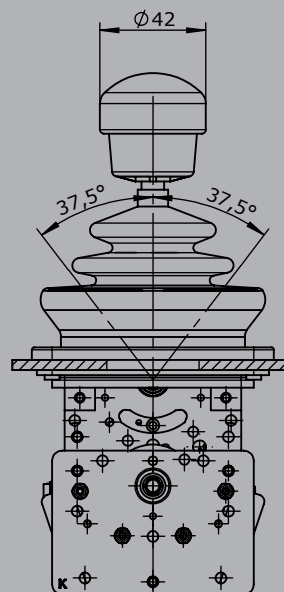
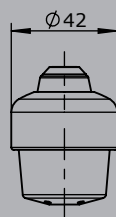
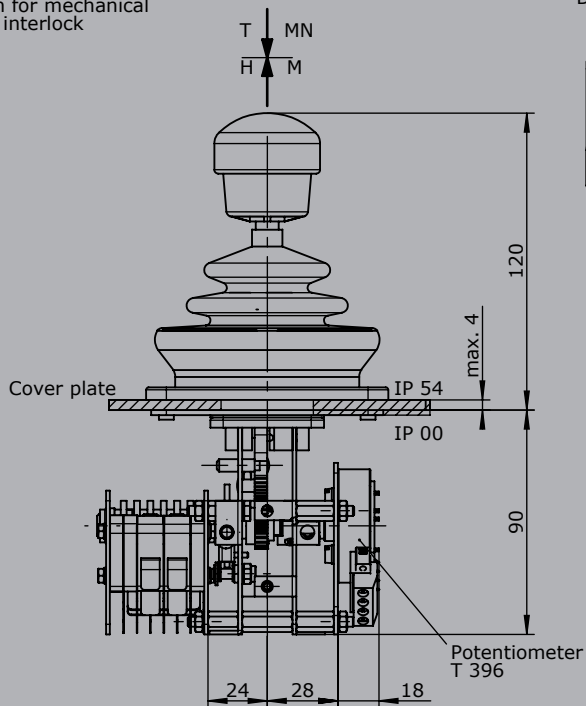


Type	No. of contacts	Maß B
02	3	62
03	5	72
04	7	83
05	9	93

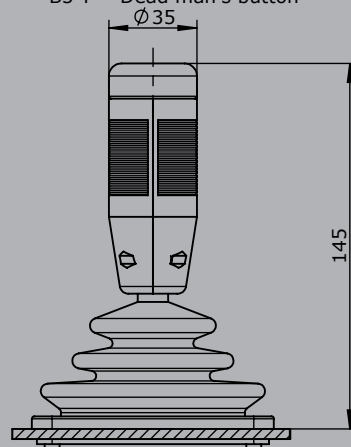
S21

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 S2/SS2 is a robust switching device for remote controlled and electrohydraulic 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 S22	6 million operating cycles
Mechanical life SS22	10 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54

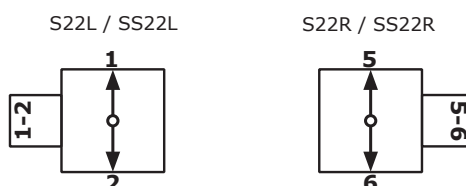


Example

	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						
P134 Potentiometer T396 2 x 5 kOhm						
Special model						
X Special / customer specified						

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

Identification of the installation variants with switching directions:



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

Single-axis controller

S22 / SS22

Combination possibilities with our handles



	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... (see page palm grip 151)					

		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 135						
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		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	Codierer	C...Encoder see page 1414						

Single-axis controller

S22 / SS22



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

Special model

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

Attachments

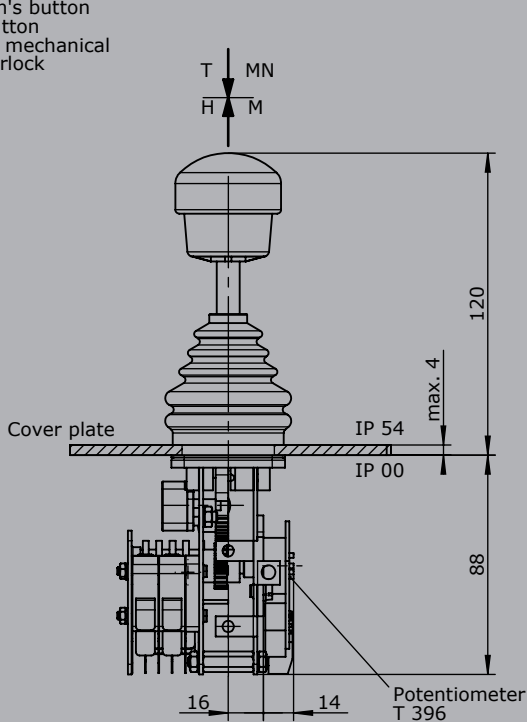
- Indicating labels
- Indicating labels with engraving

1

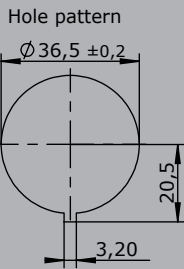
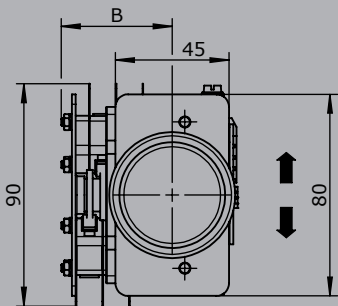
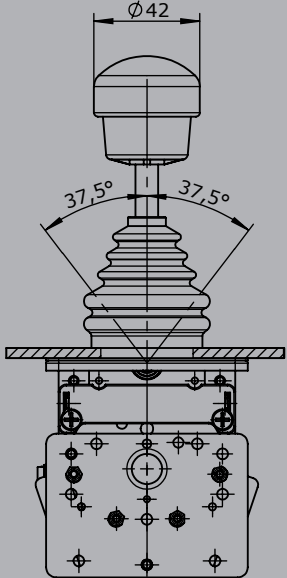
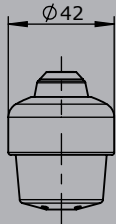
Single-axis controller

S22 / SS22

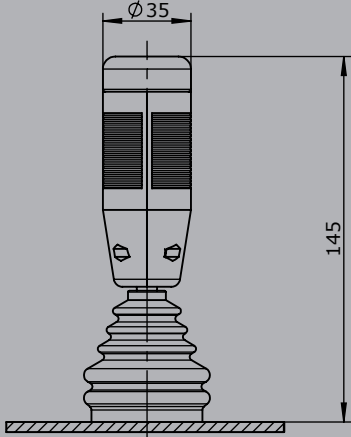
T = Dead man's button
H = Signal button
M = Latch for mechanical zero interlock



Knob solid
D= Push button



Palm grip B5
B5 T = Dead man's button



Type	No. of contacts	Dim. B
1	1	25
2	2	31
3	3	36
4	4	42

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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65



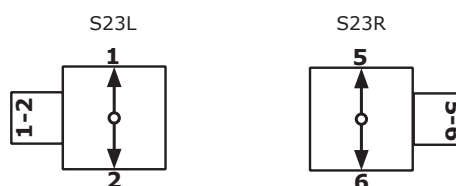
Example

	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
Basic unit		
S23L left		
S23R right		
Control-handle extended		
Standard 140 mm		
S5 -20 mm		
S8 +20 mm		

M - 3 Z P - A050 P134 - X

Identification of the installation variants with switching directions:



Single-axis controller S23

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 135		
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	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 141		

S23L S5 M - 3 Z P - A050 P134 - X

Special model

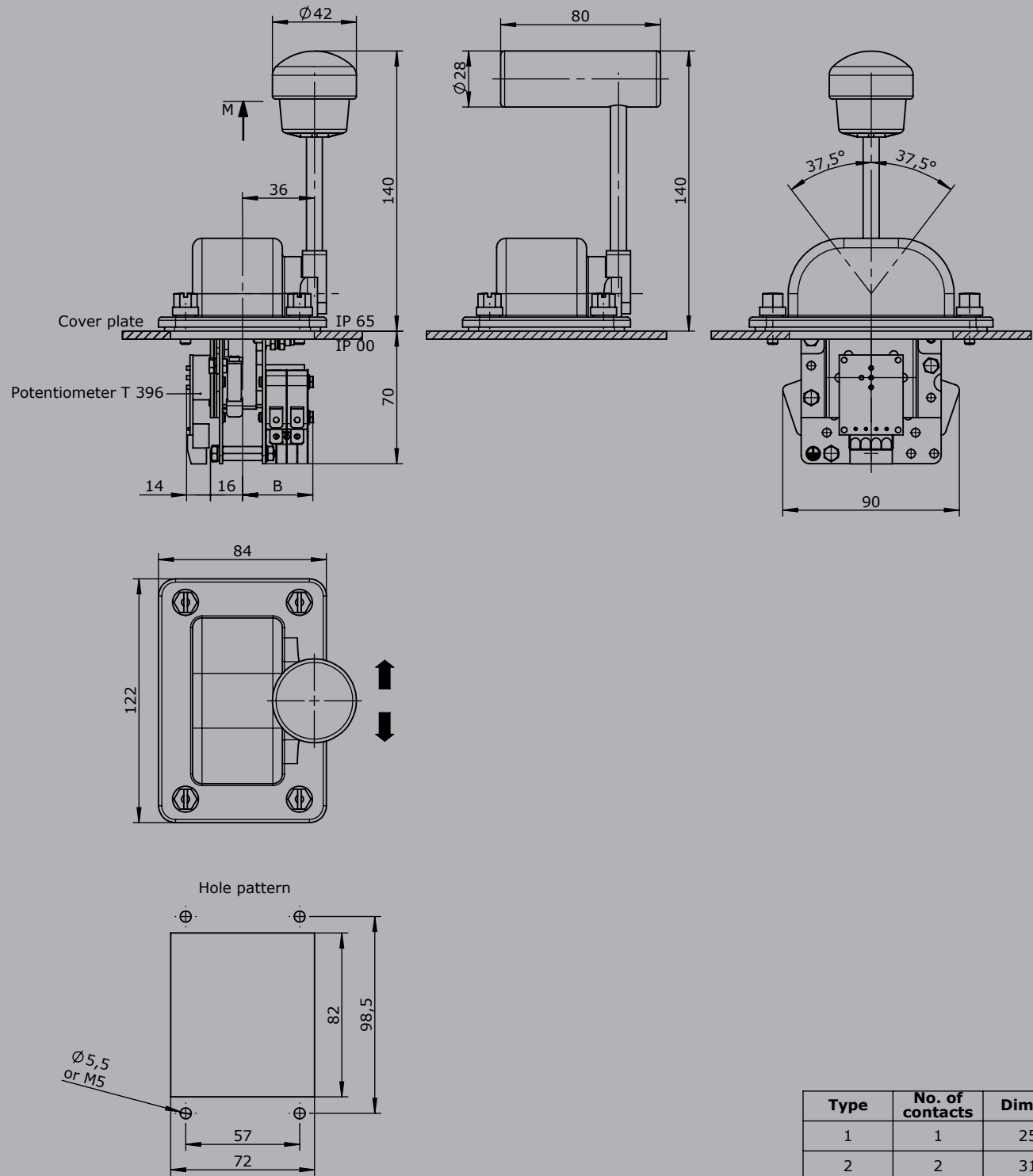
X	Special / customer specified
---	------------------------------

Single-axis controller
S23

M = Latch for mechanical
zero interlock

T - grip

1



Type	No. of contacts	Dim. B
1	1	25
2	2	31
3	3	36
4	4	42

Single-axis controller S14



The single-axis controller S14 is a designed hall sensor switching device 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

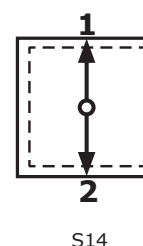
Mechanical life S14	6 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65



	S14L	S8	Example T	-01ZC	-A05 C61	-X
Basic unit						
S14L						
Control-handle extended						
S8 +20 mm						
Grip / palm grip						
T Dead man						
Axis 1 (direction 1-2)						
01 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						
S8 +20 mm						
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						
GK1MN Mechanical zero interlock (push down)						
GK1T Dead man						
GK1H Signal button						

**Identification of the installation
variants with switching directions:**



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

Single-axis controller S14

S14L S8 T -012C -A05 C61 -X

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 151)

Attention! The single-axis controller S14 is not suited for big palm grip (B3, B7/B8, B9...)!

S14L S8 T -012C -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 135	
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
			Potentiometer track
			Direction track
			I max. 1 mA
			2 x 10 kOhm
			Arrangement MS26-0
		C62	MEC 1-7
			EA/10-10
			Potentiometer track
			Direction track
			I max. 1 mA
			2 x 5 kOhm
			Arrangement MS26-0-1
		C66	MEC 1-10
			EA/17-10
			Potentiometer track
			Direction track
			I max. 1 mA
			2 x 1,5 kOhm
			Arrangement MS21-0+MS21
		C63	MEC 1-6
			EA/09-10
			6 Bit Gray Code
		C64	MEC 1-6-5
			ER/36-10
			Current output 20...4...20 mA
			Us= 18-30 V
		C65	MEC 1-6-8
			ER/ 36-10
			Current output 20...0...20 mA
			Us= 18-30 V
		C67	MEC 1-6-9
			ER/36-11
			Voltage output 10...0...10V
			Us= 18-30 V
		More potentiometers on request!	
H	Hall-Potentiometer	E14811	0,5...2,5...5,4 V / 4,5...2,5...0,5 V

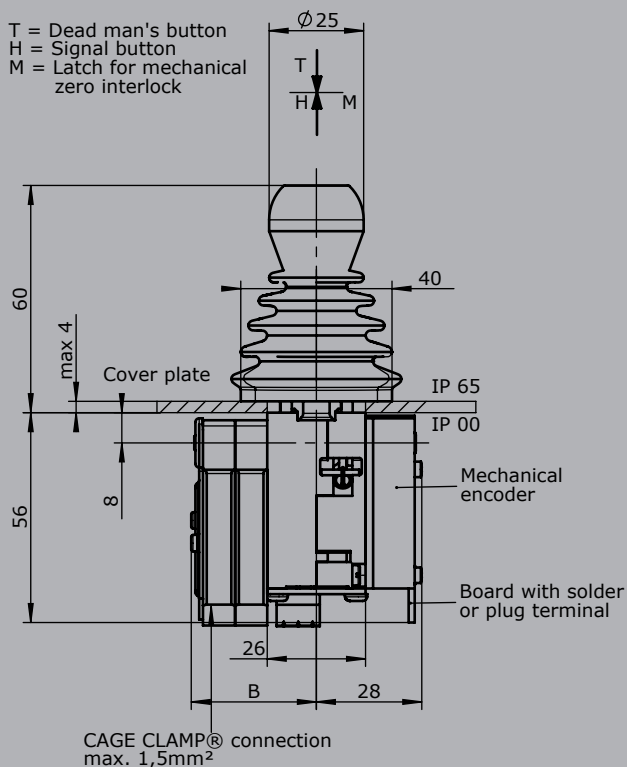
S14L S8 T -012C -A05 C61 -X

Special model

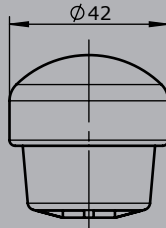
X	Special / customer specified
---	------------------------------

Single-axis controller S14

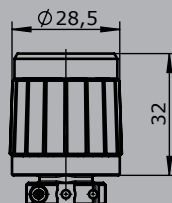
T = Dead man's button
H = Signal button
M = Latch for mechanical
zero interlock



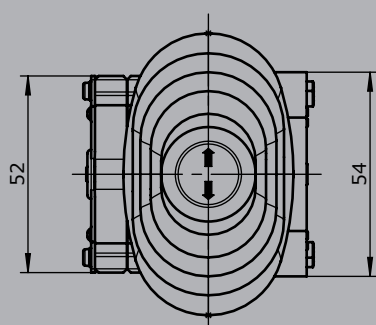
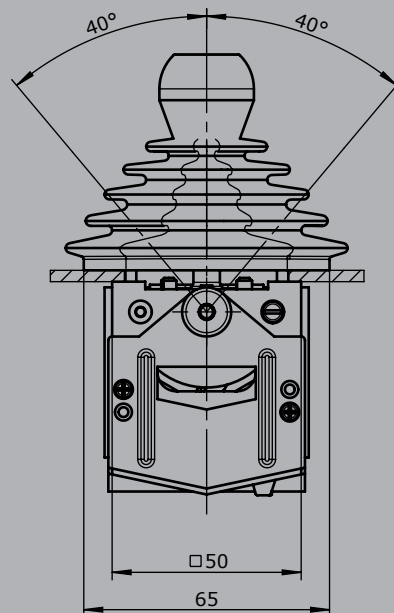
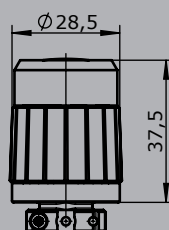
Knob solid GK
for MN, MP



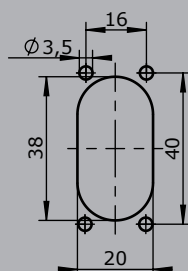
Twist grip



Twist grip
with Push button



Hole pattern



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

Single-axis controller S3



The single-axis control 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.



1 Technical data

Mechanical life S3	12 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP66 front

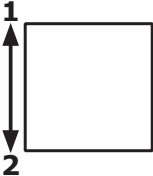
	S3L	S5	Q	-2 R P	-B	-A05 P484	-E1291	-S...	-X
Basic unit									
S3L Single-axis controller left									
Control-handle extended									
S5 -20 mm									
Grip- control-handle left									
Q T-grip									
Axis 1									
2 2 contacts (1,5A 24 V DC13)									
R Friction brake									
P Potentiometer									
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 133)									
Special model									
X Special / customer specified									

Single-axis controller S3

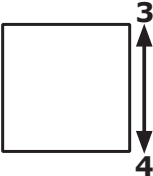
	S3L	S5	Q	-2 R P	-B	-A05	P484	-E1291	-S...	-X
Basic unit										
S3L	Single-axis controller, control-handle left									
S3R	Single-axis controller, control-handle right									
Control-handle extended*										
	Standard 148 mm									
S5	-20 mm									
S8	+20 mm									
<i>*Only possible in combination with handle!</i>										
Grip										
	Knob									
D	Push button									
Q	T-grip									
QD	T-grip with push button side									

**Identification of the installation variants
with switching directions:**

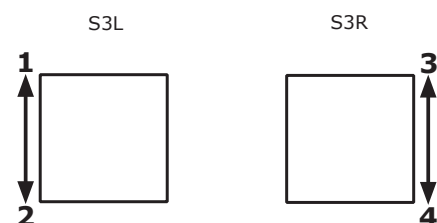
S3L



S3R



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	Standard contact - arrangement see page 135									
2	2 contacts	z.B.									
3	3 contacts	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 <i>(description on the following pages)</i>										
	Potentiometer output									
E1xx	Voltage output									
E2xx	Current output									
Special model										
X	Special / customer specified									

Voltage output

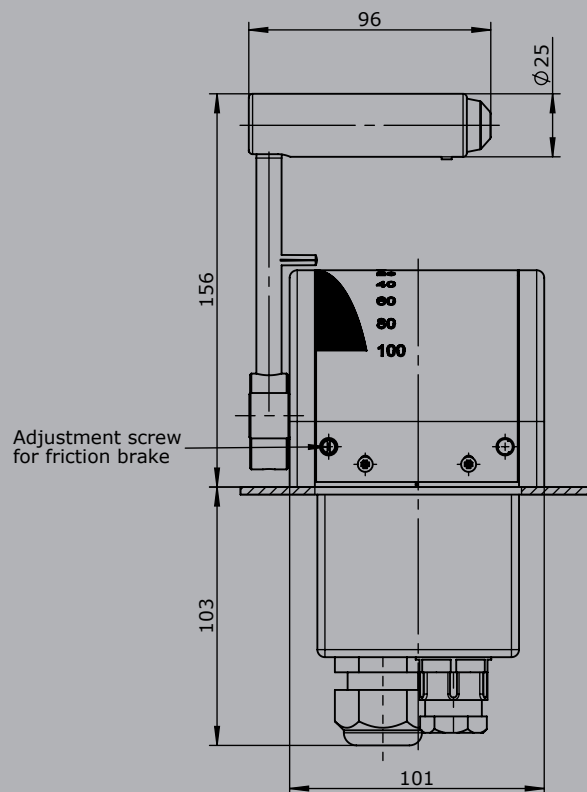
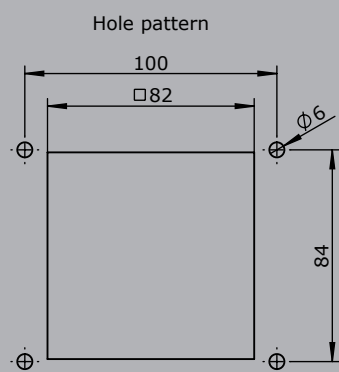
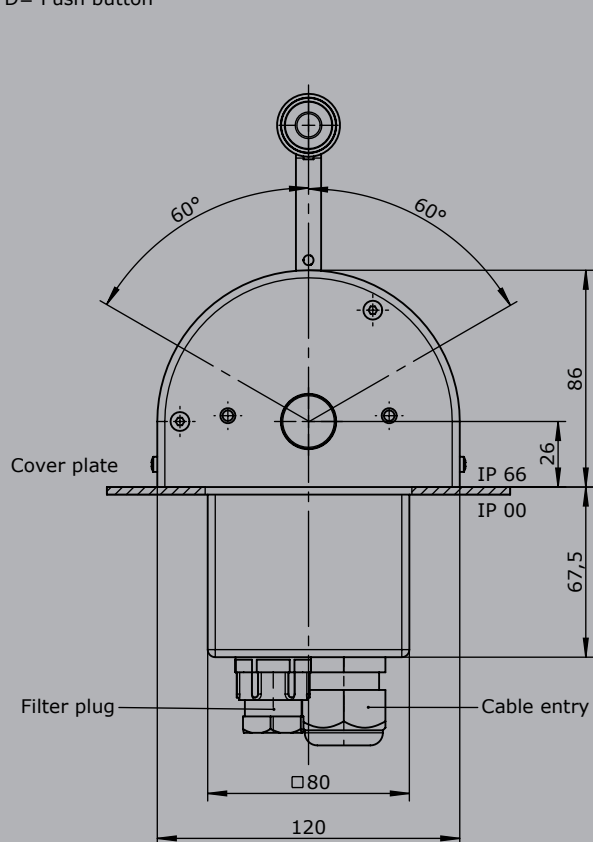
Supply voltage	11,5-32 V DC		
Wiring	Cable 500 mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		S
...5...10V			
	1 axis	E112 1	
10...0...10V			
	1 axis	E141 1	
-10...0...+10V			
	1 axis	E140 1	
Voltage output with other value on request!			

Current output

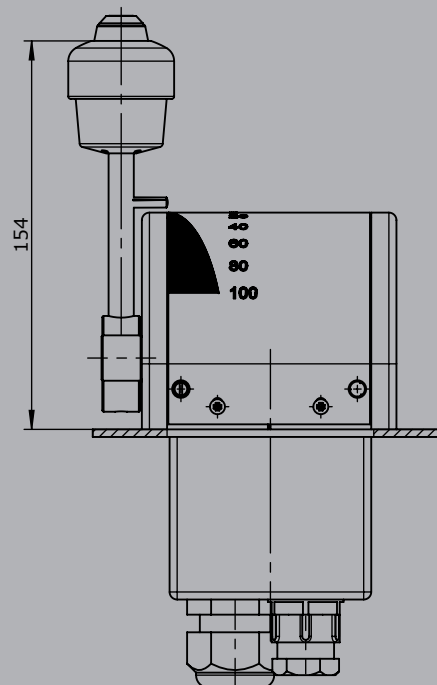
Supply voltage	18-36 V DC		
Wiring	Cable 500mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		S
4...12...20 mA			
	1 axis	E209 1	
20...4...20 mA			
	1 axis	E217 1	

Single-axis controller S3

T - grip
D= Push button



Knob solid
D= Push 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 single-axis controller 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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	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				

Control switch

N6

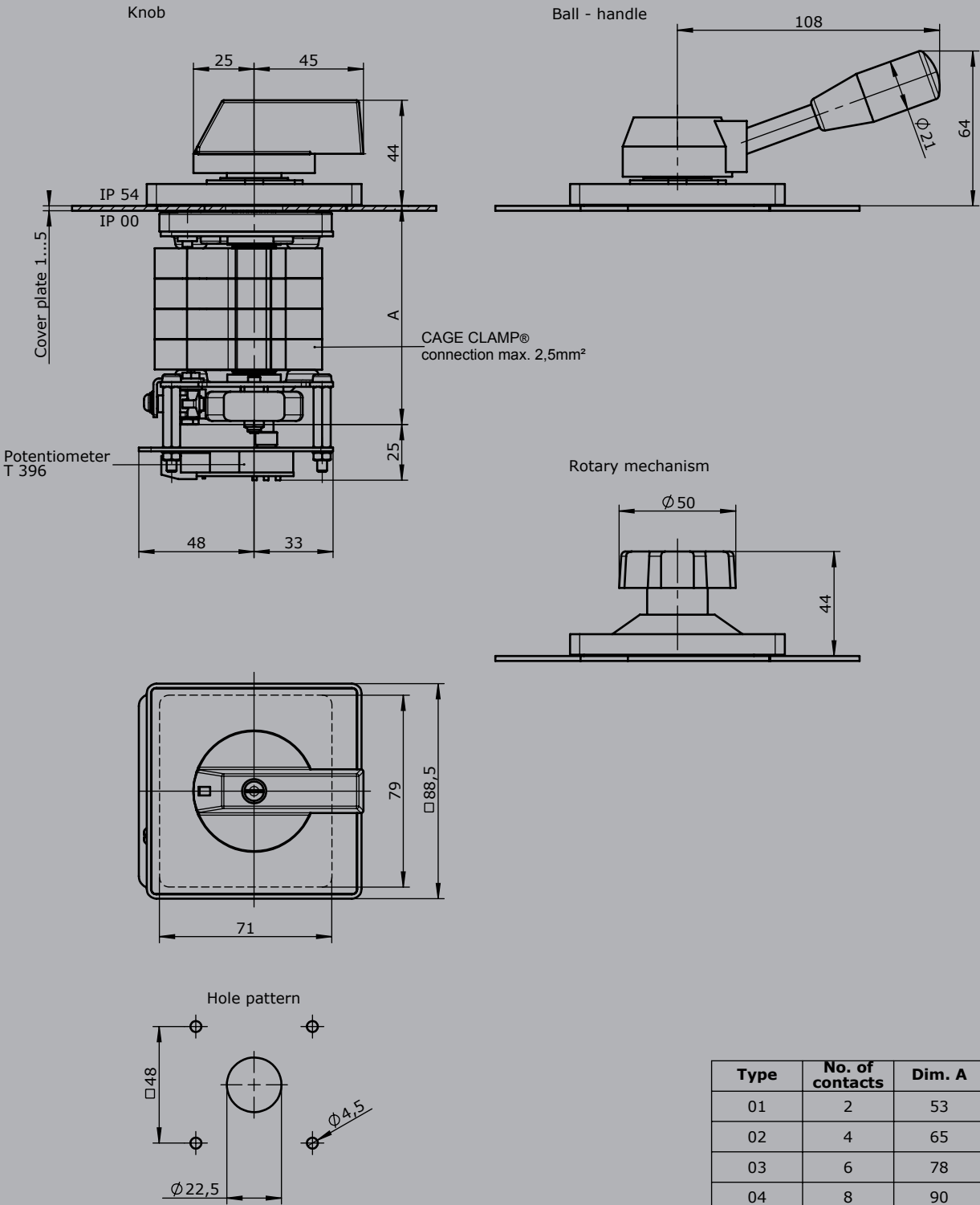
	N6	-DG	-01 Z P	-A05	P134	-X
Basic unit						
N6	incl. ISO-front plate 88 x 88 mm					
N6A	incl. ISO-front plate 88 x 88 mm, IP65 (front)					
Grip						
KN	Knob					
HG	Ball grip					
DG	Twist grip					
Axis 1: direction 3-4						
(Standard contacts gold-plated 2A 250 V AC15)						
01	☐ 2 contacts	Standard contact - arrangement see page 135				
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			
	☒ = 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		
		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		C... Encoder see page 141				

	N6	-DG	-01 Z P	-A05	P134	-X
Special model						
X	Special / customer specified					
Attachments						
Indicating label						
Indicating label with engraving						

Control switch

N6

1



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

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

Control switch N9



The control-switch N9 is a rugged switching device for hoisting applications. The modular design enables the switching device to be used universally.

Technical data

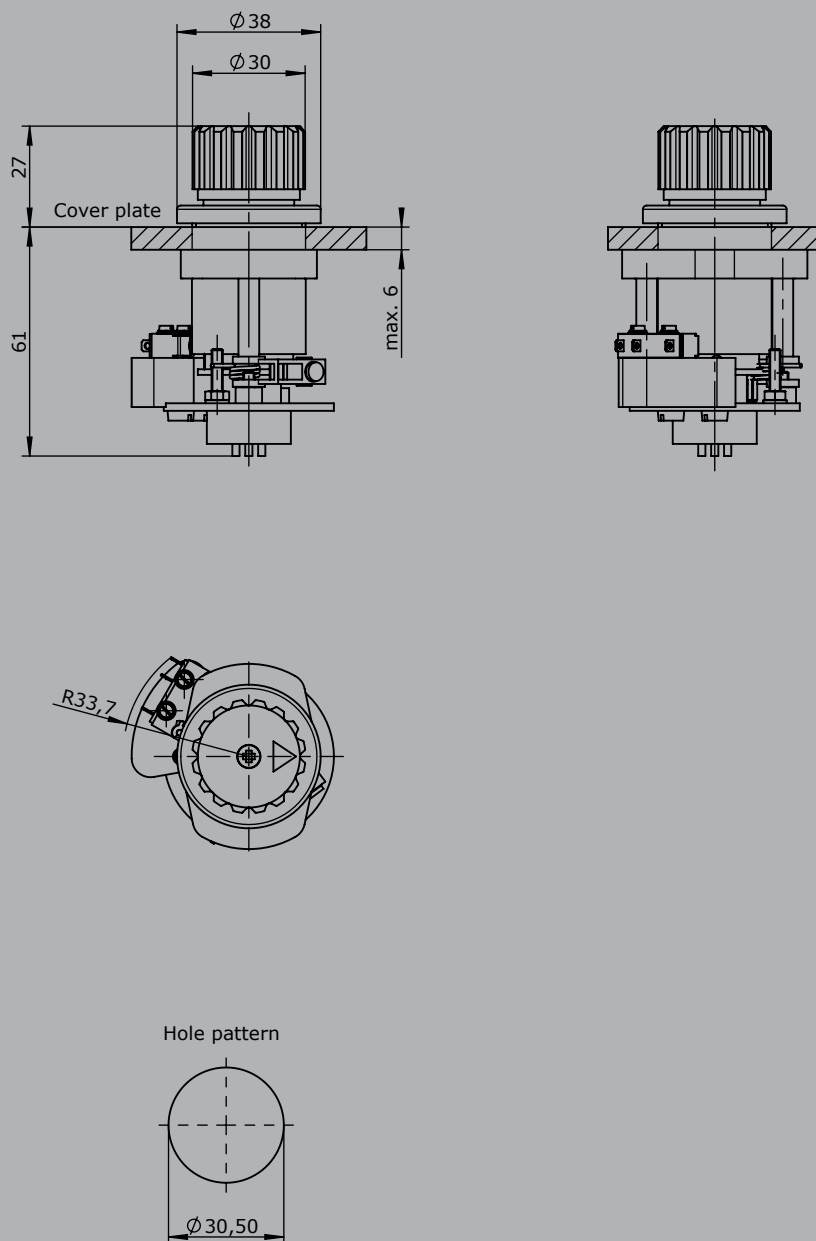
Mechanical life N9	10 million operating cycles
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54



1

		Example				
		N9	-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 135				
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		
		More potentiometers on request!				
H	Hall-Potentiometer	E14811	0,5...2,5...4,5 V / 4,5...2,5...0,5 V			
Special model						
X	Special / customer specified					

1



Molex Micro-Fit 3.0

Suited for conductor cross-section 0,1 til 0,75 mm²

S001	Male housing 4-pole
S002	Male housing 6-pole
S003	Male housing 8-pole
S004	Male housing 10-pole
S005	Male housing 12-pole
S006	Male housing 14-pole
S007	Male housing 18-pole
S008	Male housing 24-pole



S009	Female housing 4-pole
S010	Female housing 6-pole
S011	Female housing 8-pole
S012	Female housing 10-pole
S013	Female housing 12-pole
S014	Female housing 14-pole
S015	Female housing 18-pole
S016	Female housing 24-pole



Deutsch DTM

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

S017	Male housing 4-pole
S018	Male housing 6-pole
S019	Male housing 8-pole
S020	Male housing 10-pole
S021	Male housing 12-pole



S022	Female housing 4-pole
S023	Female housing 6-pole
S024	Female housing 8-pole
S025	Female housing 10-pole
S026	Female housing 12-pole



Deutsch DT

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

S027	Male housing 4-pole
S028	Male housing 6-pole
S029	Male housing 8-pole
S030	Male housing 10-pole
S031	Male housing 12-pole



S032	Female housing 4-pole
S033	Female housing 6-pole
S034	Female housing 8-pole
S035	Female housing 10-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
S038	Male housing CPC 17 14-pole
S039	Male housing CPC 23 37-pole



S040	Female housing CPC 13 9-pole
S041	Female housing CPC 17 14-pole
S042	Female housing CPC 23 37-pole



AMP Mini-Universal MATE-N-LOK

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

- S043 Male housing 4-pole
- S044 Male housing 6-pole
- S045 Male housing 8-pole
- S046 Male housing 10-pole
- S047 Male housing 16-pole



- S048 Female housing 4-pole
- S049 Female housing 6-pole
- S050 Female housing 8-pole
- S051 Female housing 10-pole
- S052 Female housing 16-pole



Phoenix

Suited for conductor cross-section til 1,5 mm²

- S053 Male housing IC 2,5 8-pole with screw terminal
- S054 Male housing IC 2,5 12-pole with screw terminal
- S055 Male housing IC 2,5 14-pole with screw terminal
- S056 Male housing IC 2,5 18-pole with screw terminal



- S057 Female housing MSTB 2,5 8-pole with screw terminal
- S058 Female housing MSTB 2,5 12-pole with screw terminal
- S059 Female housing MSTB 2,5 14-pole with screw terminal
- S060 Female housing MSTB 2,5 18-pole with screw terminal



Standard contact-arrangement for master switch

Type **MS11** Form



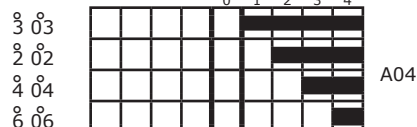
Type **MS12** Form



Type **MS13** Form



Type **MS14** Form



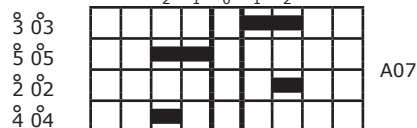
Type **MS21** Form



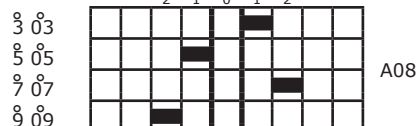
Type **MS22** Form



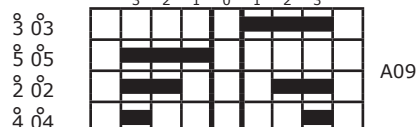
Type **MS212** Form



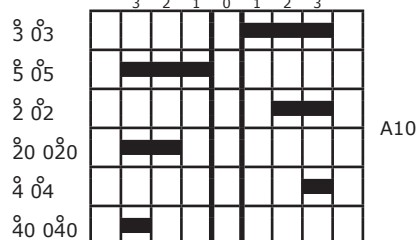
Type **MS222** Form



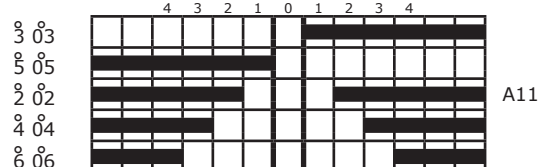
Type **MS23** Form



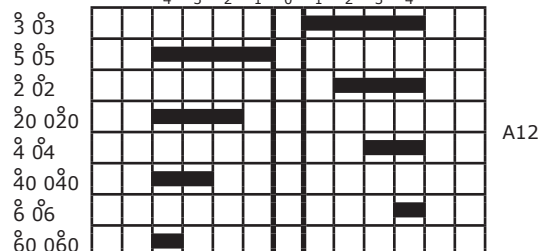
Type **MS213** Form



Type **MS24** Form



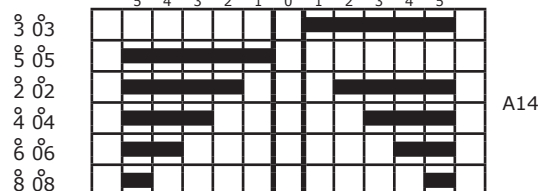
Type **MS214** Form



Type **MS224** Form



Type **MS25** Form



Type **MS26** Form



Type **MS0** Form



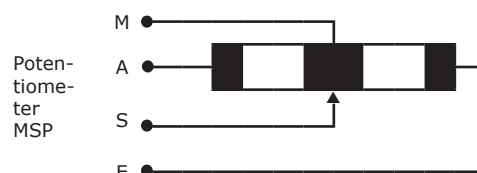
Zero contact NC

Type **MS0** Form

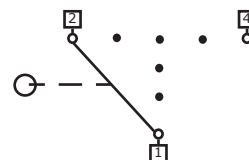


Zero contact NO

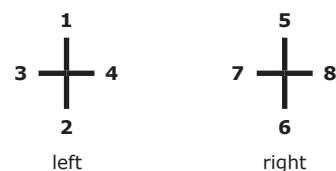
Type **MS0** Form



Micro change over
contact for control
handle with dead
man's button signal button
push button



contact 5 05 = direction 1/4/5/8
contact 3 03 = direction 2/3/6/7



Deflection directions designated
DIN 15025

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			Breaker		
		I= current made, Ic= current broken Ie= rated operational current, U= voltage before make Ue= rated operational voltage Ur= recovery voltage T 0,95= time in ms, to reach 95% of the steady-state current. P= UE · Ie= steady-state power consumption in watts	I — Ie	U — Ue	cos	Ic — Ie	Ur — Ue	cos
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
			I — Ie	U — Ue	t 0,95	Ic — Ie	Ur — Ue	t 0,95
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 S6 N61 N62	VV6 DD64	V11	V5 S2-S23	VV5 SS2-SS21
Rated isolation voltage Ui in Volt	250	250	250	250	250
Rated operational voltage Ue in Volt	250	250	250	250	250
Rated operational current in Ampere	Ie AC 12 6 or 16 6 or 16 6 or 16 10				10
	AC 15 2	4 2	4 2	4 2	2
	DC 12 24 V 6	8 6	8 6	8 4	4
	48 V 2	4 2	4 2	4 2	2
	110 V 0,5	1 0,5	1 0,5	1 0,2	0,2
	220 V 0,1	0,5 0,1	0,5 0,1	0,5 0,1	0,1
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	9L 6 6	16 6 16 6	6 6 16 6	16 10 16 10	10 10
Circuit-breaker G-characteristic					
Terminal screws Plug-in connector CAGE CLAMP® connection is a registered trademark of WAGO Kontakttechnik GmbH Germany	M 3,5 2,5 mm²	M 3,5 2,5 mm²	M 3,5 2,5 mm²	M 3,5 6,3 x 0,8	M3,5 6,3 x 0,8
Conductor sizes in mm² 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				

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	Protection deposits of dust	Protection splashing of water
IP65	Protection complete of dust	Protection hosed of water
IP66	Protection complete of dust	Protection hosed strong of water

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

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	le 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 4	4	4	6	16	6
Circuit-breaker G-characteristic	4	4	4	6	16	6
Terminal screws Plug-in connector CAGE CLAMP® connection is a registered trademark of WAGO Kontakttechnik GmbH Germany	Solder terminal			M4 1,5 mm²	M 3,5 6,3 x 0,8	6,3 x 0,8
Conductor sizes in mm² 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	Protection deposits of dust			Protection splashing of water	
	IP65	Protection complete of dust			Protection hosed of water	
	IP66	Protection complete of dust			Protection hosed strong of water	

Potentiometer with attach to our switching device

for mounting on	Typ	Capacity (W)	Imax 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	☐	x	x	x	x	x		524004400	☐	characteristic progressive *1 R= 2 x 6,5 kOhm
	T132	2,5	10	P05	☐	x	x	x	x	x		524000500	☐	
	T132 Öl	2,5	10	P06	☐	x	x		x	x		524000600	☐	
	T178	1,5	10	P07	☐		x	x	x			524000700	☐	
	T238	1	10	P08	☐	x	x	x	x	x*1		524000800	☐	
	T133	60	85	P10	☐	x						524001000	☐	
	T396	0,5	1	P13	☐	x	x	x	x	x		524001300	☐	
	T1350 Ex	0,5	1	P14	☐	x	x	x	x	x		524001400	☐	
	T1360			P43							x	5240043009		
V8 / VV8 D8 P10 P11 P12	T239	1	10	P17	☐			x	x			524001700	☐	with direction lines
	T301	0,5	1	P18	☐		x	x	x	x		524001800	☐	
	T426	0,5	1	P19	☐				x	x		524001900	☐	
	T432	0,5	1	P20	☐				x			524002000	☐	
	T246	0,5	1	P21	☐	x	x		x	x		524002100	☐	
	T362	0,5	1	P22	☐		x	x	x			524002200	☐	
	T1003			P42							x	5240042009		
	T1360			P43							x	5240043009		
V10 S1 Palm handle	T321	1	10	P24	☐		x					524002400	☐	with direction lines
	T320	0,5	1	P25	☐		x		x			524002500	☐	
	T430	0,5	1	P27	☐				x			524002700	☐	
	T375	0,5	1	P37	☐		x		x			524003700	☐	
	T997			P41							x	5240041009		
V11	T316	1	10	P31	☐				x*2			524003100	☐	*2 R= 2 x 4 kOhm
	T365	0,5	1	P32	☐				x	x		524003200	☐	
D3 S3	T318	0,5	1	P48	☐				x			524004800	☐	

for mounting on	Typ	Capacity (W)	Imax 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	☐	x	x	x	x	x	524004600	☐	
	T131	2,5	10	P03	☐	x	x	x	x	x	524000300	☐	
	T131 Oil	2,5	10	P04	☐		x		x	x	524000400	☐	
	T134	60	85	P11	☐				x		524001100	☐	
	T374	0,5	1	P12	☐	x	x	x	x	x	524001200	☐	
V8 / VV8 /D8 P10/P11/P12	T244	0,5	1	P23	☐			x	x	x	524002300	☐	
	T397	0,5	1	P47	☐		x	x	x		524004700	☐	
V10 / S1 Palm grip	T337	0,5	1	P26	☐		x	x	x	x	524002600	☐	
GE1/GE2	PW70	5	30	P45	☐	x	x		x		524004500	☐	

Hall-Potentiometer HG 2

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

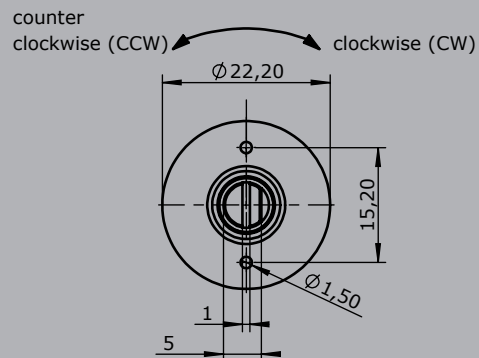
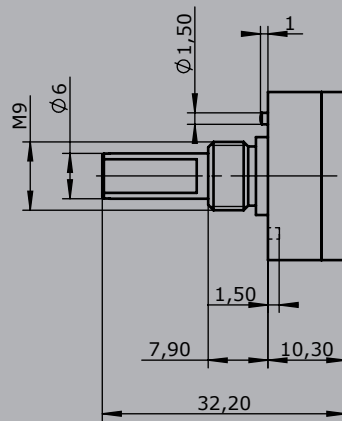
Technical data

Mechanical life	10 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP67

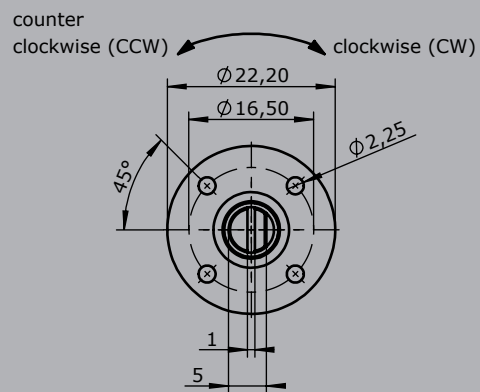
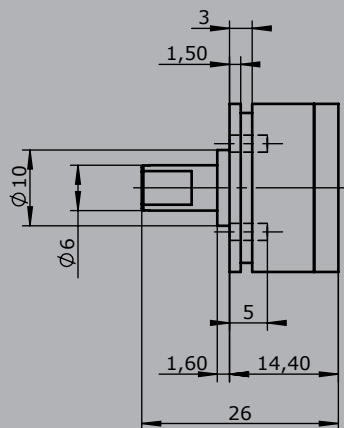


	HG2A	-60	-6	-E14811	-X
<i>Example</i>					
Basic unit					
HG2A	Hall-Potentiometer HG2 Model A				
HG2B	Hall-Potentiometer HG2 Model B				
Operating distance					
0-359° possible					
Example 60° => 60					
Dead zone around the center position					
0	No dead zone				
Example +/-3° => 6					
Interface					
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			
Special model					
X		Special / customer specified			

HG2A



HG2B



Opto-electronic encoder Output digital OEC 2 with attach to our switching device

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

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

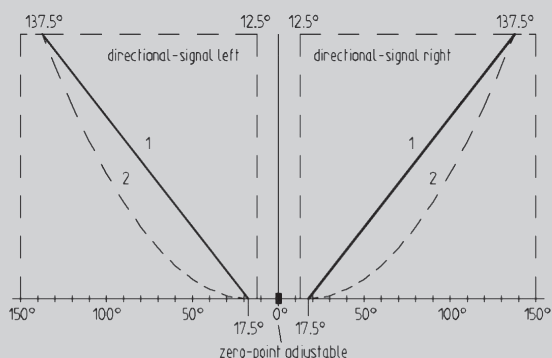
8-Bit-type T359

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

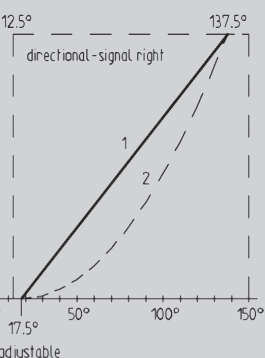
9 Bit-type T384

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 digital OEC 2 with attach to our switching device

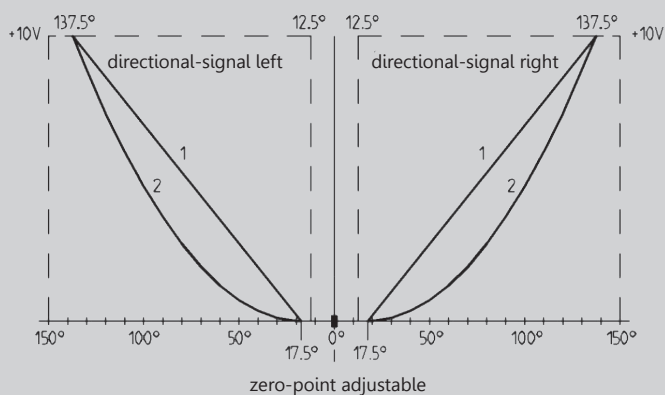
Opto-electronical encoder OEC 2 with voltage output

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

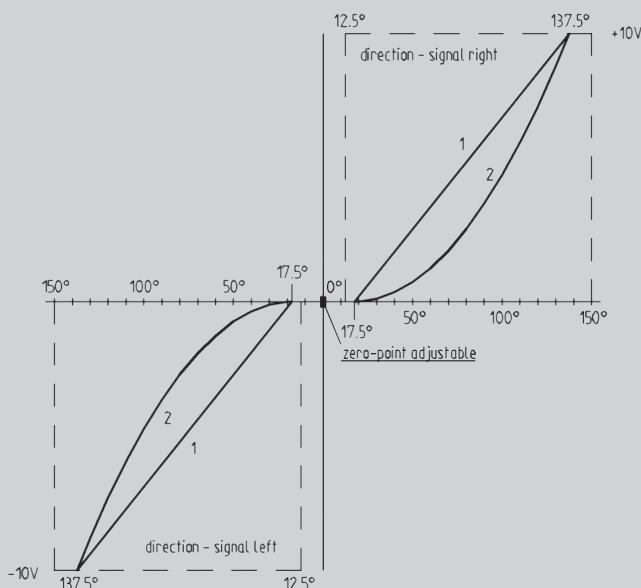
Voltage output

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

6 Bit-type T366



6 Bit-type T367



Opto-electronic encoder Output digital OEC 2 with attach to our switching device

Opto-electronical encoder OEC 2 with current output

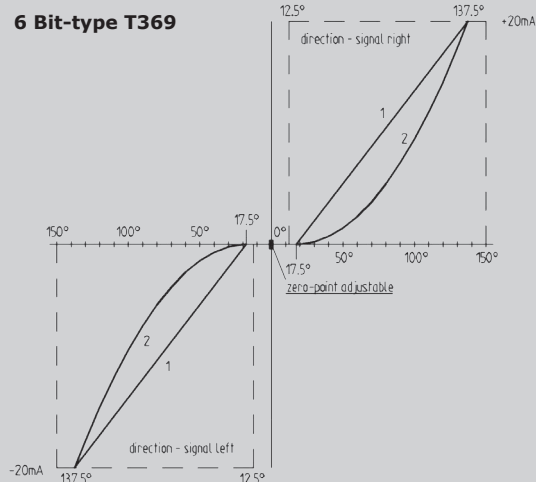
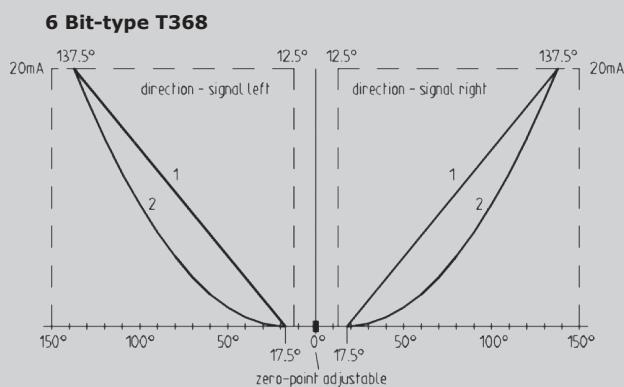
Power supply	18 - 30 V DC				
Scanning	6 Bit Gray-Code				
Rotation angle	Max. +/-150°				
Output current	20...4...20 mA T368	Output characteristic linear	OEC 2-3-1-5	C191	410 g
	20...4...20 mA T368	Output characteristic quadratic	OEC 2-3-2-5	C192	410 g
	20...0...20 mA T368	Output characteristic linear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



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

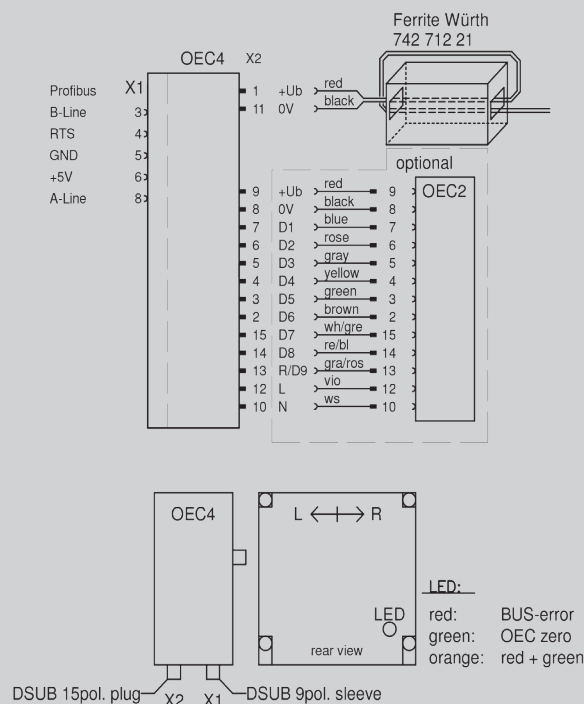
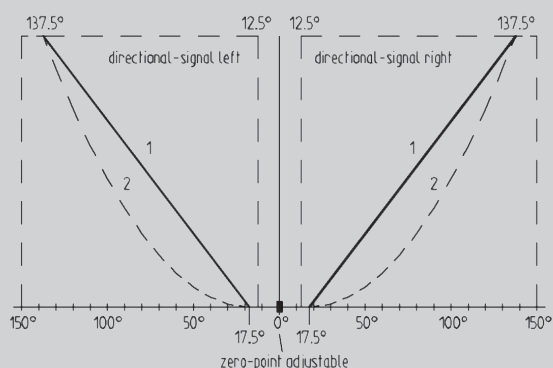
The OEC 2 is able for mounting on V6,VV6/D64,DD64/V11/S2,SS2/S6/N6. For mounting a potentiometer mounting option (P) of the respective controller is required!

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.



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



Example

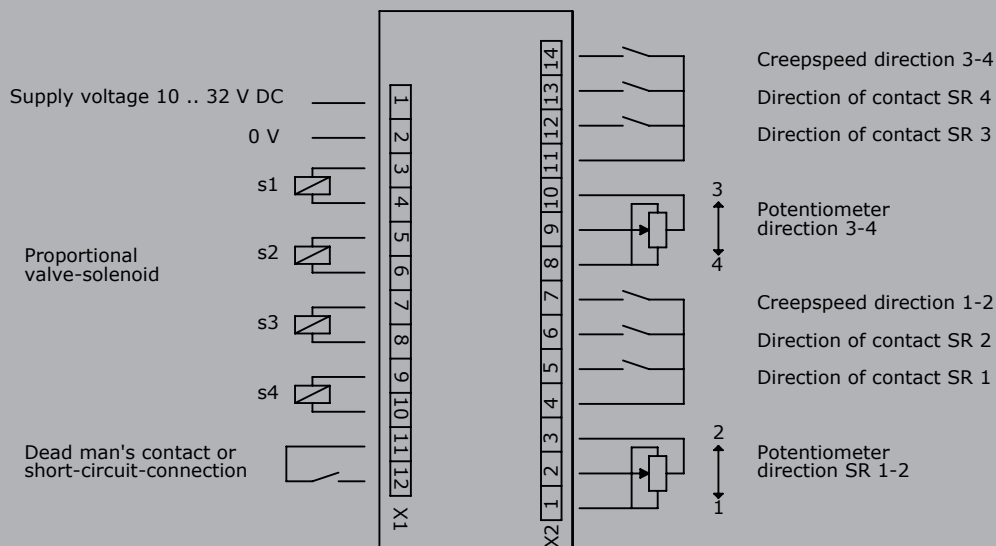
Technical data:

- Supply voltage		10...	32 V DC
- 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	-20°C to +60°C		
- Storage temperature	-40°C to +80°C		

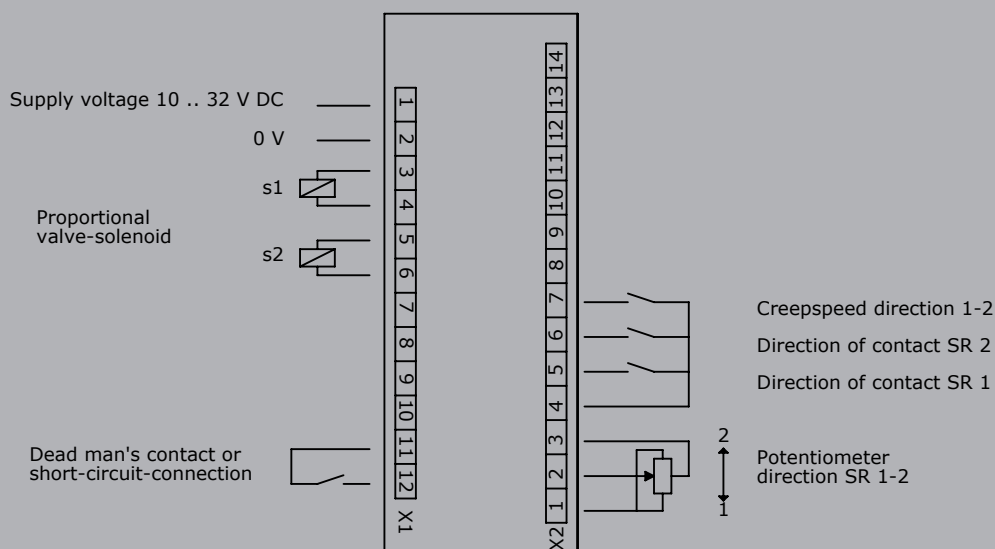
Electronic control unit for 4 proportional valves solenoid ES/43-10

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



Palm grip MATRIX with attach to our switching device

Controllers	Palm grip																				
	B1	B2	B3	B5	B6	B7 / B8	B9	B10	B14 / B15	B20	B22	B23	B24	B25	B28	B29	B30	B31	B32	B33	B34
V6 / VV6	X	X	X*1	X	X			X	X		X		X		X		X		X	X	X
V11	X			X	X			X	X		X		X		X		X		X	X	X
V8 / VV8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
V85 / VV85	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
V25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
V24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
V14 / S14				X	X						X								X*2	X	
D64 / DD64								X													
D8								X													
D3								X													
S2 / SS2				X																	
S22 / SS22				X																	
S21 / SS21				X	X			X			X		X		X	X	X		X	X	X
S26				X																	
V27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

*1 deflection limited to 28°

*2 only with adapter installation plate (installation from the top)

Hall-push button HD

The hall-push button impressed by its durability and versatility. It is available in three 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 +80°C
Operation temperature	-50°C til +80°C
Degree of protection	IP67



2

		Example						
		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							
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							
Actuator colour								
1	Transparent							
2	Black*							
*Only possible by unlighted push button!								
Icon platelets								
1	White transparent*							
2	White							
3	Yellow							
4	Green							
5	Blue							
6	Black							
7	Red							
8	Orange							
*Print on back side possible, thereby the print is resistant to abrasion!								

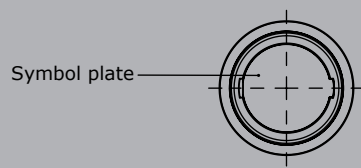
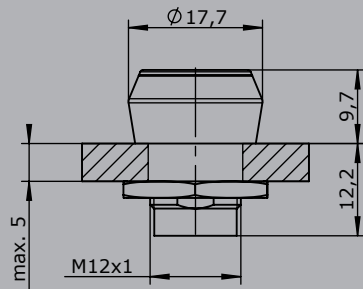
Hall-push button

HD

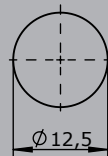
		HD1	-2	-1	-1	-1	-E0111	-X
Symbol								
1	Without							
2	Buzzer							
3	Arrow up							
4	Arrow down							
5	Turtle							
6	Rabbit							
X	Custom-made							
Interface								
E0101	Push button signal not redundant $U_b=4,5 - 5,5$ V DC							
E0111	Push button signal redundant $U_b=4,5 - 5,5$ 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 SPS							
	2 Power switch (Open Drain) $I_{Hallmax}= 25$ mA							
Special model								
X	Special / customer specified							

Hall-push button HD

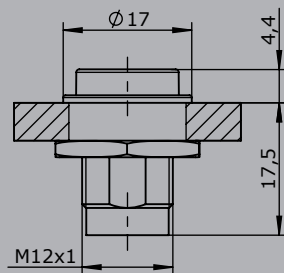
Edition:
HD1



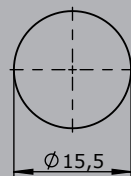
Hole pattern



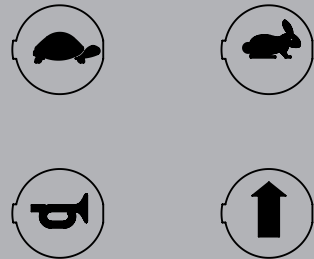
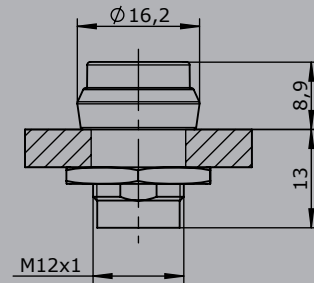
Edition:
HD3



Hole pattern



Edition:
HD2



Palm grip B25



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC 13 (*1 0,1A 24 V DC13)

	B25L	-2D	W	K	SE	V21	H13	-X
Basic unit								
B25L	Palm grip left							
B25R	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 148)							
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white							
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white							
W	Rocker switch R-R, Colour: red, black, yellow, blue, white							
K	Lever switch							
SR	Sliding switch R-O-R							
ST	Slide switch T-0-T							
SE	Sensor button capacitive with external control electronics							
S	Sensor button capacitive without external control electronics							
	(Consistent with V85 / VV85 and V25 with interface E3xx + E4xx + E5xx + E6xx)							
V	Vibration							
Analog actuating element								
S12	Hall-Thumb rocker (see page 97)							
	Output 0,5...2,5...4,5 V inverse dual							
V21	Hall-minijoystick (see page 42)							
	Output 0,5...2,5...4,5 V inverse dual							
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

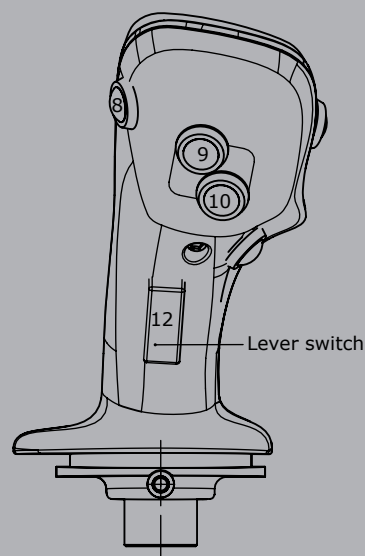
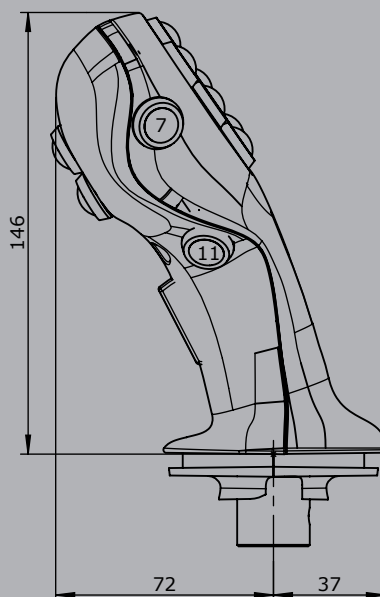
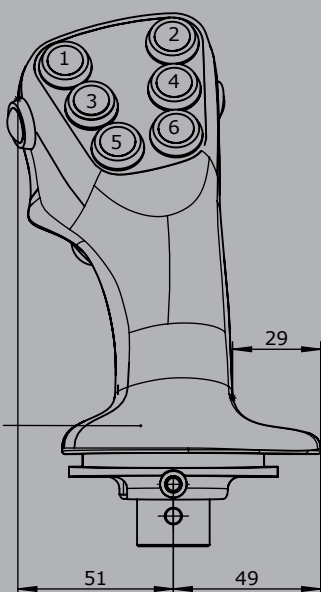
Technical details may vary based on configuration or application! Technical data subject to change without notice!

B25R

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

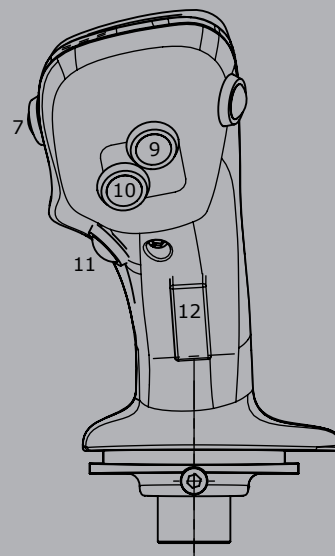
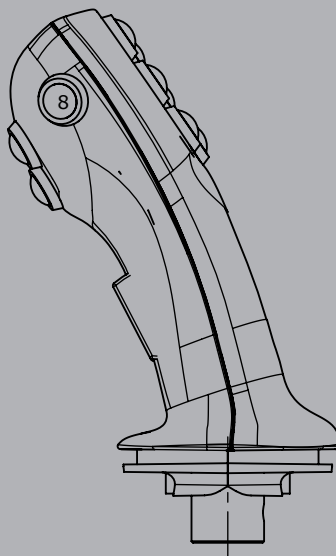
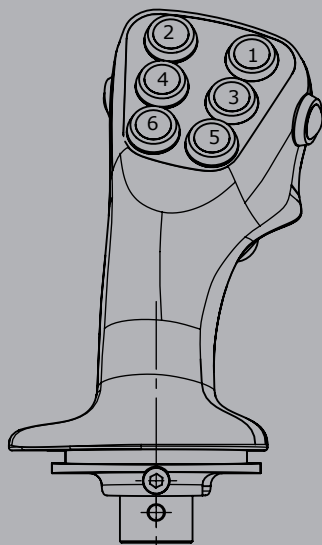
Rocker switch
installed Pos. 9+10 possible

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

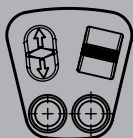


Edition: B25R
Rocker switch installed Pos. 3+1
Rocker switch installed Pos. 2+4

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 B30



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

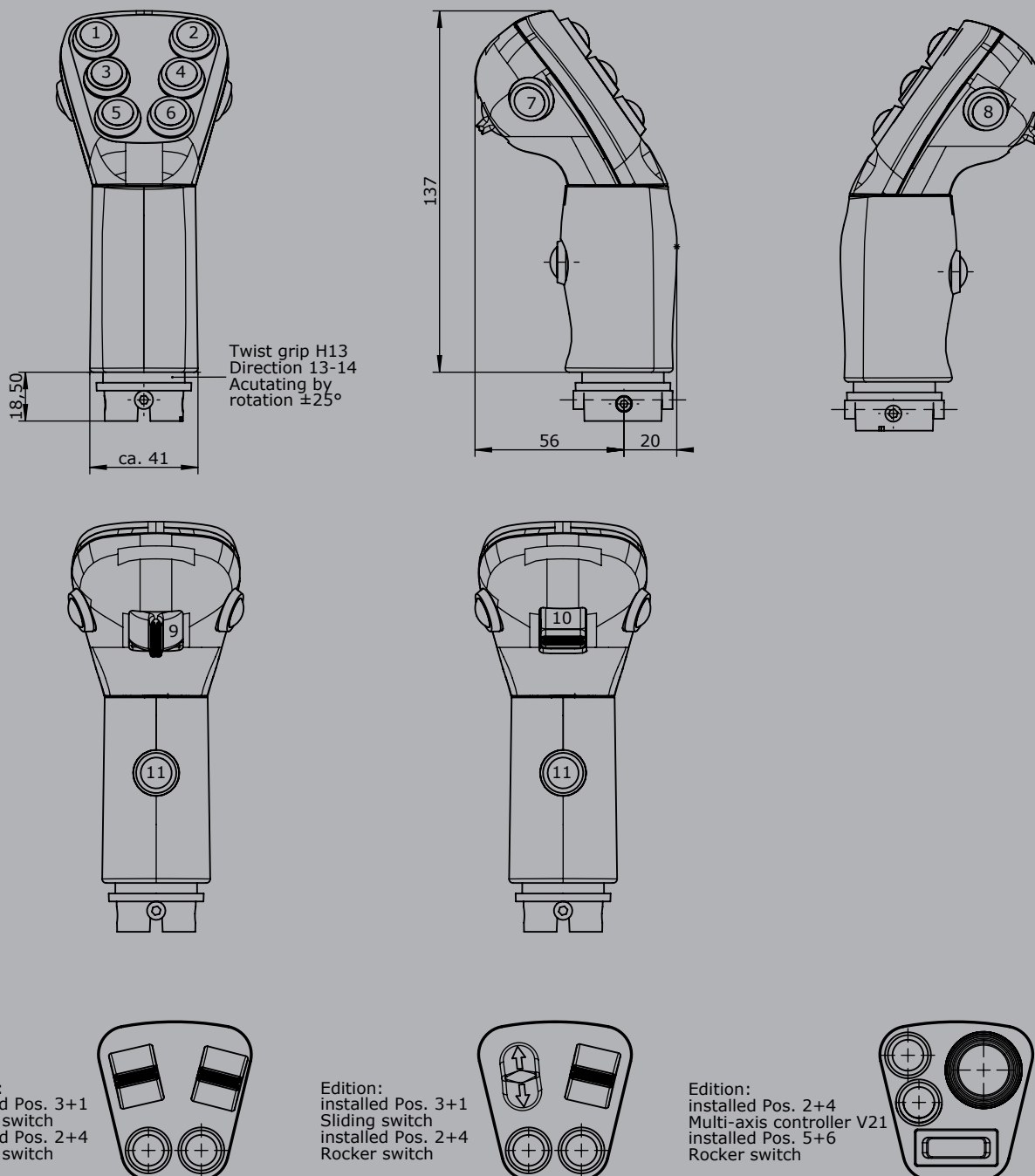
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC 13 (*1 0,1A 24 V DC13)



		Example						
		B30	-2D	W	SR	SE	S12	H13
Basic unit		B30						
Digitale actuating element								
D	Push button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange							
HD	Hall-push button (see page 148)							
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white							
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white							
W	Rocker switch R-R, Colour: red, black, yellow, blue, white							
SR	Sliding switch R-O-R							
ST	Slide switch T-0-T							
SE	Sensor button capacitive with external control electronics							
S	Sensor button capacitive without external control electronics (Consistent with V85 / VV85 and V25 with interface E3xx + E4xx + E5xx + E6xx)							
Analog actuating element								
S12	Hall-Thumb rocker (see page 97) Output 0,5...2,5...4,5 V inverse dual							
V21	Hall-minijoystick (see page 42) Output 0,5...2,5...4,5 V inverse dual							
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



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)



		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 and V25 with interface E3xx + E4xx + E5xx + E6xx)								
V	Vibration								

Example

2

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

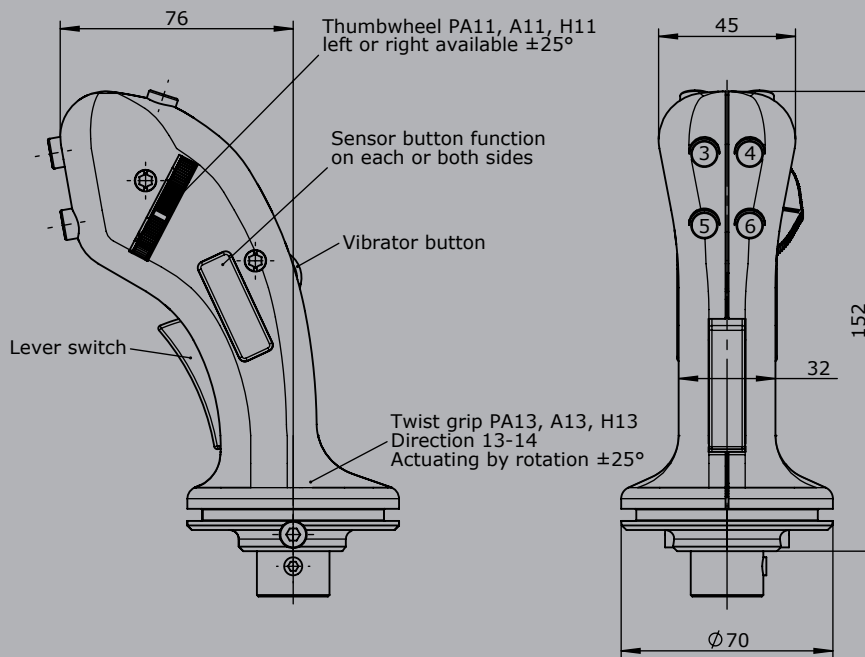
Special model

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

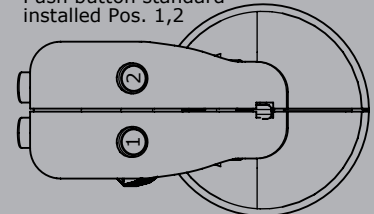
Attachments

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

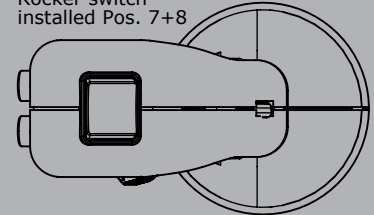
B3



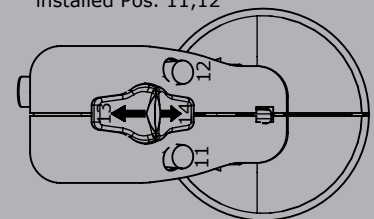
Edition:
Push button standard
installed Pos. 1,2



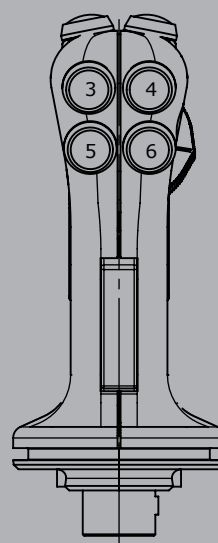
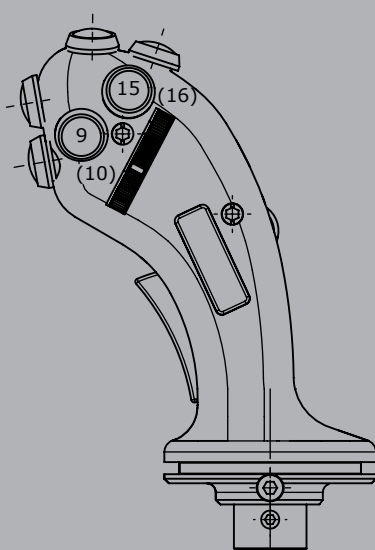
Edition:
Rocker switch
installed Pos. 7+8



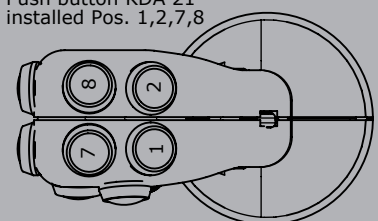
Edition:
Sliding switch
installed Pos. 13 + 14
Drive with potentiometer PA12 bzw.
Push button with 2 steps ZD
installed Pos. 11,12



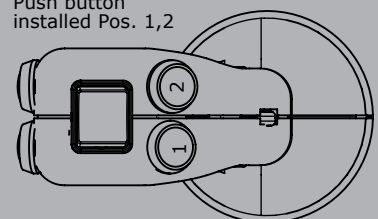
() = Installation right



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 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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)



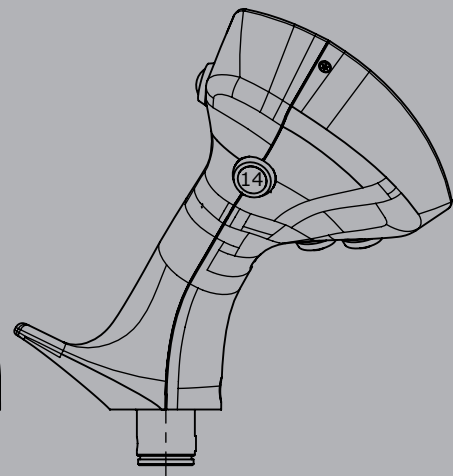
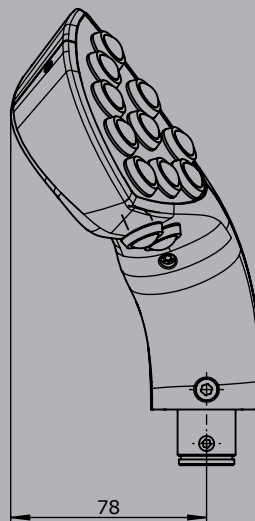
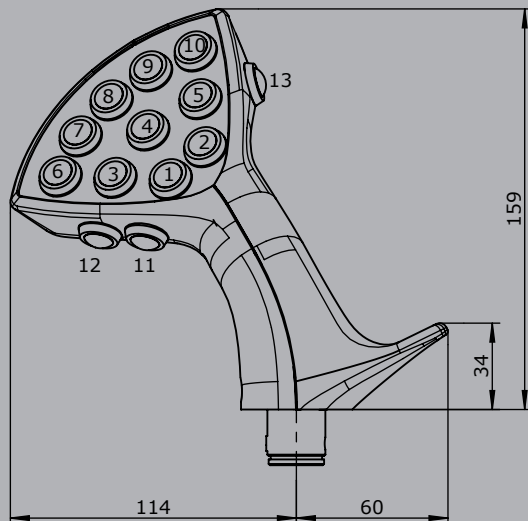
Example

	B31R	-2D	W	KT	S12	V21	-X
Basic unit							
B21R	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 148)						
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white						
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white						
W	Rocker switch R-R, Colour: red, black, yellow, blue, white						
KT	Cross switch T-0-T / T-0-T						
Analog actuating element							
S12	Hall-Thumb rocker (see page 97)						
	Output 0,5...2,5...4,5 V inverse dual						
V21	Hall-minijoystick (see page 42)						
	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 LED`s)						
Protocol	CANOpen CiA DS 301 or SAE J1939						
Baud rate	20 kBit/s to 1 Mbit/s (standard 250 kBit/s)						
Output value	255...0...255						
CAN						E311 1	
- 4 analog joystick axis							
- 24 digital joystick functions							
Additional with 16 LED-outputs							2
Special model							
X	Special / customer specified						

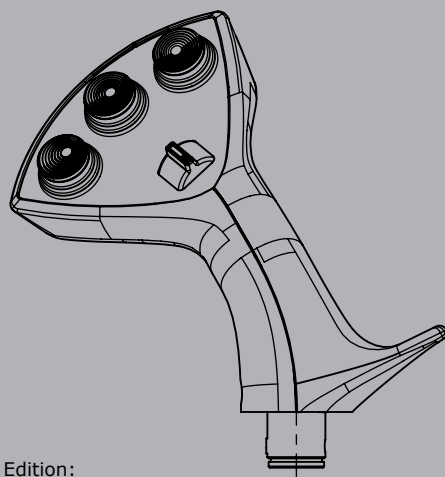
Technical details may vary based on configuration or application! Technical data subject to change without notice!

B31

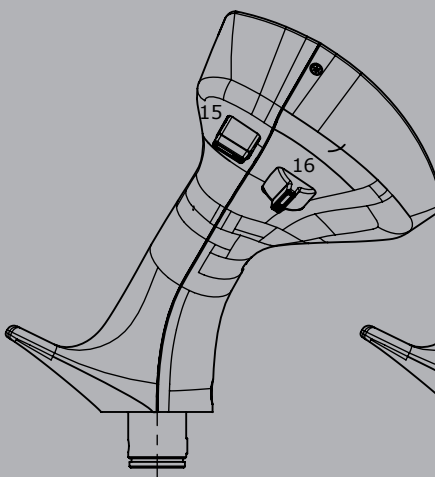
Edition:
Push button installed Pos. 1-14



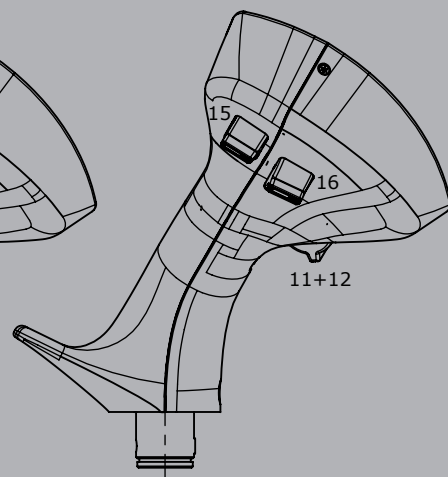
Edition:
Multi-axis controller V21
installed Pos. 6+7, Pos.8, Pos. 9+10
Rocker switch installed Pos. 1+2



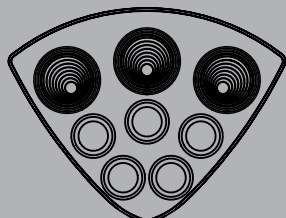
Edition:
Rocker switch
installed Pos. 15, 16 horizontal



Edition:
Rocker switch
installed Pos.11+12, 15, 16 vertical



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



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC 13 (*1 0,1A 24 V DC13)



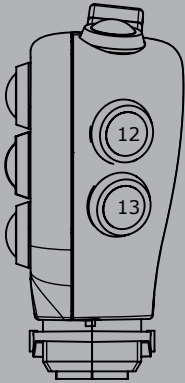
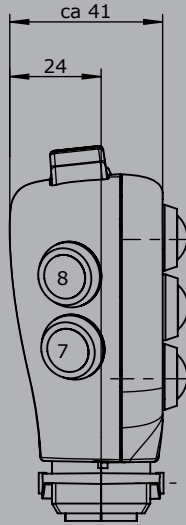
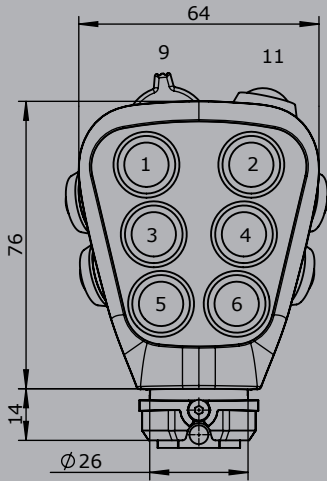
2

		B32L	Example -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 148)						
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white						
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white						
W	Rocker switch R-R, Colour: red, black, yellow, blue, white						
SE	Sensor button capacitive with external control electronics						
S	Sensor button capacitive without external control electronics (Consistent with V85 / VV85 and V25 with interface E3xx + E4xx + E5xx + E6xx)						
Analog actuating element							
S12	Hall-Thumb rocker (see page 97) Output 0,5...2,5...4,5 V inverse dual						
V21	Hall-mini joystick (see page 42) Output 0,5...2,5...4,5 V inverse dual						
Special model							
X	Special / customer specified						

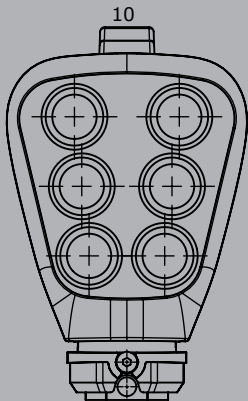
Technical details may vary based on configuration or application! Technical data subject to change without notice!

B32

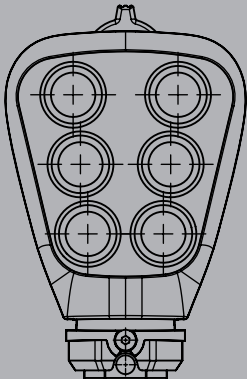
Push button
installed Pos. 1 - 8, 11 - 13
Rocker switch
installed Pos. 9



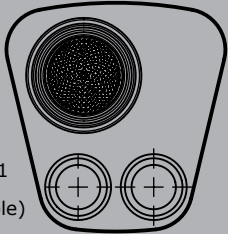
Push button
installed Pos. 1 - 8, 12 + 13
Rocker switch lengthwise
installed Pos. 10



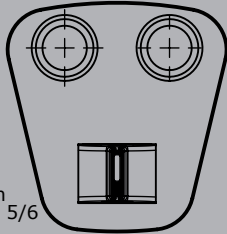
Rocker switch crosswise
installed Pos. 10



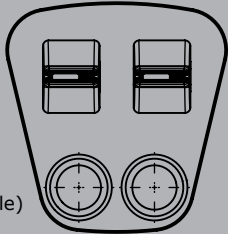
Edition:
Multi-axis controller V21
installed Pos. 1/3
(Pos. 9 - 11 not available)



Edition:
Rocker switch
installed Pos. 5/6



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



Palm grip B33



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	*1 0,1A 24 V DC13

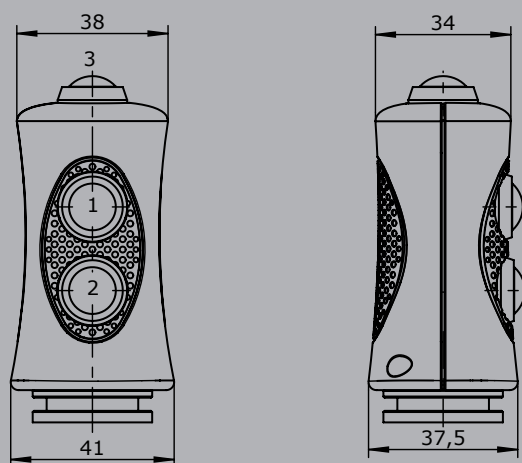
NEW
available from June 2018



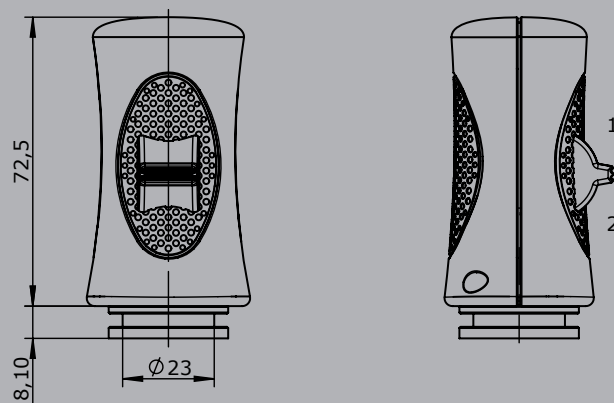
	B33L	-2D	S12	-X
Basic unit				
B32L Palm grip left				
B32R Palm grip right				
Digitale actuating element				
D Push button KDA21 *1				
Colour: red, black, yellow, green, blue, white, orange				
HD Hall-push button (see page 148)				
Analog actuating element				
S12 Hall-Thumb rocker (see page 97)				
Output 0,5...2,5...4,5 V inverse dual				
Special model				
X Special / customer specified				

B33

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



Edition:
Rocker switch installed Pos. 1+2



Palm grip B34



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC 13 (*1 0,1A 24 V DC13)



B34L -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 157)
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white
W	Rocker switch R-R, Colour: red, black, yellow, blue, white
K	Lever switch

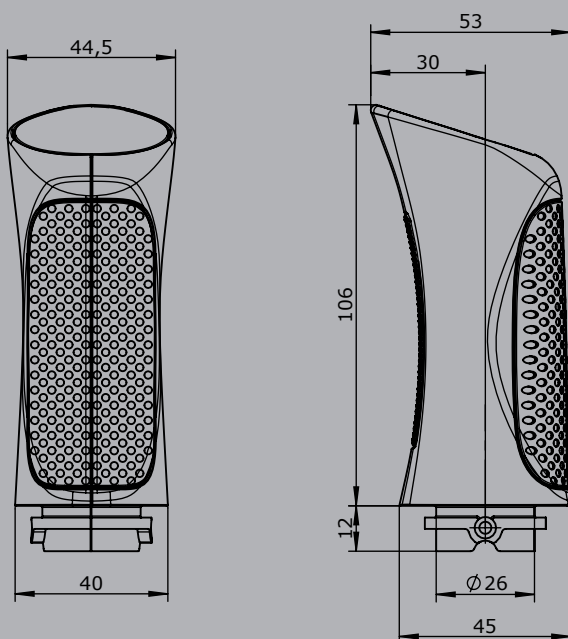
Analog actuating element

S12	Hall-Thumb rocker (see page 97) Output 0,5...2,5...4,5 V inverse dual
-----	--

Special model

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

B34



Edition:

Push button installed Pos. 1-3

Rocker switch installed Pos. 4-5

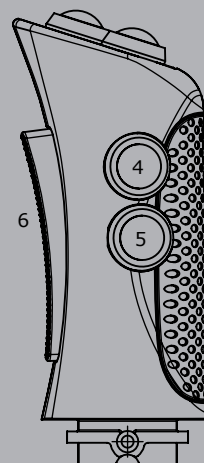
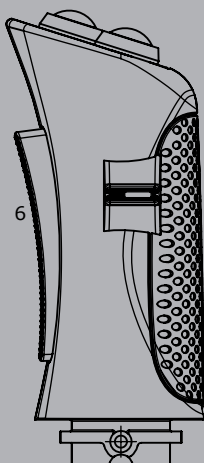
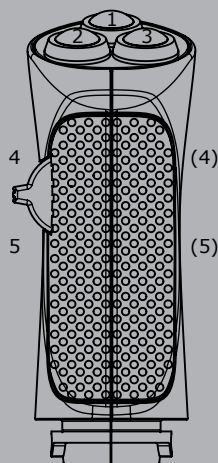
Lever switch installed Pos. 6

Position rocker switch or push button left hand ()

Edition:

Push button installed Pos. 1-3,4,5

Lever switch installed Pos. 6



Palm grip 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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)

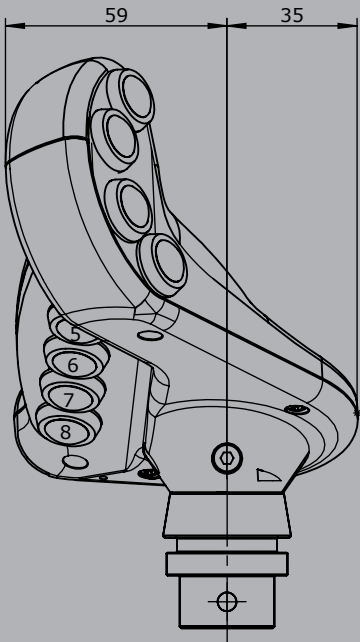
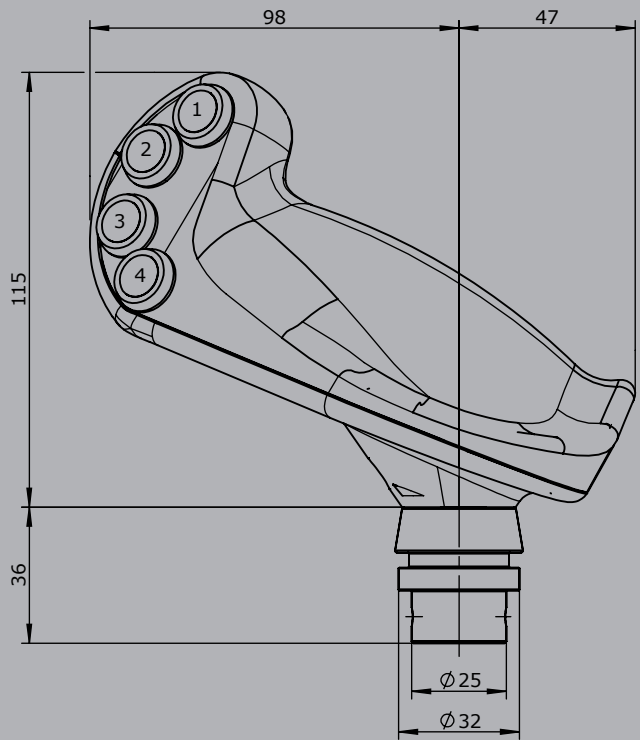
2

		Example				
		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					
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white					
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white					
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white					
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white					
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white					
W	Rocker switch R-R, Colour: red, black, yellow, blue, white					
Analog actuating element						
S12	Hall-Thumb rocker (see page 97)					
	Output 0,5...2,5...4,5 V inverse dual					
V21	Hall-mini joystick (see page 42)					
	Output 0,5...2,5...4,5 V inverse dual					
Special model						
X	Special / customer specified					

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

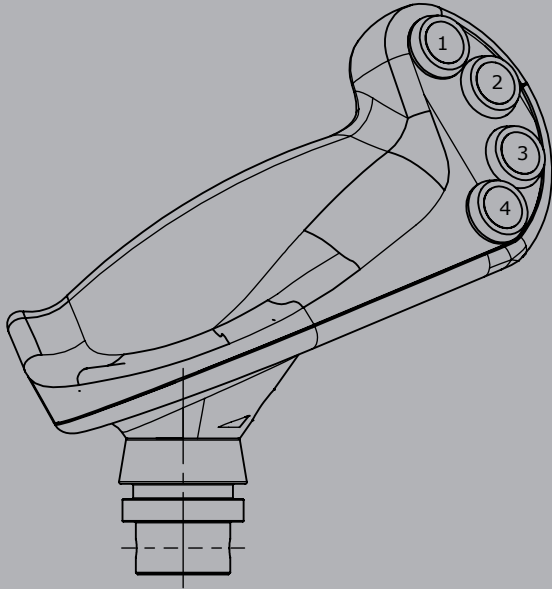
B23R

Push button installed Pos. 1 - 8

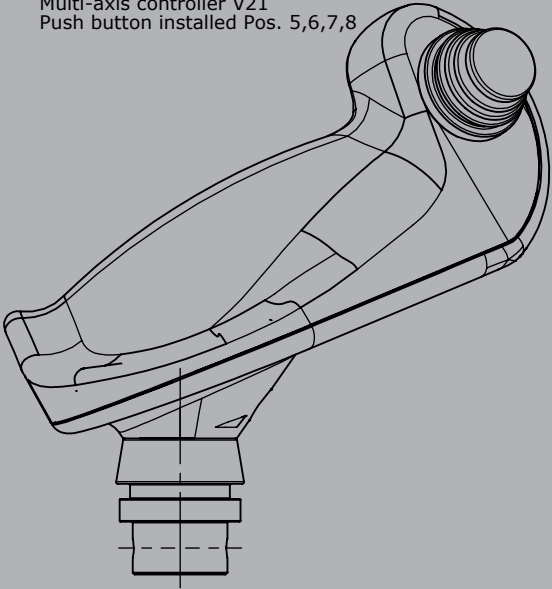


B23L

Push button installed Pos. 1 - 8



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



Palm grip 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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)

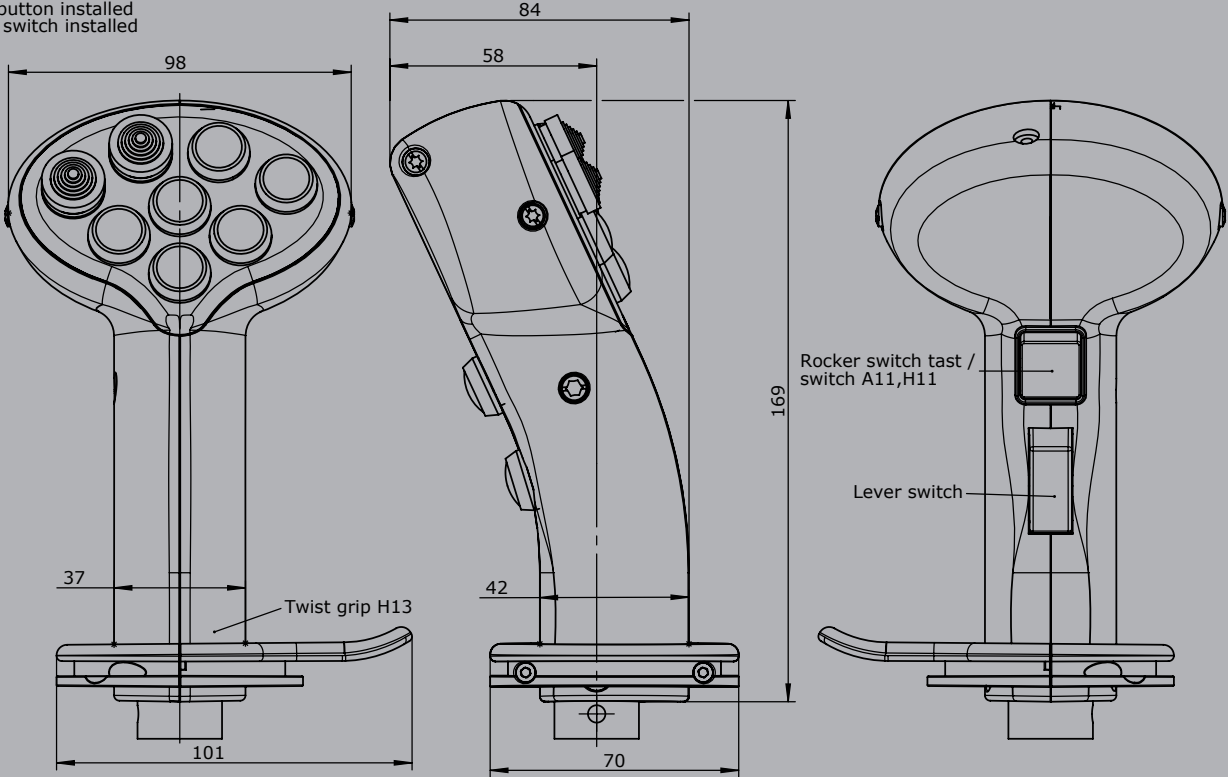


Example

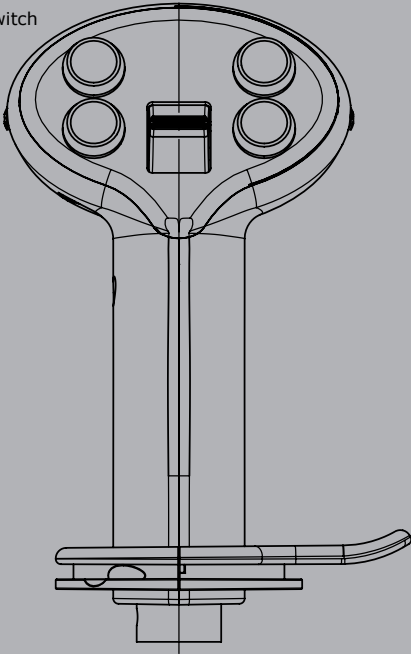
	B20L	-2D	W	K	V21	H13	-X
Basic unit							
B20L	Palm grip left with hand pad						
B20R	Palm grip right with hand pad						
Digital actuating element							
D	Push button KDA21 *1						
	Colour: red, black, yellow, green, blue, white, orange						
HD	Hall-push button (see page 148)						
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white						
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white						
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white						
W	Rocker switch R-R, Colour: red, black, yellow, blue, white						
K	Lever switch						
KT	Cross switch T-0-T / T-0-T						
SE	Sensor button capacitive with external control electronics						
S	Sensor button capacitive without external control electronics						
	(Consistent with V85 / VV85 and V25 with interface E3xx + E4xx + E5xx + E6xx)						
Analog actuating element							
S12	Hall-thumb rocker (see page 97)						
	Output 0,5...2,5...4,5 V inverse dual						
V21	Hall-minijoystick (see page 42)						
	Output 0,5...2,5...4,5 V inverse dual						
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		

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

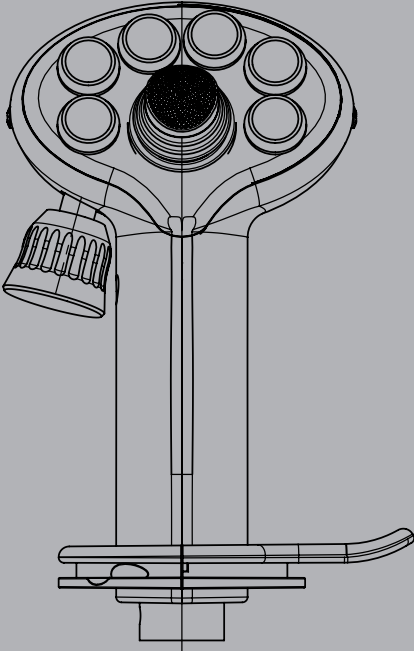
Edition:
Push button installed
Cross switch installed



Edition:
Hall rocker switch
Push button



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



Palm grip

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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5 24 V DC13 (*1 0,1A 24 V DC13)

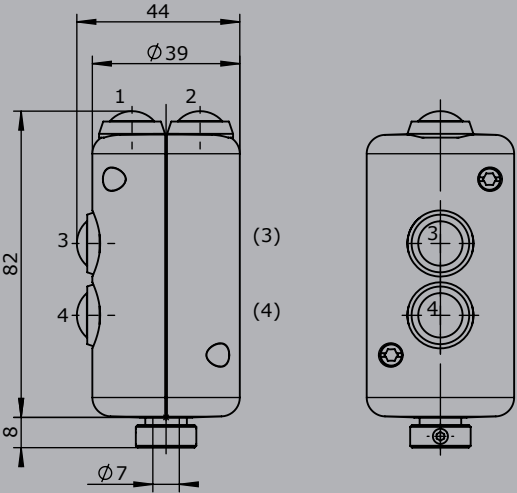


		B22AL	Example -4D	W	-X
Basic unit					
B22L	Palm grip left				
B22R	Palm grip right				
B22AL	Palm grip left with support				
B22AR	Palm grip right with support				
Digital actuating element					
D	Push button KDA21 *1				
	Colour: red, black, yellow, green, blue, white, orange				
W*	Rocker switch T-0-T				
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 and V25 with interface E3xx + E4xx + E5xx + E6xx)				
Special model					
X	Special / customer specified				

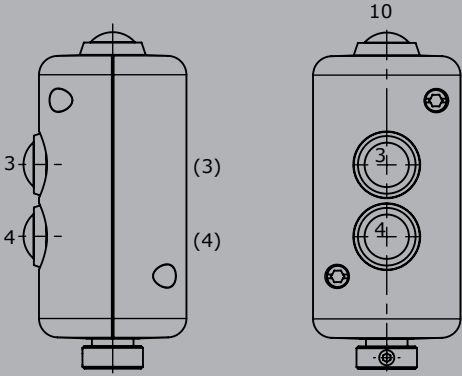
Technical details may vary based on configuration or application! Technical data subject to change without notice!

B22

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

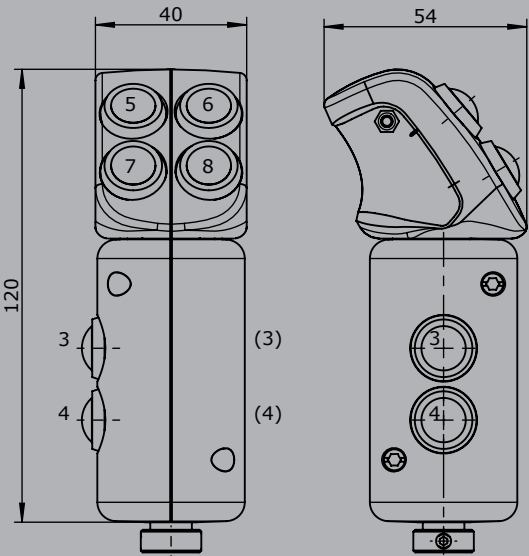


Edition:
Push button installed Pos. 3,4,10
Position push button left hand ()

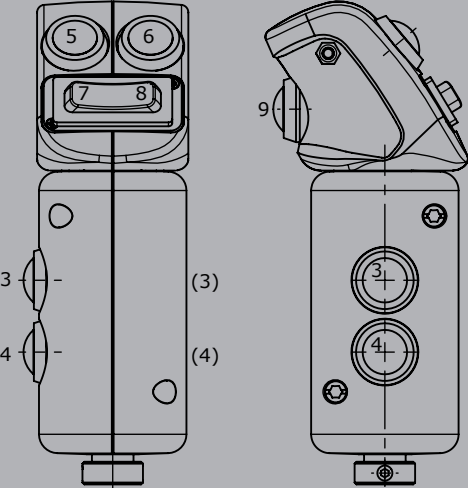


B22A

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 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

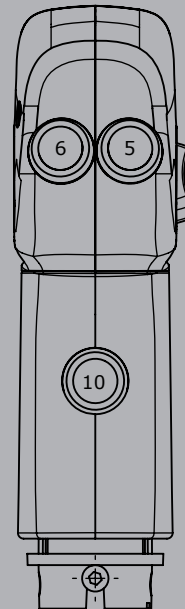
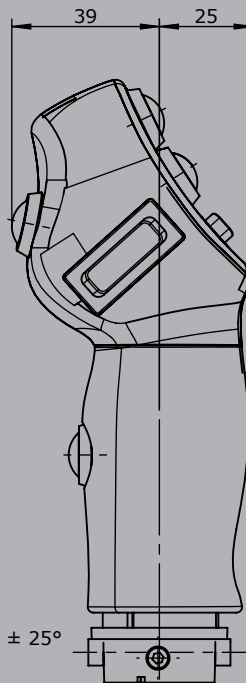
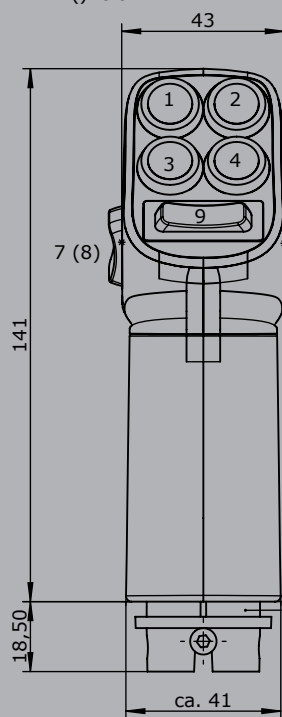
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)



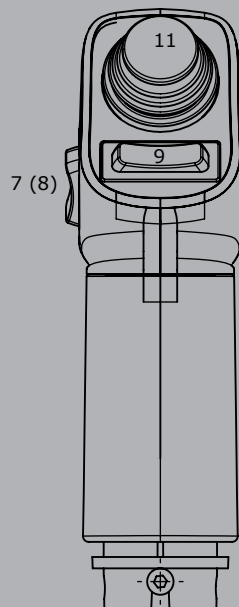
	B24	-D	Example 2W	V21	-IWH	-X
Basic unit						
B24	Palm grip					
Digital actuating element						
D	Push button KDA21 *1 Colour: red, black, yellow, green, blue, white, orange					
W	Rocker switch T-0-T					
W	Rocker switch 0-T					
W	Rocker switch R-0-T					
W	Rocker switch R-0-R					
W	Rocker switch 0-R					
W	Rocker switch R-R					
SE	Sensor button capacitive with external control electronics					
S	Sensor button capacitive without external control electronics (Consistent with V85 / VV85 and V25 with interface E3xx + E4xx + E5xx + E6xx)					
Analog actuating element						
V21	Hall-minijoystick (see page 42) Output 0,5...2,5...4,5 V inverse dual					
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					

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

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 B9



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC13



Example

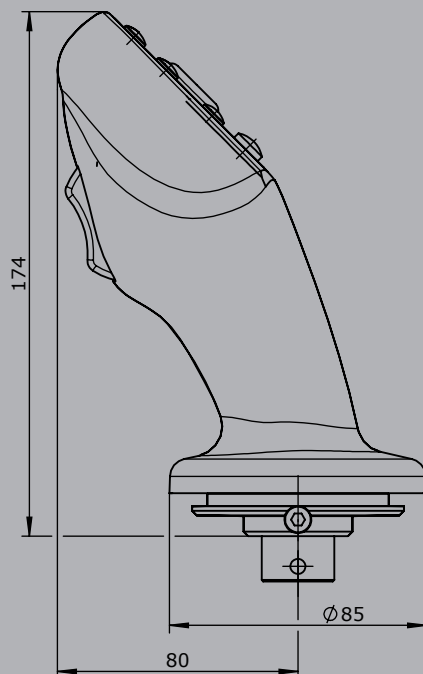
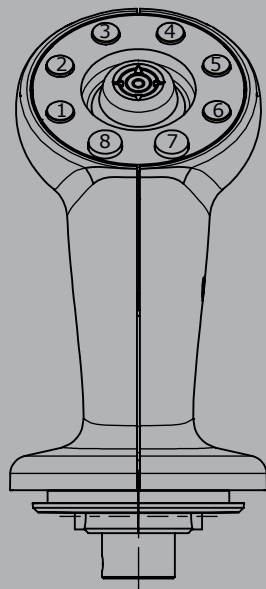
	B9	-2D	KT	A13	PA11	PA13	-X
Basic unit							
B9 Palm grip							
Digital actuating element							
D Push button Colour: red, black, yellow, green, blue, white							
KT Cross switch T-0-T / T-0-T							
KR Cross switch R-0-R / R-0-R							
A11 Rocker switch T-0-T Pos. 11 + 12							
A11 Rocker switch R-0-R Pos. 11 + 12							
A13 Rotary grip T-0-T							
Analog actuating element							
V21 Hall-minijoystick (see page 42) Output 0,5...2,5...4,5 V inverse dual							
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							
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!

Palm grip B9

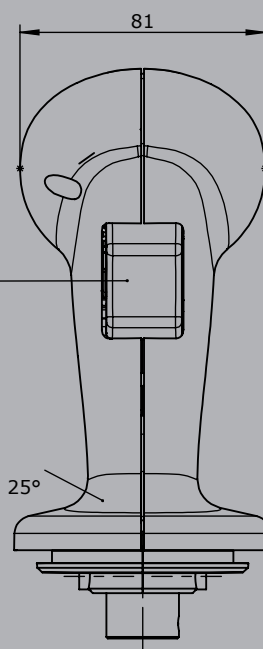
B9

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

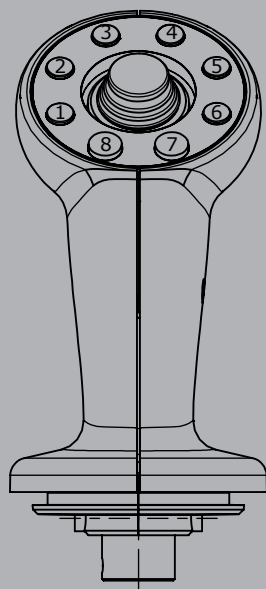


Rocker PA11, A11, H11
Direction 11-12

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



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



Palm grip

B7 / B8



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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)



		Example						
		B7	-2D	W	K	SE	S9	PA13
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							
W	Rocker switch T-0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch 0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch R-0-T, Colour: red, black, yellow, blue, white							
W	Rocker switch R-0-R, Colour: red, black, yellow, blue, white							
W	Rocker switch 0-R, Colour: red, black, yellow, blue, white							
W	Rocker switch R-R, Colour: red, black, yellow, blue, white							
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 and V25 with interface E3xx + E4xx + E5xx + E6xx)							
V	Vibrator							
	Impulse 24 V DC ED 100%							
Analog actuating element								
S12	Hall-thumb rocker (see page 97)							
	Output 0,5...2,5...4,5 V inverse dual							
V21	Hall-minijoystick (see page 42)							
	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							

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

Palm grip

B7 / B8

B7 -2D W K SE S9 PA13 -X

Special model

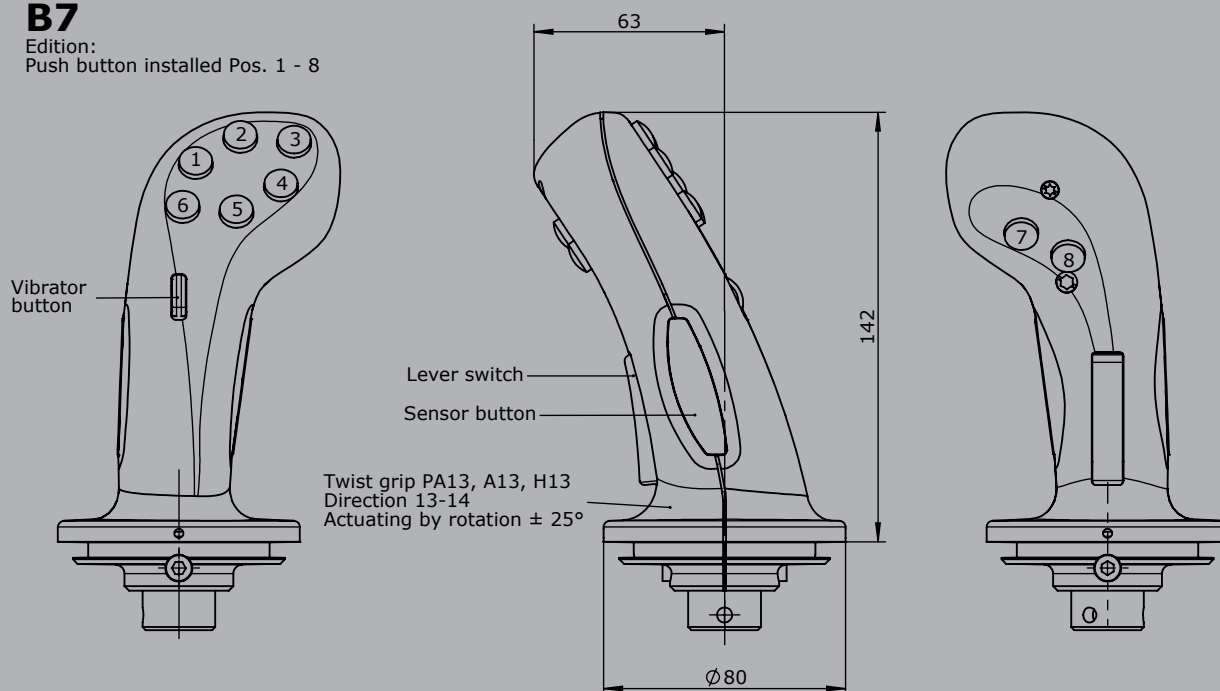
X Special / customer specified

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

B7

Edition:
Push button installed Pos. 1 - 8

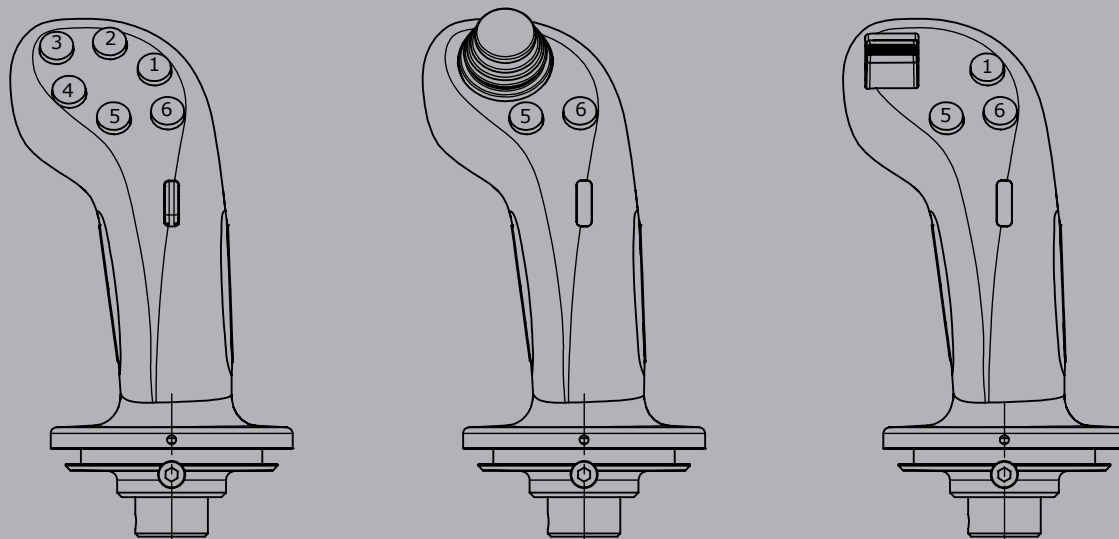


B8

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



Palm grip

B1



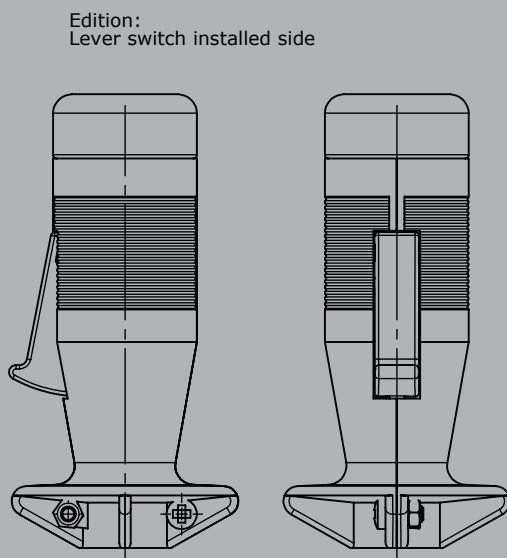
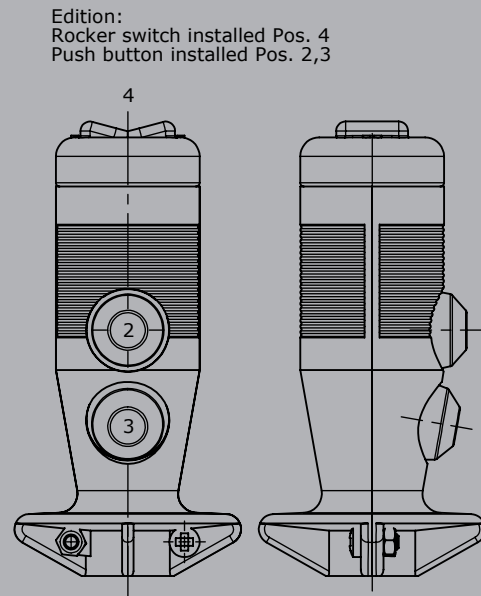
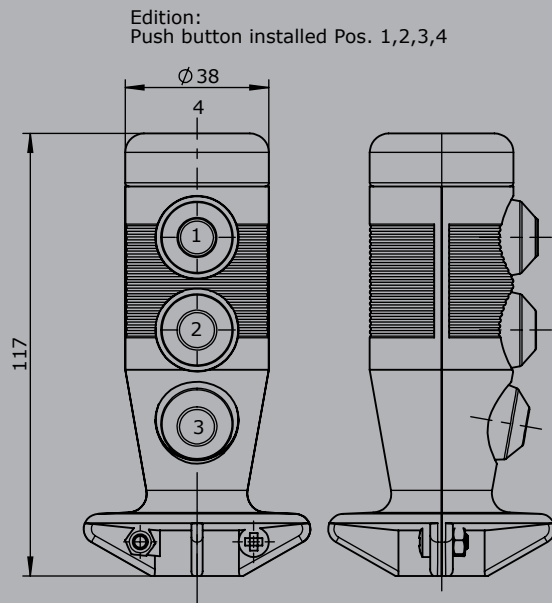
The palm grip B1 has different equipment options for many requirements. It is compatible with our multi-axis controller or mounted on hydraulic drives. The palm grip has a highly flexible cable (4 respectively 8 x 0,25 mm², 450 mm long). The mounting piece can be supplied with a tapped hole M10 (standard)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

Technical data

Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°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				



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

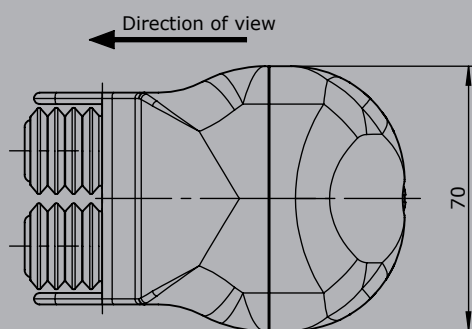
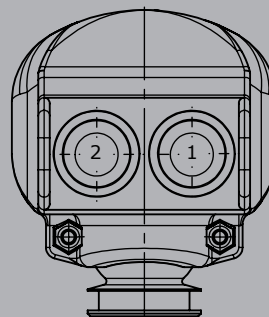
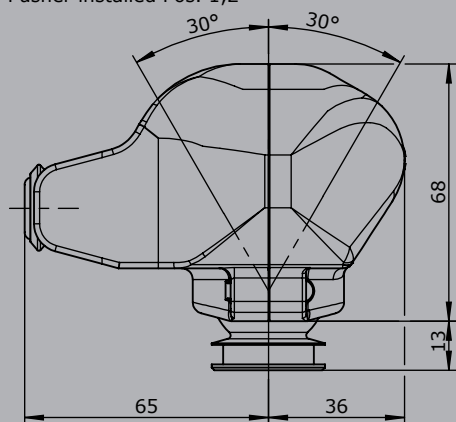
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)



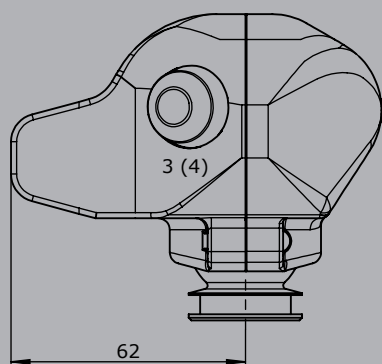
		Example			
		B2	-2D	PA15	-X
Basic unit					
B2	Palm grip				
Digital actuating element					
D	Push button KDA/70				
D	Push button KDA21 *1				
	Colour: red, black, yellow, green, blue, white, orange				
A15	2 push button Pos. 1 + 2 interlocked				
Analog actuating element					
PA15	Push button analog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

B2

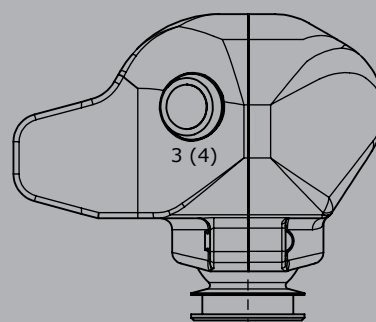
Edition:
Pusher installed Pos. 1,2



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



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



Palm grip 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.

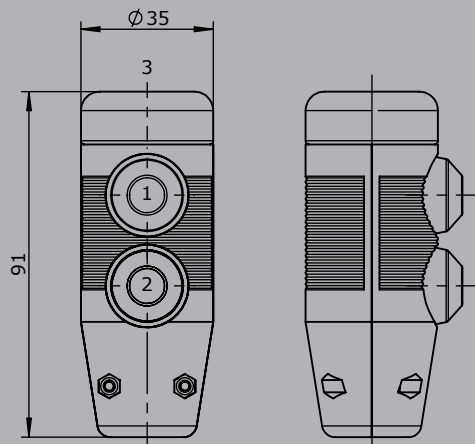
Technical data

Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54
Contact complement	3A 24 V DC13 (*1 1,5A 24 V DC13)

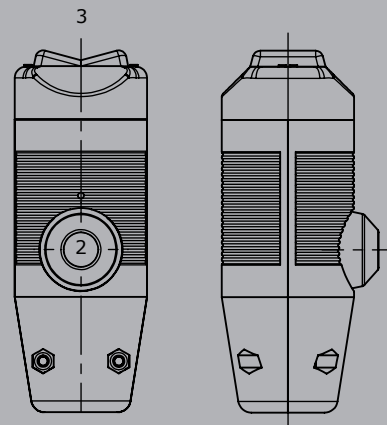


	Example	B5	-2D	W	-X
Basic unit					
B5	Palm grip				
Digital actuating element					
D	Push button top				
D	Push button side *1				
W	Rocker switch top T-0-T				
W	Rocker switch top R-0-T				
W	Rocker switch top R-0-R				
T	Push button top mechanical operation <i>(Only possible in combination with multi-axis controller or single-axis controller!)</i>				
Special model					
X	Special / customer specified				

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



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



Palm grip

B6



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

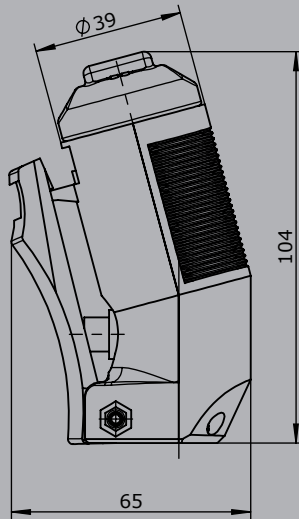
Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54
Contact complement	1,5A 24 V DC13



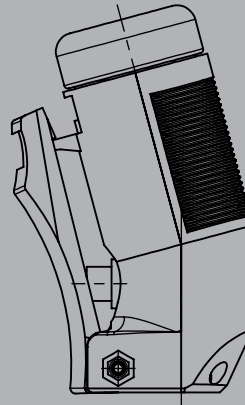
	B6	-2D	K	-X
Basic unit				
B6 Palm grip				
Digital actuating element				
D Push button top				
W Rocker switch top T-0-T				
W Rocker switch top R-0-T				
W Rocker switch top R-0-R				
K* Lever switch				
* Included with the delivery of palm grip B6!				
Special model				
X Special / customer specified				

B6

Edition:
Lever switch side
Rocker switch installed top



Edition:
Lever switch side
Push button top



Palm grip B28



The palm grip B28 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 10 mm (standard).

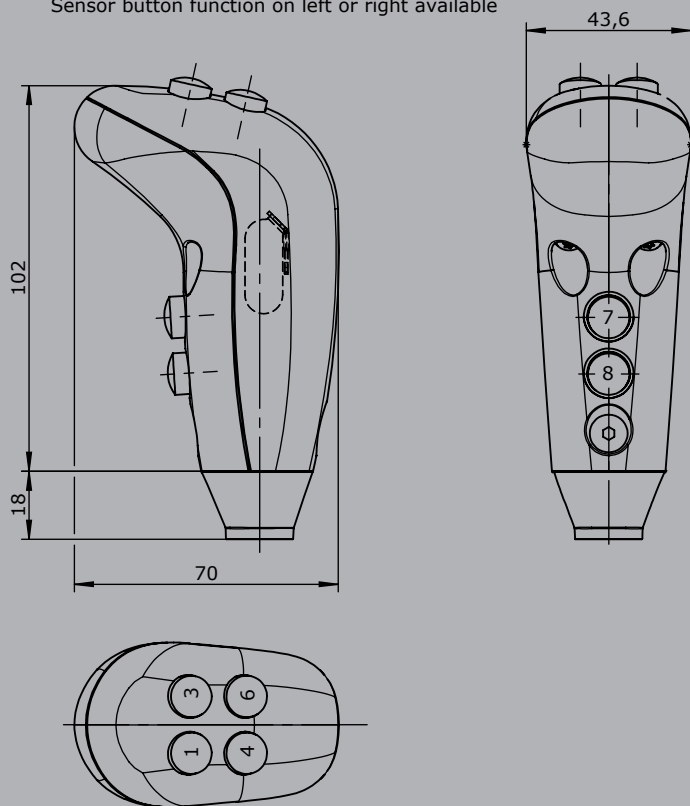
Technical data

Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54

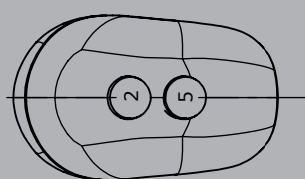


		Example			
		B28	-2D	SE	-X
Basic unit					
B28	Palm grip				
Digital actuating element					
D	Push button (1,5A 24 V DC13)				
	Colour: red, black, yellow, green, blue, grey				
SE	Sensor button capacitive with external control electronics				
S	Sensor button capacitive without external control electronics				
	(Consistent with V85 / VV85 and V25 with interface E3xx + E4xx + E5xx + E6xx)				
Special model					
X	Special / customer specified				

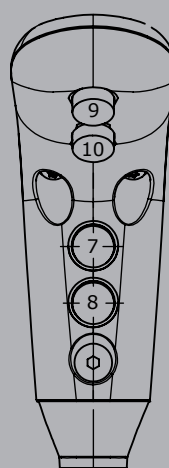
Edition:
Push button installed
Pos. 1,3,4,6,7,8
Sensor button function on left or right available



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 B29



The palm grip B29 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.

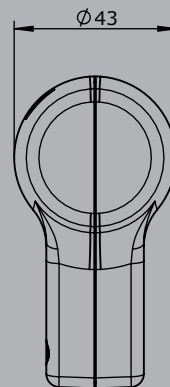
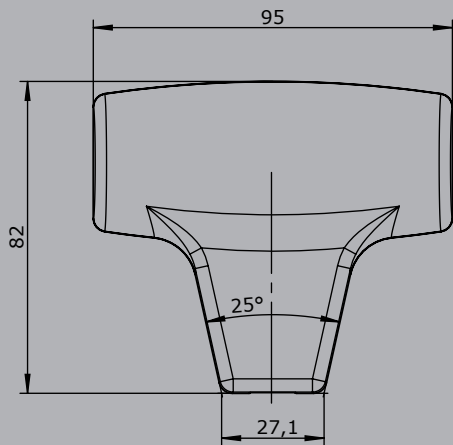
Technical data

Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	0,1A 24 V DC13

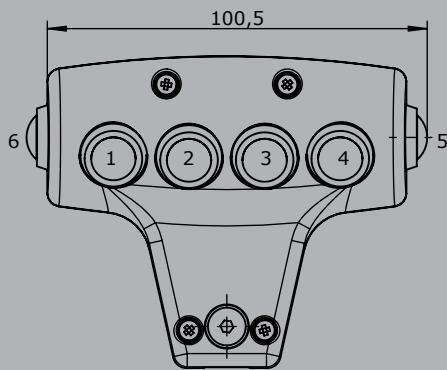


		Example		
		B29	-2D	-X
Basic unit				
B29	Palm grip			
Digital actuating element				
D	Push button KDA21			
	Colour: red, black, yellow, green, blue, white, orange			
SE	Sensor button capacitive with external control electronics			
S	Sensor button capacitive without external control electronics			
	(Consistent with V85 / VV85 and V25 with interface E3xx + E4xx + E5xx + E6xx)			
Special model				
X	Special / customer specified			

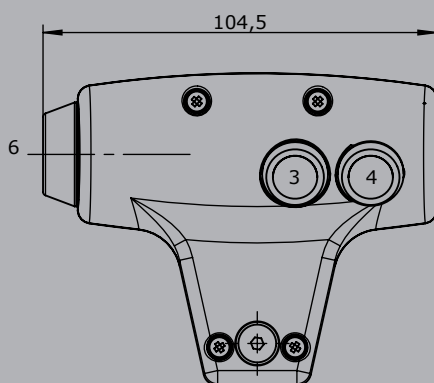
B29



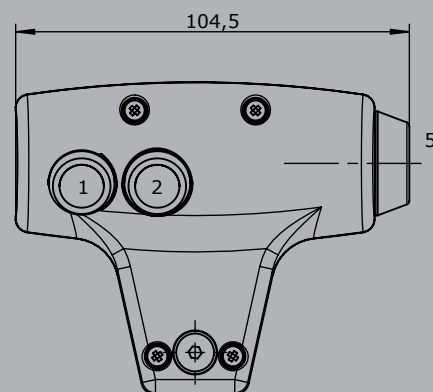
Edition:
Push button installed Pos. 1-6



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



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



Palm grip

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.

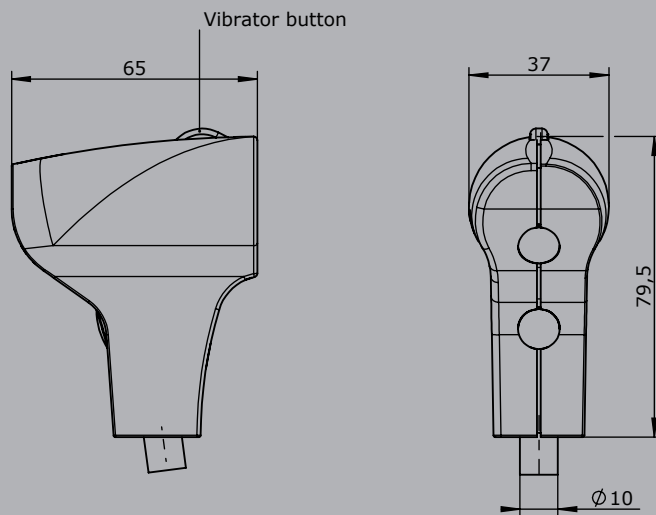
Technical data

Operating temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	1,5A 24 V DC13 (*1 0,1A 24 V DC13)



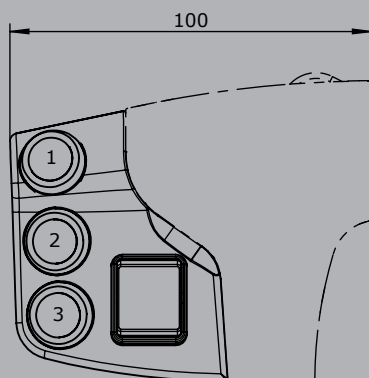
		Example				
		B10AL	-3D	W	V	-X
Basic unit						
B10L	Palm grip left					
B10R	Palm grip right					
B10AL	Palm grip left with growing part					
B10AR	Palm grip right with growing part					
Digital actuating element						
D	Push button KDA21 *1					
	Colour: red, black, yellow, green, blue, white, orange					
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

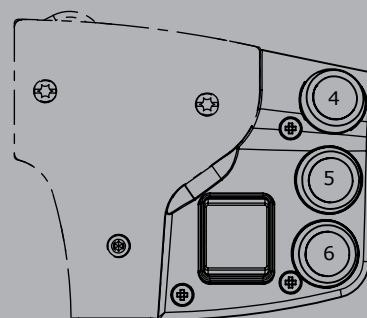


B10A

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



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



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

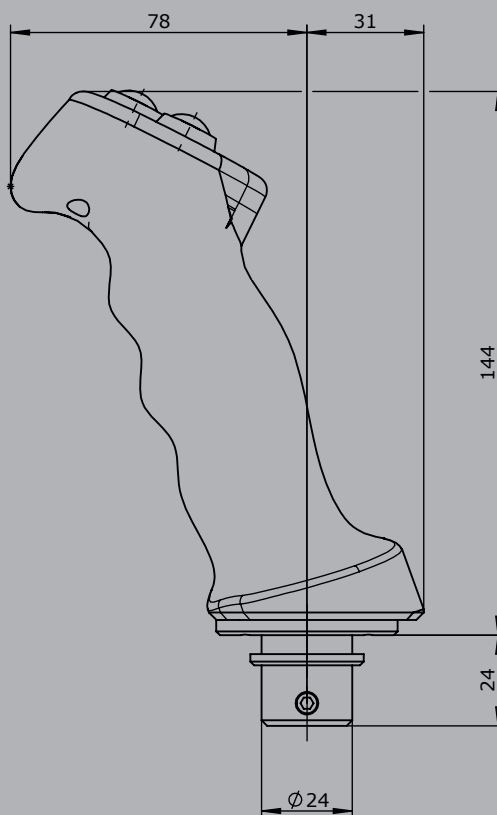
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65
Contact complement	0,1A 24 V DC13



	B14	-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



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 - 28mm	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				
Indicating labes with engraving	Character			

Attachment for crane control unit, portable control unit and housing

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 seat				

Crane control unit

KST 30 swiveling



The KST 30 is an ergonomically designed swiveling crane control 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



		KST 311	-U2	-M1	-F3	-LK	/	KFS 11	/	V85	/	V85	/	KL	/	X
Basic unit																
KST 301	With inner equipment boxes version 1															
KST 311	With inner equiupment boxes version 1 and outside equiupment boxes 160 mm wide															
KST 331	With inner equiupment boxes version 1 and outside equiupment boxes 270 mm wide															
KST 341	With inner equiupment boxes version 1 and outside equiupment boxes 320 mm wide															
		Special equipment boxes form on request!														
Base unit																
U2	Swiveling 180° left, 90° right with detent															
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 seat																
KFS 11*	(Included in the delivery!)															
KFS 9*																
KFS 10*																
KFS 12*																
		*Description see driver seat page 223														

Crane control unit

KST 30 swiveling

KST 311 -U2 -M1 -F3 -LK / KFS 11 / V85 / V85 / KL / X

Mounting for equipment boxes

V...	Multi-axis controller (see page 1)
S...	Single-axis controller (see page 90)
D...	Double-handle controller (see page 67)
N...	Control-switch (see page 128)
...	More command and indicating devices (see page 196)

Wiring

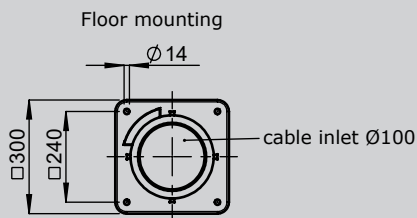
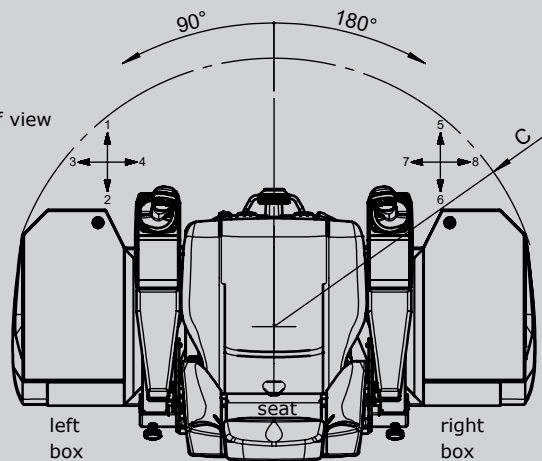
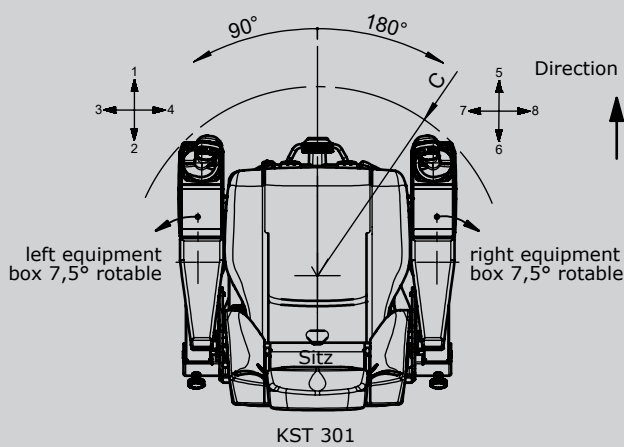
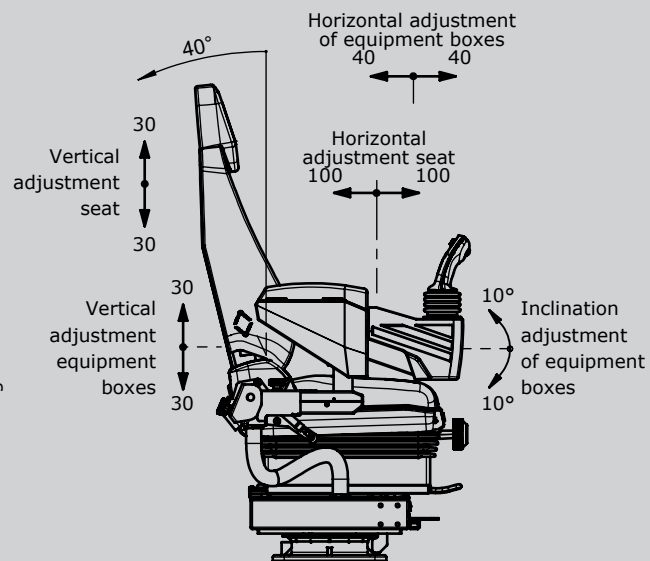
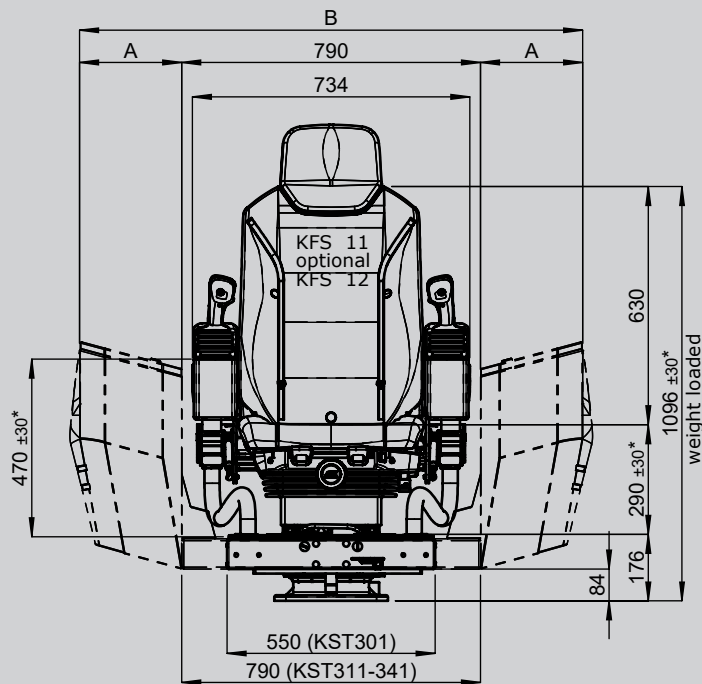
KL	Without wiring, but terminal block built in each terminal
KL V	On terminal block 4 mm ² with single wire 1 mm ² each terminal
KL V	On SPS (SPS provision) with single wire 1 mm ² each terminal
KLVA	External wiring single wire highly flexible 1,5 mm ² , 5 m long each terminal
<i>Additional-/ reduction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

Special model

X	Special / customer specified
X	Special painted

Crane control unit

KST 30 swiveling



* adjustable

Type	Dim. A	Dim. B	Dim. C
KST 301	-	-	500
KST 311	160	1110	610
KST 331	270	1330	710
KST 341	320	1430	755

Crane control unit

KST 19 swiveling



The KST 19 is an ergonomically designed swiveling crane 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 seat:

As standard the KST 19 is fitted with a KFS 10 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 arm-rests and a headrest. There is the option to have the seat covered with air-permeable artificial leather.

Cross-member with swivel base:

Swivel base has zero-clearance bearing and can be locked by a friction brake.

Surface treatment:

Base coat and textured varnish

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



Example

KST 19 -U1 -M1 -F3 -LK / KFS 10 / V64 / V64.1 / KL / X

Basic unit

KST 19 With equipment boxes

Base unit

U1 Swiveling 180° left, 90° right with friction brake
U2 Swiveling 180° left, 90° right with detent
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 seat

KFS 10* (Included in the delivery!)

*Description see driver seat page 227

Crane control unit

KST 19 swiveling

KST19 -U1 -M1 -F3 -LK / KFS10 / V64 / V64.1 / KL / X

Mounting for equipment boxes

V...	Multi-axis controller (see page 1)
S...	Single-axis controller (see page 90)
D...	Double-handle controller (see page 67)
N...	Control-switch (see page 128)
...	More command and indicating devices (see page 196)

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

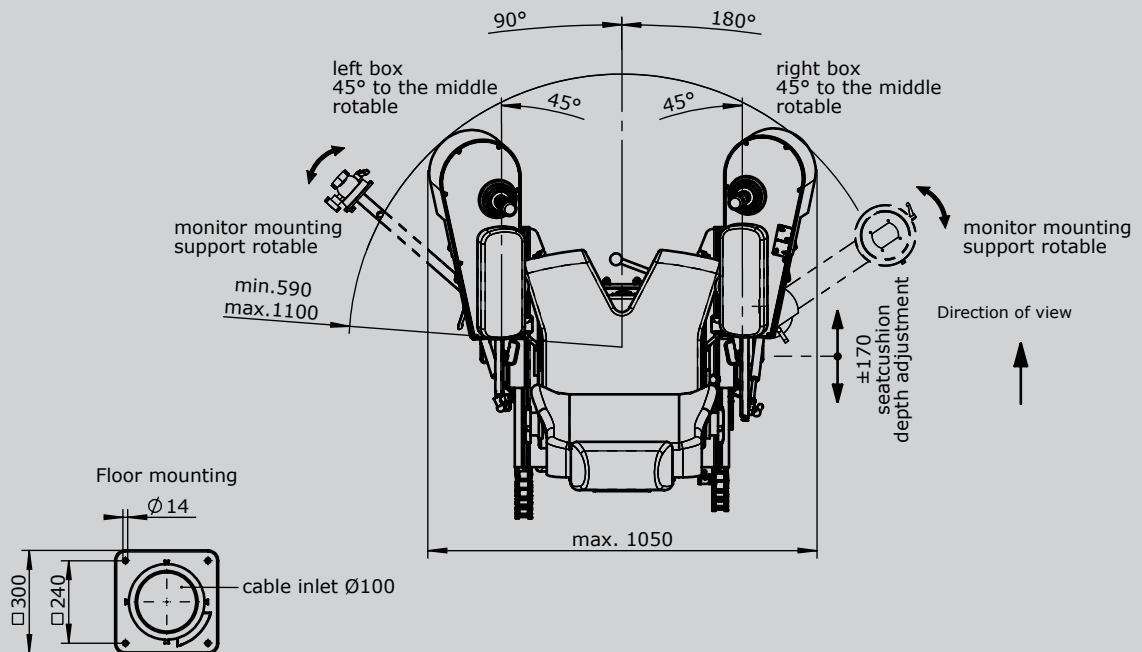
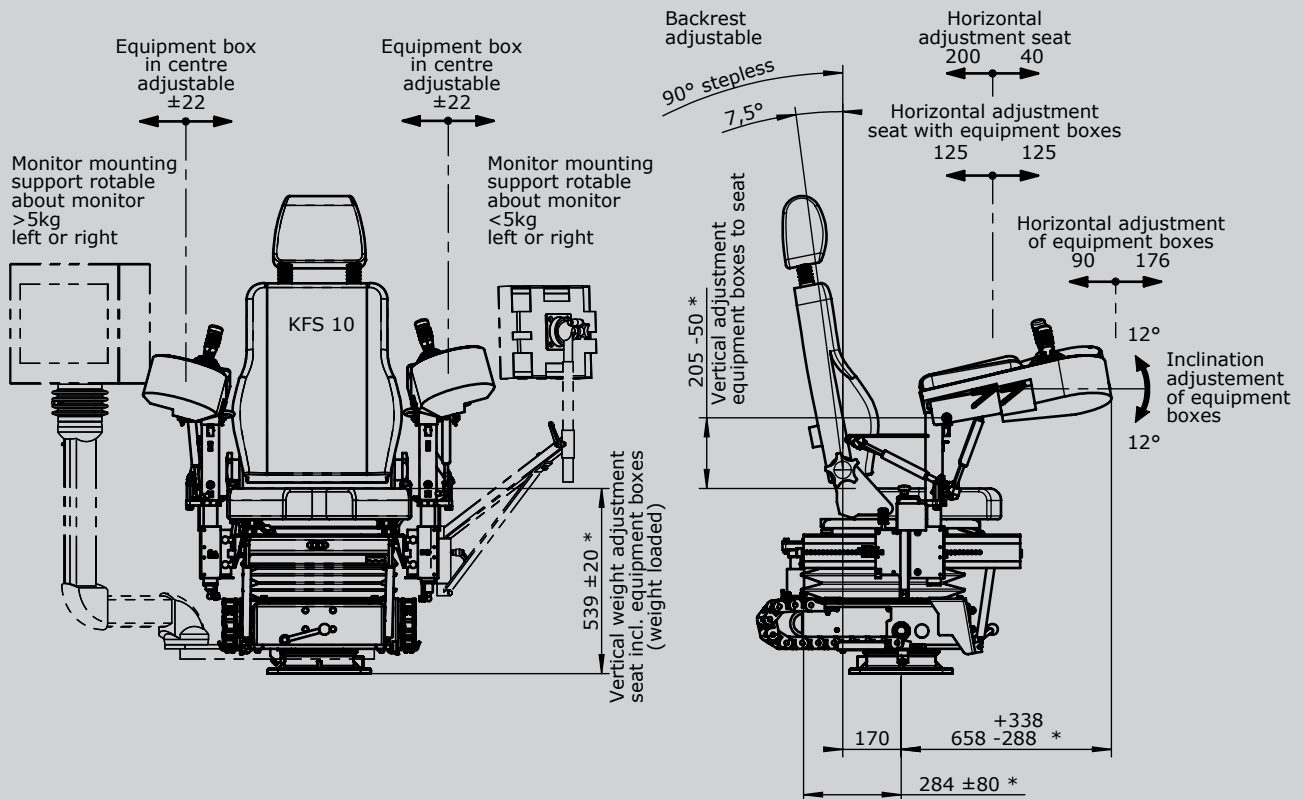
Special model

X	Special / customer specified
X ¹	Special painted

Option

Radio remote control system

Crane control unit KST 19 swiveling



* adjustable

Crane control unit

KST 10 swiveling



The KST 10 is an ergonomically designed swiveling crane 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 seat:

As standard the KST 10 is fitted with a KFS 11 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. Swivel base has zero-clearance bearing and can be locked by a friction brake.

Surface treatment:

Base coat and textured varnish
 Standard colour RAL 9011 black



		Example														
		KST 10	-U1	-M1	-F3	-LK	/	KFS 11	/	V85	/	V85.1	/	KL	/	X
Basic unit																
KST 10	With equipment boxes															
Base unit																
U1	Swiveling 180° left, 90° right with friction brake															
U2	Swiveling 180° left, 90° right with detent															
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 seat																
KFS 11*	(Included in the delivery!)															
KFS 9*																
KFS 10*																
KFS 12*																
*Description see driver seat page 223																

Crane control unit

KST 10 swiveling

KST 10 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

V...	Multi-axis controller (see page 1)
S...	Single-axis controller (see page 90)
D...	Double-handle controller (see page 67)
N...	Control-switch (see page 128)
...	More command and indicating devices (see page 196)

Wiring

KL	Without wiring, but terminal block built in 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

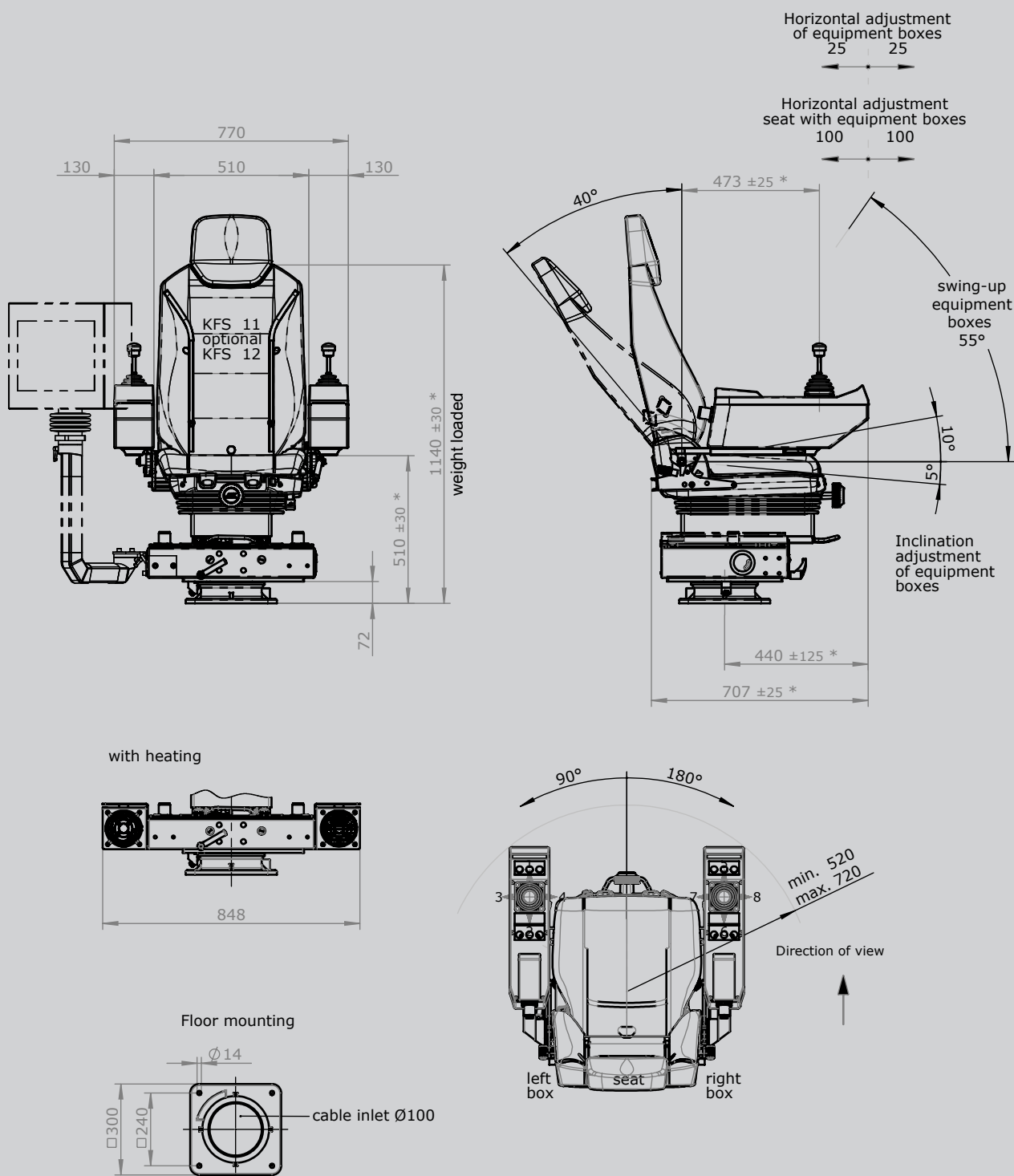
Special model

X	Special / customer specified
X ¹	Special painted

Option

Radio remote control system

Crane control unit KST 10 swiveling



* adjustable

Crane control unit

KST 4 swiveling



The KST 4 is an ergonomically designed swiveling crane 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 seat:

As standard the KST 4 is fitted with a KFS 11 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. Swivel base has zero-clearance bearing and can be locked by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 9011 black



		Example														
		KST 41	-U1	-M1	-F3	-LK	/	KFS 11	/	V64	/	V64.1	/	KL	/	X
3	Basic unit															
	KST 41	With equipment boxes 160 x 420 mm														
	KST 42	With equipment boxes 200 x 420 mm														
3	Base unit															
	U1	Swiveling 180° left, 90° right with friction brake														
	U2	Swiveling 180° left, 90° right with detent														
	U3	Electric swiveling 180° left, 90° right														
	U4	Non swiveling														
	U5	Without base frame														
3	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 crane control units +/- 250 mm														
3	Driver seat															
	KFS 11*	(Included in the delivery!)														
	KFS 9*															
	KFS 10*															
	KFS 12*															
*Description see driver seat page 223																

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

Crane control unit

KST 4 swiveling

KST 41 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

V...	Multi-axis controller (see page 1)
S...	Single-axis controller (see page 90)
D...	Double-handle controller (see page 67)
N...	Control-switch (see page 128)
...	More command and indicating devices (see page 196)

Wiring

KL	Without wiring, each terminal block built in 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

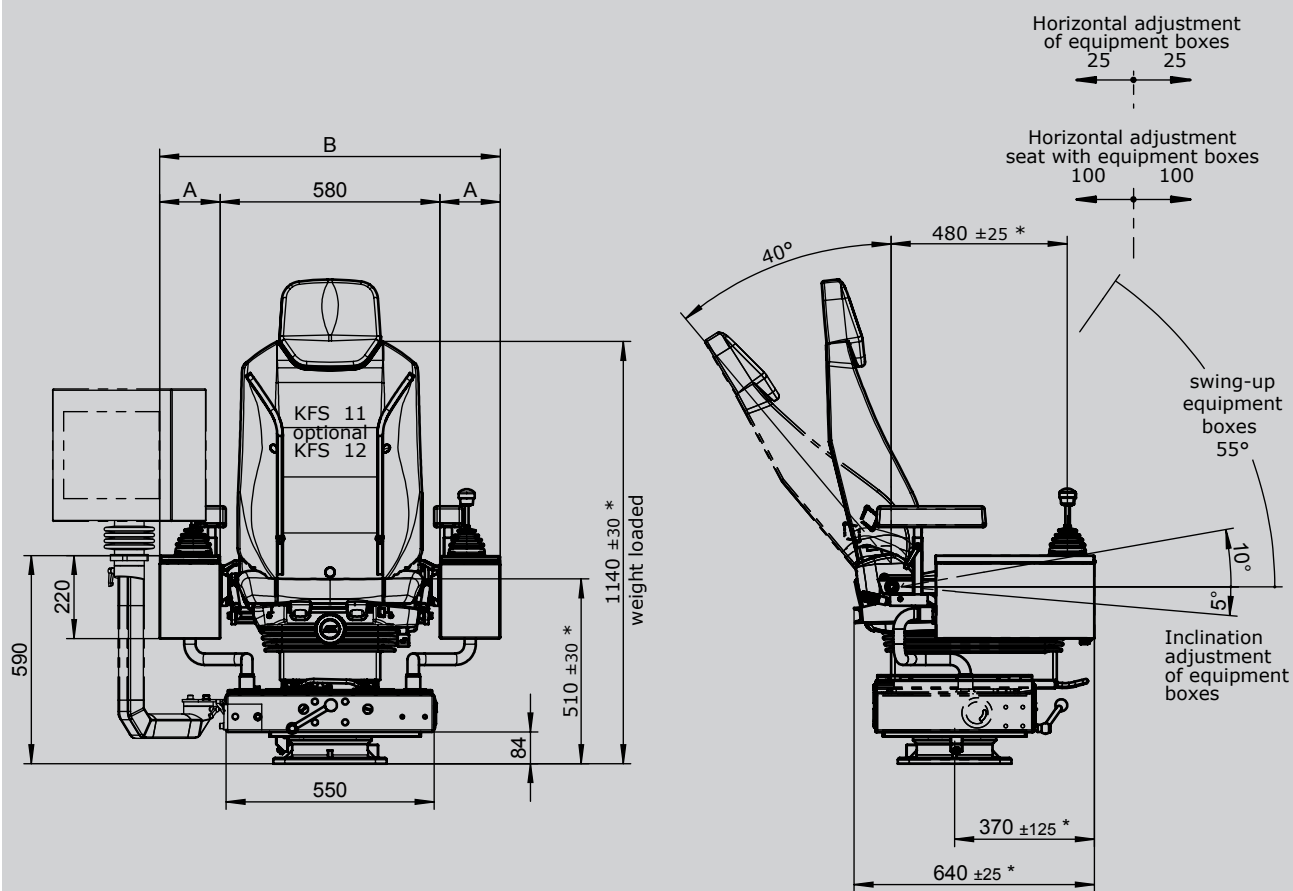
Special model

X	Special / customer specified
X ¹	Special painted

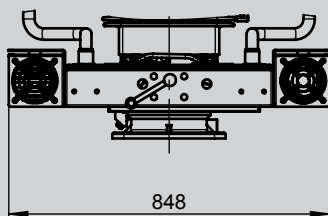
Option

Radio remote control system

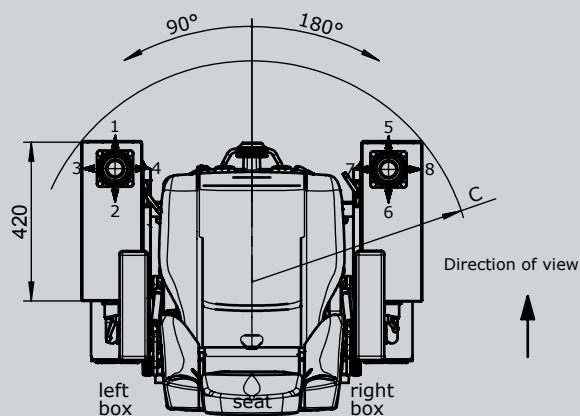
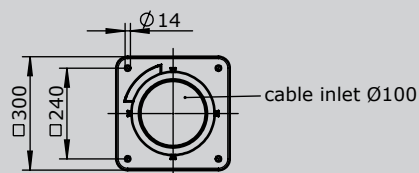
Crane control unit KST 4 swiveling



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

Crane control unit

KST 5 swiveling



The KST 5 is an ergonomically designed swiveling crane 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 KST 5 is very flexible and customisable solution.

Driver seat:

As standard the KST 5 is fitted with a KFS 11 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. Swivel base has zero-clearance bearing and can be locked by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 7035 light grey



		Example														
		KST 51	-U1	-M1	-F3	-LK	/	KFS 11	/	V64	/	V64.1	/	KL	/	X
Basic unit																
KST 51	With equipment boxes 200 x 580 mm															
KST 52	With equipment boxes 270 x 580 mm															
KST 54	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															
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																

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

Crane control unit

KST 5 swiveling

KST 51 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Driver seat

KFS 11* *(Included in the delivery!)*

KFS 9*

KFS 10*

KFS 12*

*Description see driver seat page 223

Mounting for equipment boxes

V... Multi-axis controller *(see page 1)*

S... Single-axis controller *(see page 90)*

D... Double-handle controller *(see page 67)*

N... Control-switch *(see page 128)*

... More command and indicating devices *(see page 196)*

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

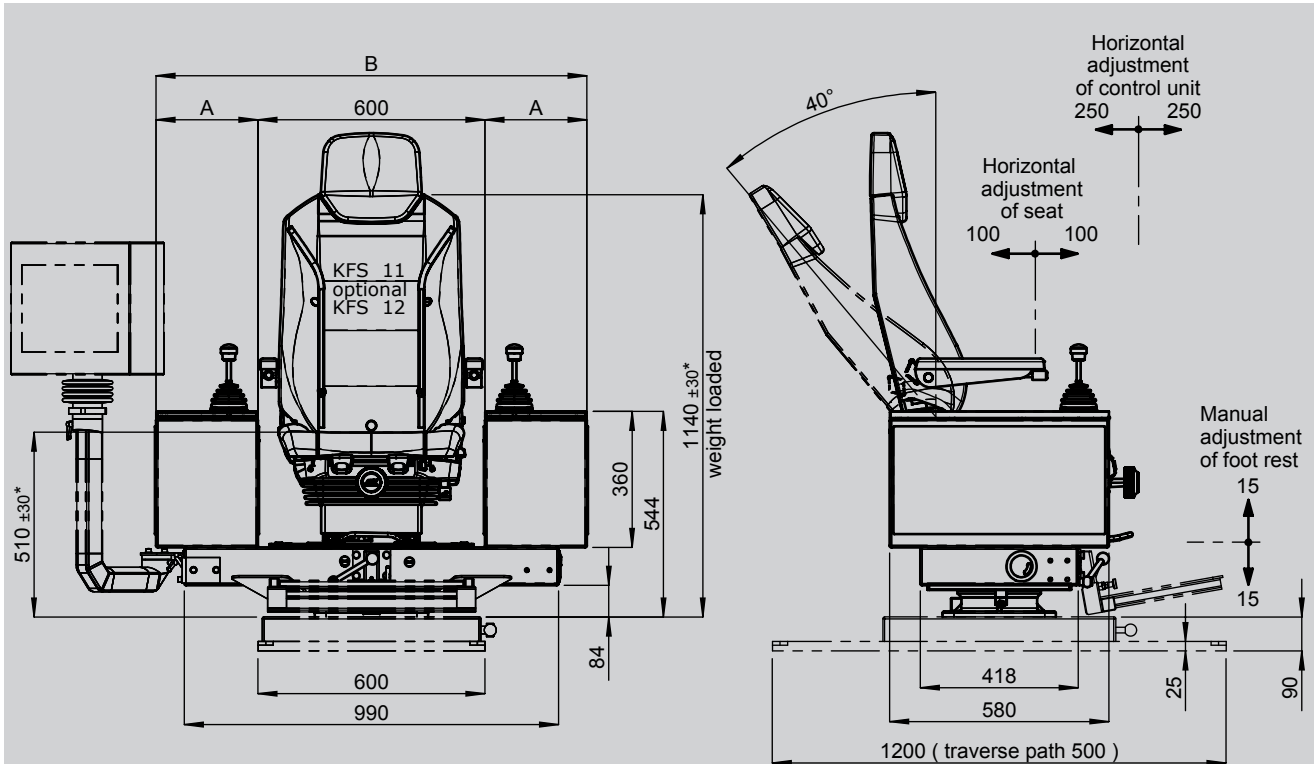
X Special / customer specified

X1 Special painted

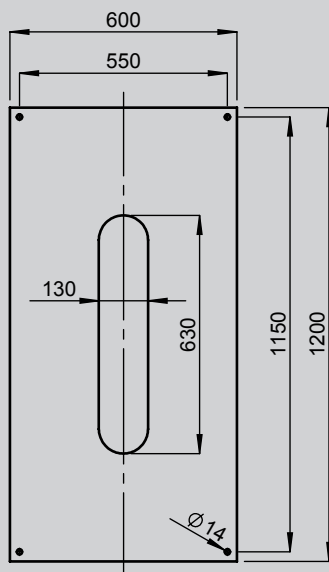
Option

Radio remote control system

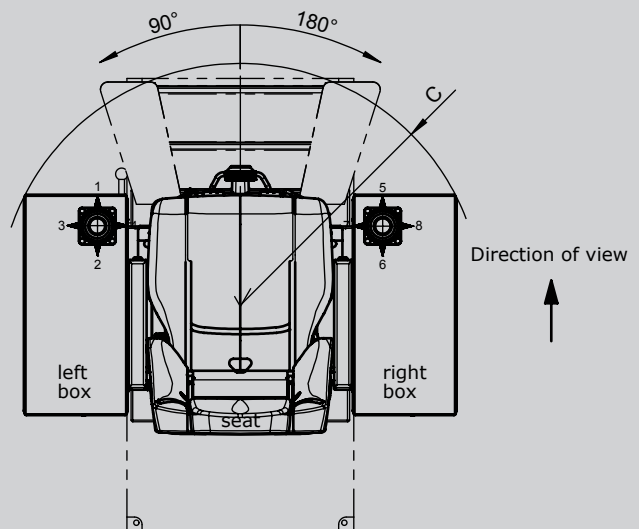
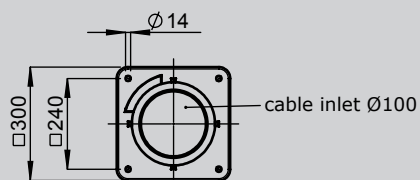
Crane control unit KST 5 swiveling



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

Crane control unit

KST 6 swiveling



The KST 6 is an ergonomically designed swiveling crane 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 seat:

As standard the KST 6 is fitted with a KFS 11 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. Swivel base has zero-clearance bearing and can be locked by a friction brake.

Surface treatment:

Base coat and textured varnish
Standard colour RAL 9011 black



Example

	KST 6	-U2	-M1	-F3	-LK	/	KFS 11	/	V64	/	V64.1	/	KL	/	X
Basic unit															
KST 6	With equipment boxes														
Base unit															
U1	Swiveling 180° left, 90° right with friction brake														
U2	Swiveling 180° left, 90° right with detent														
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 seat															
KFS 11*	(Included in the delivery!)														
KFS 9*															
KFS 10*															
KFS 12*															
*Description see driver seat page 223															

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

Crane control unit

KST 6 swiveling

KST 6 -U2 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

V...	Multi-axis controller (see page 1)
S...	Single-axis controller (see page 90)
D...	Double-handle controller (see page 67)
N...	Control-switch (see page 128)
...	More command and indicating devices (see page 196)

Wiring

KL	Without, 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

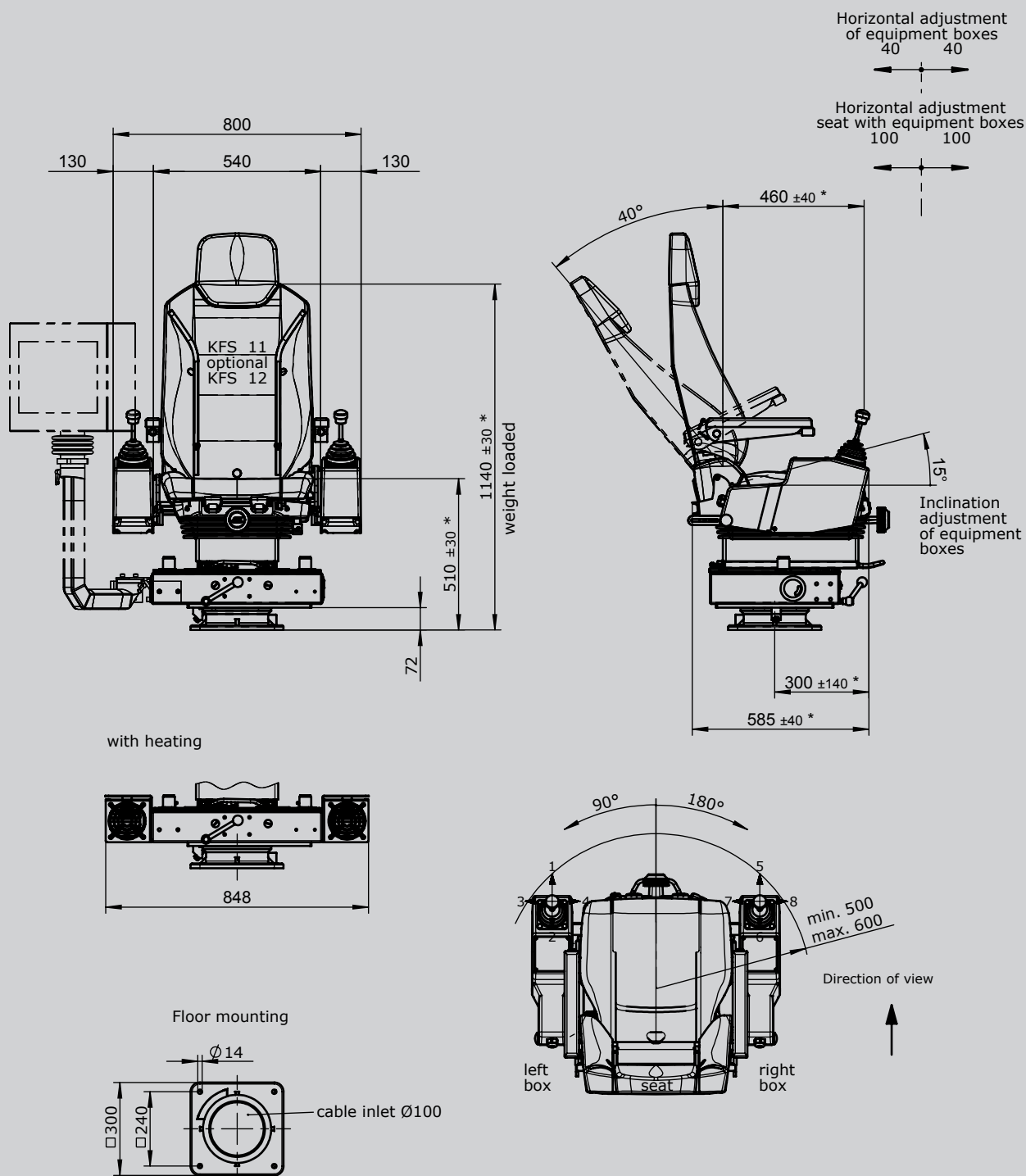
Special model

X	Special / customer specified
X ¹	Special painted

Option

Radio remote control system

Crane control unit KST 6 swiveling



* adjustable

Crane control unit

KST 8 swiveling



The KST 8 is an ergonomically designed swiveling crane 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 seat:
As standard the KST 8 is fitted with a KFS 11 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. Swivel base has zero-clearance bearing and can be locked by a friction brake.

Surface treatment:
Base coat and textured varnish
Standard colour RAL 9011 black



		Example														
		KST 8	-U1	-M1	-F3	-LK	/	KFS 11	/	V64	/	V64.1	/	KL	/	X
Basic unit																
KST 8	With equipment boxes															
Base unit																
U1	Swiveling 180° left, 90° right with friction brake															
U2	Swiveling 180° left, 90° right with detent															
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 seat																
KFS 11*	(Included in the delivery!)															
KFS 9*																
KFS 10*																
KFS 12*																
*Description see driver seat page 223																

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

KST 8 -U1 -M1 -F3 -LK / KFS 11 / V64 / V64.1 / KL / X

Mounting for equipment boxes

V...	Multi-axis controller (see page 1)
S...	Single-axis controller (see page 90)
D...	Double-handle controller (see page 67)
N...	Control-switch (see page 128)
...	More command and indicating devices (see page 196)

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

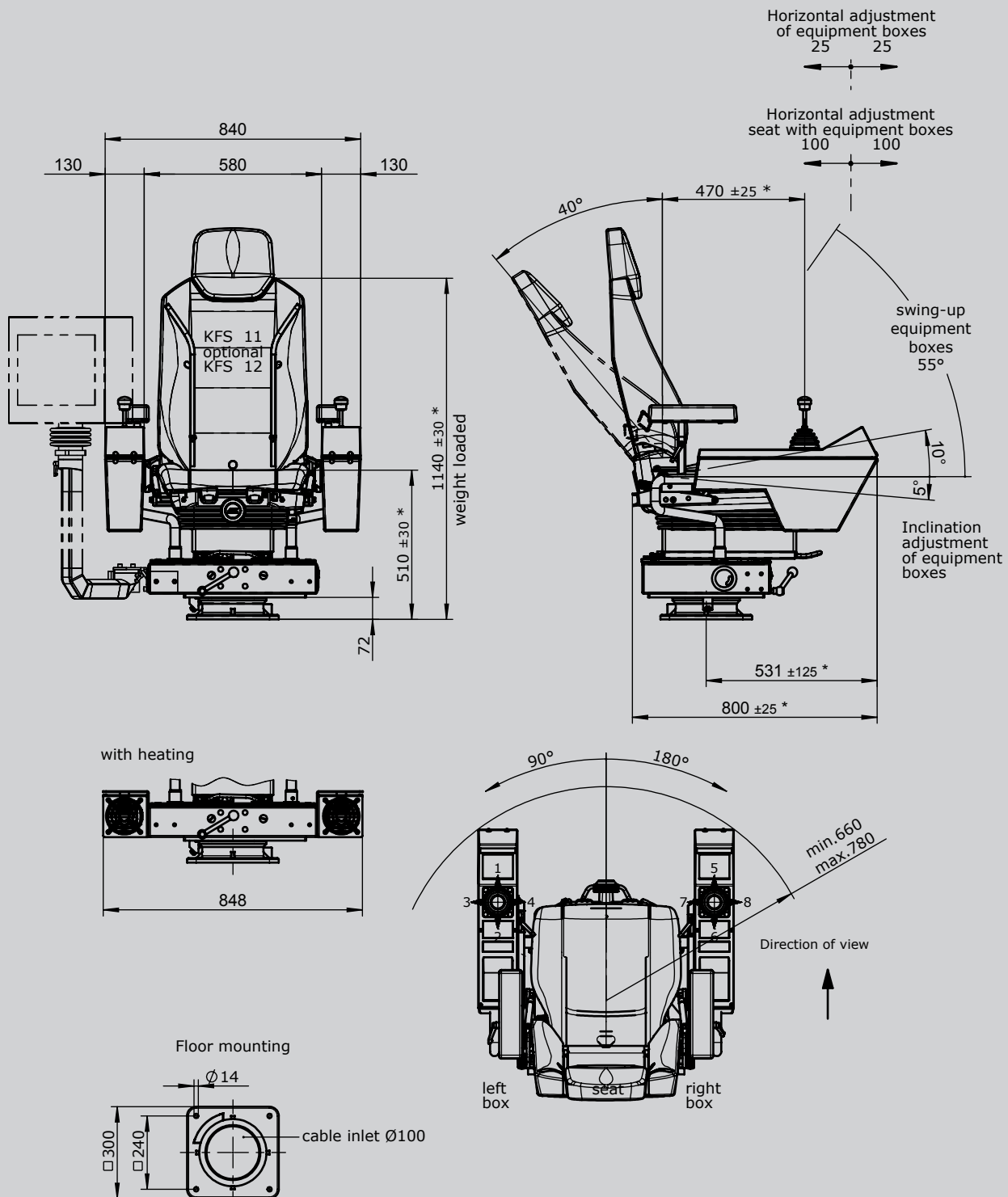
Special model

X	Special / customer specified
X ¹	Special painted

Option

Radio remote control system

Crane control unit KST 8 swiveling



* adjustable

Crane control unit KST 85



The KST 85 is an ergonomically designed swiveling crane 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 seat:

The comfortable spring mounted seat KFS 85 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.

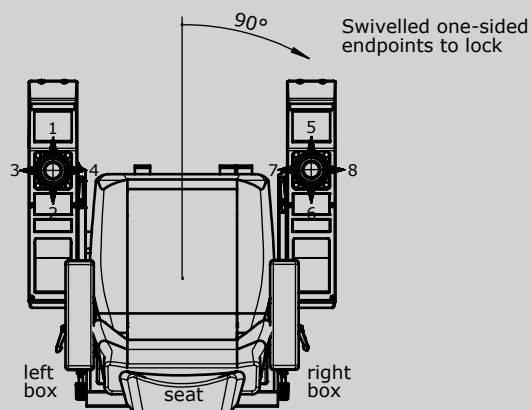
Surface treatment:

Base coat and textured varnish
Standard colour RAL 9011 black



	KST 85	-M1	/	KFS 82	/	V64	/	V64.1	/	KL	/	X
Basic unit												
KST 85	With heating in the apron											
KST 87	With apron 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 seat												
KFS 82*	(Included in the delivery!)											
Mounting for equipment boxes												
V...	Multi-axis controller (see page 1)											
S...	Single-axis controller (see page 90)											
D...	Double-handle controller (see page 67)											
N...	Control-switch (see page 128)											
....	More command and indicating devices (see page 196)											
Wiring												
KL	Without wiring, but with 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 ¹	Special painted											
Option												
Radio remote control system												

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



page 219

Crane control unit

KST 7



The KST 7 is an ergonomically designed swiveling crane 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 KST 7 is very flexible and customisable solution.

Driver seat:

The tipped spring mounted seat KFS 4 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

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

Basic unit

KST 7 With equipment boxes 290 x 500 mm

KST 75 With equipment boxes 210 x 500 mm

Special boxes for request!

Base plate

- 1 With base plate prepare for driver seat KFS 4
- 2 With base plate prepare for driver seat KFS 2
- 3 With base plate with apron for driver seat KFS 9, KFS 11...
- 4 Without base plate

Driver seat

KFS 4* *(Included in the delivery!)*

KFS 2*

KFS 11*

KFS 9*

**Description see driver seat page 221*

Mounting for equipment boxes

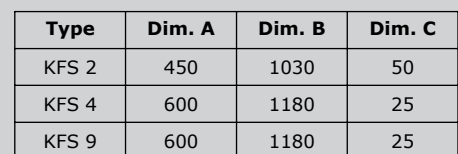
- V... Multi-axis controller *(see page 1)*
- S... Single-axis controller *(see page 90)*
- D... Double-handle controller *(see page 67)*
- N... Control-switch *(see page 128)*
- ... *More command and indicating devices (see page 196)*

Crane control unit

KST 7

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 ¹	Special painted
Option	
Radio remote control system	



Driver seat

KFS 12



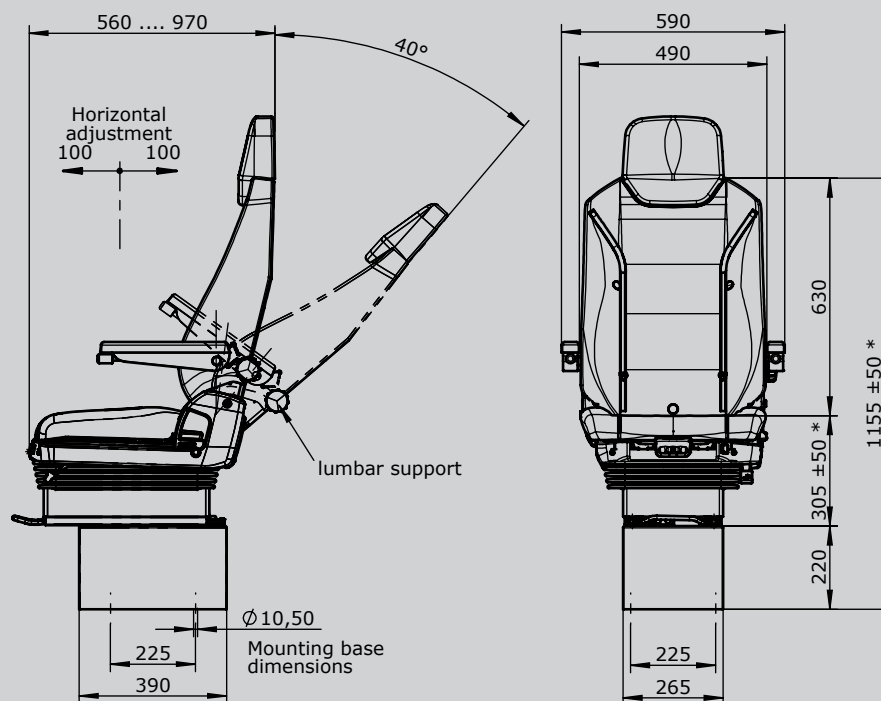
The crane driver`s seat KFS 12 is ergonomically designed and provides a high grade of comfort. The driver's seat is equipped with an air-sprung vibration system. The weight adjustment is infinitely. Heated seats 24V, lumbar support, seat cushion adjustment, seat allocation recognition and headrest are 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:

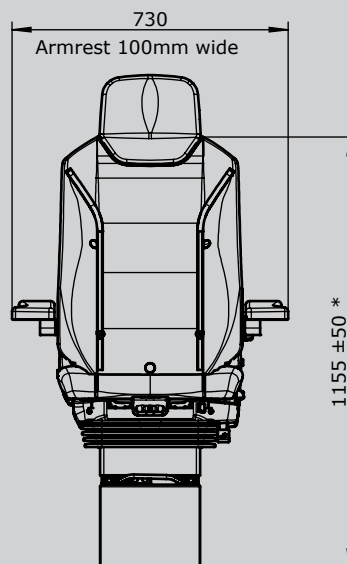
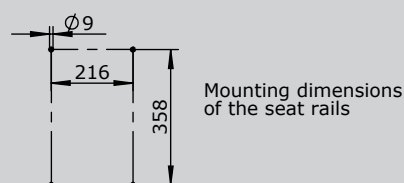
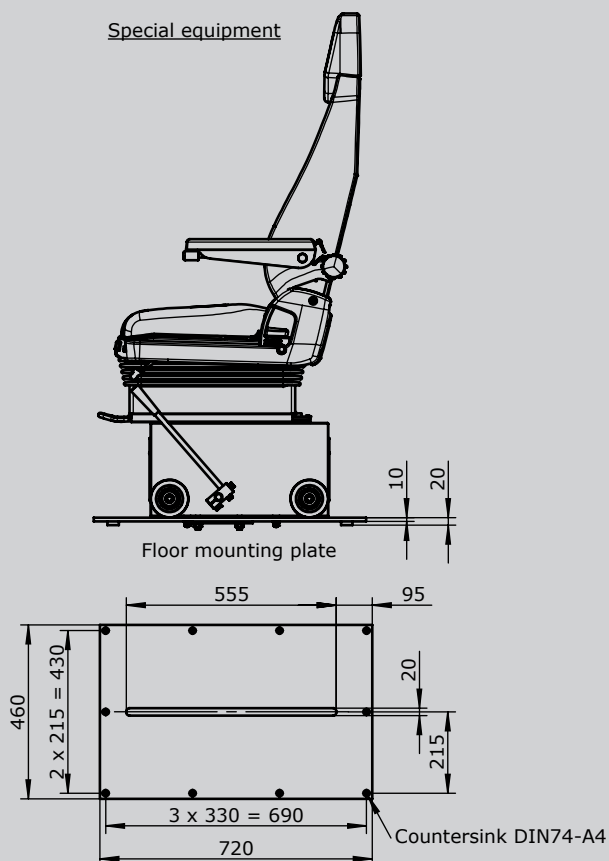
Suspension stoke	80 mm
Weight adjustment	50 - 150 kg
Horizontal adjustment	200 mm
Inclination of the backrest	-12°/+40°
Slope adjustment	-2°/+14°
Height adjustment	100 mm
Seat cushion adjustment	60 mm



		Example		
		KFS 12	-A1	-S1
Driver seat				
KFS 12	Driver seat with textile cover grey / 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 seat KFS 11 / KFS 12			
U	Console (base)			



Special equipment



* adjustable

Driver seat

KFS 11



The crane driver`s seat KFS 11 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.

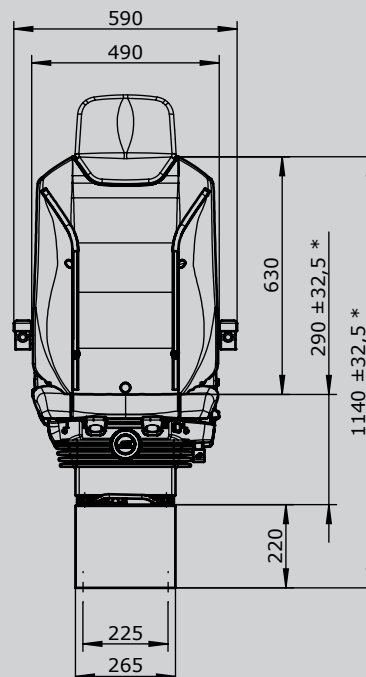
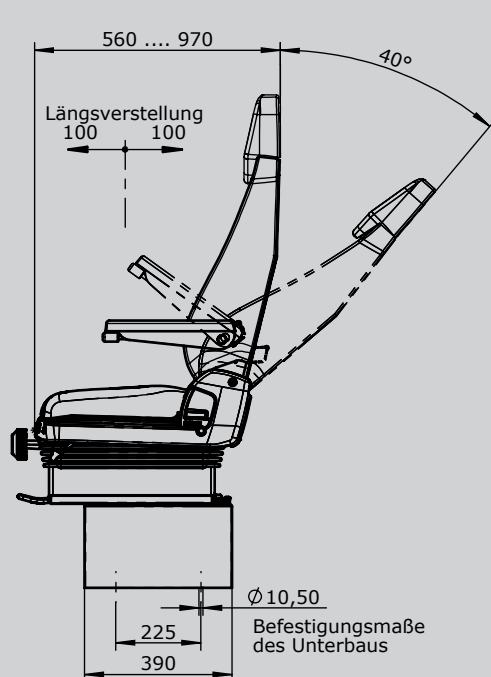
Technical data

Suspension stoke	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

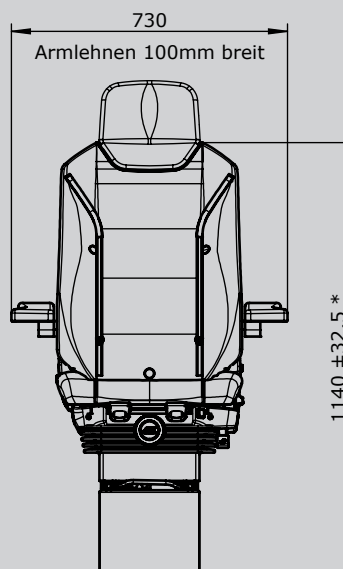
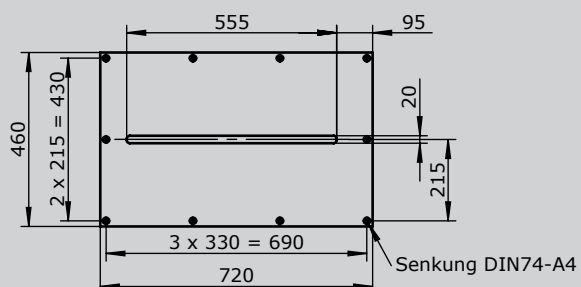
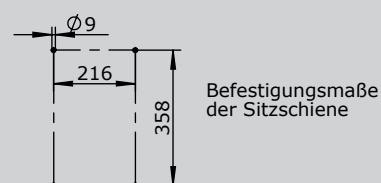
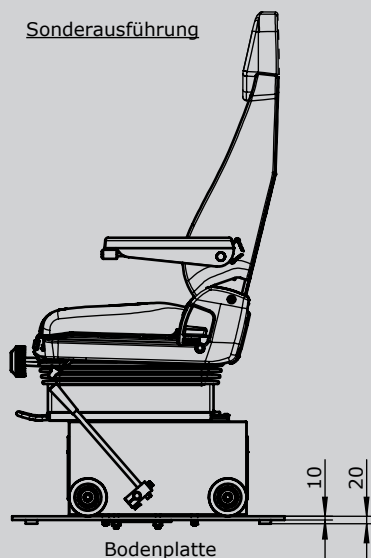


Example

		KFS 11	-A1	-S1
Driver seat				
KFS 11	Driver seat with textile cover grey / 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 47W			
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 seat KFS 11 / KFS 12			
U	Console (base)			



Sonderausführung



* einstellbar

Driver seat KFS 10



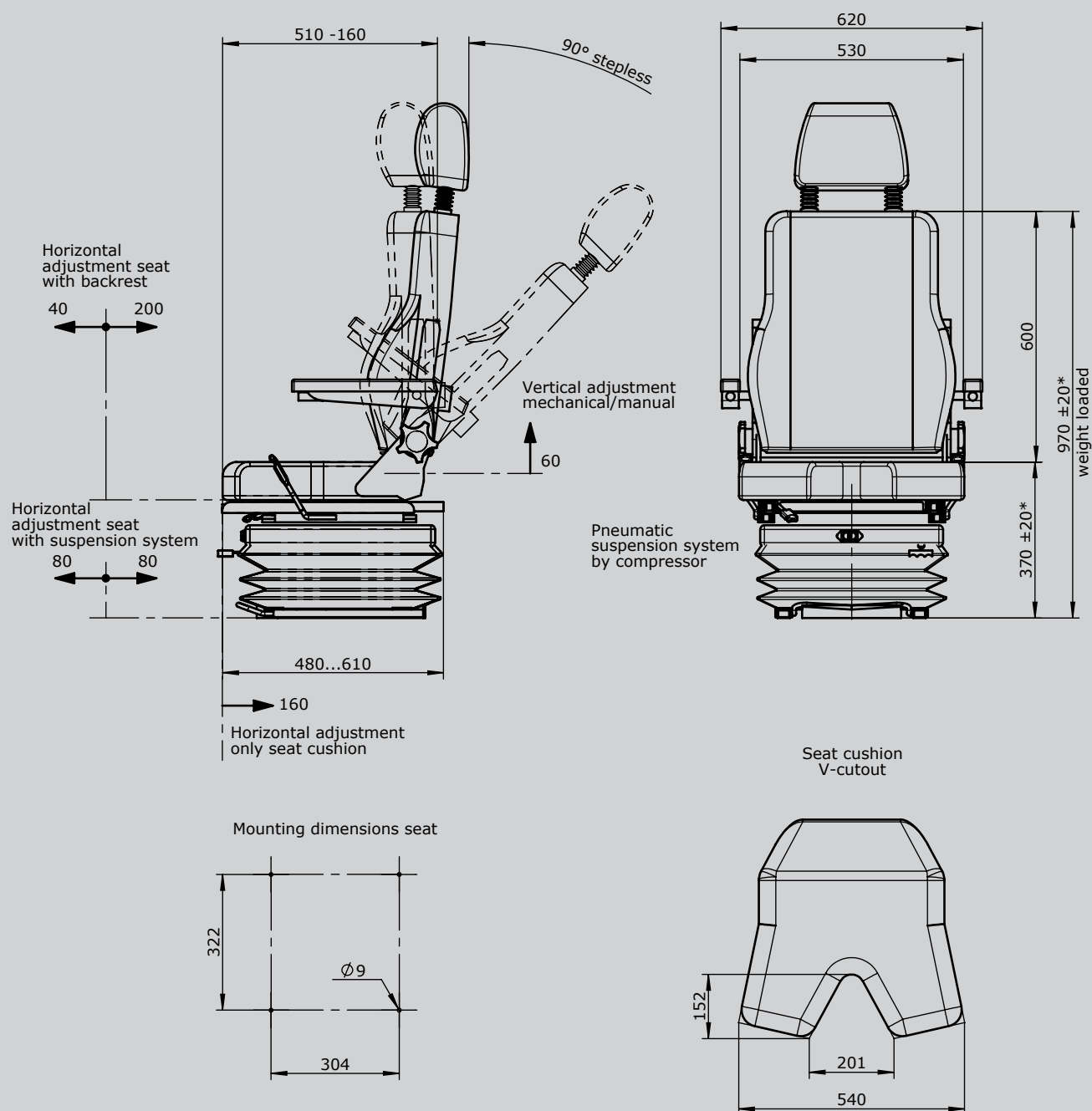
The crane driver`s seat KFS 10 is ergonomically designed and provides a high grade of comfort. The driver`s seat has a pneumatic vibration absorption system with weight adjustment by compressor (24V DC 8 Ampere) and a standard seat cushion V-cut. Through its three horizontal adjustment, it can be flexibly 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 stoke	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



		KFS 102	-A1	-L2	-S2	-R1
Driver seat						
KFS 101	Driver seat with air-permeable artificial leather cover black with V-cut					
KFS 102	Driver seat with textile cover grey / 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 seat KFS 10 with V-cut					
R1	Price reduction pneumatic vibration absorption system					
R2	Seat cushion without V-cut					



* adjustable

Driver seat KFS 9



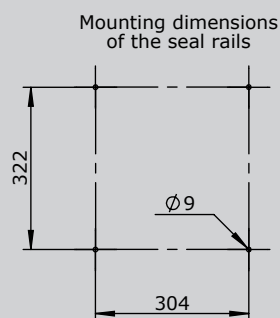
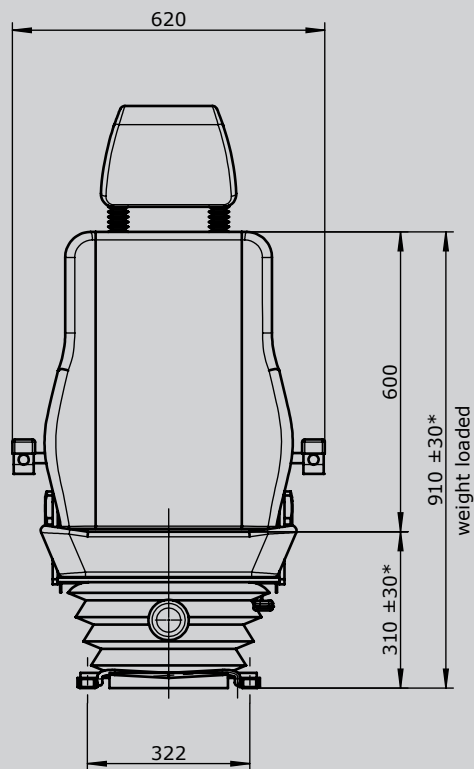
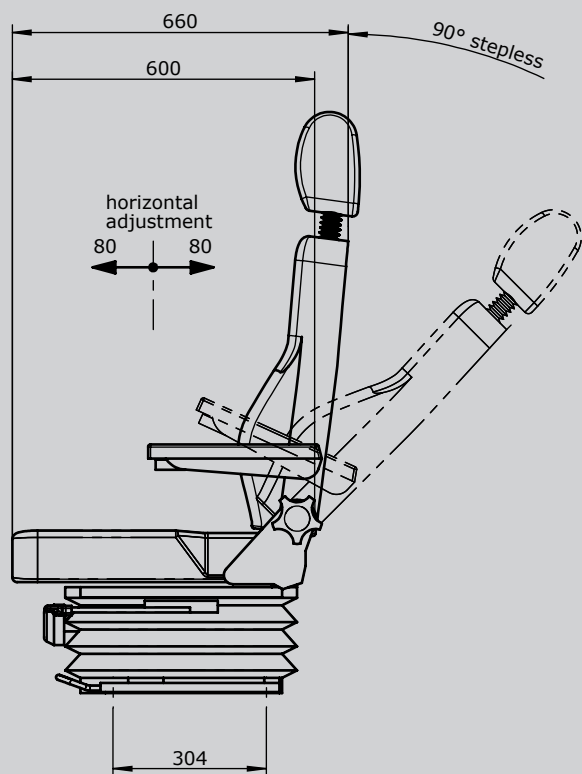
The crane driver's seat KFS 9 is ergonomically designed and provides a high grade of comfort. The driver's seat is a low level mechanical suspension seat with an oil-hydraulic vibration absorption system with weight adjustment. Upon request, a pneumatic vibrating system with weight adjustment is available. All adjustment controls are positioned ergonomically within easy access. The metal parts are protected against corrosion and painted black.

Technical data

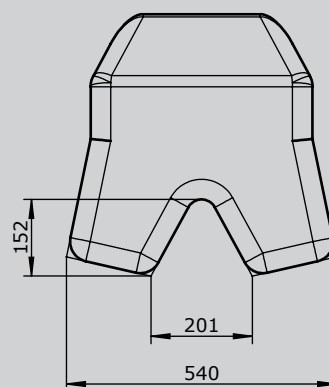
Suspension stroke	80 mm
Weight adjustment	50 - 150 kg (pneumatic) 50 - 130 kg (mechanical)
Horizontal adjustment	160 mm
Inclination of the backrest	max. 90°
Height and slope adjustment	60 mm



		KFS 92	-A1	-L2	-S1	-P
Driver seat						
KFS 91	Driver seat with air-permeable artificial leather cover black					
KFS 92	Driver seat with textile cover grey / 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 seat KFS 9					
C2	Loose cover for driver seat KFS 9 with V-cut					
U	Console (base)					



Seat cushion
v-cutout



* adjustable

Driver seat KFS 8



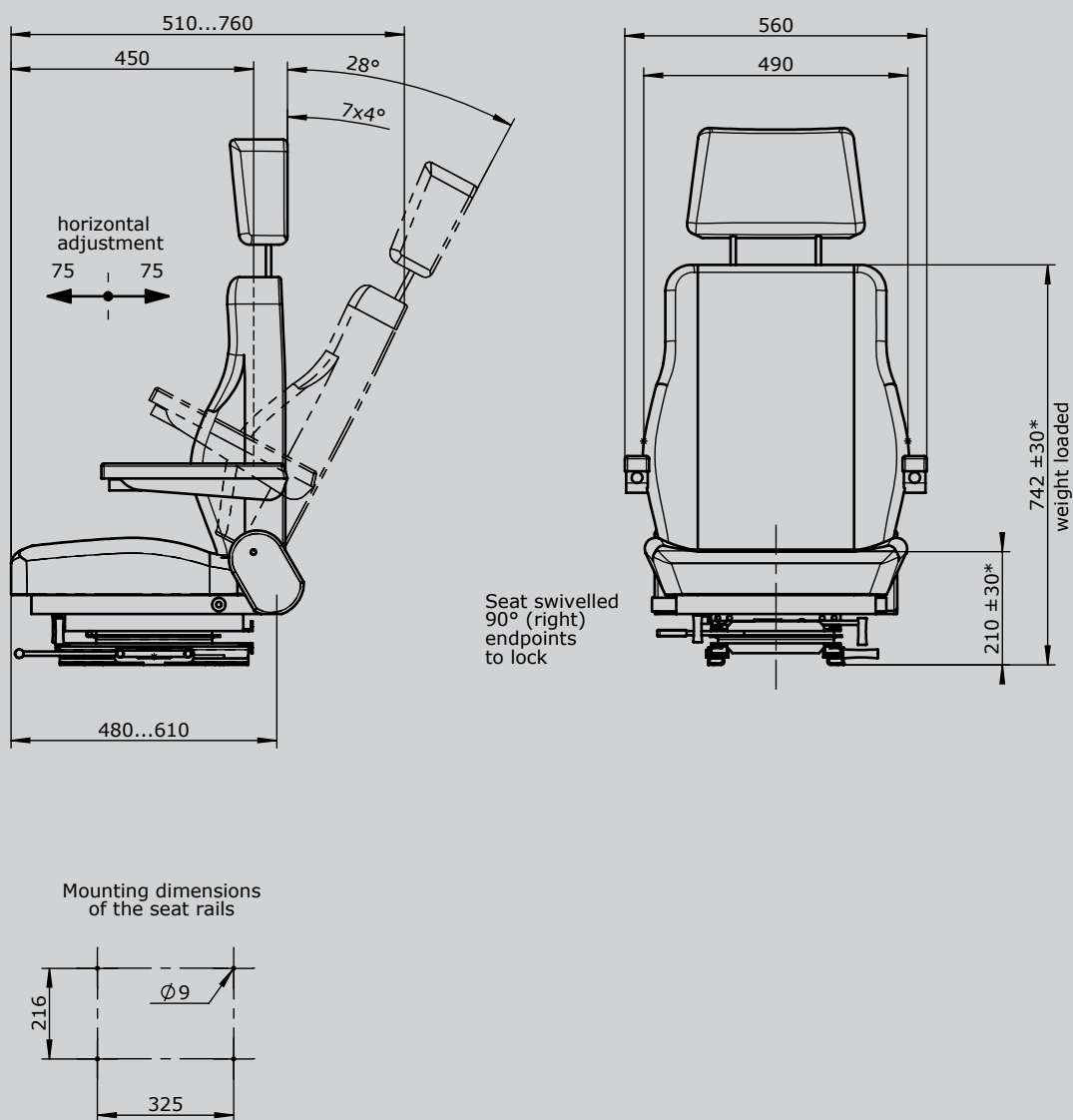
The crane driver`s seat KFS 8 is a static seat with ergonomically designed and provides a high grade of comfort. The driver`s seat is equipped with roller-bearing swivel system. All adjustment controls are positioned ergonomically within easy access. The metal parts are protected against corrosion and painted black.

Technical data:

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



		Example			
		KFS 82	-A1	-S1	-U
Driver seat					
KFS 82	Driver seat with textile cover grey / 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)				



* adjustable

Driver seat KFS 4



The crane driver`s seat KFS 4 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.

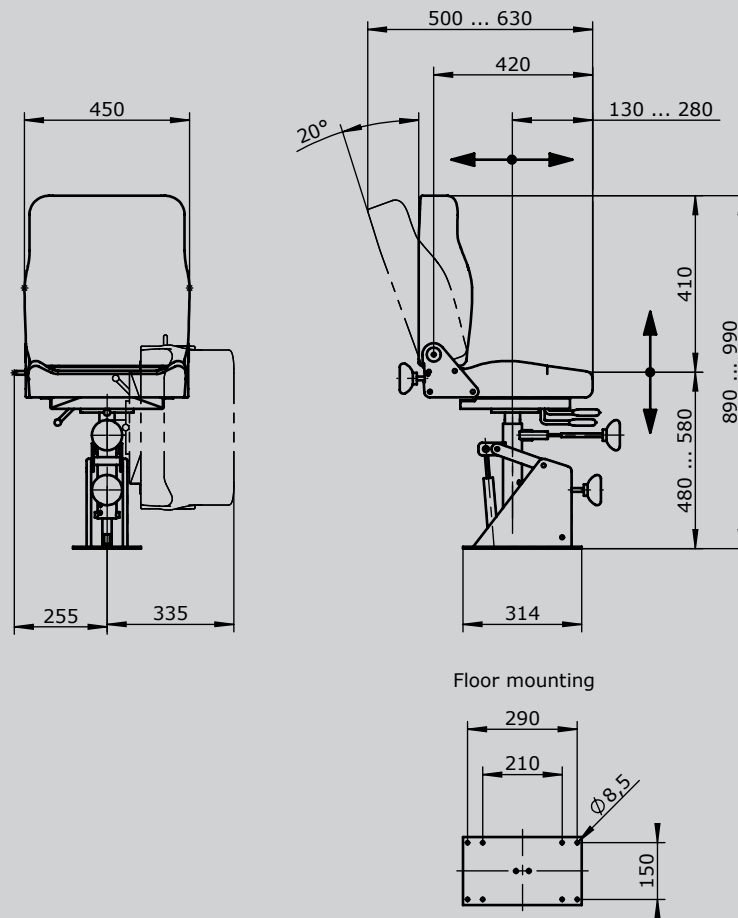
Technical data:

Suspension stoke	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 seat			
KFS 41	Driver seat with air-permeable artificial leather cover black		
KFS 42	Driver 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		



Floor mounting

Driver seat KFS 2



The crane driver`s seat KFS 2 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

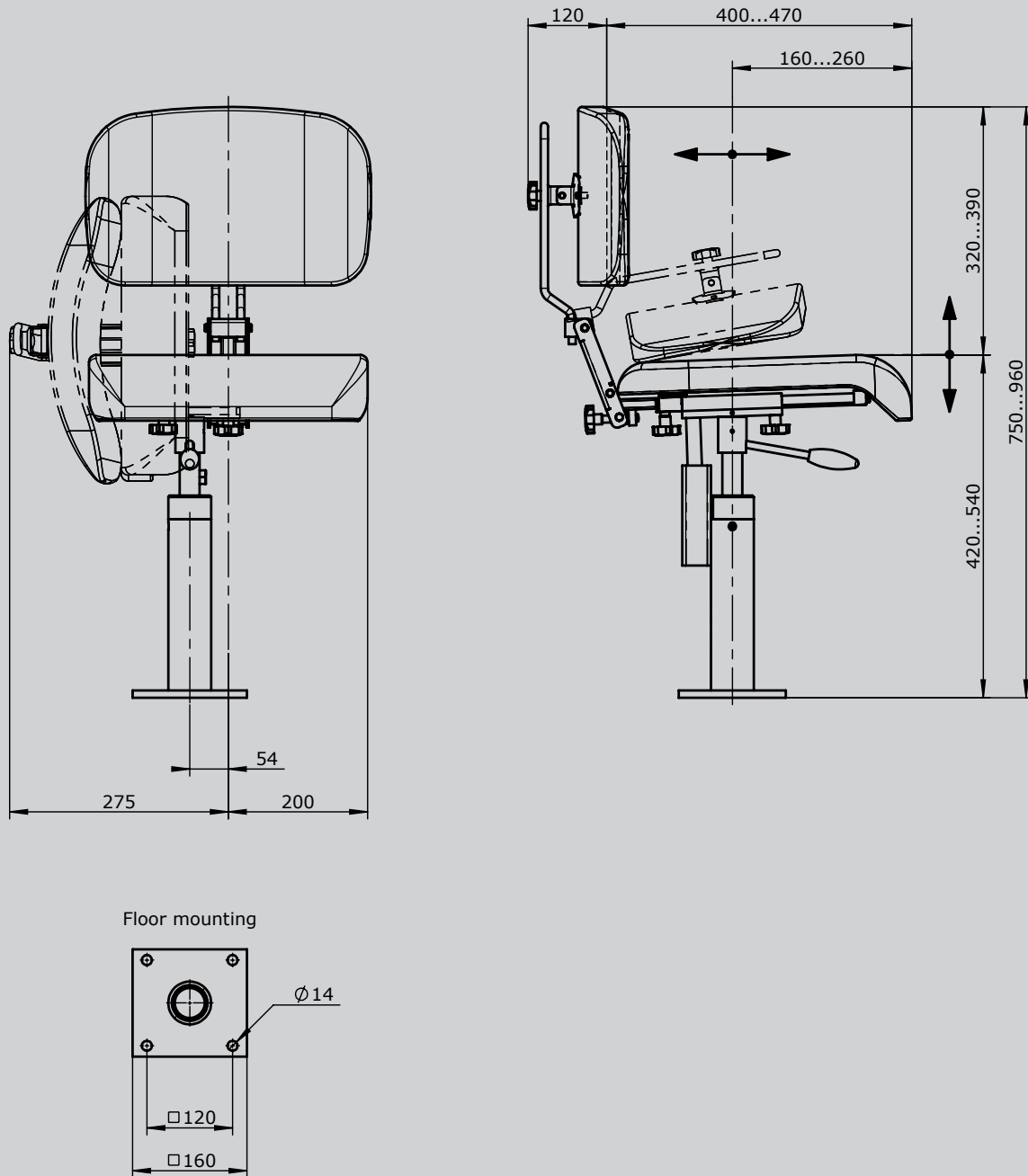
Horizontal adjustment	100 mm
Inclination of the backrest	max. 10°
Height adjustment	120 mm



Example

KFS 22

Driver seat	
KFS 21	With air-permeable artificial leather cover black
KFS 22	With textile cover grey / black

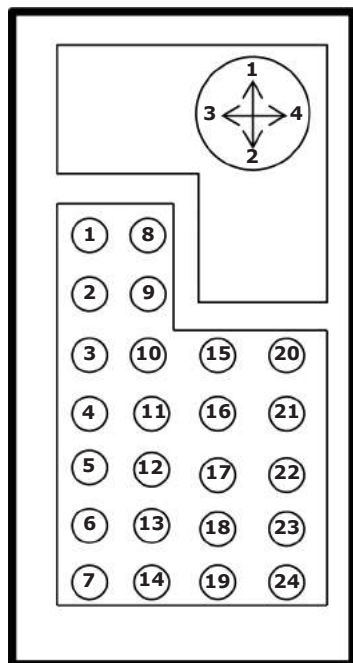


Ordering information

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.196) in our control units and housings if our multi-axis controllers V62 (see p.54) are used. Additional command and indicating devices can be installed of multi-axis controllers V64 or V11 (see p.54 or p.63) are used. (please enquire)

Control unit (see p. 197)
Type

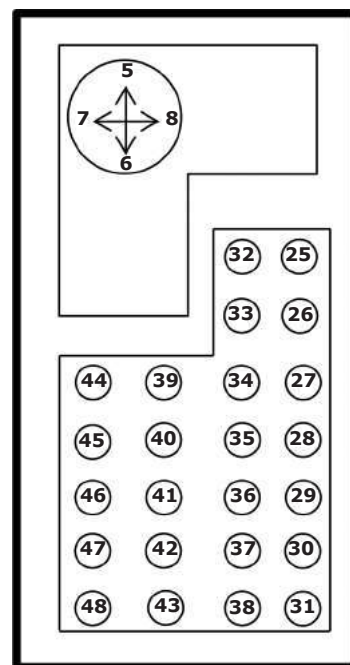
		No. of pieces max.
KST 3	1 - 6, 8 - 13, 15 - 18	16
KST 41/181	1 - 5, 10 - 12	8
KST 42/182	1 - 5, 8 - 12, 15 - 17	13
KST 51/151	3 - 7, 10 - 14, 15 - 19, 20 - 24	20
KST 52/53/54/152/154	1 - 24	24
KST 6	3 - 4, 10 - 11, 15 - 16	6
KST 7	1 - 24	24
KST 75	1 - 19	19

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.	Destination	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							

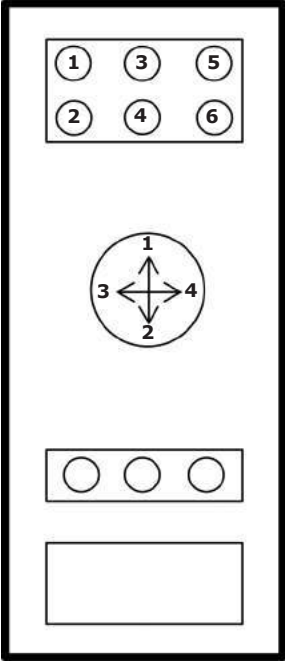


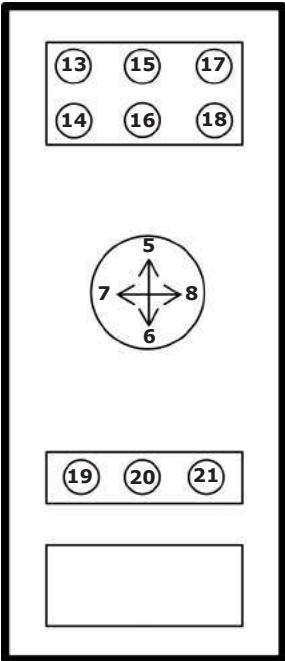
Maximum installation of command and indicating devices 22 (see p.196) in our control units and housings if our multi-axis controllers V62 (see p.54) are used. Additional command and indicating devices can be installed if multi-axis controllers V64 or V11 (see p.54 or p.63) are used. (please enquire)

	No. of pieces max.	Control unit (see p.197) Type
25 - 30, 32 - 37, 39 - 42	16	KST 3
25 - 29, 34 - 36	8	KST 41/181
25 - 29, 32 - 36, 39 - 41	13	KST 42/182
27 - 31, 34 - 38, 39 - 43, 44 - 48	20	KST 51/151
25 - 48	24	KST 52/53/54/152/154
27 - 28, 34 - 35, 39 - 40	6	KST 6
25 - 48	24	KST 7
25 - 43	19	KST 75

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

Customer _____ Order No. _____

Equipment box left		Pos. No.	Type	Colour	Lable text (max). 2 x 12 characters	Plant ref.	Desti- nation	Notes
	Max. 6 pcs. installation of command and indicating de- vices 22 (see <i>p.196</i>) or 1 pcs. monito- ring device 72 x 72mm	1	_____	_____	_____	_____	_____	_____
		2	_____	_____	_____	_____	_____	_____
		3	_____	_____	_____	_____	_____	_____
		4	_____	_____	_____	_____	_____	_____
		5	_____	_____	_____	_____	_____	_____
	Multi-axis controller V64 (see <i>p.54</i>) or V11 (see <i>p.63</i>)	6	_____	_____	_____	_____	_____	_____
		7	_____	_____	_____	_____	_____	_____
		8	_____	_____	_____	_____	_____	_____
	Max. 3 pcs. installation of command and indicating de- vices 22 (see <i>p.196</i>)	9	_____	_____	_____	_____	_____	_____
		10	_____	_____	_____	_____	_____	_____
		11	_____	_____	_____	_____	_____	_____
	Place to put on devices	12	_____	_____	_____	_____	_____	_____

Equipment box right								
	Max. 6 pcs. installation of command and indicating de- vices 22 (see <i>p.196</i>) or 1 pcs. monito- ring device 72 x 72mm	13	_____	_____	_____	_____	_____	_____
		14	_____	_____	_____	_____	_____	_____
		15	_____	_____	_____	_____	_____	_____
		16	_____	_____	_____	_____	_____	_____
		17	_____	_____	_____	_____	_____	_____
	Multi-axis controller V64 (see <i>p.54</i>) or V11 (see <i>p.63</i>)	18	_____	_____	_____	_____	_____	_____
		19	_____	_____	_____	_____	_____	_____
		20	_____	_____	_____	_____	_____	_____
	Max. 3 pcs. installation of command and indicatin de- vices 22 (see <i>p.196</i>)	21	_____	_____	_____	_____	_____	_____
		22	_____	_____	_____	_____	_____	_____
		23	_____	_____	_____	_____	_____	_____
	Place to put on devices	24	_____	_____	_____	_____	_____	_____

GESSMANN
Industrial Controllers

Order No. _____

1
2
3



4
5
6

10
11
12



13
14
15

Max. 3 pcs.
installation of
command and
indicating
devices 22
(see p.196)

13						
14						
15						
16						
17						
18						

Customer _____ Order No. _____

Equipment box left	Pos. No.	Type	Colour	Label text (max. 2 x 12 characters)	Plant-ref.	Desti-nation	Notes
Multi-axis controller V11, V14, V25, V85 see p. 63, 50, 25, 10 max. 7 installations of command and indicating devices 22 (see p.196)	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						

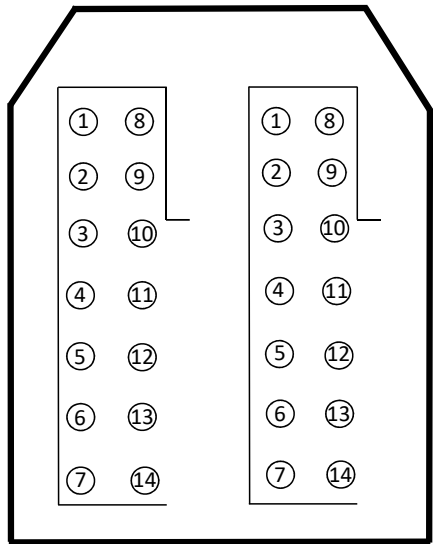
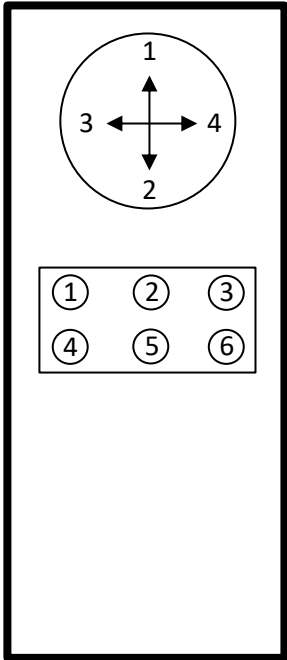
Equipment box right	Pos. No.	Type	Colour	Label text (max. 2 x 12 characters)	Plant-ref.	Desti-nation	Notes
Multi-axis controller V11, V14, V25, V85 see p. 63, 50, 25, 10 max. 7 installations of command and indicating devices 22 (see p.196)	25						
	26						
	27						
	28						
	29						
	30						
	31						

Ordering information KST 30

Customer _____

Order No. _____

Equipment box left

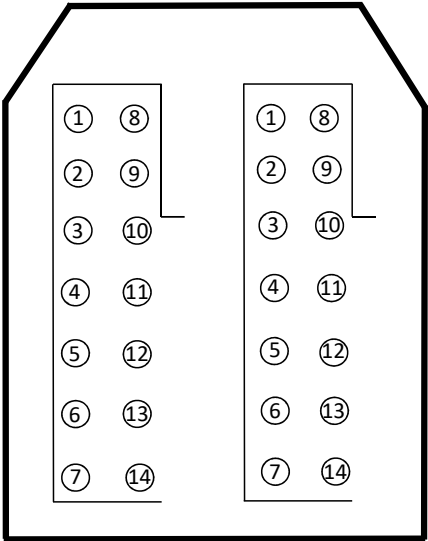
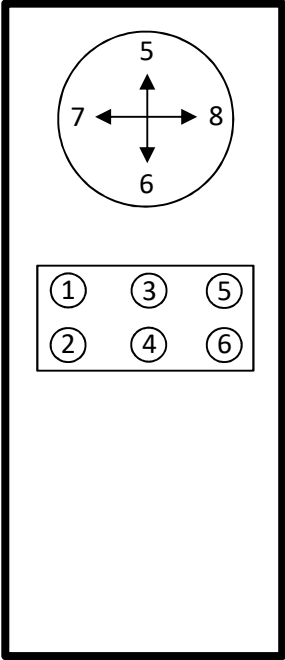


Pos. No.	Type	Colour	Lable text (max). 2 x 12 characters	Plant ref.	Desti- nation	Notes
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

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						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Portable control unit TS 1



The portable control unit TS 1 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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP54



		TS 1	-SB 1	-RH 1	Example		-K 3	-HS 1	/	V...	/	KLS	/	X
Basic unit														
TS 1	With chest plate and straps													
TS 11	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													
HB 1	Connector 16-pole female insert													
HS 2	Plug in socket 24-pole female insert													
HB 2	Connector 24-pole female insert													
HS 3	Plug in socket 32-pole male insert													
HB 3	Connector 32-pole female insert													
Indicating labels not engraved for multi-axis-/ single-axis controller														
Mounting for equipment boxes														
V	Multi-axis controller (see page 1)													
S	Single-axis controller (see page 90)													
N	Control-switch (see page 128)													
...	More command and indicating devices (see page 196)													
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 Neonflex	18 x 1 mm ²	19,2 mm Ø	-25°C to +80°C	each meter										
Cable Neonflex	24 x 1 mm ²	22,1 mm Ø	-25°C to +80°C	each meter										
Cable Neonflex	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													

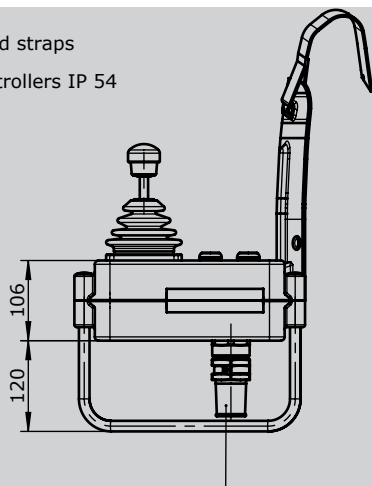
Portable control unit
TS 1

TS 1 -SB 1 -RH 1 -K 3 -HS 1 / V... / KLS / X

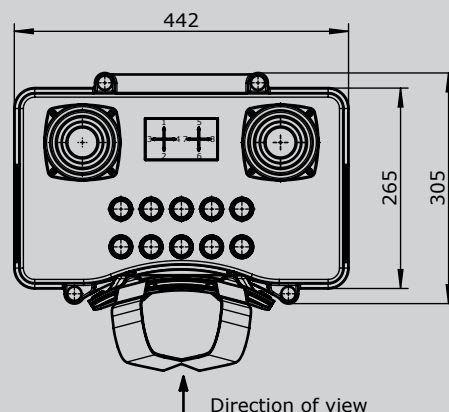
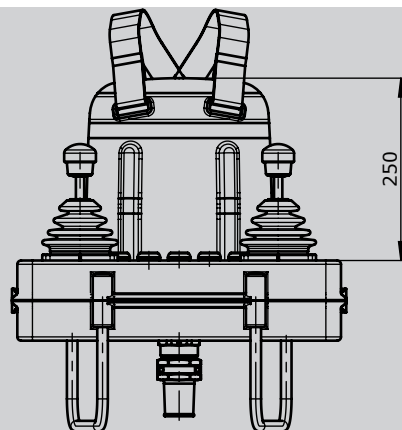
Special model	
X	Special / customer specified
X1	Housing antistatic design < 10 ⁹ Ohm/cm
X2	Finishing colour yellow RAL 1021

Portable control unit TS 1

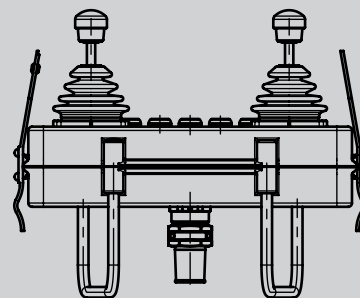
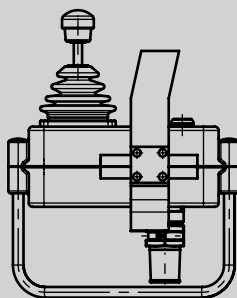
With chest plate and straps
Protection IP 65
with multi-axis controllers IP 54



Cable entry
with anti-kink protection
and stain relief or connectors



With adjustable carrying strap
Protection IP 65
with multi-axis controllers IP 54





The portable control unit TS 2 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 +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP65



		Example									
		TS 2	-SB 1	-RH 1	-K 3	-HS 1	/	V...	/	KLS	/ X
Basic unit											
TS 2	With chest plate, straps										
TS 21	With straps										
TS 22	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										
HB 1	Connector 16-pole female insert										
HS 2	Plug in socket 24-pole female insert										
HB 2	Connector 24-pole female insert										
HS 3	Plug in socket 32-pole male insert										
HB 3	Connector 32-pole female insert										
Indicating labels not engraved for multi-axis-/ single-axis controller											
Indicating labels engraved for multi-axis-/ single-axis controller											
Mounting for equipment boxes											
V	Multi-axis controller (see page 1)										
S	Single-axis controller (see page 90)										
N	Control-switch (see page 128)										
...	More command and indicating devices (see page 196)										

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

Portable control unit TS 2

TS 2 -SB 1 -RH 1 -K 3 -HS 1 / V... / KLS / X

Cable and wiring

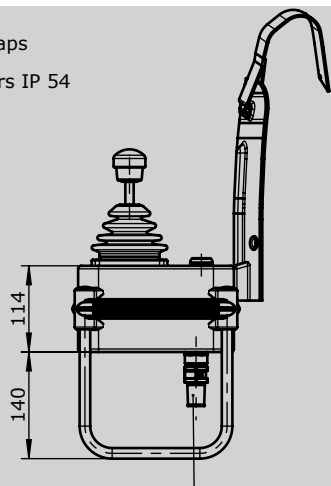
Cable Oelflex	18 x 1 mm ²	13,9 mm Ø	-5°C to +70°C	each meter
Cable Oelflex	25 x 1 mm ²	16,4 mm Ø	-5°C to +70°C	each meter
Cable Oelflex	34 x 1 mm ²	18,9 mm Ø	-5°C to +70°C	each meter
Cable Ölflex Crane	18 x 1 mm ²	19,2 mm Ø	-25°C to +80°C	each meter
Cable Ölflex Crane	24 x 1 mm ²	22,1 mm Ø	-25°C to +80°C	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

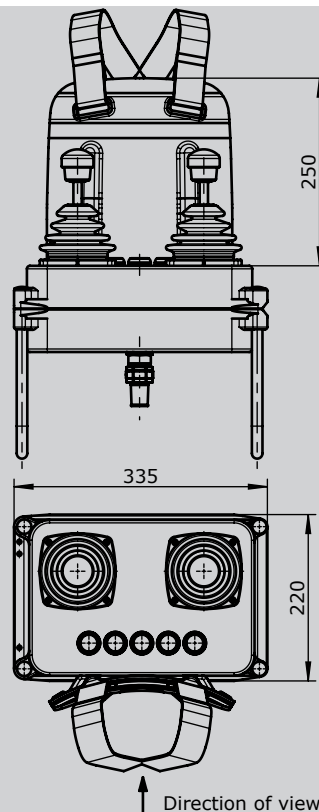
X	Special / customer specified
X1	Housing antistatic design < 10 ⁹ Ohm/cm
X2	Finishing color yellow RAL 1021

Portable control unit TS 2

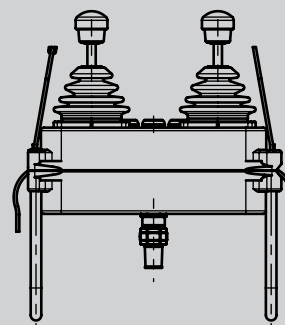
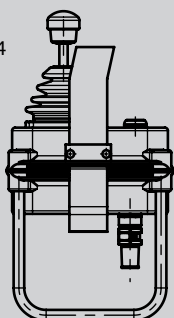
With chest plate and straps
Protection IP 65
with multi-axis controllers IP 54



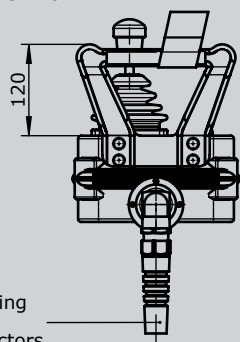
Cable entry
with anti-kink protection
and stain relief or connectors



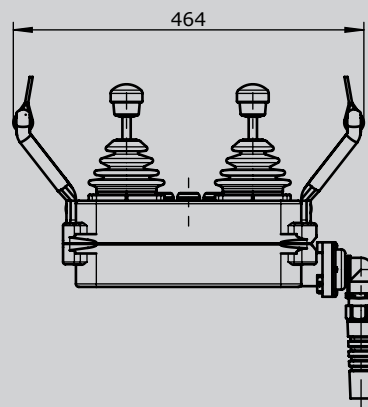
With adjustable carrying strap
Protection IP 65
with multi-axis controllers IP 54



With bracket and cable entry swivelling
Protection IP 65
with multi-axis controllers IP 54



Cable entry 180° swivelling
with anti-kink protection
and stain relief or connectors



Control pedestal for offshore U22 / 32



The control pedestal U22 / 32 accomodate 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 +60°C
Degree of protection	IP66



Example

U22 / 32 / **N61.../ N62...** / **H / PW / 2D** / **PQ** / **KLK** / **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 135
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

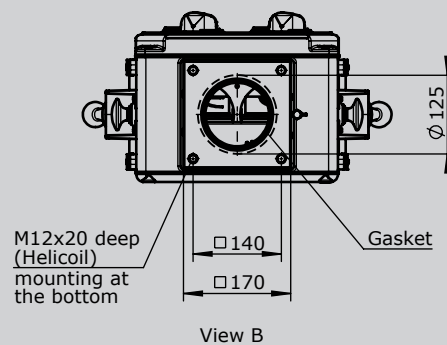
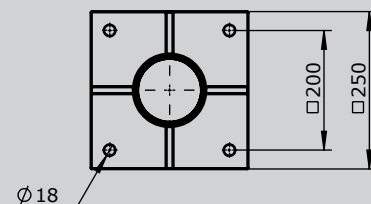
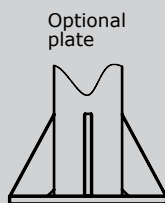
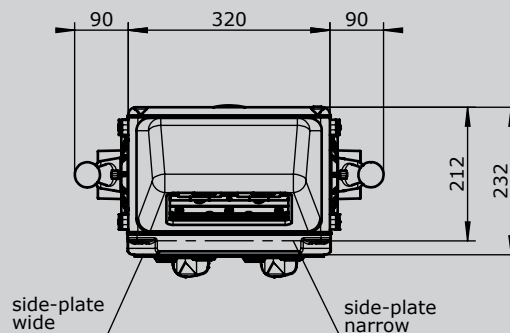
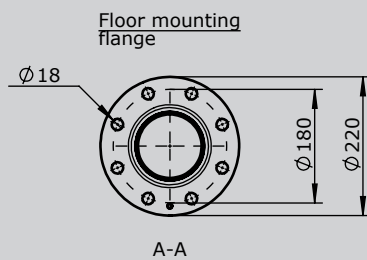
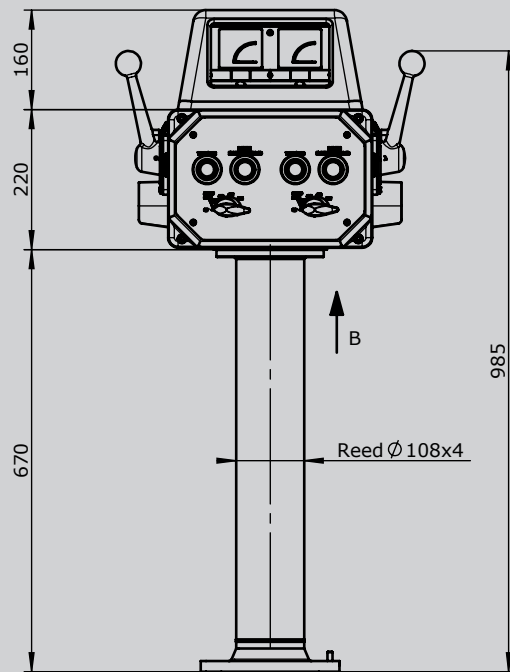
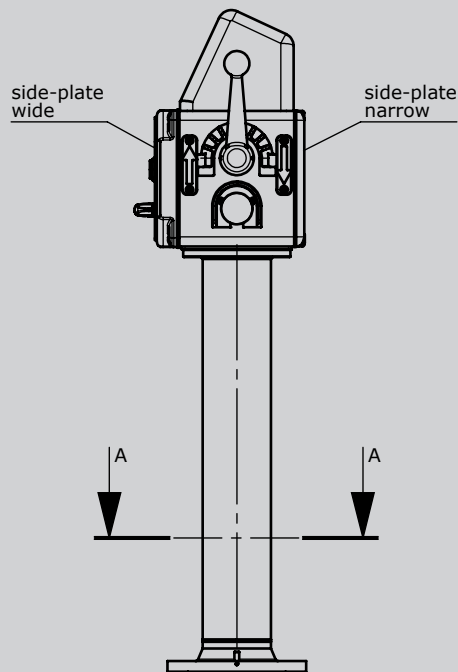
R Friction brake

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								



Control pedestal for offshore

U23 / 23



The control pedestal U23 / 23 accomodate 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 +60°C
Degree of protection	IP66

Example

U23 / 23		/	N61.../N62...	/	H / PW / 2D	/	PQ	/	KL V	/	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 135									
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!									

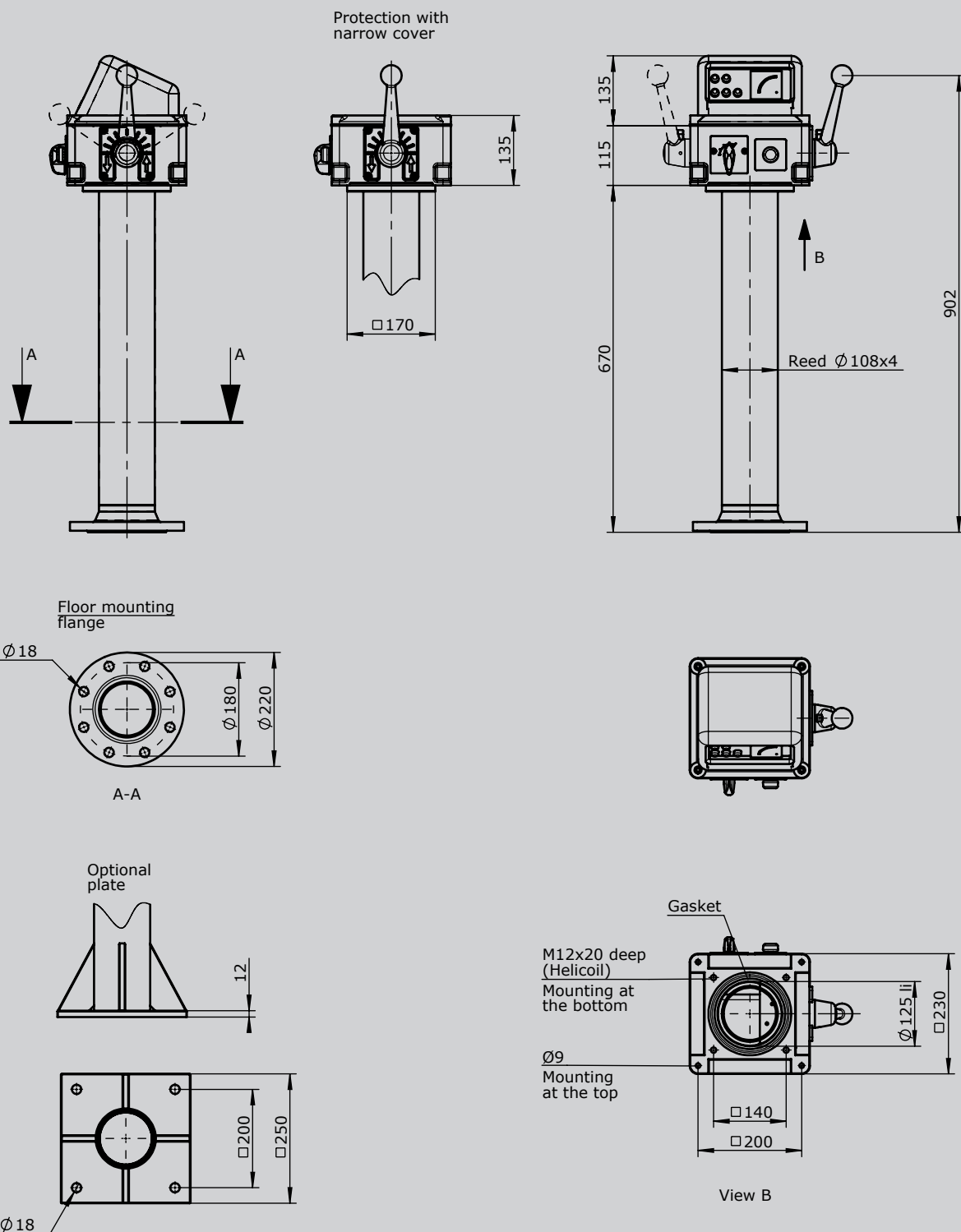
U23 / 23 / N61.../N62... / H / PW / 2D / PQ / KLV / X

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 mm² with wire line 0,75 mm²	

Special model	
X	Special / customer specified



Naval cruise controller

AZ1

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.

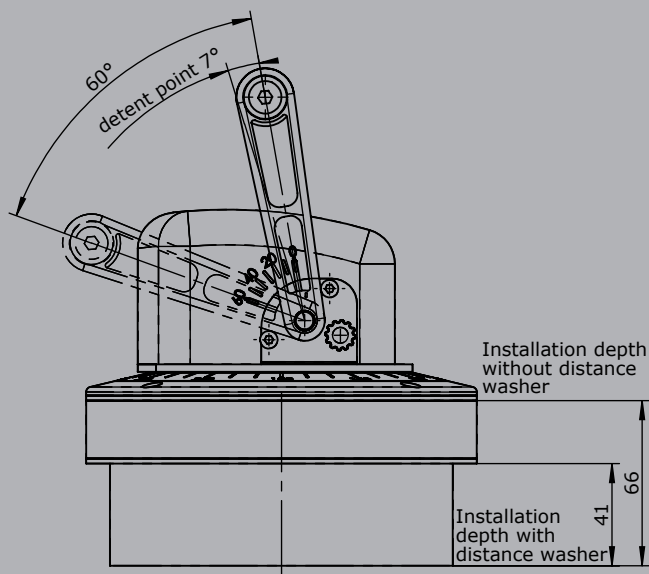
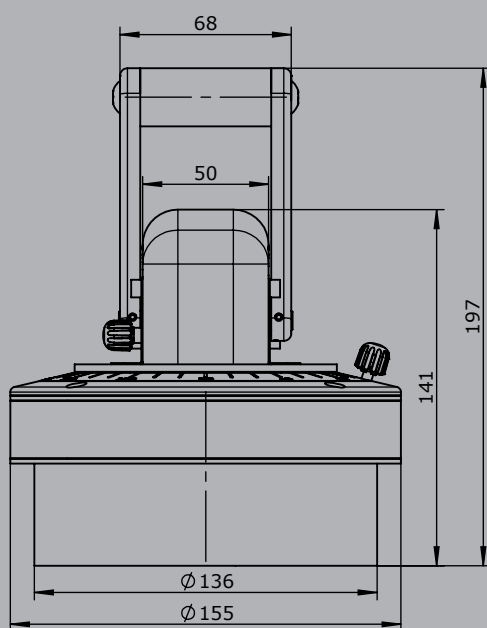
The AZ1 is resistant to oil, maritime climate, ozone and UV radiation.



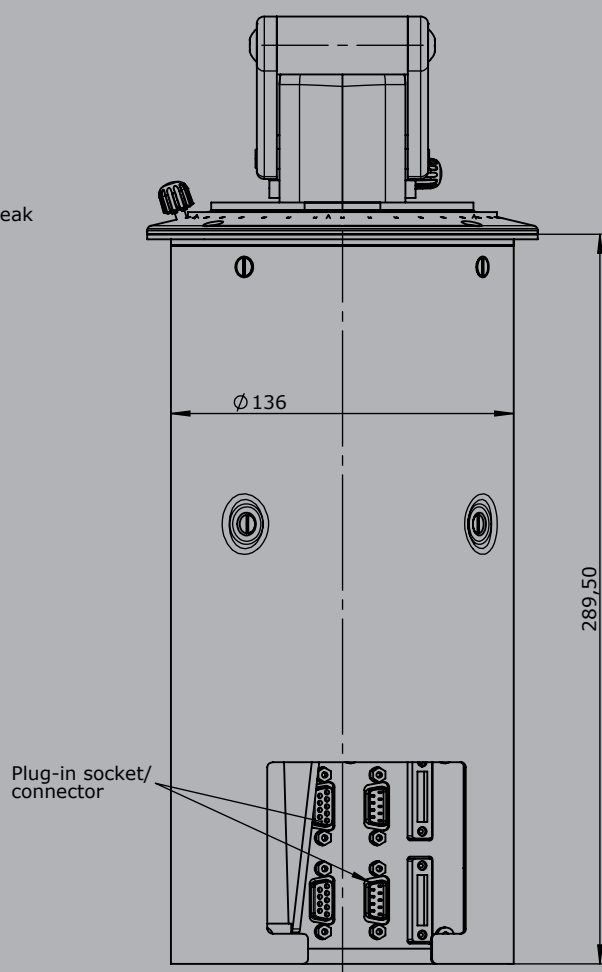
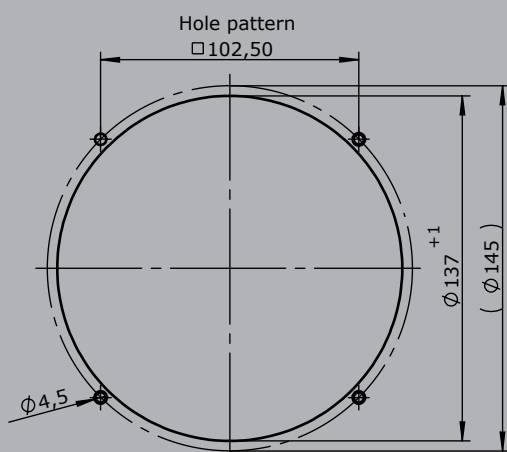
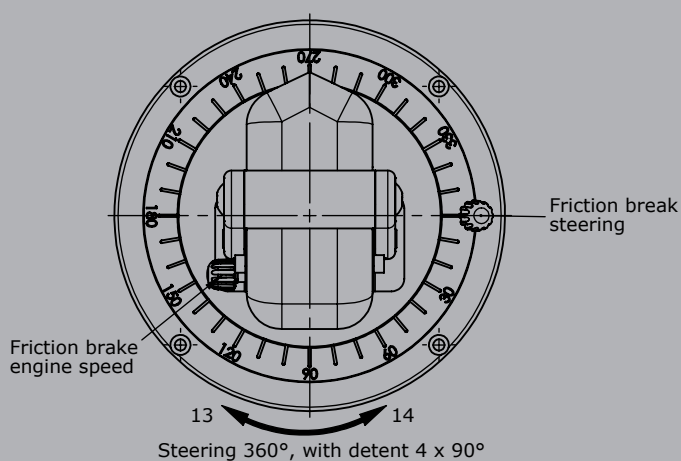
Technical data

Mechanical life AZ 1	12 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection	IP66

	AZ1	-L	-N	E2112	-X
Example					
Basic unit					
AZ1	Naval cruise controller				
Options					
L	Scale illuminated (LED) 24 V dimmable				
N	Follow-up control system 24 Volt DC for direction 0 - 2 and 13 - 14				
Interface					
Voltage output (not stabilized)					
Supply voltage 4,75 - 5,25 V DC					
		Characteristic: <u>1</u> = Inverse dual, <u>2</u> = 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: <u>1</u> = Inverse dual, <u>2</u> = 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: <u>1</u> = Inverse dual, <u>2</u> = Dual			
4...12...20 mA redundant per axis	1 axis		E211 1		
	2 axis		2		
Special model					
X	Special / customer specified				



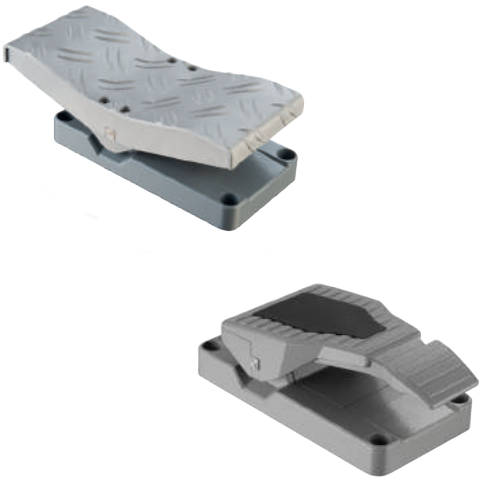
Edition:
with motor rossetting control system



Pedal-controller P20



The pedal-controller P20 is a rugged switching device for electro-hydraulic. The modular design enables the switching device to be used universally. The P20 is resistant to oil, maritime, climate, ozone and UV radiation.



Technical data

Mechanical life P20	10 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection P20	IP67 (electronic)
Functional safety	PLd (EN ISO 13849) possible

		P20	-1	Example -ZZ	-E1041	-S...	-X
Basic unit							
P20	Pedal-controller						
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°						
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	(see page 133)					
Special model							
X	Special / customer specified						

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 500mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		S
2 direction signals + 1 zero position signal (galvanically isolated)		E001 1	
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		
Wiring	Cable 500mm long without plug connector		
	Optional with plug connector (<i>standard plug connectors see page 133</i>)		S
0,5...2,5...4,5 V redundant + 2 direction signals		E104 1	
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°			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 133</i>)		S
0,5...2,5...4,5 V redundant + 2 direction signals + 1 zero position signal (galvanically isolated)		E112 1	
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	
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	
Output options			
Characteristic:			
Inverse dual *1			1
Dual *1			2
Inverse dual with dead zone +/- 3° *1			3
Dual with dead zone +/- 3° *1			4
*1 not combinable with output E136X			
Single *2			5
Single with dead zone *2			6
*2 not combinable with output E1121 and E1321, E1461 und E1471			

Voltage output with other value on request!

Pedal-controller P20

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 133</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 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°		6
<i>Current output with other value on request!</i>		

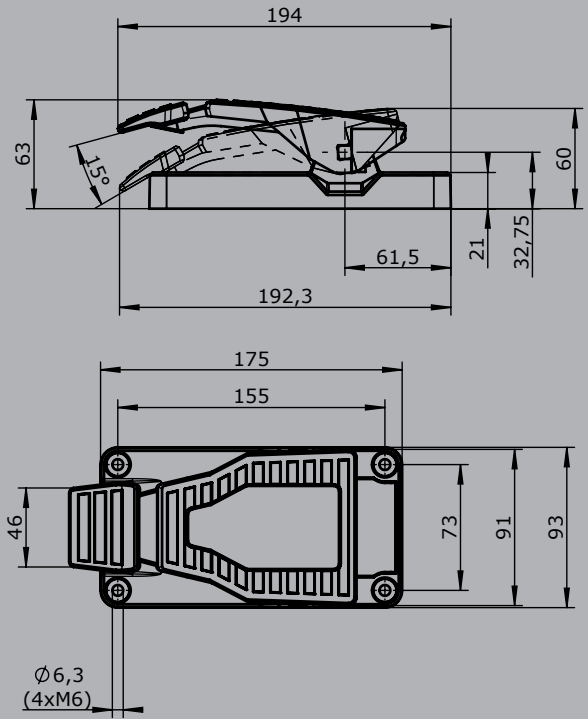
CAN		
Supply voltage	9-36 V DC	
Idle current consumption	120 mA	
Current carrying capacity	Direction signal 100 mA	
Protocol	CANopen CiA DS 301 or SAE J 1939	
Baud rate	125 kBit/s to 1 Mbit/s (standard 250 kBit/s)	
Output value	0...255 / 255...0...255	
Wiring	CAN (IN) cable 500 mm with plug connector 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	125 kBit/s to 1 MBit/s (standard 250 kBit/s)	
Baud rate	0...255 / 255...0...255	
Ausgangswert	CANopen Safety CIA 304	
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

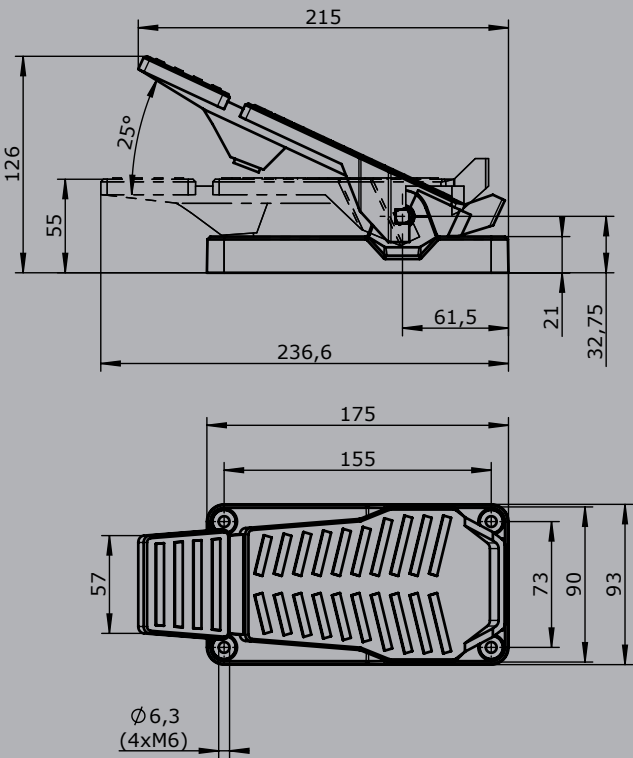
Attachments	
Z01 Mating connector M12 male insert with 2 m cable	20201140
Z02 Mating connector M12 female insert with 2 m cable	20202298

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

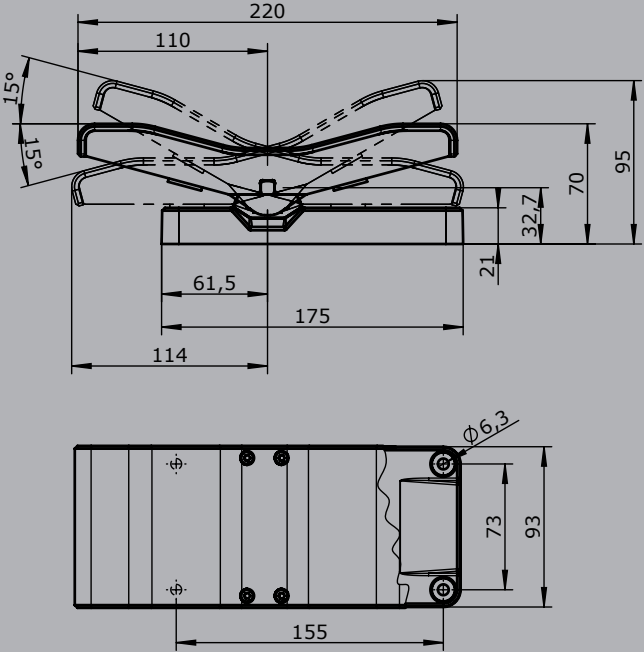
Pedalform A



Pedalform B



Pedalform C



Pedal-controller P10/P11/P12



The pedal-controller 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.

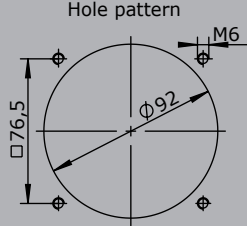
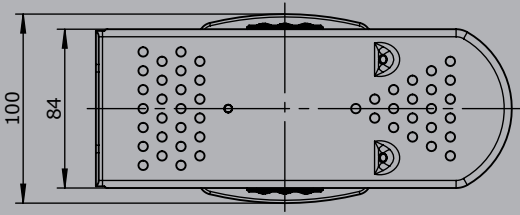
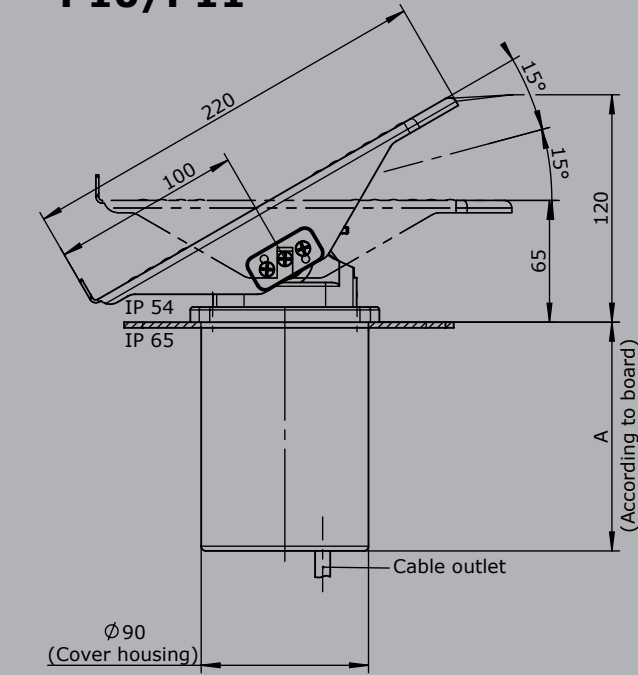
Technical data

Mechanical life P10	8 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection P10	IP54

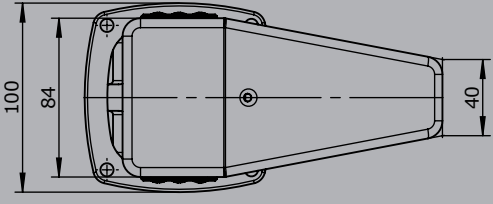
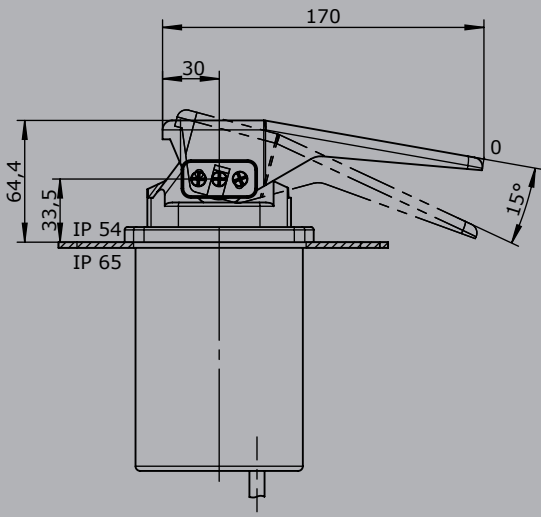


		Example							
		P10		-1 Z	P	-A01	P224	-B	-X
Basic unit									
P10	Pedal-controller, 0-30°								
P11	Pedal-controller, 15°-0-15°								
P12	Pedal-controller, 0-15°								
Detent									
	Without								
R4	1-0-1								
Direction 1-2									
1	1 contact	Standard contact - arrangement see page 135							
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



Pedal-controller

P8 / PP8

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

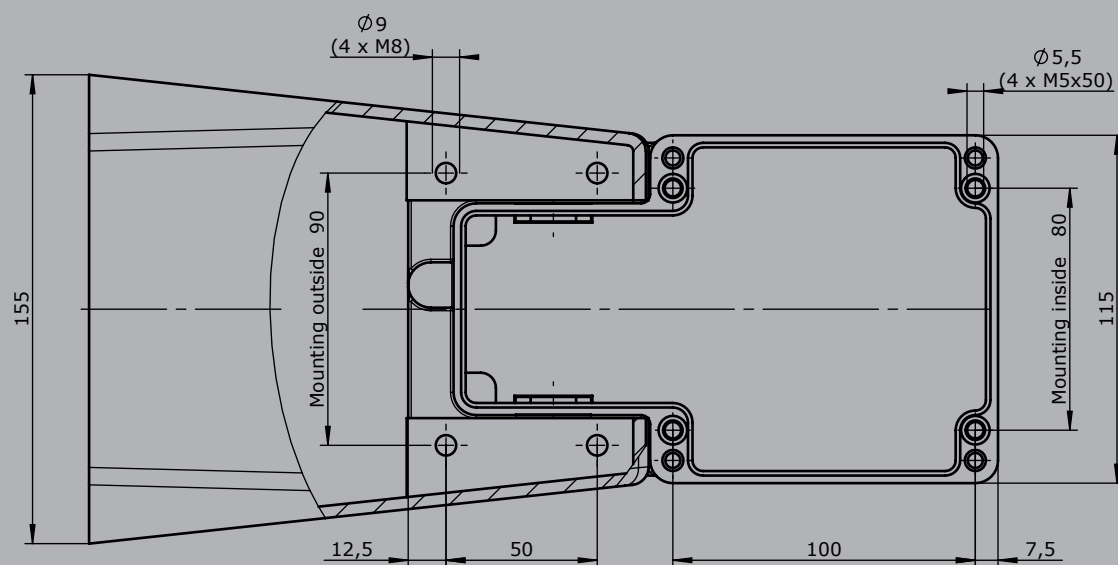
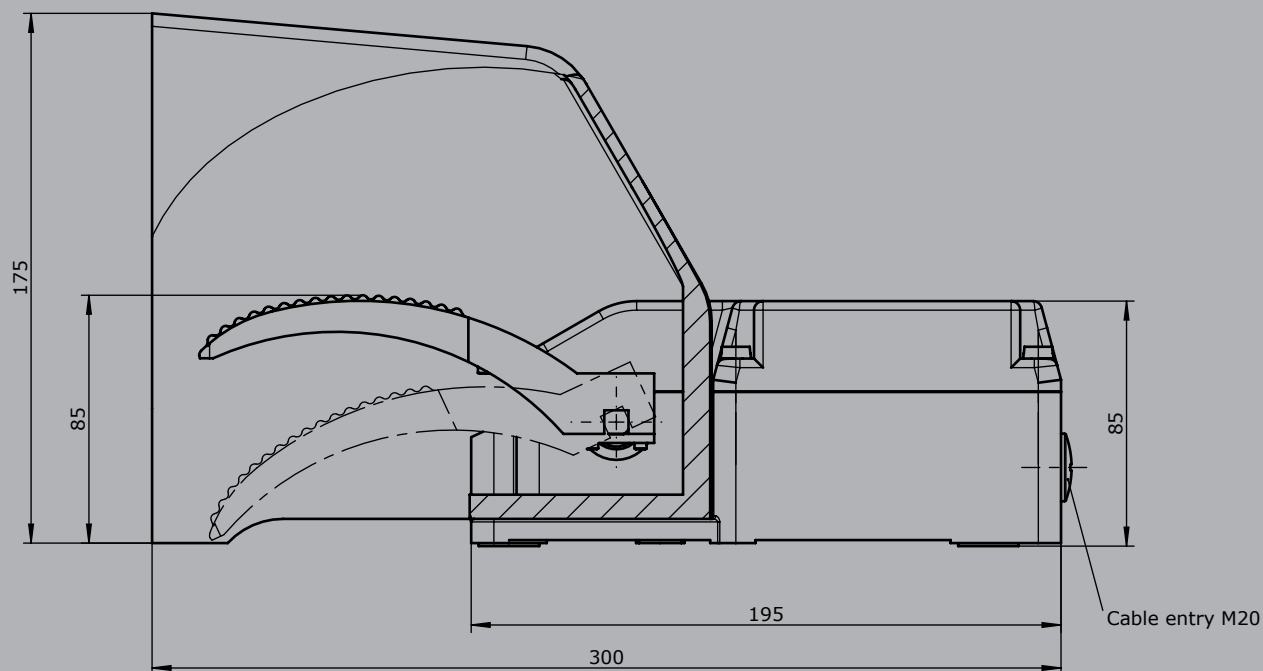
Technical data

Mechanical life P8	6 million operating cycles
Mechanical life PP8	10 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection P8	IP54
Degree of protection PP8	IP65
Colour	RAL 7032 pebble-grey



Example

	P8	-1 Z	P	-A01	P124	-X
Basic unit						
P8	Pedal-controller					
	Reinforced version					
PP8	Pedal-controller					
Detent						
	without					
R2	0-2					
R3	0-3					
R4	0-4					
Direction 1-2						
1	1 contact	Standard contact - Arrangement see page 135				
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					



Pedal-controller

P7 / PP7

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

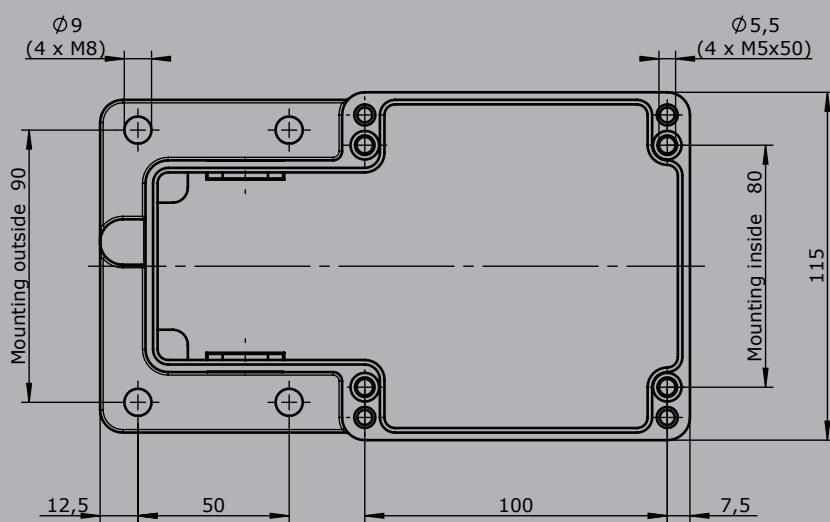
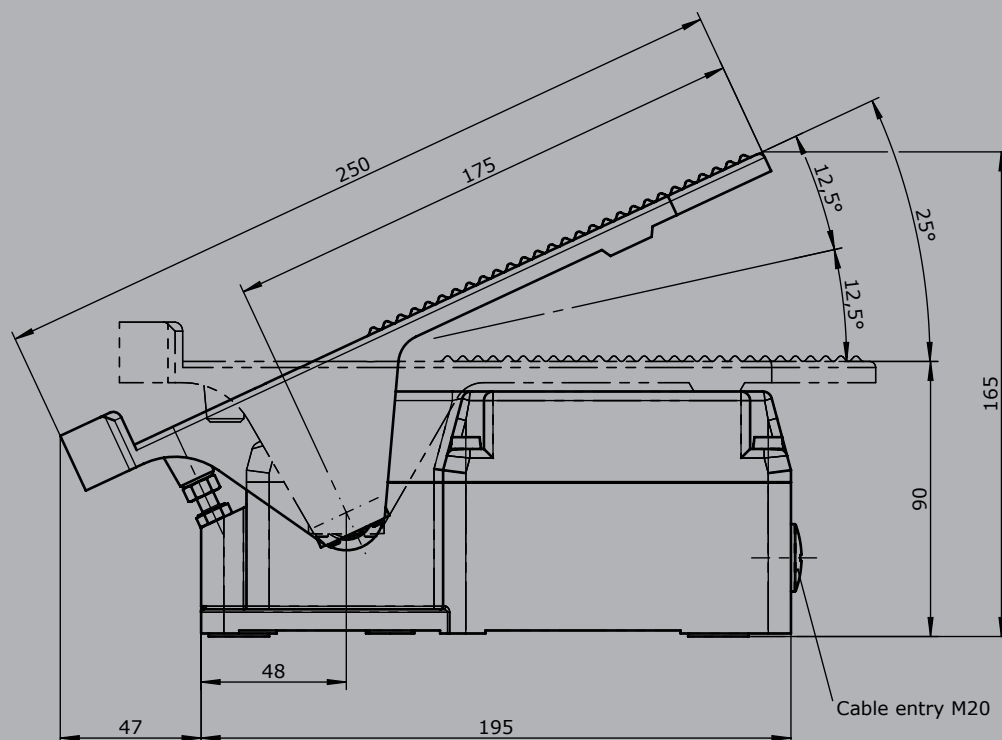
Technical data

Mechanical life P7	6 million operating cycles
Mechanical life PP7	10 million operating cycles
Operation temperature	-40°C to +60°C
Storage temperature	-50°C to +80°C
Degree of protection P7	IP54
Degree of protection PP7	IP65
Colour	RAL 7032 pebble-grey



		P7	-1 Z	P	-A01	P124	-X
Basic unit							
P7	Pedal-controller						
	Reinforced version						
PP7	Pedal-controller						
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 135					
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!



Gear limit switch
GE 1 / GE 2



The gear limit switch GE 1 / GE 2 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

Table with 2 columns: Parameter and Value.
Parameters: Mechanical life GE1/GE2, Operation temperature, Storage temperature, Degree of protection, Colour.
Values: 10 million operating cycles, -40°C to +60°C, -50°C to +80°C, IP65, RAL 7032 pebble grey.

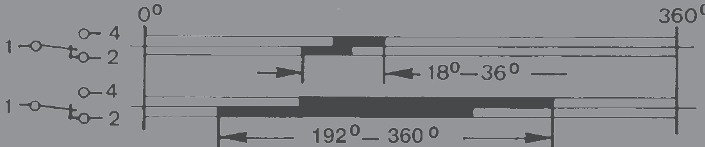
Example

Main configuration table with columns for GE 1, -10, -4, -P, and Example variants (-U7, -P, -18, -30, -60, -90, -X). Rows include Basic unit, Gearing (Ratios), Limit switch (2-16 contacts), and Potentiometer options (P451-P455).

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

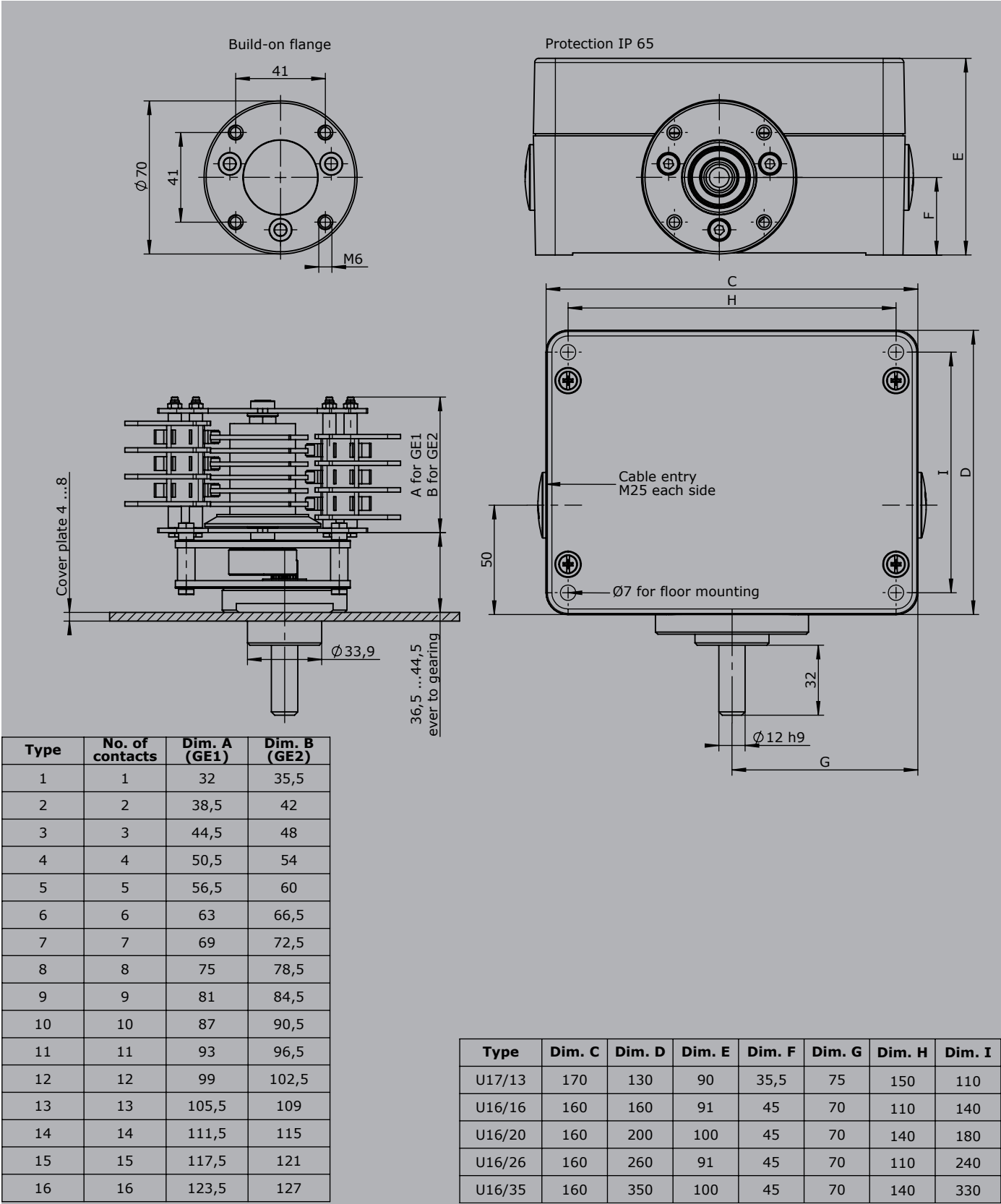
Gear limit switch

GE 1 / GE 2

	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										

Gear limit switch

GE 1 / GE 2



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

DC-Contact

SO 1.10 Normally closed (NC)

SS 1.10 Normally open (NO)

The DC contact block 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 contact blocks to prevent the magnets adversely affecting each other. Contact blocks in four different colours are available for polarity identification of the magnets when fitted.

The contact blocks 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 contact blocks 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 contact blocks can be provided with shock protection to DIN VDE 0106 Part 100.



Example

	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 +60°C
Degree of protection	IP40

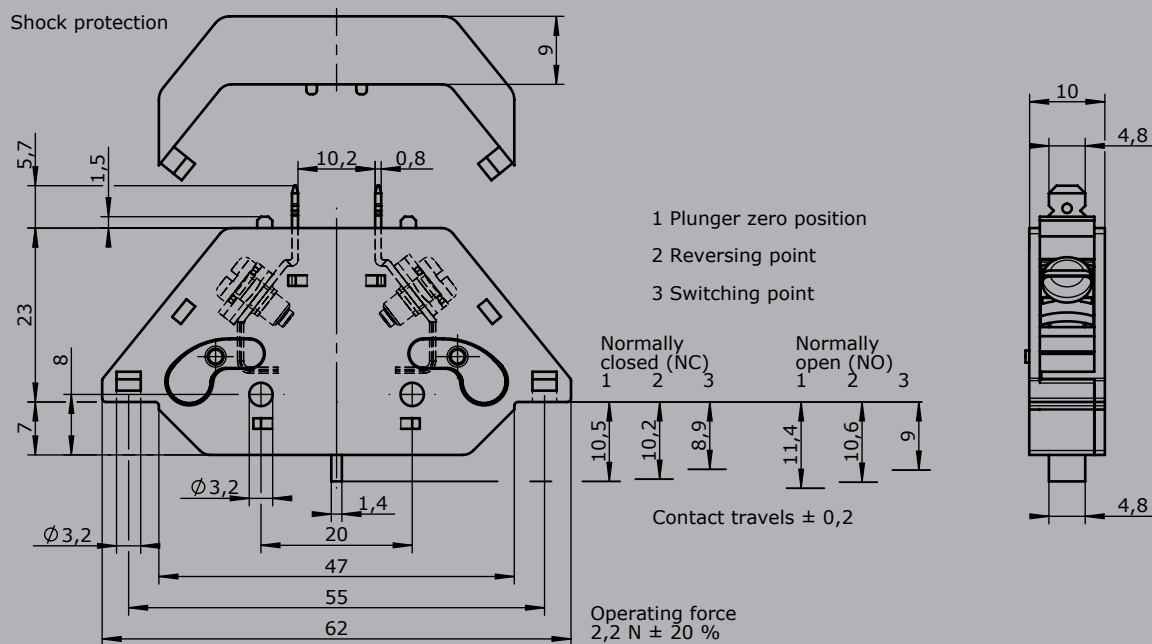
		SO 1.10	-B	-R	-F	-X
Basic unit						
SO1.10	DC-contact normally closed (NC)					
	Colour code grey or blue					
SS1.10	DC-contact normally open (NO)					
	Colour code yellow or green					
Attachment						
B	Shock protection KEG 142 to DIN VDE 0106 part 100					
R	Roller lever					
K	Toggle lever (switching 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!

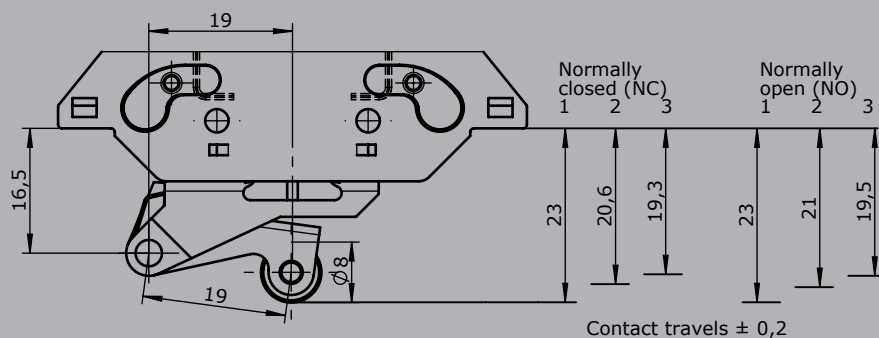
DC-Contact

SO 1.10 Normally closed (NC)

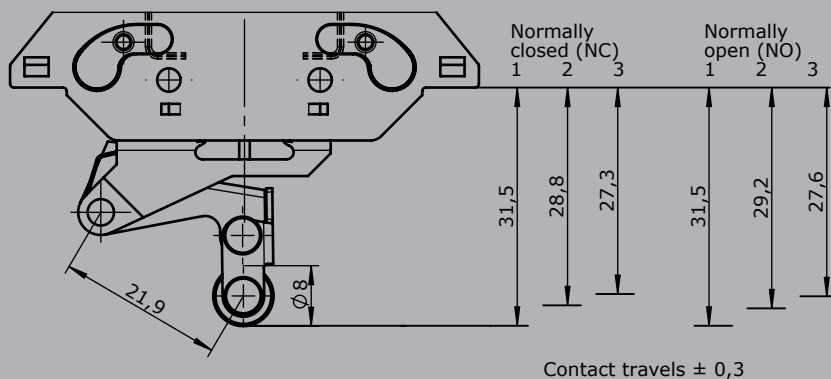
SS 1.10 Normally open (NO)



with roller lever



with toggle lever



Signal-cam controller NU 1

The 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 DC contact blocks 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 +60°C
Degree of protection	IP40 / IP65 with aluminium housing

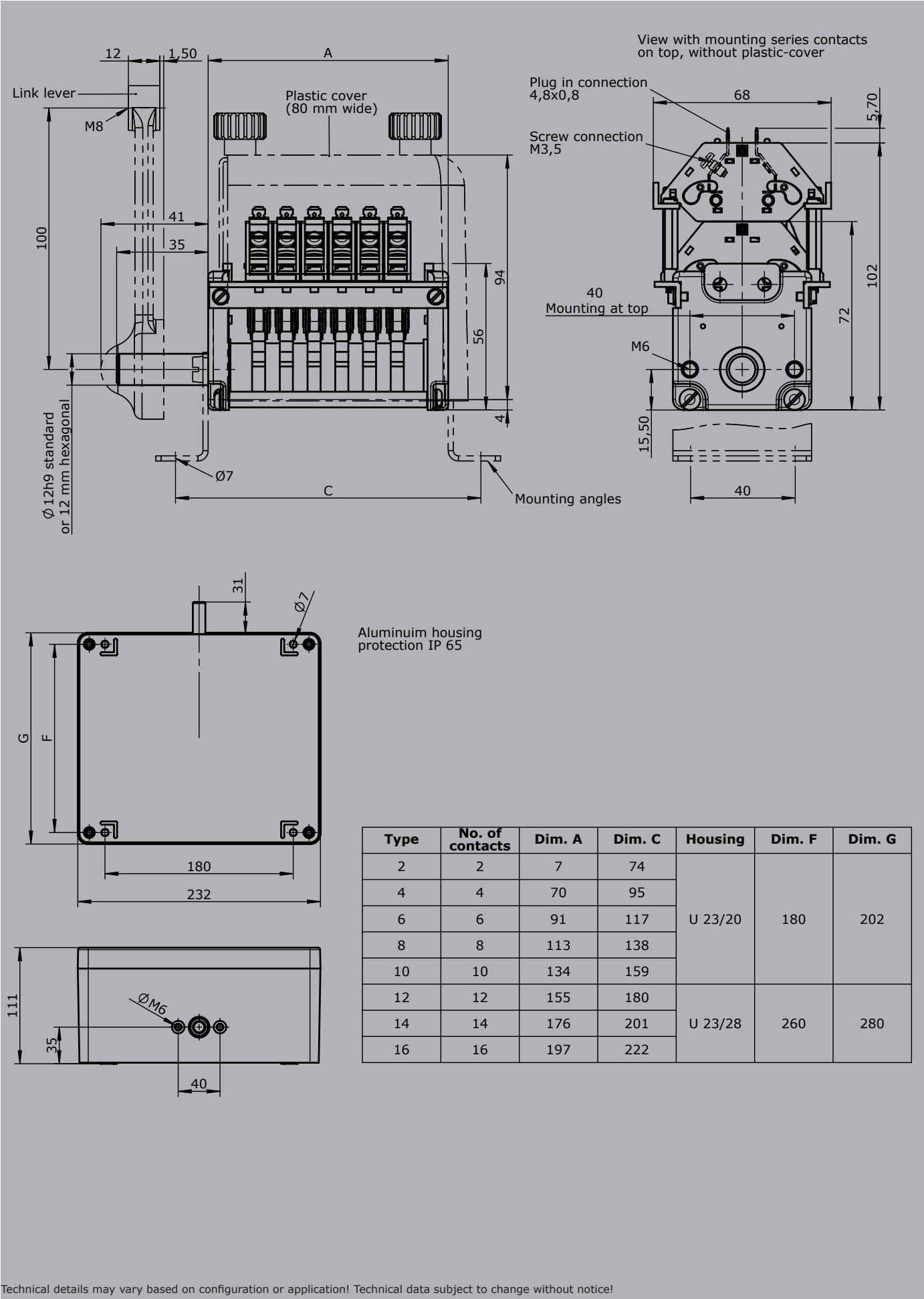
Switching capacity	NC	NO	Time constant
250 V DC	2A	1A	20 ms
125 V DC	4A	3A	20 ms
50 V DC	6A	6A	20 ms
30 V DC	10A	10A	20 ms
250 V DC15	6A	6A	



	NU1	-4	-4	-F2	-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								



Headquarters and locations of Gessmann Group



Headquarters

W. Gessmann GmbH
Postfach 11 51
74207 Leingarten
Eppinger Straße 221
74211 Leingarten
Phone +49 7131 40 67-722
Fax +49 7131 40 67-10
sales@gessmann.com
www.gessmann.com

Sales Office Northwest Germany

Phone +49 4221 9285 640
Fax +49 7131 4067 10
tino.krueder@gessmann.com
www.gessmann.com



Gessmann Group

Sales office France

Bureau Gessmann France
Nicolas Patricot
14 rue de la Perruche
78117 Chateaufort
Phone +33 65 20 74 55 9
Fax +33 989 264 847
nicolas.patricot@gessmann.com
www.gessmann.com

Sales office Scandinavia

Gessmann Office Finland
Harri Järvenpää
Vuorikatu 30 A
23500 Uusikaupunki
Phone + 358 408 2800 10
harri.jarvenpaa@gessmann.com

Responsible for:

Finnland
Norwegen
Schweden

Subsidiary North America, Mexico, Chile, Canada

Gessmann North America Limited
8620 Escarpment Way, Unit 5-7
Milton ON L9T 0M1
CANADA
Phone +1 905 693 6948
Fax +1 905 693 8097
sales@senett.ca
www.senett.ca

Responsible for:

USA
Mexico
Chile
Canada

Subsidiary Asia

Gessmann China Ltd.
K2-183, No. 3188 Xiupu Road
201315 Pudong, Shanghai
Phone +86 21 5011 3466
Fax +86 21 5186 1266
sales@gessmann.com.cn
www.gessmann.com

Responsible for:

China

Subsidiary India

Gessmann Controllers India Pvt. Ltd.
1st Floor, Plot No. 19/1-A
2nd Main, 2nd Phase,
Peenya Industrial Area
560058 Bangalore
Phone +91 99 4591 9170
gopalshastry@gessmann.com
www.gessmann.com

Responsible for:

India

Gessmann Partner

Brazil
Choice Tecnologia Ind.e Com.de
equipamentos industrial Ltda
Rua Afonso Fruct, 131, Fazendinha
81320-020 Curitiba / PR
Phone +55 41 3015 7953
Fax +55 41 3015 7853
contato@choicetech.com.br
www.choicetech.com.br

USA

OEM Controls, inc.
10 Controls Drive
Shelton, Conn. 06484
Phone +1 203 929 84 31
Fax +1 203 926 69 24
ContactUs@oemcontrols.com
www.oemcontrols.com

Representatives in Germany

Dr.-Ing. Klaus Zimmermann
Ingenieurbüro
Hauptstraße 158
06493 Harzgerode OT Neudorf
Phone +49 39484 63 64
Fax +49 39484 63 19
ib-zimmermann@gmx.de
www.gessmann.com

Systemautomation Zimmermann
Dipl.-Ing. Jan Zimmermann
Hauptstraße 158
06493 Harzgerode OT Neudorf
Phone +49 39484 74 24 84
Fax +49 39484 63 19
saz-zimmermann@gmx.de
www.gessmann.com

Bretzel GmbH
Postfach 64 331, 64331 Weiterstadt
Am Rotböll 8, 64331 Weiterstadt
Phone +49 0615 086 56 00
Fax +49 0615 086 56 069
info@bretzel-gmbh.de
www.bretzel-gmbh.de

Christiani Elektro-Vertriebs-GmbH
Innungstraße 39
50354 Hürth
Phone +49 2233 3 50 35
Fax +49 2233 3 61 81
vertrieb@christiani-gmbh.de
www.christiani-gmbh.de

Dealer network worldwide



Argentina

Cavotec Latin America S.A.
calle Bogotá 1362
B1640DDL Martínez
Buenos Aires
Phone +54 11 4836 2726
Fax +54 11 4836 2116
info.ar@cavotec.com
www.cavotec.com

Australia

Cavotec Australia Pty Ltd.
Head Office Newcastle
P.O. Box 577
28 Mitchell Road, Cardiff NSW 2285
Phone +61 2 4956 5788
Fax +61 2 4956 5823
info.au@cavotec.com
www.cavotec.com

Belgium

Batenburg Mechatronica B.V.
Leuvensesteenweg 613
1930 Zaventem zuid 7
Phone +32 225 33 120
Fax +32 225 30 897
info@batenburgbelgie.be
www.batenburg-mechatronica.com

Brazil

Choice Tecnologia Ind.e Com.de
equipamentos industrial Ltda
Rua Afonso Fruct, 131
81320-020 Curitiba / PR
Phone +55 41 3015 7953
Fax +55 41 3015 7853
contato@choicetech.com.br
www.choicetecnologia.com.br

Canada

Gessmann North America Limited
8620 Escarpment Way, Unit 5-7
Milton ON L9T 0M1
CANADA
Phone +1 905 693 6948
Fax +1 905 693 8097
sales@senett.ca
www.senett.ca

Chile

Gessmann North America Limited
8620 Escarpment Way, Unit 5-7
Milton ON L9T 0M1
CANADA
Phone +1 905 693 6948
Fax +1 905 693 8097
sales@senett.ca
www.senett.ca

Sistemas de Control Ltda.
La Cordillera 21- Lampa
8320000 Santiago
Phone +562 295 27966
alorca@scontrol.cl
www.scontrol.cl

China

Gessmann China Ltd.
K2-183, No. 318 Xiupu Road
201315 Pudong, Shanghai
Phone +86 21 5011 3466
Fax +86 21 5186 1266
sales@gessmann.com.cn
www.gessmann.com

Cavotec (Shanghai) Power Supply and
Crane Technology Co., Ltd.
Unit 11, No. 1951, Duhui Road
Minhang District
Shanghai 201108
Phone +86 21 5442 9778
Fax +86 21 3407 3498
info.cn@cavotec.com
www.cavotec.com

Czech Republic

RIA control a.s.
Míru 3
739 61 Trinec-Kanada
Phone +420 553038848
Fax +420 558 988815
info@riaccontrol.cz
www.riaccontrol.cz

Denmark

Baastup A/S
Dronning Olgas Vej 30
2000 Frederiksberg
Phone +45 38 10 21 29
Fax +45 38 10 29 69
info@baastup.com
www.baastup.com

Finland

Gessmann Office Finland
Harri Järvenpää
Vuorikatu 30 A
23500 Uusikaupunki
Phone +358 408 2800 10
harri.jarvenpaa@gessmann.com
www.gessmann.com

Kentek Oy
Postbox 18, 01721 Vantaa
Tiilenlyöjankuja 4, 01720 Vantaa
Phone +358 9 849 420 0
Fax +358 9 849 420 59
kentek@kentek.fi
www.kentek.fi

France

Bureau Gessmann France
Nicolas PATRICOT
14 rue de la Perruche
78117 Chateaufort
Phone +33 65 20 74 55 9
nicolas.patricot@gessmann.com
www.gessmann.com

Greece

Euroelektrik
Stefanidou Kalliopi & Co.
Agios Dimitrios
50100 Kozani
Phone +30 30 2 46 10 9 44 45
Fax +30 30 2 46 10 9 44 25
kastefa@otenet.gr

Hong Kong

Cavotec Hong Kong Ltd.
Unit A, 9th Floor, Chinaweal Centre
414-424 Jaffe Road
Wanchai, Hong Kong
Phone +852 2791 6161
Fax +852 2791 1834
info.hk@cavotec.com
www.cavotec.com

India

Gessmann Controllers India Pvt. Ltd.
1st Floor, Plot No. 19/1-A
2nd Main, 2nd Phase
Peenya Industrial Area
560058 Bangalore
Phone +91 99 4591 9170
gopalshashtry@gessmann.com
www.gessmann.com

Arihant Elsys Private Limited
24/4866 Ansari Road Darya Ganj
New Delhi - 110002
Phone +91 11 23 26 90 11
Fax +91 11 23 27 35 54
info@arihantelectricals.com
www.arhantelectricals.com

SEVA Switchgear Pvt. Ltd.
97, Magadi Road, Metro pillar 219
560023 Bangalore
Tel.: +91 80 2338 3047
info@sevaspl.com
www.sevaspl.com

Iran

Lebon Company
83, NO.9, Brand Center bldg.
Shahid Lavasani (Farmanieh) Str.
Tehran 1954664598
Phone +98 21 2614 0496
Fax +98 21 2613 0981
lebon@lebonco.com

Sepahan Pishtaz Electronic
SPE Co
No.38, Taher Lane-58
St. Baghdaryache St.
81767-75861 Isfahan
Phone +98 31 3776 0042
Fax +98 31 3776 9231
info@spe.ir
www.spe.ir

Italy

U-CONTROL Srl
Via G. Righi 2/a
43122 Parma
Phone +39 0521 27 3823
Fax +39 0521 78 9510
info@u-control.eu
www.u-control.eu

Japan

JEPICO Corporation
Shinjuku Front Tower
211 Kita Shinjuku 2-Chome
Shinjuku-ku, Tokyo 169-0074
Phone +81 3 6362 0316
Fax +81 3 5386 8235
a_oeiki@jepico.co.jp
www.jepico.co.jp

Kazakhstan

EIM engineering Ltd.
Trefoleva str. 1, liter.P
198097 Sankt-Petersburg
Phone +7 812 325 93 65
info@eim-engineering.ru

Korea

Roritec Co. Ltd.
460-1 Hyomun-Dong
Buk-Ku 683-360 Ulsan
Phone +82 52 288 7114
Fax +82 52 288 7124
keonju@roritec.co.kr
www.roritec.co.kr

Latvia

MAA Intelengineering LTD
Zentenes street 32
1069 Riga
Phone +371 263 90 398
maaie@maaie.net
www.maaintelengineerin.wixsite.com/maaie

Malaysia

PINTSCH-BUBENZER MYPORT SDN BHD
No. 22, Jalan Mega 1/4
Taman Perindustrian Nusa Cemerlang,
81550 Gelang Patah,
Johor Darul Takzim
Phone +607 5319 799
Fax +607 5319 798
info@pbmyport.com.my
www.my-port.net

Mexico

Gessmann North America Limited
8620 Escarpment Way, Unit 5-7
Milton ON L9T 0M1
CANADA
Phone +1 905 693 6948
Fax +1 905 693 8097
sales@senett.ca
www.senett.ca

Alimentaciones Electricas, S.A. de C.V.
Parque Industrial Empresarial
Cuautlancingo R.F.C. AEL 740715 1YA
Rio Suchiate No. 24
Phone +52 222 210 50 93
Fax +52 222 210 50 69
almesa@mexis.com.mx
www.almesa.com.mx

Netherlands

Batenburg Mechatronica B.V.
P.O. Box 9393, 3007AJ Rotterdam
Stolwijkstraat 33,
3079 DN Rotterdam
Phone +31 10 2 92 87 87
Fax +31 10 2 92 87 65
info.mechatronica@batenburg.nl
www.batenburg-mechatronica.com

Norway

Cavotec Norge, AS
Strandveien 6
3050 Mjøndalen
Postbox 276
3051 Mjøndalen
Phone +47 32 27 43 00
Fax +47 32 23 00 77
info@cavotec.no
www.cavotec.com

Peru

Sistemas de Control Ltda.
La Cordillera 21- Lampa
8320000 Santiago
Phone +562 295 27966
alorca@scontrol.cl
www.scontrol.cl

Poland

ELEKTRO-TRADING
ul.P.Gojawiczynskiej 13
44-109 Gliwice, Poland
Phone +48 32 330 45 70
Fax +48 32 330 45 74
et@elektro-trading.com.pl
www.elektro-trading.com.pl

Portugal

Kimatic S.L.
Calle Sasikoa, 30
48200 Durango (Vizcaya)
Spain
Phone +34 946 20 10 36
Fax +34 946 20 8 32
info@kimatic.es
www.kimatic.es

Romania

ELECTRO-DISTRIBUTION S.R.L.
Str. mecer nr. 42-44, sector 2
Bucuresti
Phone +40 21 253 29 55
Fax +40 21 253 29 56
office@electrodistribution.ro
www.electrodistribution.ro

Russia

Smart Automatica Ltd.
Belinski str 83, office 416
620026 Jekaterinburg
Phone +7 343 344 34 21
inf@smartautomatica.ru

Trader Group Ltd.
Himicheskiy narrow str. 1, liter.P
198095 Sankt-Petersburg
Phone +7 812 3259 365
tradergroupspb@gmail.com

Serbia

Bosnia-Herzegovina
Kosovo
Macedonia
Montenegro
Elektro UMI d.o.o.
Milene Cupic 11
11250 Zeleznik
Phone +381 11 2576 206
Fax +381 11 2577 364
office@elektroumi.rs
www.elektroumi.rs

Singapore

Cavotec Singapore PTE Ltd.
No. 8, Boon Lay Way,
Tradehub21 #07-05
Singapore 609964
Phone +65 6862 2545
Fax +65 6862 2548
info.sg@cavotec.com
www.cavotec.com

Slovakia

VENIO, s.r.o.
Karmínová 1092/3
01030 Zilina
Phone +421 949 130 270
venio@venio.sk
www.venio.sk

South Africa

Powermite
A division of Hudaco Trading (PTY) Ltd.
92, Main Reef Road
1724 Roodepoort
Phone +27 11 271 0000
Fax +27 11 760 3099
info@powermite.co.za
www.powermite.co.za

Dealer network worldwide



Spain

Kimatic S.L.
Calle Sasikoa, 30
48200 Durango (Vizcaya)
Phone + 34 946 20 10 36
Fax + 34 946 20 8 32
info@kimatic.es
www.kimatic.es

OEM Controls inc.
10 Controls Drive
Shelton, Conn. 06484
Phone + 1 203 929 84 31
Fax + 1 203 926 69 24
contactUs@oemcontrol.com
www.oemcontrols.com

Sweden

Gessmann Office Finland
Harri Järvenpää
Vuorikatu 30 A
23500 Uusikaupunki
Phone +358 408 2800 10
harri.jarvenpaa@gessmann.com
www.gessmann.com

Cavotec USA Inc.
333 Oates Road
Mooresville, NC 28117
Phone +1 704 873 3009
Fax +1 704 873 3093
sales.us@cavotec.com
www.cavotec.com

Kiepe Elektriska AB
Lodgatan 4
21124 Malmö
Phone +46 40 29 15 55
Fax +46 40 29 12 31
klepe@kiepe.se
www.kiepe.se

Switzerland

ELVA AG – Elektrische Verteilanlagen
Werbhollenstrasse 54
4143 Dornach
Phone +41 61 706 85 95
Fax +41 61 706 85 91
info@elva.ch
www.elva.ch

Thailand

Philippines

Vietnam

MTI Engineering CO., LTD
94/20, moo 3, Soi-Janthongaium
Bangrakpattana, Bangbaothong
Nonthaburi 11110
Phone +662 02 1902050 53
Fax +662 02 19020 54
info@mti-eng.com
www.mti-eng.com

Turkey

ARDA Makina Elektrik
Ticaret ve Sanayi Ltd. Sti.
100. Yil Bulvarı 1230. Street No.1
06374 Ostim-Ankara
Phone +90 312 385 80 37
Fax +90 312 385 80 58
arda@ardaelektrik.com
www.ardaelektrik.com

Ukraine

UA-Systems LLC.
Moskalivska 93
61004 Charkov
Phone +38 057 759 00 96
Fax +38 057 759 07 32
gessmann@systemsua.com.ua
www.geonorma.com.ua

United Arab Emirates

Cavotec Middle East FZE
P.O. Box 61 124
Jebel Ali Free Zone, AA2 & AA3-RA08
Dubai
Phone +971 488 38 350
Fax +971 488 38 352
info.ae@cavotec.com
www.cavotec.com

United Kingdom

Cavotec UK Limited
Unit 5/6 St. Anne's Industrial Estate
Limeoak Way
Stockton-on-Tees, TS18 2LS
Phone +44 1624 608 245
Fax +44 1624 608 224
sales.uk@cavotec.com
www.cavotec.com

United States

Gessmann North America Limited
8620 Escarpment Way, Unit 5-7
Milton ON L9T 0M1
CANADA
Phone +1 905 693 6948
Fax +1 905 693 8097
sales@senett.ca
www.senett.ca

Crane Systems and Hoisting Equipment



Pedal Controller P7



Multi-axis Controller V14



Portable Control Unit TS 22



Multi-axis Controller V6/VV6

**Setting big things
into motion.**



Multi-axis Controller V8/V85



Single-axis controller S26



Gear Limit Switch GE1



Crane Control Unit KST 19



Handles



Double-handle controller D8

Electro Hydraulics and Industrial Applications



Multi-axis Controller V85/B25



Multi-axis Controller V24



Multi-axis Controller V25



Foot pedal P20

**Setting big things
into motion.**



Multi-axis Controller V22



Multi-axis Controller S11



Palm grip B25



Palm grip B20



Hall-push button



Palm grip B3

Offshore and Ship Controller



Aqua Pilot ND



Aqua Pilot 2000



Azimuth



Sensor Box

**Setting big things
into motion.**



Control Switch N7



Control pedestal for offshore
U22/32



Double Handle Controller D3



Single-axis Controller S3



Single-axis Controller S23



Thruster lever D30

[illegible]

[illegible]

[illegible]

www.gessmann.com

W. Gessmann GmbH

**P/O Box 11 51
74207 Leingarten
GERMANY**

**Eppinger Straße 221
74211 Leingarten
GERMANY**

Phone +49 (0) 7131 40 67-722

Fax +49 (0) 7131 40 67-10

sales@gessmann.com

www.gessmann.com