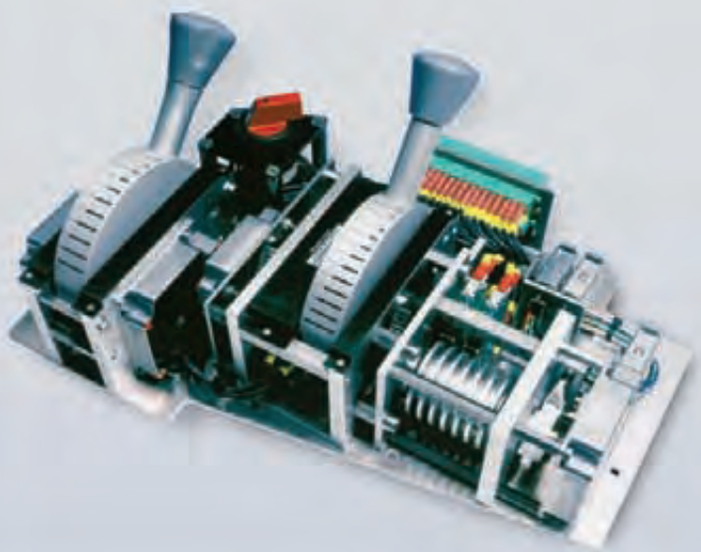
GESSMANN

Industrial Controllers

precision

competence

innovation



Catalog 2008

Our product range includes:

- Multi-axis controller, Double-handle controller, Control switch (Masterswitch), Gear Limit switch for hoisting-, electro-hydraulic application-, material-handling technology and remote control
- Complete crane control unit, portable control unit, pedant control unit, including wiring for all types of cranes and vehicles
- Control pedestal, controllers for offshore application and nautical control devices (ship-drive)
- Pedal controller for welding machine control and speed control
- Master controller for rolling stock
- Displays for forklift and construction machinery
- Proportional control electronic for solenoid valves
- Control electronic with digital and analog outputs matching our controllers
- Control electronic with Profi-Bus interface or CAN-Bus interface matching our controllers (input/output cards)
- DC-contact, signal cam controller for high voltage systems
- Customised solutions for operating units for any type of machinery and vehicles

W. Gessmann GmbH
Schaltgeräte
Leingarten

GESSMANN

Industrial Controllers

CRANE CONTROL UNIT KST 4
swivelling manual adjustment
Catalog 2/040

CRANE CONTROL UNIT KST 15
swivelling manual and/or motorized adjustment
Catalog 2/102

CRANE CONTROL UNIT KST 5
swivelling manual adjustment
Catalog 2/050

Our fields of activity are:

- Crane operation systems
- Remote control, hoisting application
- materials-handling technology, forklift
- Ports, Terminals, Offshore
- Steel Mills
- Mining, Tunnelling
- Forestry
- Welding machine control
- Railtrain, Vehicle application
- High voltage systems
- Explosion protected (flame proof) application

Please ask for our detailed catalog!

Originally designed and manufactured first by Gessmann

Product Lines

GESSMANN

CRANE CONTROL UNIT KST 10
swivelling adjustment
manual
Catalog 2/100

CRANE CONTROL UNIT KST 18
swivelling manual and/or motorized adjustment
Catalog 2/108

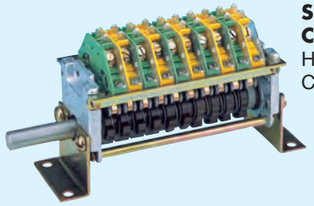
PEDAL CONTROLLER P7
Welding machine control
Catalog 3/100

PEDAL CONTROLLER P10
Electro-hydraulic applications
Catalog 3/102

CONTROL PEDESTAL FOR OFFSHORE U22/32
Catalog 2/160

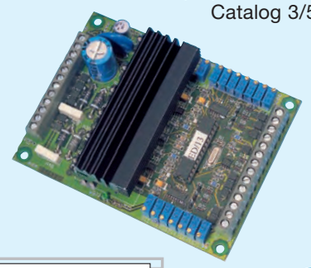
PEDANT CONTROL UNIT HT1
Catalog 2/170

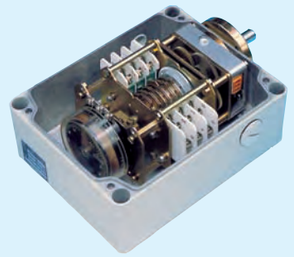
PORTABLE CONTROL UNIT TS22
Catalog 2/152



SIGNAL CAM CONTROLLER NU1
Hv Systems
Catalog 3/402

ELECTRONIC CONTROL UNIT ES/43
Serves for control of proportional valves
Catalog 3/502

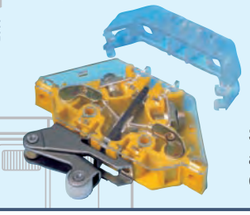




GEAR LIMIT SWITCH GE1
Hoisting applications
Catalog 3/200

REPRESENTATION IN YOUR COUNTRY:

2008



DC-CONTACT S01.10
Signalling and announciation applications
Catalog 3/400

GESSMANN

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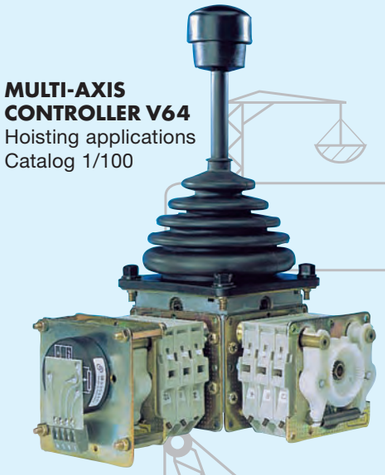
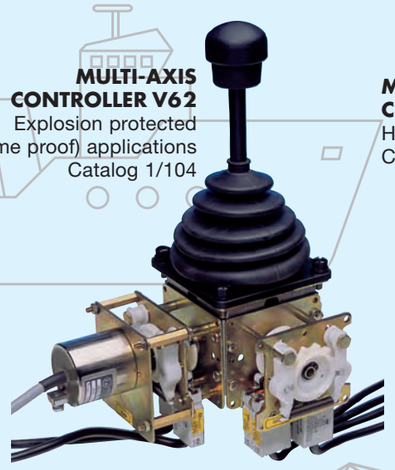


MULTI-AXIS CONTROLLER V64
Hoisting applications
Catalog 1/100



MULTI-AXIS CONTROLLER V62
Explosion protected (flame proof) applications
Catalog 1/104

MULTI-AXIS CONTROLLER V11
Hoisting applications
Catalog 1/110

MULTI-AXIS CONTROLLER V8B1
Electro-hydraulic applications
Catalog 1/130

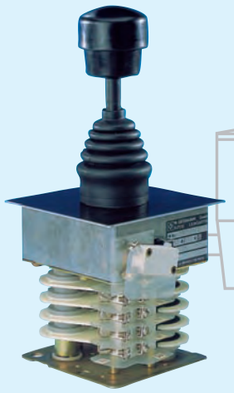
DOUBLE-HANDLE CONTROLLER D8
Electro-hydraulic applications
Catalog 1/162

MULTI-AXIS CONTROLLER VV8
Electro-hydraulic applications
Catalog 1/132

MULTI-AXIS CONTROLLER V85
Electro-hydraulic applications
Catalog 1/132

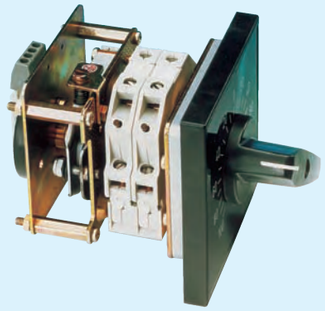
DOUBLE-HANDLE CONTROLLER D3
Nautical navigation applications
Catalog 1/164

MULTI-AXIS CONTROLLER V25
Electro-hydraulic applications
Catalog 1/134



MULTI-AXIS CONTROLLER V5
Hoisting applications
Catalog 1/120

MULTI-AXIS CONTROLLER VV5
Electro-hydraulic applications
Catalog 1/122



CONTROL SWITCHES N6
Hoisting and Electro-hydraulic applications
Catalog 1/220

GESSMANN

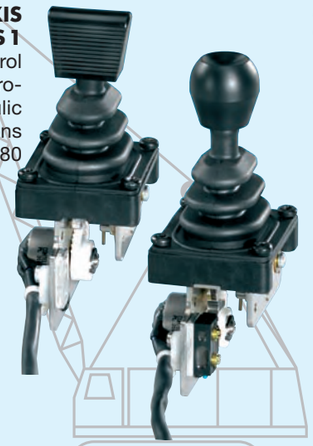
MULTI-AXIS CONTROLLER V10
Remote control and Electro-hydraulic applications
Catalog 1/140

SINGLE-AXIS CONTROLLER S22
Electro-hydraulic applications
Catalog 1/204

SINGLE-AXIS CONTROLLER S23
Electro-hydraulic applications and Offshore
Catalog 1/208

MULTI-AXIS CONTROLLER V21
Electro-hydraulic applications
Catalog 1/146

SINGLE-AXIS CONTROLLER S14
Remote control and hoisting applications
Catalog 1/188



SINGLE-AXIS CONTROLLER S1
Remote control and Electro-hydraulic applications
Catalog 1/180

MULTI-AXIS CONTROLLER V14
Remote control and hoisting applications
Catalog 1/142

MULTI-AXIS CONTROLLER V20
Remote control and other applications
Catalog 1/144

B1

B2

B3

B4

B5

B6

B7

B8

B9

B10

B14

B15

B20

PALM GRIP B1...20
Catalog 1/280...

Our supplies are made in accordance with the “General Conditions of Supply and Delivery for products and services of the electrical and electronic industry“ of the German Electrical and Electronic Manufacturers’ Association (ZVEI).

Please note additional:

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. Our gross prices apply for orders below EURO 75,–. There is a minimum charge of EURO 25,–. Where possible, small orders should be combined.

We are entitled to charge any handling and production costs resulting from modifications of the order caused by the customer (both technical modifications and noncompliance of dead lines).

Payment may be made within 30 days without discount.
These conditions of payment shall be deemed to apply on receipt of our written order confirmation.

All delivery goods remain our sole and absolute property until paid for in full.

The **delivery period** commences only when all technical details have been clarified. Unforeseen circumstances justify an appropriate extension of the delivery period. All documents such as drawings, dimensional drawings, circuit diagramms, etc., are non-binding. We reserve the right to make any changes necessary, in particular technical changes.

Court venue will be exclusively 74072 Heilbronn, Federal Republic of Germany.

⚠ **Warning**

Hazardous voltages are present on specific parts in this electrical device during operation.
Only qualified personal, paying attention to the relevant safety precautions, should install, maintain, modify or fit accessories to the controller. Non-observance of this warning can result in death, severe personal injury or substantial property damage.

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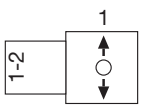
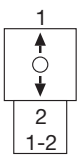
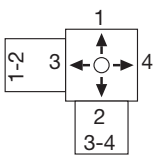
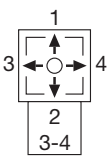
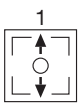
Deutsche Bank Heilbronn (BLZ 620 700 81) account No. 01 94 605
SWIFT-Code: DEUT DE SS 620 · IBAN-Code: DE 14 620 700 81 0019460500
Kreissparkasse Heilbronn (BLZ 620 500 00) account No. 4776
SWIFT-Code: HE IS DE 66 · IBAN-Code: DE 22 620 500 000 00 0004776

Handelsregister/ commercial register:
Stuttgart HRB 100312
Geschäftsführer/ manager:
Gerhard Häußermann
Alwin Ehrensperger

GESSMANN
Industrial controllers

Ordering example Multi-axis controller V 6

2008

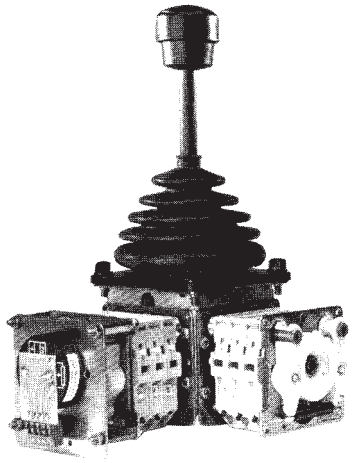
Pos.	V 61	V 61.1	V 62	V 64	V 64.1	Type expansion		Weight gramm	Type	Price EURO
1								960	V 61	
2								980	V 61.1	
3								980	V 62	
4								1010	V 64	
5								960	V 64.1	
7.1	Multi-axis controller left		(dir. 1-2, 3-4)						L	
7.2	Multi-axis controller right		(dir. 5-6, 7-8)						R	
10	Gate cross-shaped		(prohibits diagonal shifting)					60	P	
11	Gate special-shaped		(e.g. H-gate)					60	PX	
20	Control-handle with knob solid									
21	Control-handle with latch for mechanical zero interlock									
21.1	by lifting							50	M	
21.2	by lifting, interlocking the gate or the joint bracket							60	MP	
21.3	by pushing down							50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282									
22	Control-handle with dead man's button 1 NO							100	T	
23	Control-handle with signal button 1 NO							100	H	
24	Control-handle with push button 1 NO							110	D	
25	Control-handle with flat push button 1 NO							110	DV	
26	Control-handle with palm grip B 1							40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO							60	B 1T	
28	Control-handle long or short									
28.1			-40 mm						S3	
28.2			-20 mm						S5	
28.3			+20 mm						S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...									
30	Masterswitch (contact set) switching sequenc 4-0-4						No. of contacts 2	290	01	
31							4	350	02	
32	Direction 1-2 and 3-4 each 1 masterswitch						6	410	03	
33	Switching program according contact-arrangement MS... see catalog 5/001					A...	8	470	04	
34	or to your contact-arrangement						10	530	05	
35							12	590	06	
36	Switching sequence 5-0-5 or 6-0-6									
37	Micro changeover contact (MZT 1) positive opening						2			
38	Spring return in 0-position		(for each direction)						Z	
39	Friction brake adjustable		(for each direction)						R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025					...P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°								(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable								(P)	
43	more Potentiometer e.t.c. see catalog 1/240...					C..., P...				
50	Steel sheet housing B 200 masterswitch max. size 04							1300	B	
51	Steel sheet housing B 230 x 340 masterswitch max. size 06							1500	B	
52	More housing see catalog 1/350									
60	Indicating labels not engraved with 2 or 4 arrows									
61	Engraving, each 10 characters									
70	Command and indicating devices see catalog 1/360									

description of one axis is enough, if both axes are identical, eg.: A05 P024 + A05 P024 => A05 P024

V64 L S5 P B1T - 02 Z P + 01 R P -B- -X- A050 P024 +A05 P022

- V64: multi-axis controller
- L: installation side L o. R
- S5: special control handle
- P: gate
- B1T: handle
- 02: contact set dir. 1-2 (5-6)
- Z: spring return dir. 1-2 (5-6)
- P: Potentiometer dir. 1-2 (5-6)
- 01: contact set dir. 3-4 (7-8)
- R: friction brake dir. 3-4 (7-8)
- P: Potentiometer dir. 3-4 (7-8)
- -B-: housing
- -X-: special please describe
- A050: Arrangement dir. 1-2 (5-6) see p. 5/001
- P024: Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A05: Arrangement dir. 3-4 (7-8) see p. 5/001
- P022: Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller V 6



Type V62L-03ZP+03Z-…

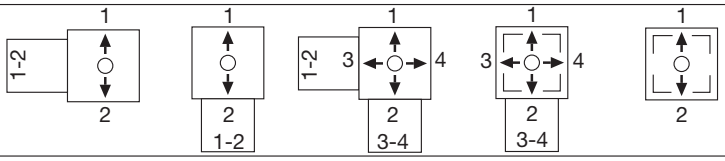
The multi-axis controller V 6 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The V 6 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

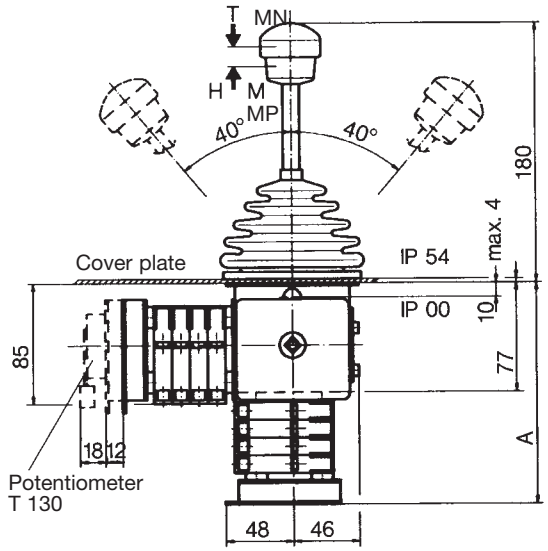
Mechanical life	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

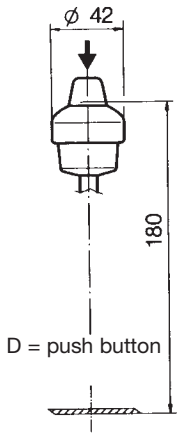
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

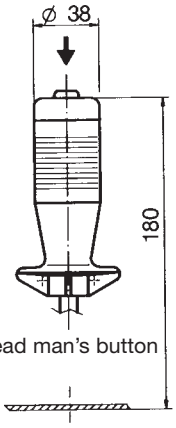
Pos.	V 61 / V 61.1 / V 62 / V 64 / V 64.1		Type expansion		Weight gramm	Type	Price EURO
1					960	V 61	
2					980	V 61.1	
3					980	V 62	
4					1010	V 64	
5					960	V 64.1	
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			60	P	
11	Gate special-shaped	(e.g. H-gate)			60	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.2	by lifting, interlocking the gate or the joint bracket				60	MP	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button	1 NO			100	T	
23	Control-handle with signal button	1 NO			100	H	
24	Control-handle with push button	1 NO			110	D	
25	Control-handle with flat push button	1 NO			110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1		-40 mm				S3	
28.2		-20 mm				S5	
28.3		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact set) switching sequenc 4-0-4			No. of contacts 2	290	01	
31				4	350	02	
32	Direction 1-2 and 3-4 each 1 masterswitch			6	410	03	
33	Switching program according contact-arrangement MS... see catalog 5/001		A...	8	470	04	
34	or to your contact-arrangement			10	530	05	
35				12	590	06	
36	Switching sequence 5-0-5 or 6-0-6						
37	Micro changeover contact (MZT 1) positive opening			2			
38	Spring return in 0-position	(for each direction)			110	Z	
39	Friction brake adjustable	(for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025		...P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.					(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		C..., P...				
50	Steel sheet housing B 200 masterswitch max. size 04				1300	B	
51	Steel sheet housing B 230 x 340 masterswitch max. size 06				1500	B	
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

T = dead man's button
H = signal button
M = latch for mechanical zero interlock



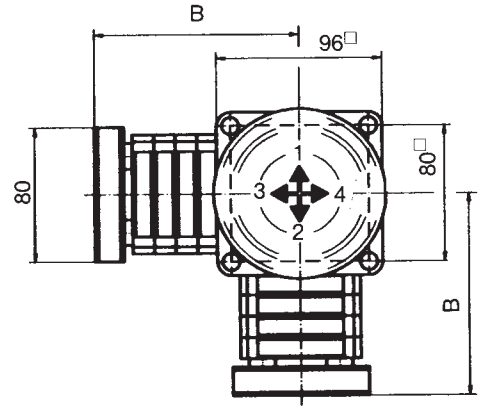


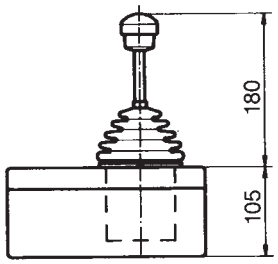
D = push button



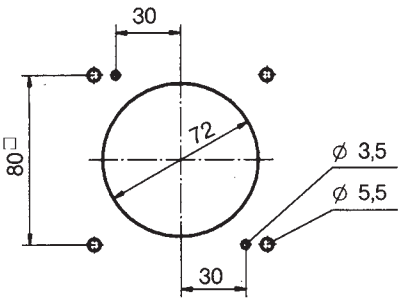
B 1T = dead man's button

Type	No. of contacts	Dimension A	Dimension 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

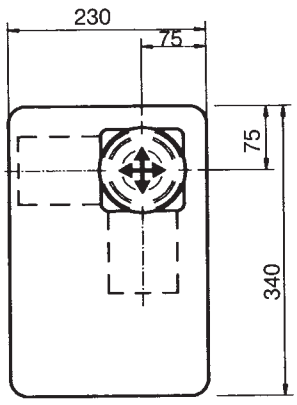




Steel sheet housing

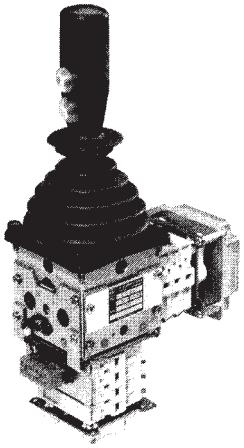


Hole pattern



V64	L	S5	P	B1T -	02	Z	P	+ 01	R	P	-B-	-X-	A050	P024	+A05	P022
multi-axis controller																Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
installation side L o. R															Arrangement dir. 3-4 (7-8) see p. 5/001	
special control handle														Potentiometer description dir. 1-2 (5-6) see p. 1/240ff		
gate													Arrangement dir. 1-2 (5-6) see p. 5/001			
handle												special please describe				
contact set dir. 1-2 (5-6)											housing					
spring return dir. 1-2 (5-6)										Potentiometer dir. 3-4 (7-8)						
Potentiometer dir. 1-2 (5-6)									friction brake dir. 3-4 (7-8)							
contact set dir. 3-4 (7-8)																

Multi-axis controller VV 6



Type V64LB12D-04Z+03ZC-…

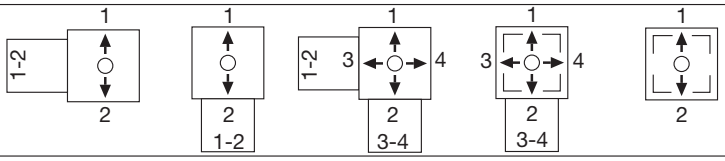
The multi-axis controller VV 6 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The VV 6 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

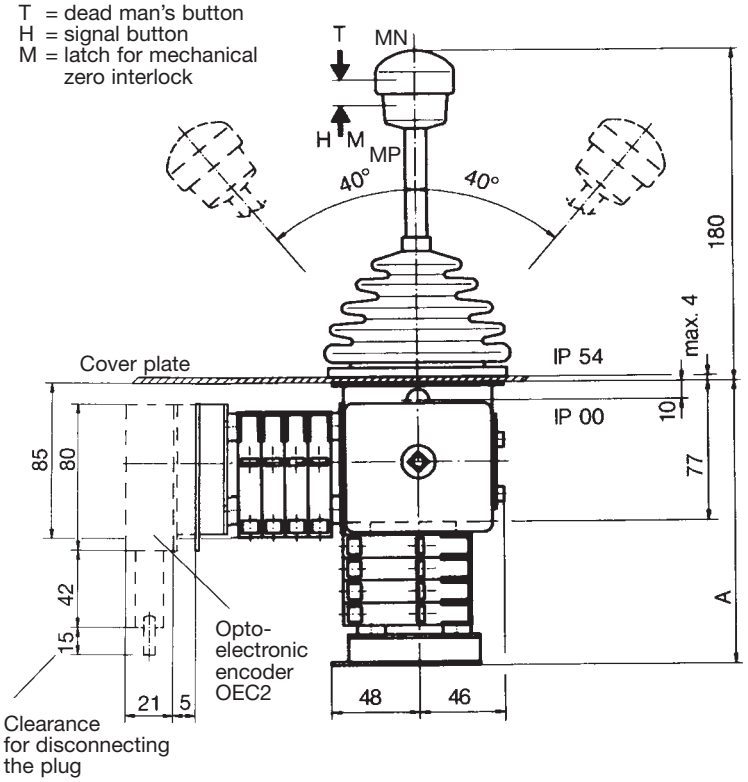
Mechanical life	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

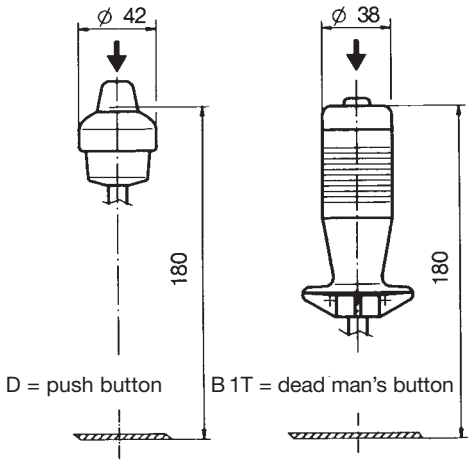
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

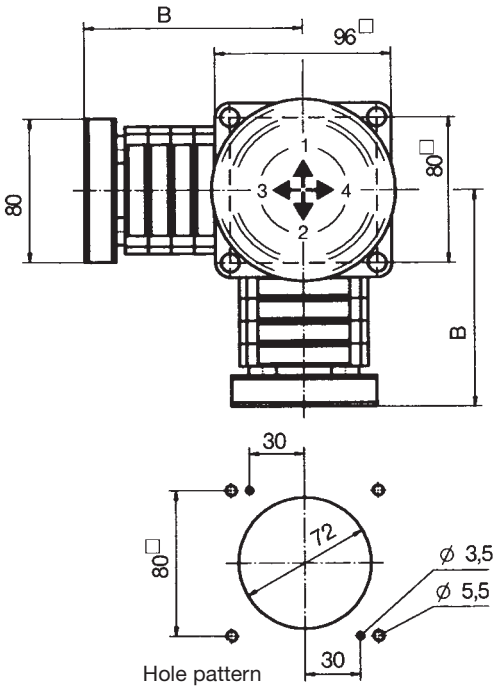
Pos.	VV 61 / VV 61.1 / VV 62 / VV 64 / VV 64.1		Type expansion		Weight gramm	Type	Price EURO
1					960	VV 61	
2					980	VV 61.1	
3					980	VV 62	
4					1010	VV 64	
5					960	VV 64.1	
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			60	P	
11	Gate special-shaped	(e.g. H-gate)			60	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.2	by lifting, interlocking the gate or the joint bracket				60	MP	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button	1 NO			100	T	
23	Control-handle with signal button	1 NO			100	H	
24	Control-handle with push button	1 NO			110	D	
25	Control-handle with flat push button	1 NO			110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1		-40 mm				S3	
28.2		-20 mm				S5	
28.3		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact set) switching sequenc 4-0-4			No. of contacts 2	290	01	
31				4	350	02	
32	Direction 1-2 and 3-4 each 1 masterswitch			6	410	03	
33	Switching program according contact-arrangement MS... see catalog 5/001		A...	8	470	04	
34	or to your contact-arrangement			10	530	05	
35				12	590	06	
36	Switching sequence 5-0-5 or 6-0-6						
38	Spring return in 0-position	(for each direction)		2	110	Z	
39	Friction brake adjustable	(for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025		...P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.					(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		C..., P...				
50	Steel sheet housing B 200 masterswitch max. size 04				1300	B	
51	Steel sheet housing B 230 x 440 masterswitch max. size 06				1600	B	
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

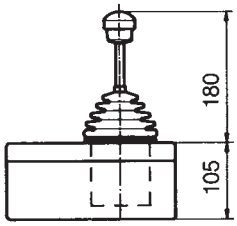
T = dead man's button
H = signal button
M = latch for mechanical zero interlock



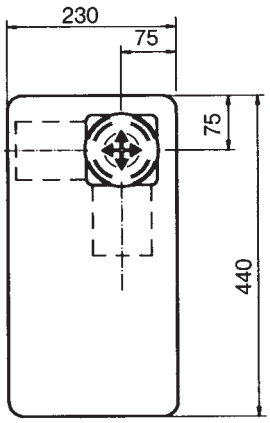


Type	No. of contacts	Dimension A	Dimension B
01	2	119	82
02	4	131	94
03	6	144	107
04	8	156	119
05	10	169	132
06	12	181	144





Steel sheet housing

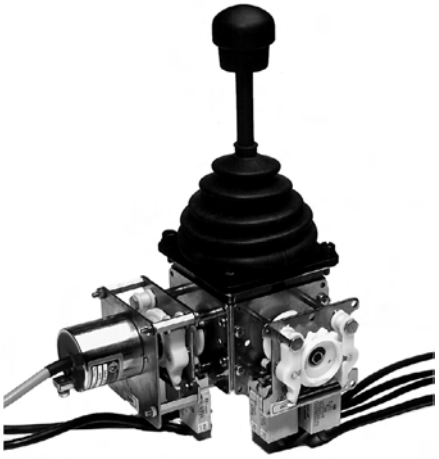


VV64	L	S5	P	B1T -	02	Z	P	+ 01	R	P	-B-	-X-	A050	P024	+A05	P022

- VV64 — multi-axis controller
- L — installation side L o. R
- S5 — special control handle
- P — gate
- B1T - — handle
- 02 — contact set dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- + 01 — contact set dir. 3-4 (7-8)
- R — friction brake dir. 3-4 (7-8)
- P — Potentiometer dir. 3-4 (7-8)
- -B- — housing
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P024 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A05 — Arrangement dir. 3-4 (7-8) see p. 5/001
- P022 — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller VA 6

Explosion protection EExdIICT 6



Type VA62L-01ZP+01Z-…

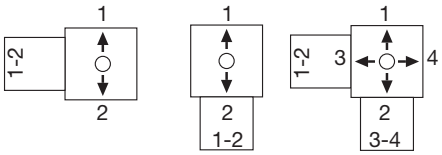
The multi-axis controller VA 6 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The VA 6 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

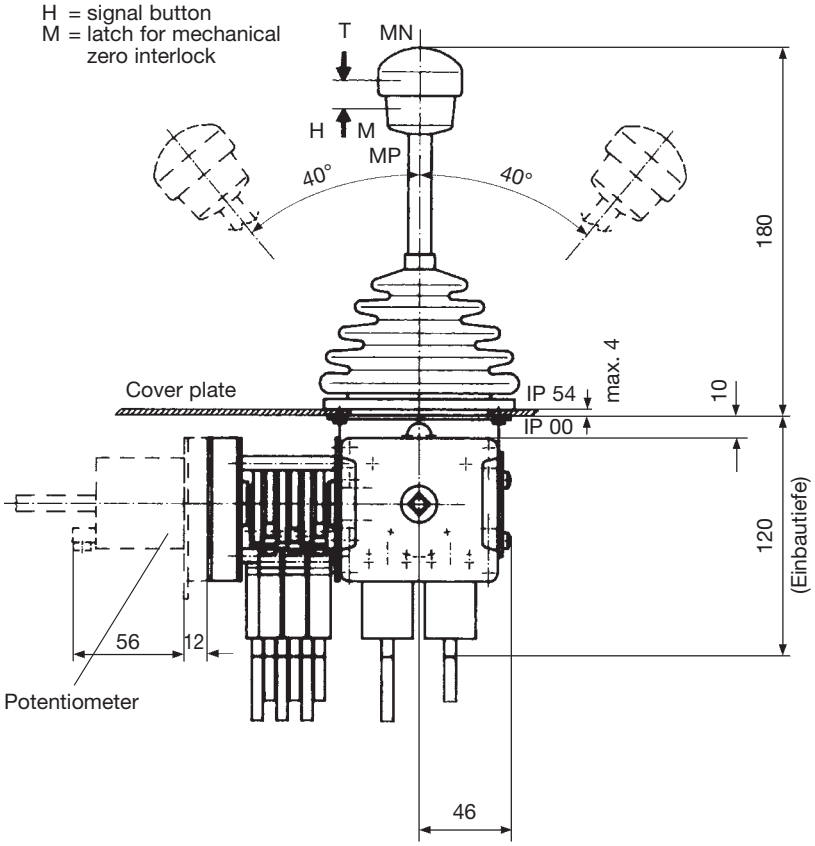
Mechanical life	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

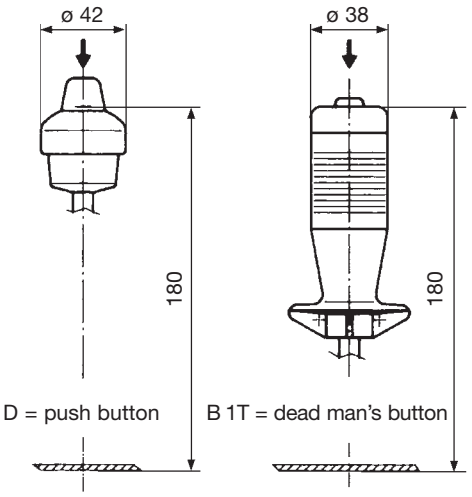
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

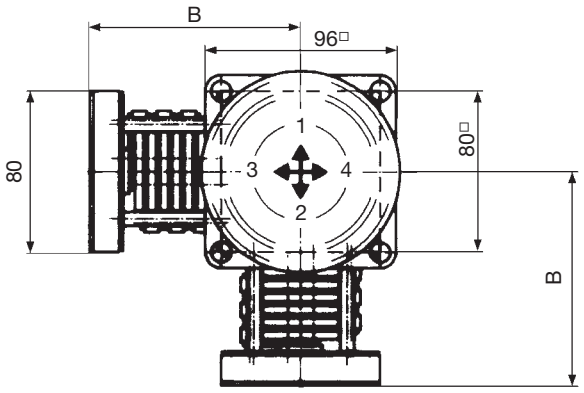
Pos.	VA 61 / VA 61.1 / VA 62 / VV 64.1			Type expansion		Weight gramm	Type	Price EURO
1						960	VA 61	
2						980	VA 61.1	
3						980	VA 62	
4								
5								
7.1	Multi-axis controller left	(dir. 1-2, 3-4)					L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)					R	
10	Gate cross-shaped	(prohibits diagonal shifting)				60	P	
11	Gate special-shaped	(e.g. H-gate)				60	PX	
20	Control-handle with knob solid							
21	Control-handle with latch for mechanical zero interlock							
21.1	by lifting					50	M	
21.2	by lifting, interlocking the gate or the joint bracket					60	MP	
21.3	by pushing down					50	MN	
22	Control-handle with dead man's button	1 NO				100	T	
23	Control-handle with signal button	1 NO	Microchange over contact			100	H	
24	Control-handle with push button	1 NO	explosion protection			110	D	
25	Control-handle with flat push button	1 NO	EExdIICT 6			110	DV	
26	Control-handle with palm grip B 1		PTB No. Ex-91C 1083 X			40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO		sealed cable			60	B 1T	
28	Control-handle long or short		3 metre long					
28.1		-40 mm					S3	
28.2		-20 mm					S5	
28.3		+20 mm					S8	
30	Masterswitch (contact) switching sequenc 4-0-4				No. of contacts 2	290	01	
31			Microchange over contact		4	350	02	
32	Direction 1-2 and 3-4 each 1 masterswitch		explosion protection		6	410	03	
33	Switching program according contact-arrangement MS see cat. 5/001		EExdIICT 6	A...	8	470	04	
34	or to your contact-arrangement		PTB No. Ex-91C 1083 X		10	530	05	
35			sealed cable		12	590	06	
36	Switching sequence 5-0-5 or 6-0-6		3 metre long					
38	Spring return in 0-position	(for each direction)				110	Z	
39	Friction brake adjustable	(for each direction)				30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 238, with centre tap linear Life 5 x 10^6 switching cycles resistance 2 x 5 kOhm, 1 Watt wiper current max. 10 mA in housing explosion protection EExdIICT 6 PTB-No. Ex-85/1131 sealed cable 3 metre long			...P084		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°						(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.						(P)	
52	Housing see catalog 1/350							
60	Indicating labels not engraved with 2 or 4 arrows							
61	Engraving, each 10 characters							
70	Command and indicating devices on enquiry							

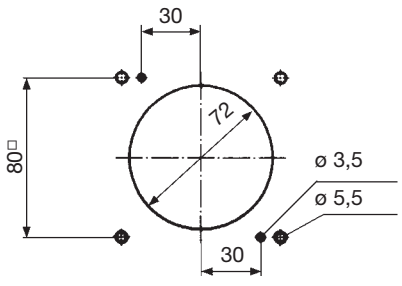
T = dead man's button
H = signal button
M = latch for mechanical zero interlock





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





Hole pattern

VA62	L	S5	P	T	-	02	Z	P	+	01	R	P	-B-	-X-	A050	P084	+A05	P082	
multi-axis controller																			Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
installation side L o. R																			Arrangement dir. 3-4 (7-8) see p. 5/001
special control handle																			Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
gate																			Arrangement dir. 1-2 (5-6) see p. 5/001
handle																			special please describe
contact set dir. 1-2 (5-6)																			housing
spring return dir. 1-2 (5-6)																			Potentiometer dir. 3-4 (7-8)
Potentiometer dir. 1-2 (5-6)																			friction brake dir. 3-4 (7-8)
contact set dir. 3-4 (7-8)																			

Multi-axis controller VVB 6

contakt S800 with magnetic blow out

Type VVB64LD-06Z+06Z-...

The multi-axis controller VVB 6 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The VVB 6 is resistant to oil, maritime climate, ozone and UV radiation.

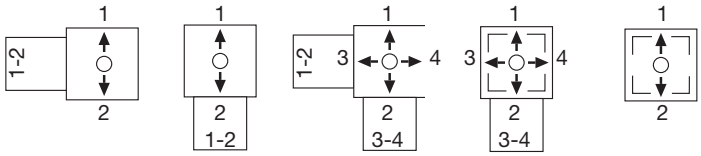
Contact complement 0,5 A 250 V DC 13

Mechanical life	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

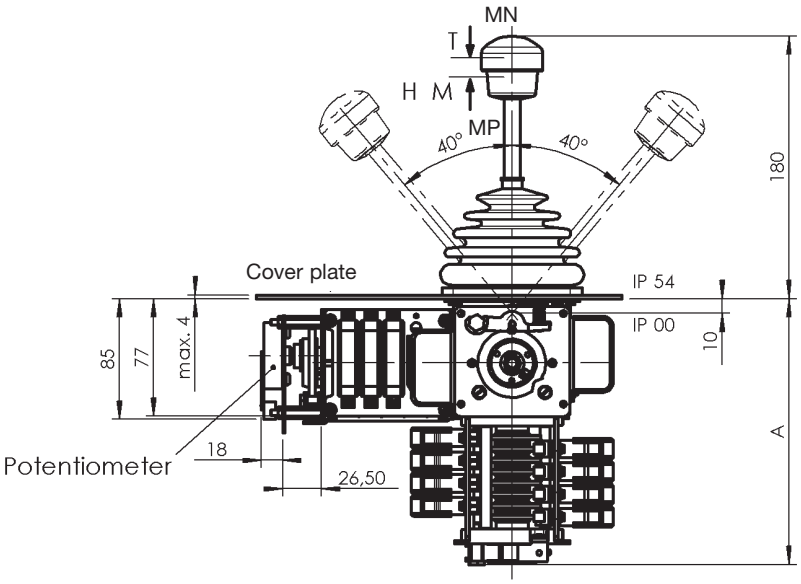
Technical data see catalog 5/100
Description data see catalog 5/002

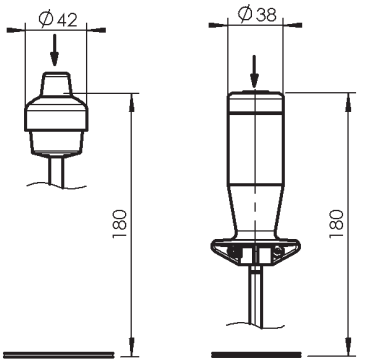
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

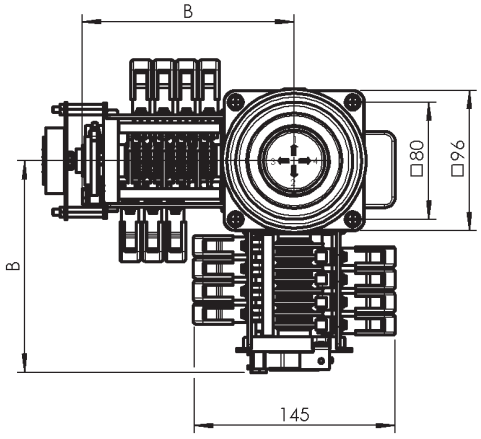
Pos.	VVB 61	VVB 61.1	VVB 62	VVB 64	VVB 64.1	Type expansion		Weight gramm	Type	Price EURO
1								960	WB 61	
2								980	WB 61.1	
3								980	WB 62	
4								1010	WB 64	
5								960	WB 64.1	
7.1	Multi-axis controller left		(dir. 1-2, 3-4)					60	L	
7.2	Multi-axis controller right		(dir. 5-6, 7-8)					60	R	
10	Gate cross-shaped		(prohibits diagonal shifting)					110	P	
11	Gate special-shaped		(e.g. H-gate)					30	PX	
20	Control-handle with knob solid									
21	Control-handle with latch for mechanical zero interlock									
21.1	by lifting							50	M	
21.2	by lifting, interlocking the gate or the joint bracket							60	MP	
21.3	by pushing down							50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282									
22	Control-handle with dead man's button 1 NO						Pos. 22-25, 27	150	T	
23	Control-handle with signal button 1 NO						not possible	150	H	
24	Control-handle with push button 1 NO						for VVB 64...	160	D	
25	Control-handle with flat push button 1 NO							160	DV	
26	Control-handle with palm grip B 1							40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO							110	B 1T	
28	Control-handle long or short									
28.1	-40 mm								S3	
28.2	-20 mm								S5	
28.3	+20 mm								S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...									
30	Masterswitch (contact) switching sequenc 4-0-4						No. of contacts 2	390	01	
31							4	550	02	
32	Direction 1-2 and 3-4 each 1 masterswitch						6	710	03	
33	Switching program according contact-arrangement MS... see catalog 5/001					A...	8	970	04	
34	or to your contact-arrangement						10	1130	05	
35							12	1390	06	
36	Switching sequence 5-0-5 or 6-0-6									
38	Spring return in 0-position (for each direction)								Z	
39	Friction brake adjustable (for each direction)								R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025					...P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°								(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.								(P)	
43	more Potentiometer e.t.c. see catalog 1/240...									
50										
60	Indicating labels not engraved with 2 or 4 arrows									
61	Engraving, each 10 characters									

T = dead man's button
H = signal button
M = latch for mechanical zero interlock



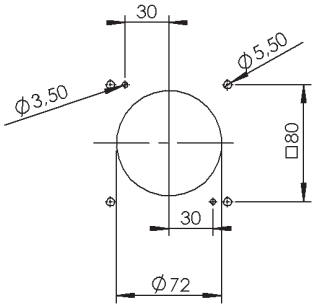


D = push button B 1T = dead man's button



Type	No. of contacts	Dimension A	Dimension B
01	2	136	99
02	4	152	115
03	6	167	130
04	8	183	146
05	10	198	161
06	12	214	177

Hole pattern



VVB64 L S5 P B1T - 02 Z P + 01 R P -B- -X- A050 P024 +A05 P022

- VVB64 — multi-axis controller
- L — installation side L o. R
- S5 — special control handle
- P — gate
- B1T — handle
- 02 — contact set dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- 01 — contact set dir. 3-4 (7-8)
- R — friction brake dir. 3-4 (7-8)
- P — Potentiometer dir. 3-4 (7-8)
- -B- — housing
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P024 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A05 — Arrangement dir. 3-4 (7-8) see p. 5/001
- P022 — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller VVC 6

contact 3XP9 221-1E with magnetic blow out

Type VVC64L-8Z+8Z-…

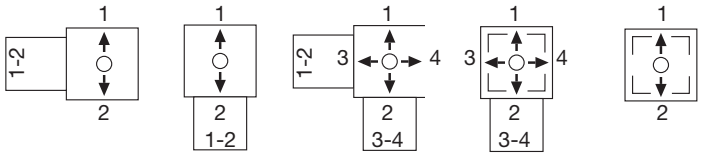
The multi-axis controller VVC 6 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The VVC 6 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 8 A 24 V DC 13

Mechanical life	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

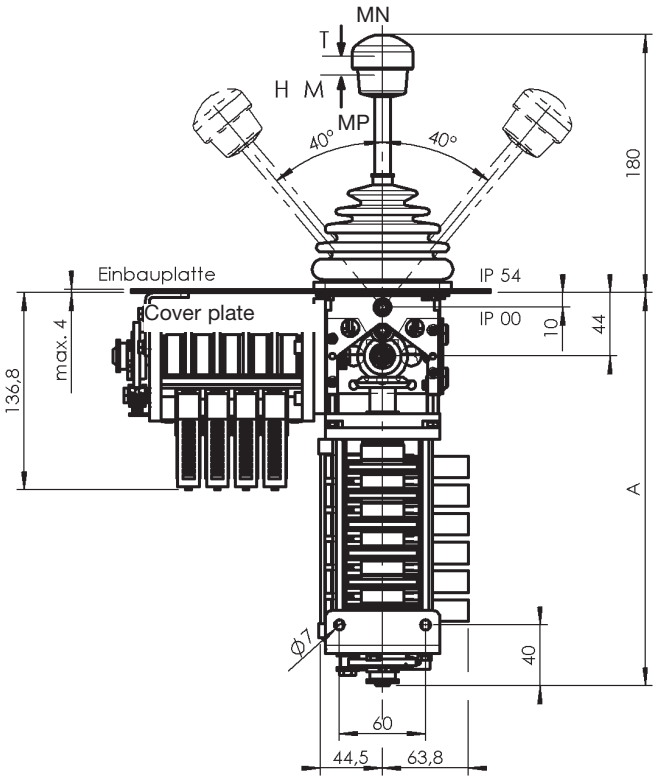
Deflection directions designated to DIN 15025

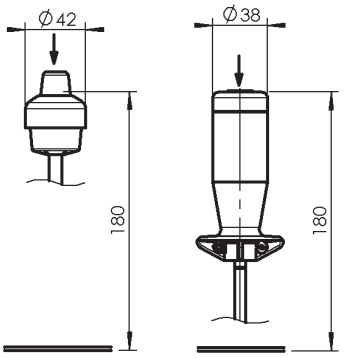
Pos.	VVC 61 / VVC 61.1 / VVC 62 / VVC 64 / VVC 64.1	Type expansion		Weight gramm	Type	Price EURO
1				960	VVC 61	
2				980	WC 61.1	
3				980	VVC 62	
4				1010	VVC 64	
5				960	WC 64.1	
7.1	Multi-axis controller left (dir. 1-2, 3-4)			60	L	
7.2	Multi-axis controller right (dir. 5-6, 7-8)			60	R	
10	Gate cross-shaped (prohibits diagonal shifting)			110	P	
11	Gate special-shaped (e.g. H-gate)			30	PX	
20	Control-handle with knob solid					
21	Control-handle with latch for mechanical zero interlock					
21.1	by lifting			50	M	
21.2	by lifting, interlocking the gate or the joint bracket			60	MP	
21.3	by pushing down			50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282					
22	Control-handle with dead man's button 1 NO		Pos. 22-25, 27	200	T	
23	Control-handle with signal button 1 NO		not possible	200	H	
24	Control-handle with push button 1 NO		for VVC 64…	210	D	
25	Control-handle with flat push button 1 NO			210	DV	
26	Control-handle with palm grip B 1			40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO			160	B 1T	
28	Control-handle long or short					
28.1	-40 mm				S3	
28.2	-20 mm				S5	
28.3	+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...					
30	Masterswitch (contact) switching sequenc 4-0-4		No. of contacts 2	490	2	
31			4	750	4	
32	Direction 1-2 and 3-4 each 1 masterswitch	A...	6	1010	6	
33	Switching program according contact-arrangement MS... see catalog 5/001		8	1370	8	
34	or to your contact-arrangement		10	1630	10	
35			12	1990	12	
36	Switching sequence 5-0-5 or 6-0-6					
38	Spring return in 0-position (for each direction)				Z	
39	Friction brake adjustable (for each direction)				R	
40						
50						
60	Indicating labels not engraved with 2 or 4 arrows					
61	Engraving, each 10 characters					

Multi-axis controller VVC 6

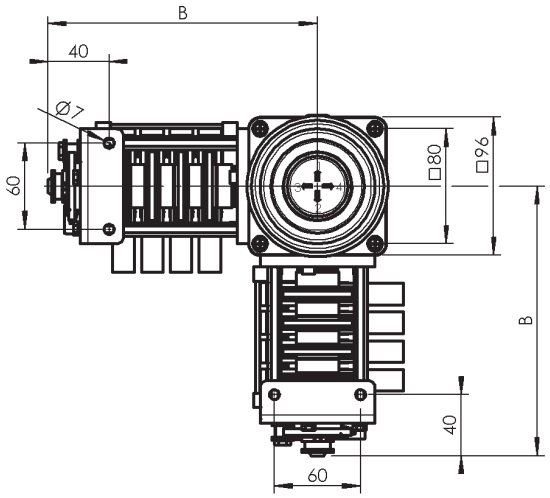
contact 3XP9 221-1E with magnetic blow out

T = dead man's button
H = signal button
M = latch for mechanical zero interlock

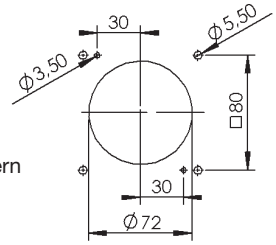




D = push button B 1T = dead man's button



Type	No. of contacts	Dimension A	Dimension B
1	1	169	125
2	2	189	145
3	3	209	165
4	4	229	185
5	5	249	205
6	6	269	225
7	7	289	245
8	8	309	265
9	9	329	285
10	10	349	305
11	11	369	325
12	12	389	345



Hole pattern

VVC64 L S5 P B1T - 02 Z + 01 R -B- -X- A050 +A05

- multi-axis controller
- installation side L o. R
- special control handle
- gate
- handle
- contact set dir. 1-2 (5-6)
- spring return dir. 1-2 (5-6)
- contact set dir. 3-4 (7-8)
- friction brake dir. 3-4 (7-8)
- housing
- special please describe
- Arrangement dir. 1-2 (5-6) see p. 5/001
- Arrangement dir. 3-4 (7-8) see p. 5/001

Multi-axis controller V 11

Type V11LT-02Z+02Z-…

The multi-axis controller V 11 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications. The modular design enables the switching device to be used universally. The V 11 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

Mechanical life	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

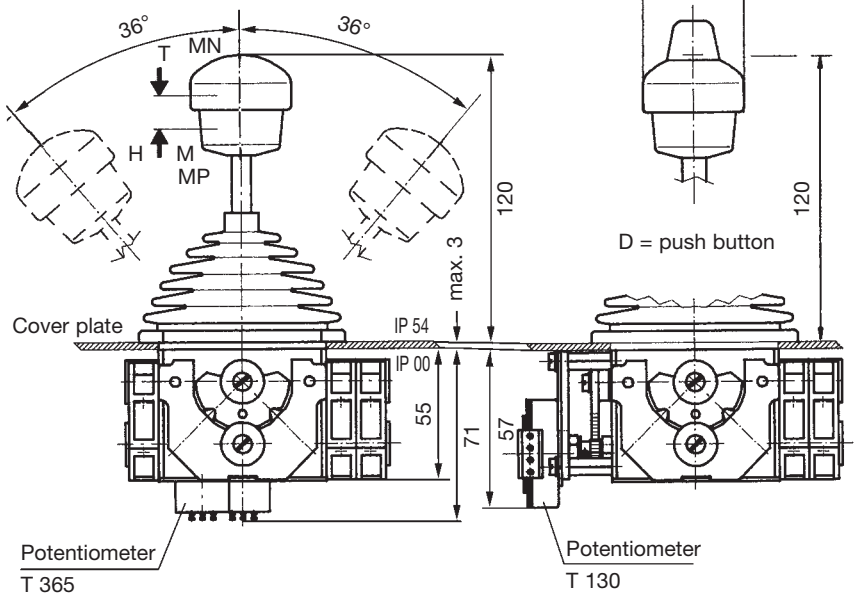
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

left

Deflection directions designated to DIN 15025

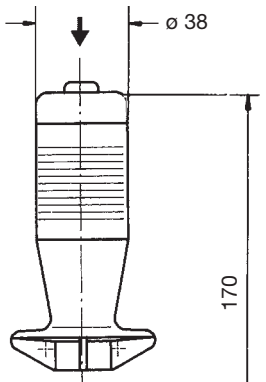
Pos.	V 11.1	V 11	Type expansion		Weight gramm	Type	Price EURO
1					400	V 11.1	
2							
3					500	V 11	
4							
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			60	P	
11	Gate special-shaped	(e.g. H-gate)			60	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.2	by lifting, interlocking the gate or the joint bracket				60	MP	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button	1 NO			100	T	
23	Control-handle with signal button	1 NO			100	H	
24	Control-handle with push button	1 NO			110	D	
25	Control-handle with flat push button	1 NO			110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1		-20 mm				S5	
28.2		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact set) switching sequenc 4-0-4			No. of contacts 2	70	01	
31				4	130	02	
32	Direction 1-2 and 3-4 each 1 masterswitch			6	190	03	
33	Switching program according contact-arrangement MS... see catalog 5/001		A...				
34	or to your contact-arrangement						
38	Spring return in 0-position	(for each direction)			25	Z	
39	Friction brake adjustable	(for each direction)			20	R	
40	Potentiometer e.t.c. each masterswitch with mounted Conductive-plastic potentiometer T 365, with centre tap linear Life 10^7 switching cycles resistance 2 x 5 kOhm, 0,5 Watt wiper current max. 1 mA		...P324		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.					(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		C..., P...				
50	Plastic housing I 160 x 240, masterswitch max. size 03				800	I	
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

T = dead man's button
H = signal button
M = latch for mechanical zero interlock

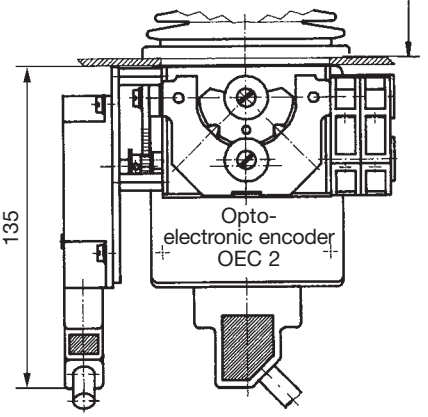


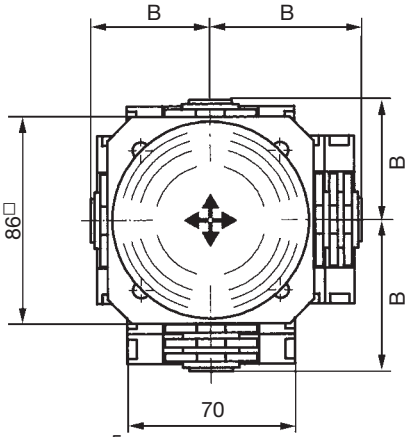
Knob solid

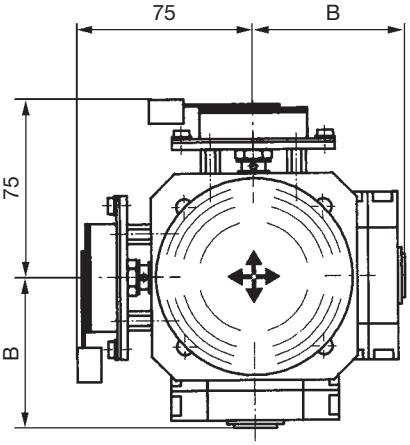
Palm grip B 1

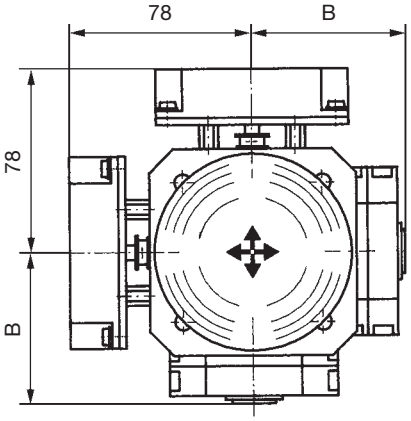


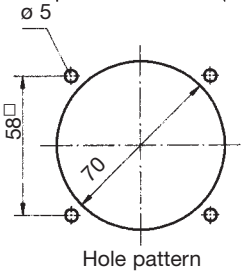
B 1T = dead man's button











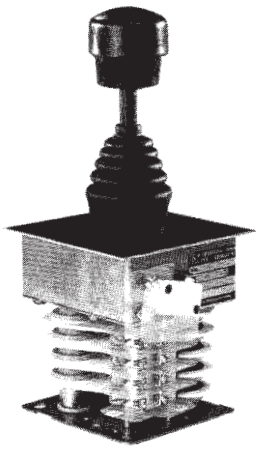
Hole pattern

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

V11	L	S5	P	B1D -	02	Z	P	+ 01	R	P	-I-	-X-	A050	P324	+A05	P322	
multi-axis controller																	
installation side L o. R																	
special control handle																	
gate																	
handle																	
contact set dir. 1-2 (5-6)																	
spring return dir. 1-2 (5-6)																	
Potentiometer dir. 1-2 (5-6)																	
contact set dir. 3-4 (7-8)																	

Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
Arrangement dir. 3-4 (7-8) see p. 5/001
Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
Arrangement dir. 1-2 (5-6) see p. 5/001
special please describe
plastic housing
Potentiometer dir. 3-4 (7-8)
friction brake dir. 3-4 (7-8)

Multi-axis controller V 5



Type V5LT-4Z+4Z-…

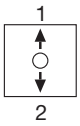
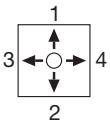
The multi-axis controller V 5 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The V 5 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

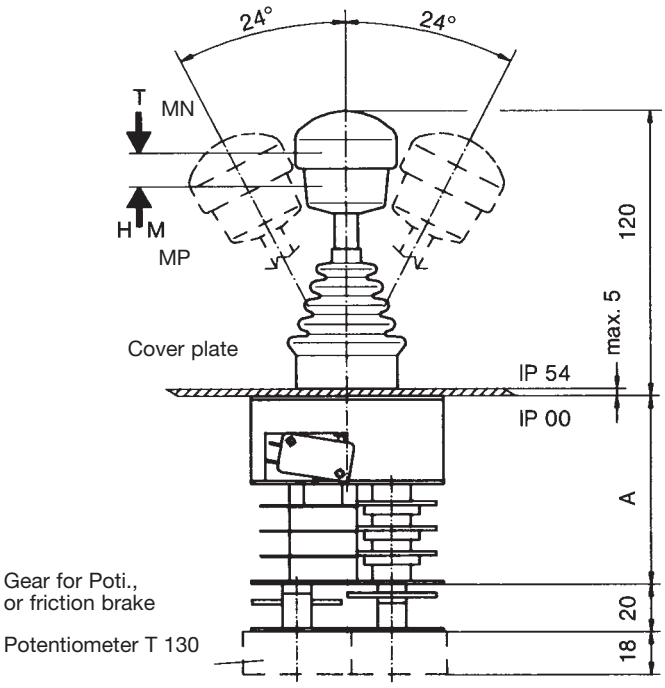
Mechanical life	6 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

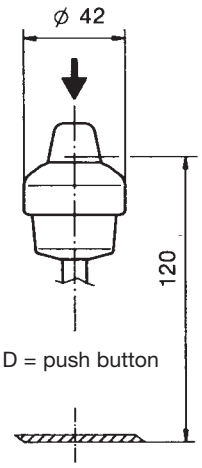
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

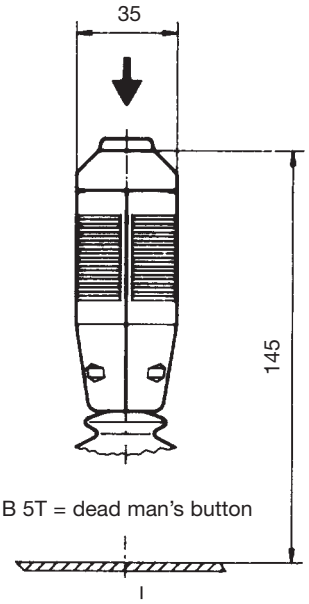
Deflection directions designated to DIN 15025

Pos.	V 51	V 5	Type expansion		Weight gramm	Type	Price EURO
1					400	V 51	
2							
3					500	V 5	
4							
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			50	P	
11	Gate special-shaped	(e.g. H-gate)			50	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.2	by lifting, interlocking the gate				60	MP	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button	1 NO			50	T	
23	Control-handle with signal button	1 NO			50	H	
24	Control-handle with push button	1 NO			60	D	
25	Control-handle with flat push button	1 NO			60	DV	
26	Control-handle with palm grip B 5				40	B 5	
27	Control-handle with palm grip B 5 with push button top 1 NO				60	B 5T	
28	Control-handle long or short						
28.1		-20 mm				S5	
28.2		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact) switching sequenc 3-0-3			No. of contacts 1	150	1	
31				2	160	2	
32	Direction 1-2 and 3-4 each 1 masterswitch			3	170	3	
33	Switching program according contact-arrangement MS... see catalog 5/001		A...	4	180	4	
34	or to your contact-arrangement			5	190	5	
35				6	200	6	
36	Switching sequence 4-0-4						
37	Micro changeover contact (MZT 1) positive opening (additional price)			1			
38	Spring return in 0-position	(for each direction)			25	Z	
39	Friction brake adjustable	(for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025		...P02 k		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.					(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		P…				
50	Plastic housing I 120 x 160, masterswitch max. size 6				600	I	
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

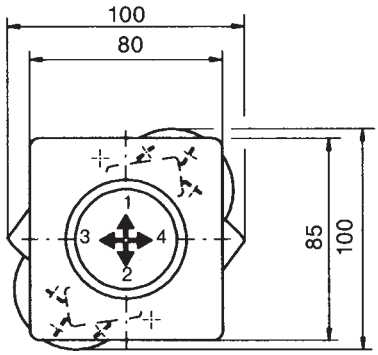
T = dead man's button
H = signal button
M = latch for mechanical zero interlock

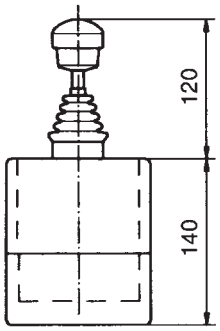




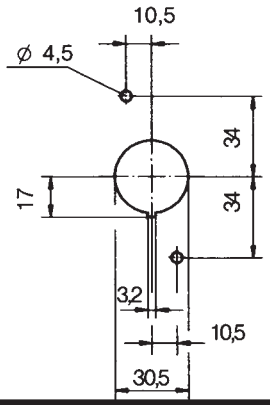


Type	No. of contacts	Dimension A
1	1	58
2	2	69
3	3	79
4	4	90
5	5	100
6	6	111

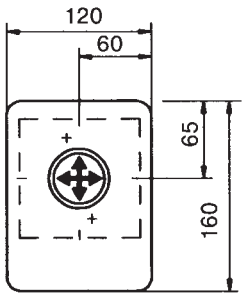




Plastic housing



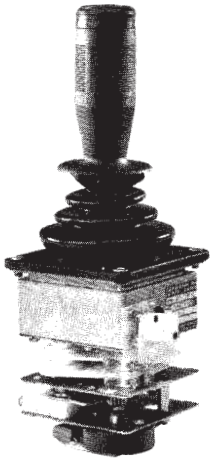
Hole pattern



V5	L	S5	P	DV	-	2	Z	P	+	1	R	P	-I-	-X-	A05	P024	+A98	P022

- V5 — multi-axis controller
- L — installation side L o. R
- S5 — special control handle
- P — gate
- DV — handle
- 2 — contact dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- 1 — contact dir. 3-4 (7-8)
- R — friction brake dir. 3-4 (7-8)
- P — Potentiometer dir. 3-4 (7-8)
- -I- — plastic housing
- -X- — special please describe
- A05 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P024 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A98 — Arrangement dir. 3-4 (7-8) see p. 5/001
- P022 — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller VV 5



Type VV51LB1T-2RP-…

The multi-axis controller VV 5 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications.
The modular design enables the switching device to be used universally.
The VV 5 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

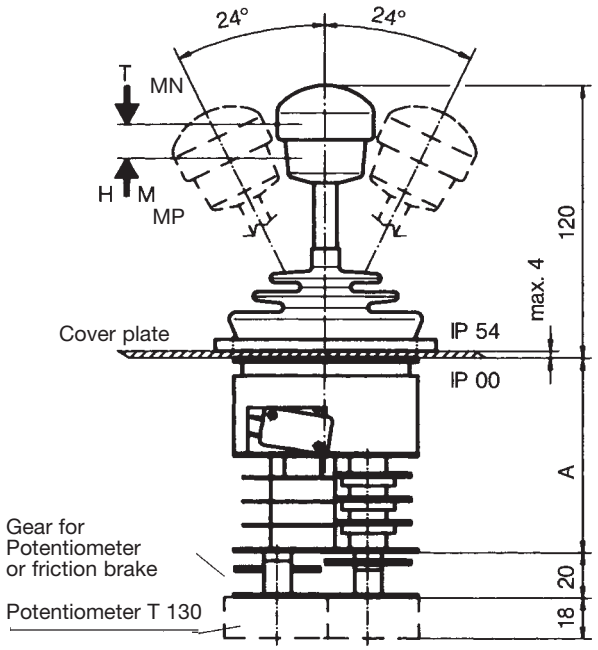
Mechanical life	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

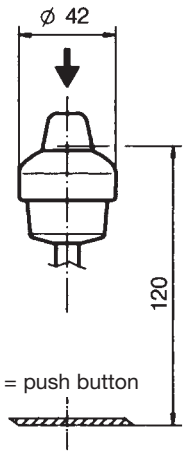
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

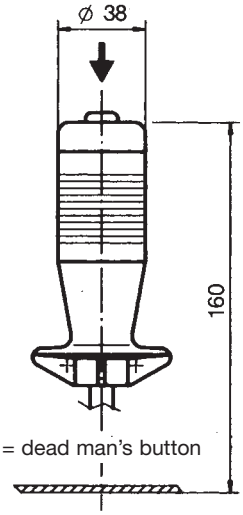
Deflection directions designated to DIN 15025

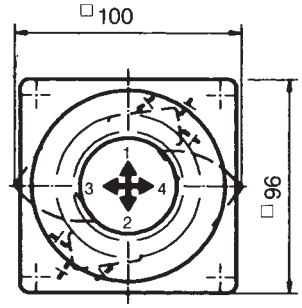
Pos.	VV 51	VV 5	Type expansion		Weight gramm	Type	Price EURO
1					500	VV 51	
2	1	1					
3		3 ◄ ○ ► 4			600	VV 5	
4	2	2					
5							
7.1	Multi-axis controller left (dir. 1-2, 3-4)					L	
7.2	Multi-axis controller right (dir. 5-6, 7-8)					R	
10	Gate cross-shaped (prohibits diagonal shifting)				60	P	
11	Gate special-shaped (e.g. H-gate)				60	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.2	by lifting, interlocking the gate or the joint bracket				60	MP	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button 1 NO				100	T	
23	Control-handle with signal button 1 NO				100	H	
24	Control-handle with push button 1 NO				110	D	
25	Control-handle with flat push button 1 NO				110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1	-20 mm					S5	
28.2	+20 mm					S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact) switching sequenc 3-0-3			No. of contacts 1	150	1	
31				2	160	2	
32	Direction 1-2 and 3-4 each 1 masterswitch			3	170	3	
33	Switching program according contact-arrangement MS... see catalog 5/001		A...	4	180	4	
34	or to your contact-arrangement			5	190	5	
35				6	200	6	
36	Switching sequence 4-0-4						
38	Spring return in 0-position (for each direction)				25	Z	
39	Friction brake adjustable (for each direction)				30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025		...P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.					(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		P…				
50	Plastic housing I 120 x 160, masterswitch max. size 4				600	I	
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

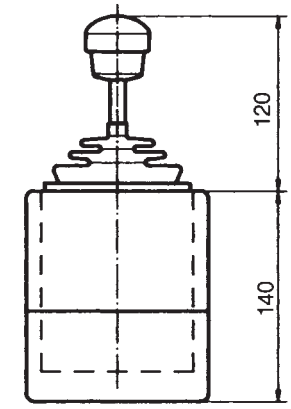
T = dead man's button
H = signal button
M = latch for mechanical zero interlock



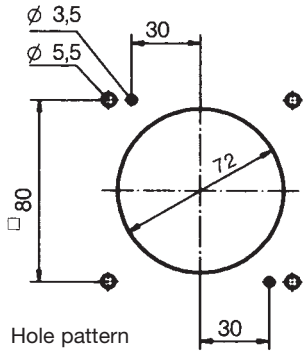






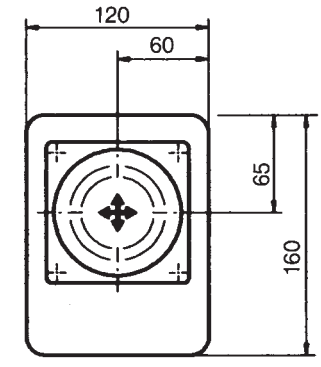


Plastic housing



Hole pattern

Type	No. of contacts	Dimension A
1	1	66
2	2	77
3	3	87
4	4	98
5	5	108
6	6	119



VV5	L	S5	P	B1T -	2	Z	P	+	1	R	P	-I-	-X-	A05	P024	+A98	P022

- VV5 — multi-axis controller
- L — installation side L o. R
- S5 — special control handle
- P — gate
- B1T - — handle
- 2 — contact dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- \+ — (separator)
- 1 — contact dir. 3-4 (7-8)
- R — friction brake dir. 3-4 (7-8)
- P — Potentiometer dir. 3-4 (7-8)
- -I- — plastic housing
- -X- — special please describe
- A05 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P024 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A98 — Arrangement dir. 3-4 (7-8) see p. 5/001
- P022 — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller V 8 / VV 8

Type V8LB3DSRPA12-2ZP+2ZP-…

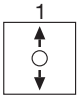
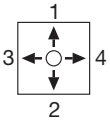
The multi-axis controller V 8 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications.The modular design enables the switching device to be used universally. The V 8 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

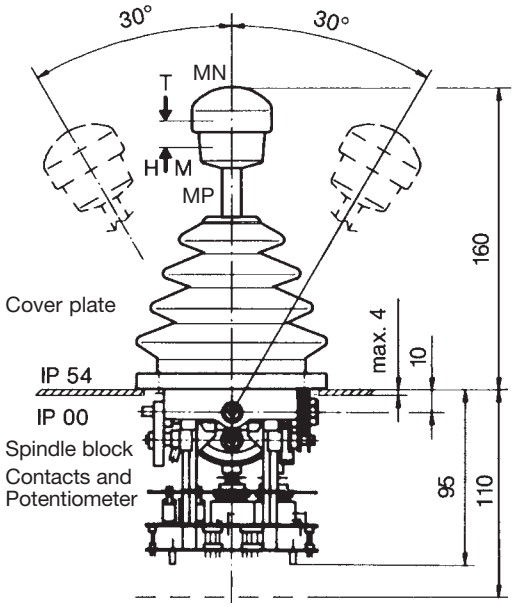
Mechanical life V 8	10 million (operating cycles)
Mechanical life VV 8	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

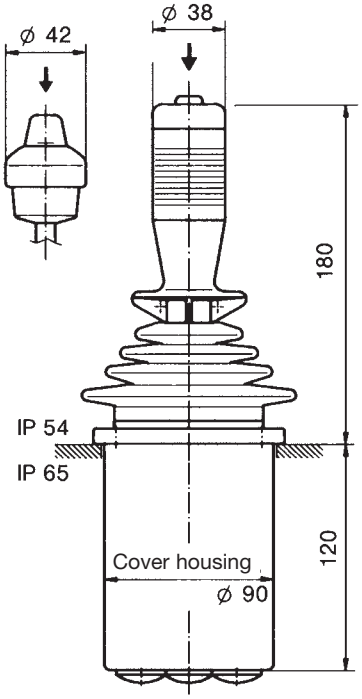
Pos.	V 81	V 8	Type expansion		Weight gramm	Type	Price EURO
1					800	V 81	
2					800	VV 81	
3					900	V 8	
4					900	VV 8	
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			60	P	
11	Gate special-shaped	(e.g. H-gate)			60	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.2	by lifting, interlocking the gate or the joint bracket				60	MP	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button	1 NO			100	T	
23	Control-handle with signal button	1 NO			100	H	
24	Control-handle with push button	1 NO			110	D	
25	Control-handle with flat push button	1 NO			110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1		-20 mm				S5	
28.2		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact) switching sequenc -0-			No. of contacts 1	20	1	
31				2	40	2	
32	Direction 1-2 and 3-4 each 1 masterswitch			3	60	3	
33	Switching program according contact-arrangement MS... see catalog 5/001		A...				
34	or to your contact-arrangement						
36	Switching sequence 3-0-3						
38	Spring return in 0-position	(for each direction)			30	Z	
39	Friction brake adjustable	(for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Conductive-plastic potentiometer T 301, with centre tap linear 0,5 Watt wiper current max. 1 mA resistance 2 x 1k ≙ P182, 2 x 2k ≙ P183, 2 x 5k ≙ P184, 2 x 10k ≙ P185		...P18 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 120°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.					(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		P…				
45	Electronic (Amplifier, Profi-Bus, CAN-Bus) see catalog 3/510/…		E…				
50	Cover housing				300	B	
51	Filter plug M 20 for air-condition				20		
52	Cable entry M 20 with anti-kink protection and strain relief				30		
53	Plug in socket	14-pole female insert CPC 17 wired			150		
54	Connector	14-pole male insert CPC 17 unwired			150		
55	Wiring plug in socket or connector each wired-connection						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						

T = dead man's button
H = signal button
M = latch for mechanical zero interlock



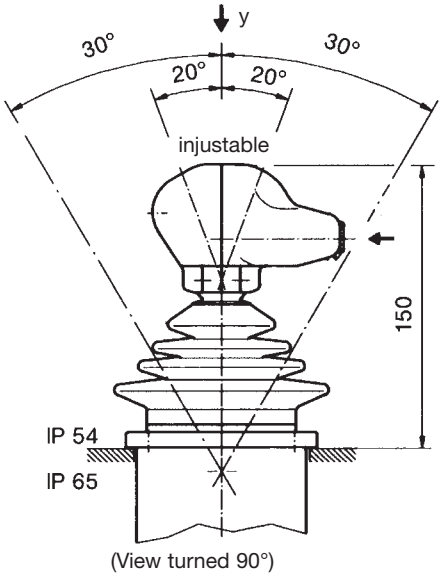
Expanse for impedance-converter and board with solder-, plug-, or screw terminal

Knob solid
D = -push button



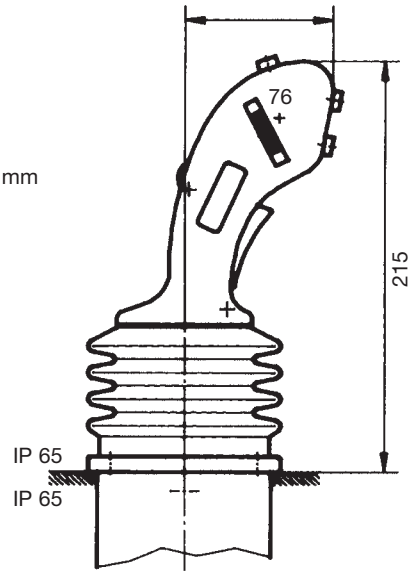
Palm grip B 1
B 1T = dead man's button
see catalog 1/284

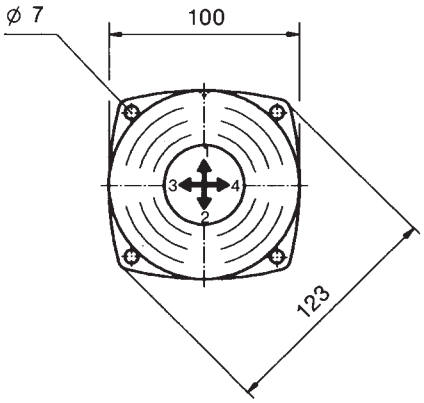
Palm grip B 2
for the 3. direction 9-10
see catalog 1/285

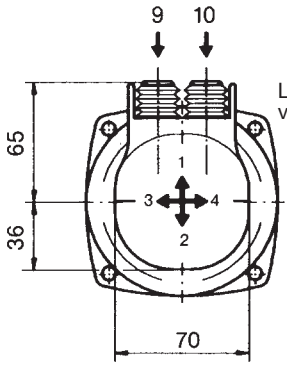


(View turned 90°)

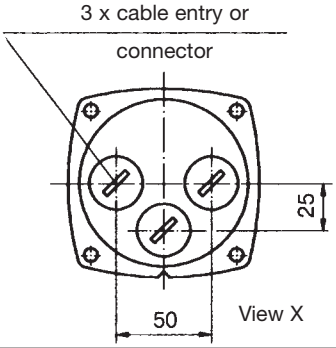
Palm grip B 3
see catalog 1/286
for the 3. direction 11-12
for the 4. direction 13-14



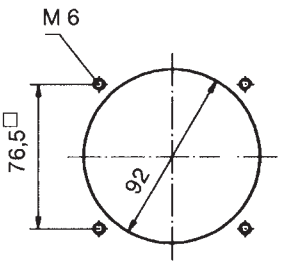




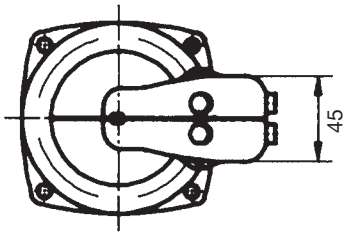
Lifting 13 mm
view y



View X



Hole pattern



V8	L	S5	P	B3K -	3	Z	P	+	1	R	P	-B-	-X-	A050	P184	+A98	P182

- V8 — multi-axis controller
- L — installation side L o. R
- S5 — special control handle
- P — gate
- B3K - — handle
- 3 — contact dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- + — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
- 1 — contact dir. 3-4 (7-8)
- R — friction brake dir. 3-4 (7-8)
- P — Potentiometer dir. 3-4 (7-8)
- -B- — housing
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P184 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A98 — Arrangement dir. 3-4 (7-8) see p. 5/001
- P182 — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller V 85 / VV 85 with contactless Sensors

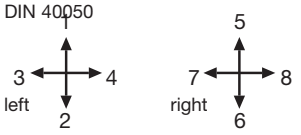
Type V85L-2ZS+2ZS-B...

The multi-axis controller V 85 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications.The modular design enables the switching device to be used universally. The V 85 is resistant to oil, maritime climate, ozone and UV radiation.

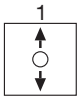
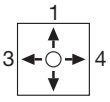
Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Mechanical life V 85	10 million (operating cycles)
Mechanical life VV 85	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).



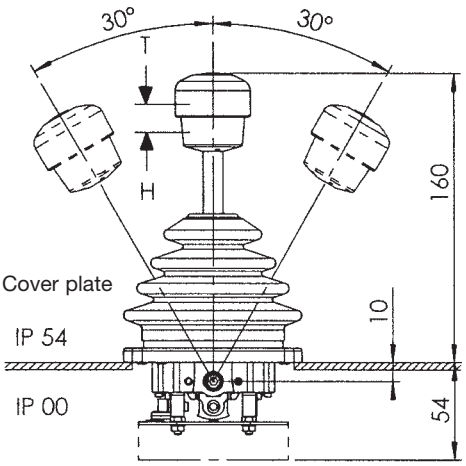
Deflection directions designated to DIN 15025

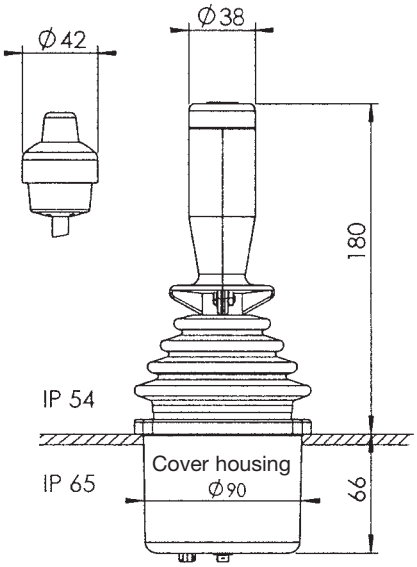
Pos.	V 85.1	V 85	Type expansion		Weight gramm	Type	Price EURO
1					800	V 85.1	
2					800	VV 85.1	
3					900	V 85	
4					900	VV 85	
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			60	P	
11	Gate special-shaped	(e.g. H-gate)			60	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
22	Control-handle with dead man's button	1 NO			100	T	
23	Control-handle with signal button	1 NO			100	H	
24	Control-handle with push button	1 NO			110	D	
25	Control-handle with flat push button	1 NO			110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1		-20 mm				S5	
28.2		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact) switching sequenc -0-			No. of contacts 1	20	1	
31				2	40	2	
32	Direction 1-2 and 3-4 each 1 masterswitch						
33	Switching program according contact-arrangement MS... see catalog 5/001		A...				
34	or to your contact-arrangement						
38	Spring return in 0-position	(for each direction)			30	Z	
39	Friction brake adjustable	(for each direction)			30	R	
	Potentiometer e.t.c. each masterswitch with mounted						
40	Magnet KEM for redundant Hallsensors				70	S	
	Voltage output impressed 0,5–2,5–4,5 Volt						
42	electronic for 1 axis		EU 15				
43	electronic for 2 axis		EU 16				
	Technical data: Power supply 4,6–5,5 Volt						
	output 0,5–2,5–4,5 Volt + 5 mA, output characteristic Linear						
45	more Electronic (Amplifier, Profi-Bus, CAN-Bus) see catalog 3/510/...		E...				
50	Cover housing				300	B	
51	Filter plug M 20 for air-condition				20		
52	Cable entry M 20 with anti-kink protection and strain relief				30		
53	Plug in socket	9-pole female insert D-SUB9 wired			150		
54	Connector	9-pole male insert D-SUB9 unwired			150		
55	Wiring plug in socket or connector each wired-connection						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						

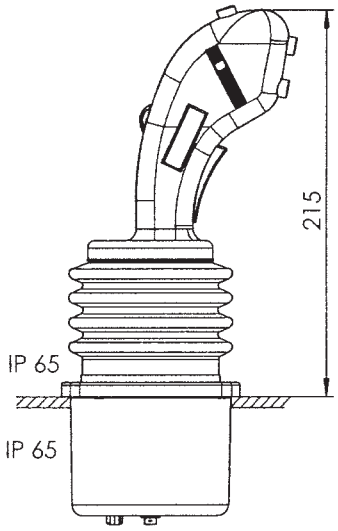
T = dead man's button
H = signal button

Knob solid
D = -push button

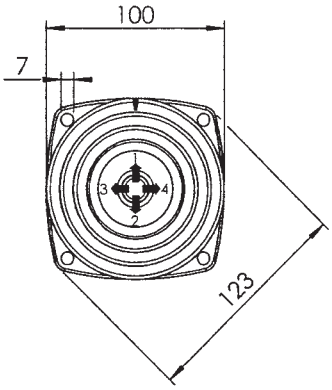
Palm grip B 1
B 1T = dead man's button
see catalog 1/283



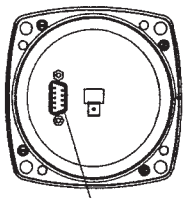




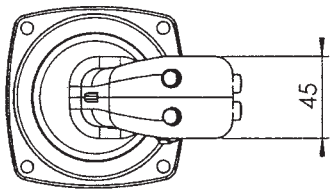
Palm grip B 3
see catalog 1/286
for the 3. direction 11-12
for the 4. direction 13-14

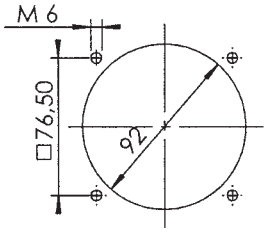


View A



Plug in socket D-SUB9





Hole pattern

V85 L S5 P D - 2 Z S + 2 Z S -B- -X- A05 EU16

- V85 — multi-axis controller
- L — installation side L o. R
- S5 — special control handle
- P — gate
- D — handle
- 2 — contact dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- S — hallsensor dir. 1-2 (5-6)
- 2 — contact dir. 3-4 (7-8)
- Z — spring return dir. 3-4 (7-8)
- S — Hallsensor dir. 3-4 (7-8)
- -B- — housing
- -X- — special please describe
- A05 — Arrangement dir. 1-2 (5-6) + dir. 3-4 (7-8) see p. 5/001
- EU16 — electronic description dir. 1-2 (5-6) + dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller V 25 with contactless Sensors

Type V25LT-2ZS+2ZS-B...

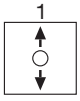
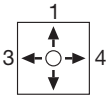
The multi-axis controller V 25 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications.The modular design enables the switching device to be used universally. The V 25 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Mechanical life V 25	8 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

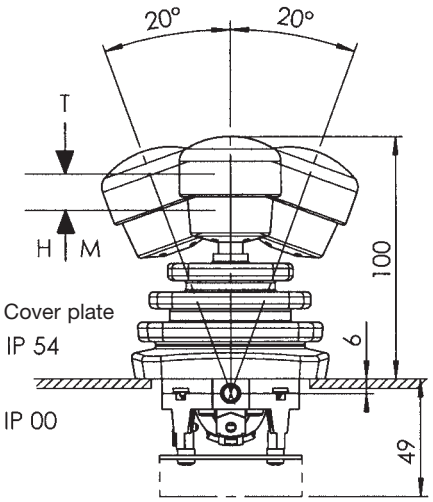
Deflection directions designated to DIN 15025

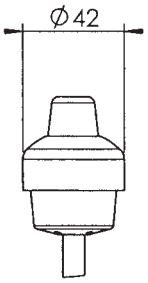
Pos.	V 25.1	V 25	Type expansion		Weight gramm	Type	Price EURO
1					500	V 25.1	
2							
3					500	V 25	
4							
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			60	P	
11	Gate special-shaped	(e.g. H-gate)			60	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
22	Control-handle with dead man's button	1 NO			100	T	
23	Control-handle with signal button	1 NO			100	H	
24	Control-handle with push button	1 NO			110	D	
25	Control-handle with flat push button	1 NO			110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1		+20 mm					
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...					S8	
30	Masterswitch (contact) switching sequenc -0-			No. of contacts 1	20	1	
31				2	40	2	
32	Direction 1-2 and 3-4 each 1 masterswitch						
33	Switching program according contact-arrangement MS... see catalog 5/001		A...				
34	or to your contact-arrangement						
38	Spring return in 0-position	(included in the spindle block)			30	Z	
	Potentiometer e.t.c. each masterswitch with mounted						
40	Magnet KEM for redundant Hallsensors				70	S	
	Voltage output impressed 0,5–2,5–4,5 Volt						
42	electronic for 1 axis		EU 15				
43	electronic for 2 axis		EU 16				
	Technical data:						
	Power supply 4,6–5,5 Volt						
	output 0,5–2,5–4,5 Volt + 5 mA, output characteristic Linear						
45	more Electronic (Amplifier, Profi-Bus, CAN-Bus) see catalog 3/510/...						
50	Cover housing		E...		300	B	
51	Filter plug M 20 for air-condition				20		
52	Cable entry M 20 with anti-kink protection and strain relief				30		
53	Plug in socket	9-pole female insert D-SUB9 wired			150		
54	Connector	9-pole male insert D-SUB9 unwired			150		
55	Wiring plug in socket or connector each wired-connection						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						

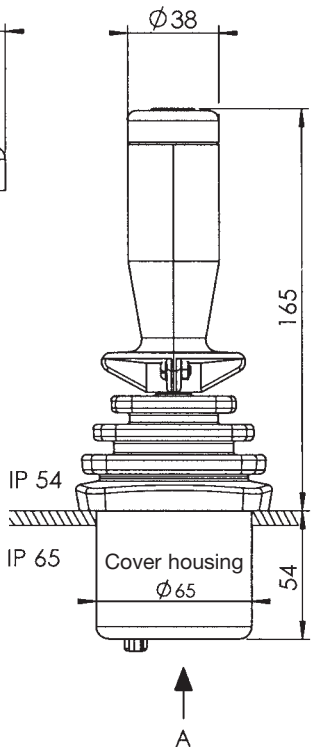
T = dead man's button
H = signal button
M = latch for machanical zero interlock

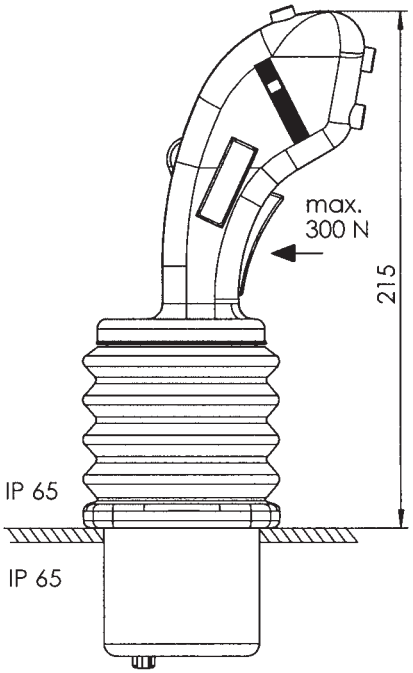
Knob solid
D = -push button

Palm grip B 1
B 1T = dead man's button
see catalog 1/283

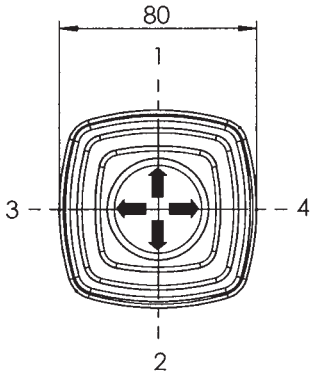




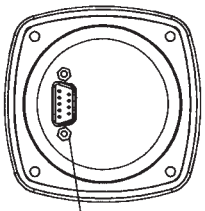




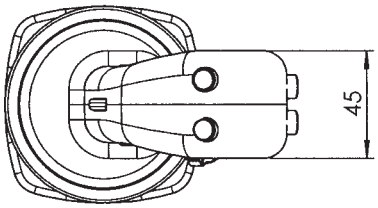
Palm grip B 3
see catalog 1/286
for the 3. direction 11-12
for the 4. direction 13-14

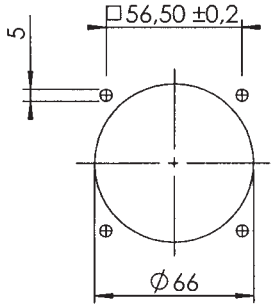


View A



Plug in socket D-SUB9





Hole pattern

V25 L S5 P D - 2 Z S + 2 Z S -B- -X- A05 EU16

- V25: multi-axis controller
- L: installation side L o. R
- S5: special control handle
- P: gate
- D: handle
- 2: contact dir. 1-2 (5-6)
- Z: spring return dir. 1-2 (5-6)
- S: hallsensor dir. 1-2 (5-6)
- 2: contact dir. 3-4 (7-8)
- Z: spring return dir. 3-4 (7-8)
- S: hallsensor dir. 3-4 (7-8)
- -B-: housing
- -X-: special please describe
- A05: Arrangement dir. 1-2 (5-6) + dir. 3-4 (7-8) see p. 5/001
- EU16: electronic description dir. 1-2 (5-6) + dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller V 10

Type V10L-01ZP+01ZP-…

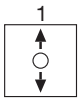
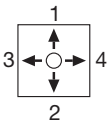
The multi-axis controller V 10 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for remote control and electro-hydraulic applications.
The V 10 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Mechanical life	8 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

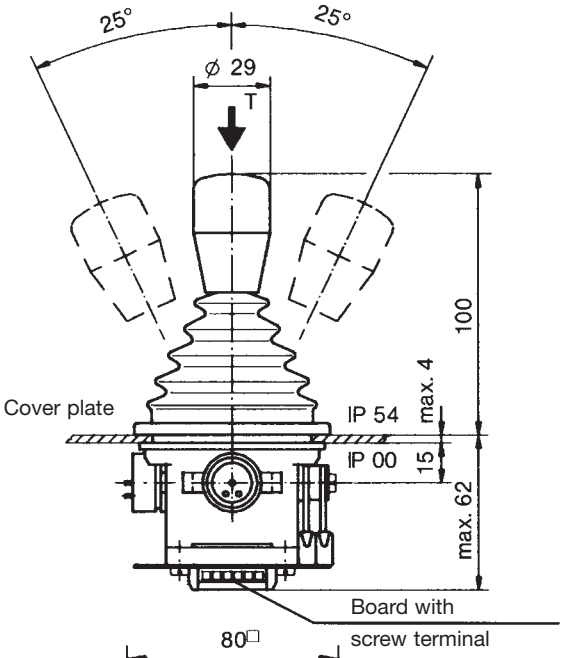
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

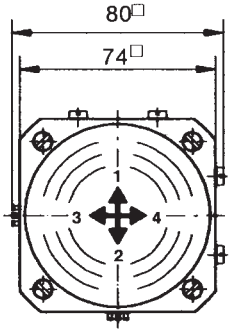
Deflection directions designated to DIN 15025

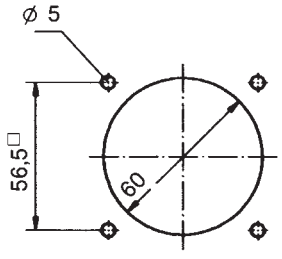
Pos.	V 10.1	V 10	Type expansion		Weight gramm	Type	Price EURO
1					200	V 10.1	
2							
3					250	V 10	
4							
5							
7.1	Multi-axis controller left (dir. 1-2, 3-4)					L	
7.2	Multi-axis controller right (dir. 5-6, 7-8)					R	
10	Gate cross-shaped (prohibits diagonal shifting)				20	P	
11	Gate special-shaped (e.g. H-gate)				20	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
22	Control-handle with dead man's button 1 NO				80	T	
23							
24							
25							
26	Control-handle with palm grip B 5				40	B 5	
27	Control-handle with palm grip B 5 with push button top 1 NO				60	B 5D	
28							
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact) without switching sequence			No. of contacts 2	20	01	
31				4	40	02	
32	Direction 1-2 and 3-4 each 1 masterswitch			6	60	03	
33	Switching program according contact-arrangement MS... see catalog 5/001		A...				
34	or to your contact-arrangement						
35							
36	Switching sequence 4-0-4						
38	Spring return in 0-position (included in the spindle block)					Z	
39	Friction brake adjustable (for each direction)					R	
40	Potentiometer e.t.c. each masterswitch with mounted Conductive-plastic potentiometer T 320, with centre tap linear 0,5 Watt wiper current max. 1 mA resistance 2 x 1k ≙ P252, 2 x 5k ≙ P254		…P25 □		20	P	
41							
42							
43	more Potentiometer e.t.c. see catalog 1/240...		P…				
45	Electronic (Amplifier, Profi-Bus, CAN-Bus) see catalog 3/510/…		E…				
50	Plastic housing l 122 x 120				350	I	
51							
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

Knob solid

T = dead man's button

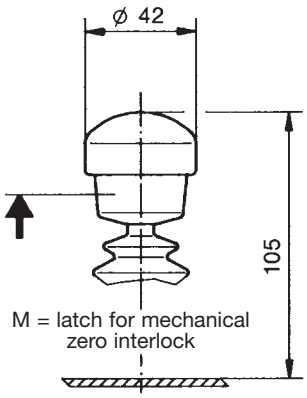




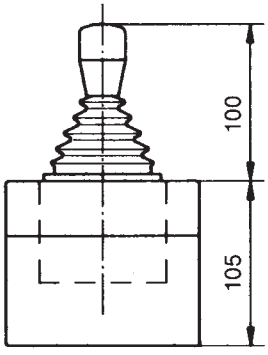


Hole pattern

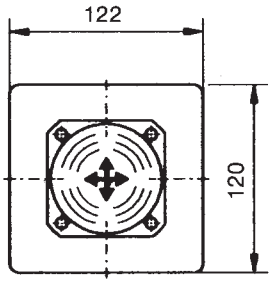
Ball grip



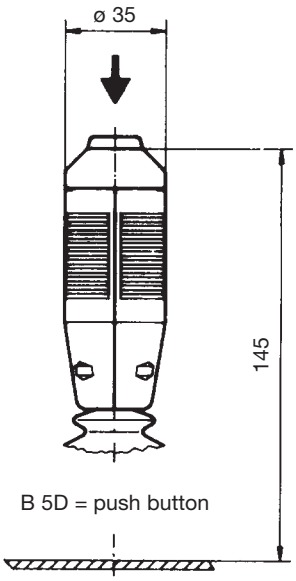
M = latch for mechanical zero interlock



Plastic housing



Palm grip B 5



B 5D = push button

V10	L	P	T	-	02	Z	P	+	01	Z	P	-I-	-X-	A050	P524	+A98	P252
multi-axis controller																	Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
installation side L o. R																Arrangement dir. 3-4 (7-8) see p. 5/001	
gate															Potentiometer description dir. 1-2 (5-6) see p. 1/240ff		
handle														Arrangement dir. 1-2 (5-6) see p. 5/001			
contact dir. 1-2 (5-6)													special please describe				
spring return dir. 1-2 (5-6)												plastic housing					
Potentiometer dir. 1-2 (5-6)											Potentiometer dir. 3-4 (7-8)						
contact dir. 3-4 (7-8)										spring return dir. 3-4 (7-8)							

Multi-axis controller V 14

Type V14L-03Z+00CZ-…

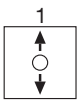
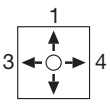
The multi-axis controller V 14 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for remote control and hoisting applications.
The V 14 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13

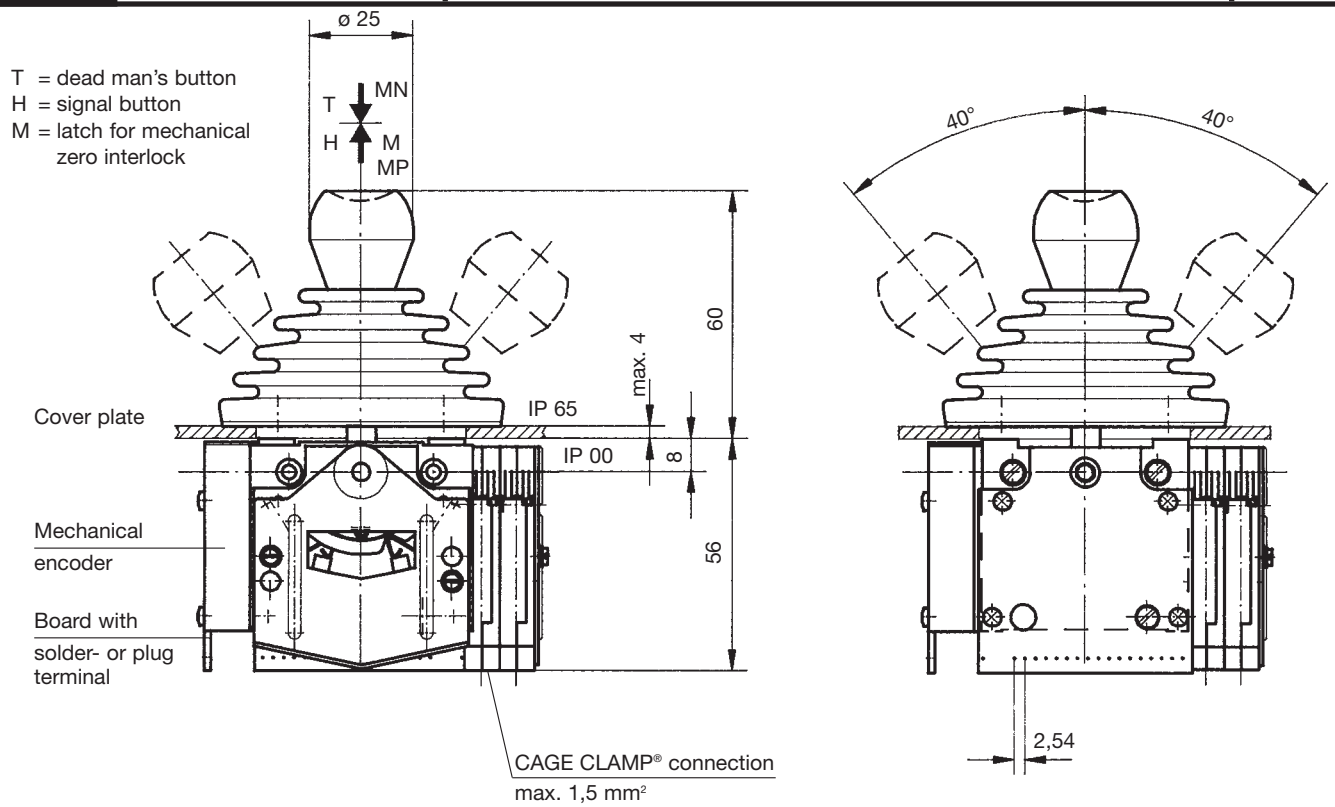
Mechanical life	6 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050
Description data see catalog 5/002	

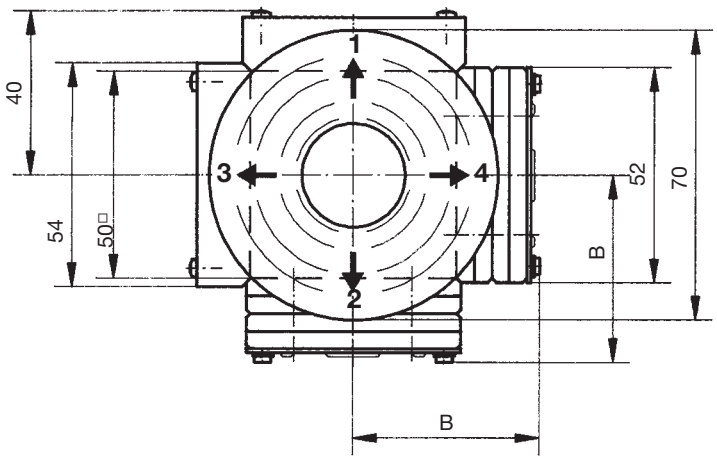
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

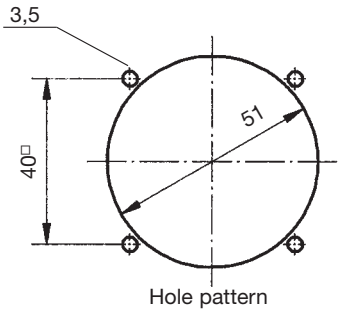
Pos.	V 14.1	V 14	Type expansion		Weight gramm	Type	Price EURO
1					175	V 14.1	
2							
3					200	V 14	
4							
5							
7.1	Multi-axis controller left (dir. 1-2, 3-4)					L	
7.2	Multi-axis controller right (dir. 5-6, 7-8)					R	
10	Gate cross-shaped (prohibits diagonal shifting)				20	P	
11	Gate special-shaped (e.g. H-gate)				20	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.2	by lifting, interlocking the joint bracket				60	MP	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button 1 NO				80	T	
23	Control-handle with signal button 1 NO				80	H	
28	Control-handle long +20 mm					S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact set) switching sequenc 4-0-4 adjustable (with encoder 6-0-6)			No. of contacts 2	70	01	
31				4	130	02	
32	Direction 1-2 and 3-4 each 1 masterswitch			6	190	03	
33	Switching program according contact-arrangement MS... see catalog 5/001						
34	or to your contact-arrangement						
38	Spring return in 0-position (included in the spindle block)		A...			Z	
39	Friction brake adjustable (for each direction)					R	
	Mechanical encoder with mounted direction 1-2 and 3-4 each 1 encoder life 5 x 106 switching cycles, 0,5 Watt wiper current max. 1 mA						
44	Mechanical encoder MEC 1-2 male connector EA/02-10 contact-arrangement MS 26-0 see catalog 5/001				30	C	
	Conductive-plastic potentiometer with centre tap linear resistance 2 x 10 kOhm		C61				
45	Mechanical encoder MEC 1-7 male connector EA / 10-10 contact-arrangement MS 26-0-1 see catalog 5/001				20	C	
	Conductive-plastic potentiometer with centre tap linear resistance 2 x 5 kOhm		C62				
46	Mechanical encoder MEC 1-6 male connector EA / 09-10, 6 Bit Gray-Code				30	C	
47	Mechanical encoder MEC 1-6-5 male connector ER / 36-10				30	C	
	Power supply 24 V DC, output power impressed 4-20 mA		C63				
48	Mechanical encoder MEC 1-6-8 male connector ER / 36-12		C64		30	C	
	Power supply 24 V DC, output power impressed 0-20 mA						
49	Mechanical encoder MEC 1-10 male connector EA / 17-10		C65		30	C	
	contact-arrangement MS21-0 + MS21 see catalog 5/001						
	Conductive-plastic potentiometer with centre tap		C66				
	Linear resistance 2 x 1,5 kOhm						
52	Housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

T = dead man's button
H = signal button
M = latch for mechanical zero interlock





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

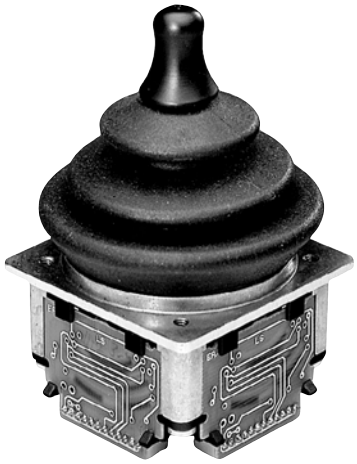


Hole pattern

V14 L S8 P T - 02 Z C + 01 R C -X- A050 C61 +A05 C62

- V14 — multi-axis controller
- L — installation side L o. R
- S8 — special control handle
- P — gate
- T — handle
- 02 — contact set dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- C — Potentiometer dir. 1-2 (5-6)
- 01 — contact set dir. 3-4 (7-8)
- R — friction brake dir. 3-4 (7-8)
- C — Potentiometer dir. 3-4 (7-8)
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- C61 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A05 — Arrangement dir. 3-4 (7-8) see p. 5/001
- C62 — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller V 20



Type V20L-0ZC+0ZC-...

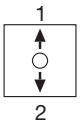
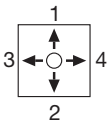
The multi-axis controller V 20 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for remote control and other applications.
The V 20 is resistant to oil, maritime climate, ozone and UV radiation.

Mechanical life	3 million (operating cycles)
Permissible ambient temperature	Operation -30° C to +70° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050

Description data see catalog 5/002

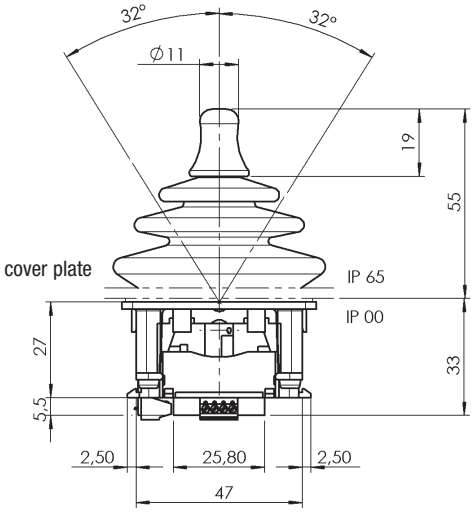
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

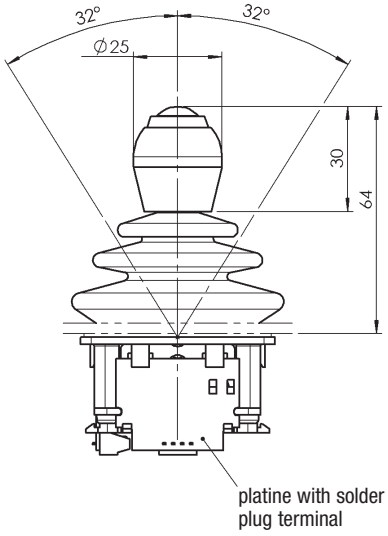
Pos.	V 20.1	V 20	Type expansion		Weight gramm	Type	Price EURO
1					80	V 20.1	
2							
3					90	V 20	
4							
5							
6	Degree of Protection, front IP67 by bellow						
7.1	Multi-axis controller left (dir. 1-2, 3-4)					L	
7.2	Multi-axis controller right (dir. 5-6, 7-8)					R	
9	Gate open-shaped for open shifting switching sequence 1-0-1 to 3-0-3						
10	Gate cross-shaped (prohibits diagonal shifting)					P	
11	Gate special-shaped (e.g. H-gate)					PX	
20	Control-handle with knob solid						
21							
22							
23							
24	Control-handle with push-button				50	D	
25							
30	without switching sequence						
31							
32							
33							
34							
35							
36	switching sequence 4-0-4						
38	Spring return in 0-position (included in the spindle block)					Z	
40	Mechanical encoder with mounted direction 1-2 and 3-4 each 1 encoder life 3 x 10^6 switching cycles 0,5 Watt wiper current max. 1 mA with solder or plug terminal						
44	Mechanical encoder MEC 2-1 male connector EA/15-10 contact-arrangement MS 224-0 see catalog 5/001 Conductive-plastic potentiometer with centre tap linear resistance 2 x 5 kOhm		C 70		15	C	
45	Mechanical encoder MEC 2-2 male connector EA / 11-10 contact-arrangement MS 24-0 see catalog 5/001 Conductive-plastic potentiometer with centre tap linear resistance 2 x 5 kOhm		C 71		15	C	
50	Cover housing KBQ 905 (IP65)						
52	Housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

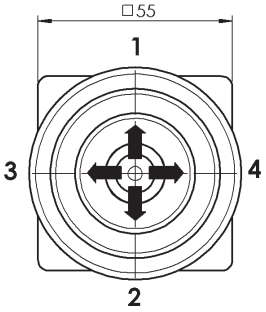
Degree of Protection front IP 65

Knob solid

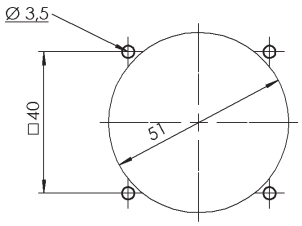


Knob solid with push button

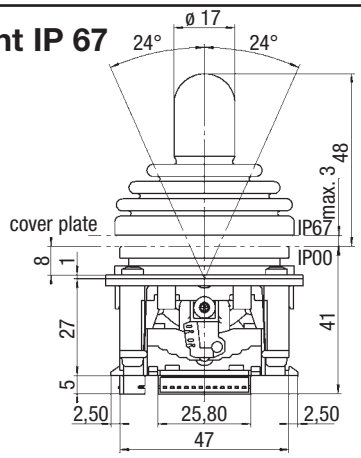


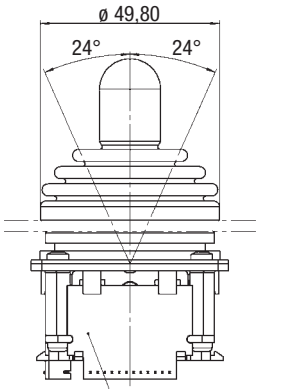


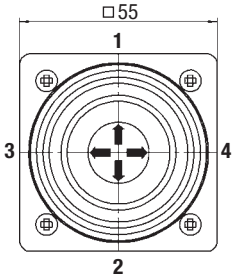
hole pattern



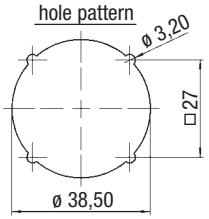
Degree of Protection front IP 67







hole pattern



V20 L P D - 0 Z C + 0 Z C -X- C70 C71

- multi-axis controller
- installation side L o. R
- gate
- handle
- contact not available
- spring return dir. 1-2 (5-6)
- Potentiometer dir. 1-2 (5-6)
- Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
- Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- special please describe
- Potentiometer dir. 3-4 (7-8)
- spring return dir. 3-4 (7-8)
- contact not available

Multi-axis controller V 21

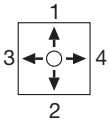
Type V21

The Multi-axis controller V 21 is a rugged switching device
according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications.
The V 21 is resistant to oil, maritime climate, ozone and UV radiation.
The V 21 has a highly flexible single wire 0,1 mm² x 450 mm long.

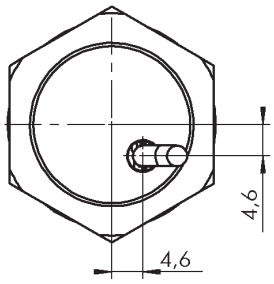
Mechanical life	6 millionen operating cycles
permissible ambient temperature	operation -40° C bis +60° C storage -50° C bis +80° C
climate resistance	
damp heat constant/cyclic	DIN IEC 68 part 2-3/30
degree of protection fronr	IP 67 IEC 529 DIN 40050

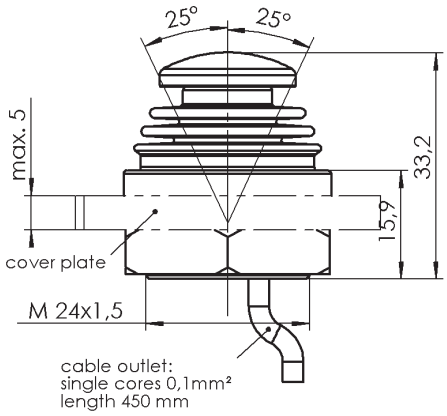
spindle block with schematic representation of the controller installation and deflection directions.
Version shown for left-hand side installation
(right-hand side installation is mirror image)

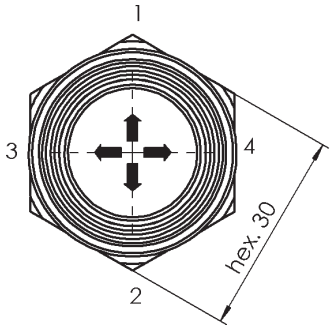
Deflection directions designated for DIN 15025

Pos.	V 21.1	V 21	Type-expansion		weight gramm	Type	Price EURO
1					350	V 21.1	
2							
3					350	V 21	
4							
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
8	mounting from the top with hexagonal nut (standard)						
8.1	mounting from the top with flange					A	
8.2	mounting from the bottom with flange					B	
10	Gate cross-shaped	(prohibits diagonal shifting)				P	
11	Gate special-shaped					PX	
36	switching sequence 4-0-4						
38	spring return in 0-position	(included in the spindle block)				Z	
	Setpoint device						
40	Magnet for redundant hall sensors	(included in the spindle block)				S	
	Voltage output impressed 0,5-2,5-4,5 Volt						
41	electonic for 1 axis redundante	(counter rotate)	EU 16				
42	electronic for 1 axis redundante	(unidirectional)	EU 18				
42	electonic for 2 axis redundante	(counter rotate)	EO 16				
44	electronic for 2 axis redundante	(unidirectional)	EO 18				
	Technical data: power supply 4,6-5,5 Volt output 0,5-2,5-4,5 Volt +5 mA output characteristic linear						
45	more electronics (Amplifier, Profi-Bus, CAN-Bus) see Catalog 3/150/…		E …				
52	Housing see Catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see Catalog 1/360						

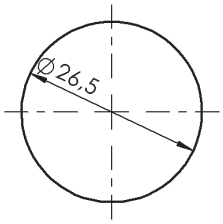
Standard mounting from the top



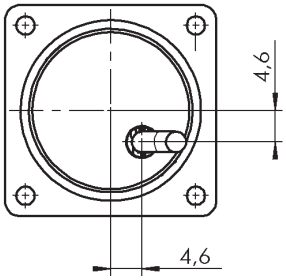


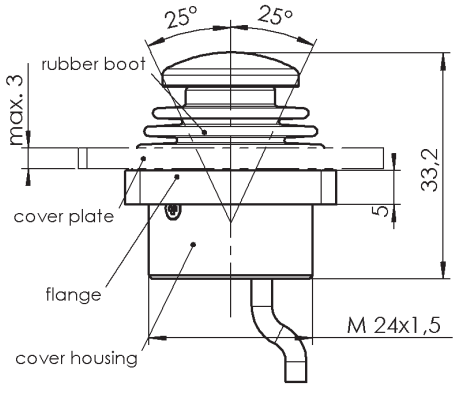


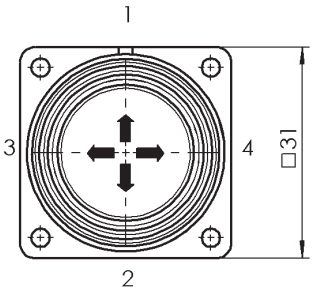
hole pattern



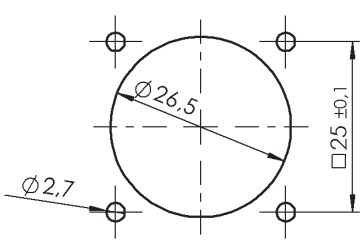
Version A with flange mounting from the top



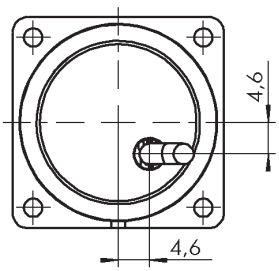


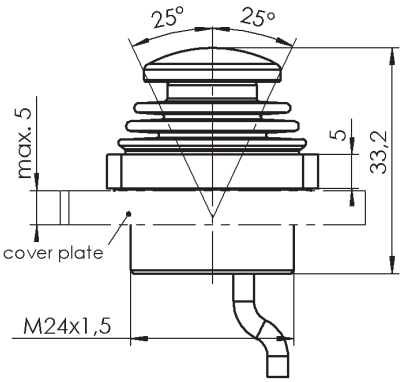


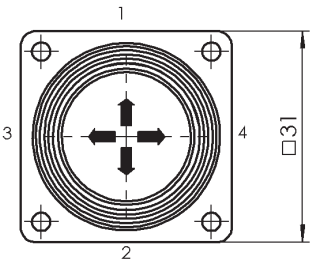
hole pattern



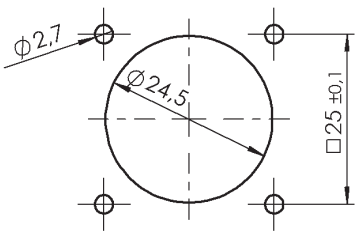
Version B with flange mounting from below







hole pattern



V21	L	A	P	-	0	Z	S	+	0	Z	S	-B	-X-	EU16

- V21: multi-axis controller
- L: installation side L o. R
- A: mounting version
- P: gate
- 0: contact not available
- Z: spring return dir. 1-2 (5-6)
- S: Hall sensor dir. 1-2 (5-6)
- +
- 0: contact not available
- Z: spring return dir. 3-4 (7-8)
- S: hall sensor dir. 3-4 (7-8)
- -B: housing
- -X-: special please describe
- EU16: Electronic description

Multi-axis controller V 3

Type V3LT-02Z+02ZP-…

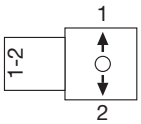
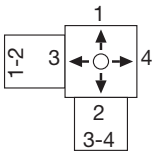
The multi-axis controller V 3 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The V 3 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 4 A 250 V AC 15 res. 1 A 24 V DC 13

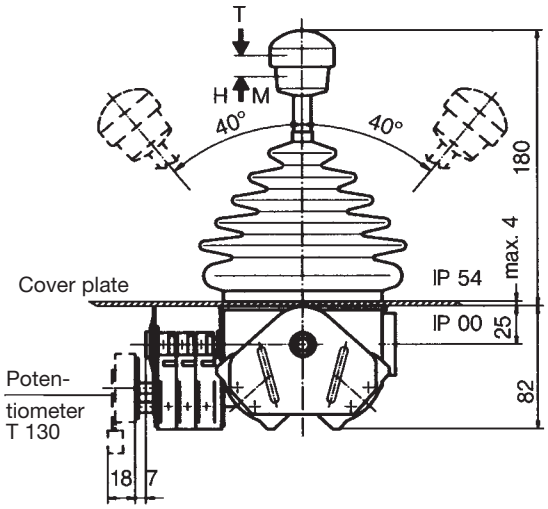
Mechanical life	6 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

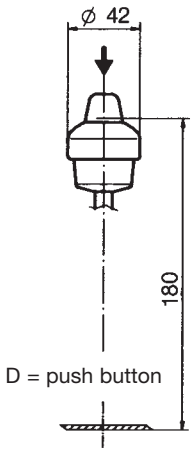
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

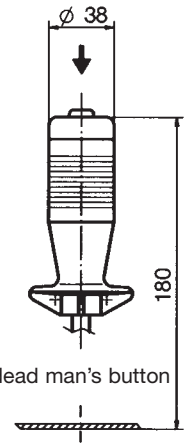
Pos.	V 31	V 3	Type expansion		Weight gramm	Type	Price EURO
1					940	V 31	
2							
3					1000	V 3	
4							
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10	Gate cross-shaped	(prohibits diagonal shifting)			100	P	
11	Gate special-shaped	(e.g. H-gate)			110	PX	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button	1 NO			100	T	
23	Control-handle with signal button	1 NO			100	H	
24	Control-handle with push button	1 NO			110	D	
25	Control-handle with flat push button	1 NO			110	DV	
26	Control-handle with palm grip B 1				40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO				60	B 1T	
28	Control-handle long or short						
28.1		-20 mm				S5	
28.2		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact) switching sequenc 4-0-4			No. of contacts 2	290	01	
31				4	350	02	
32	Direction 1-2 and 3-4 each 1 masterswitch			6	410	03	
33	Switching program according contact-arrangement MS... see catalog 5/001		A…	8	470	04	
34	or to your contact-arrangement			10	530	05	
35				12	590	06	
36	Switching sequence 5-0-5						
38	Spring return in 0-position	(for each direction)			110	Z	
39	Friction brake adjustable	(for each direction)			50	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025		…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.		P…			(P)	
43	more Potentiometer e.t.c. see catalog 1/240...						
50	Steel sheet housing B 200 masterswitch max. size 04				1300	B	
51	Steel sheet housing B 230 masterswitch max. size 06				1400	B	
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 or 4 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

T = dead man's button
H = signal button
M = latch for mechanical zero interlock



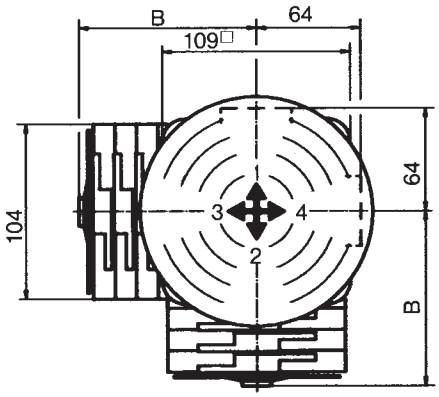


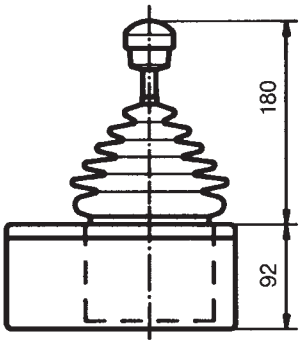
D = push button



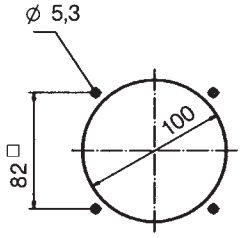
B 1T = dead man's button

Type	No. of contacts	Dimension B
01	2	77
02	4	89
03	6	102
04	8	114
05	10	127
06	12	139

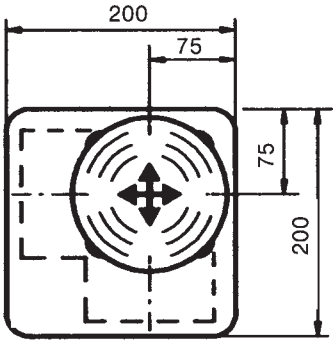




Steel sheet housing



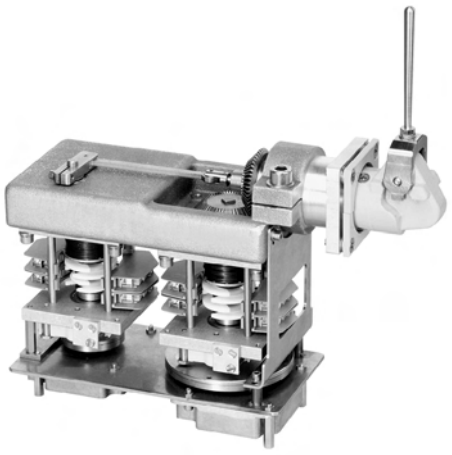
Hole pattern



V3	L	S5	P	H	-	02	Z	P	+	01	R	P	-B-	-X-	A050	P024	+A05	P022

- V3 — multi-axis controller
- L — installation side L o. R
- S5 — special control handle
- P — gate
- H — handle
- 02 — contact dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- 01 — contact dir. 3-4 (7-8)
- R — friction brake dir. 3-4 (7-8)
- P — Potentiometer dir. 3-4 (7-8)
- -B- — housing
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P024 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A05 — Arrangement dir. 3-4 (7-8) see p. 5/001
- P022 — Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Multi-axis controller V 18



Type V18L-02ZC+02ZC-…

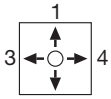
The multi-axis controller V 18 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications. The modular design enables the switching device to be used universally. The V 18 is resistant to oil, maritime climate, ozone and UV radiation. The modular micro changeover contacts are positive opening to VDE 0113.

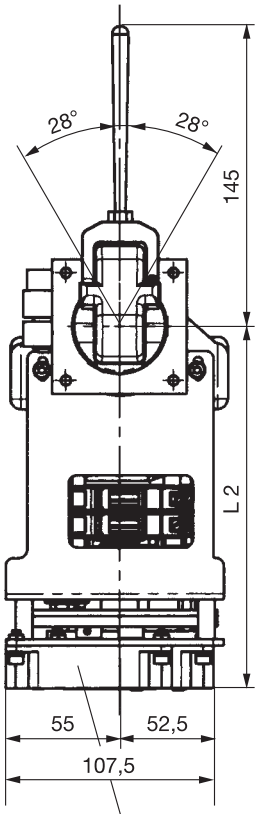
Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

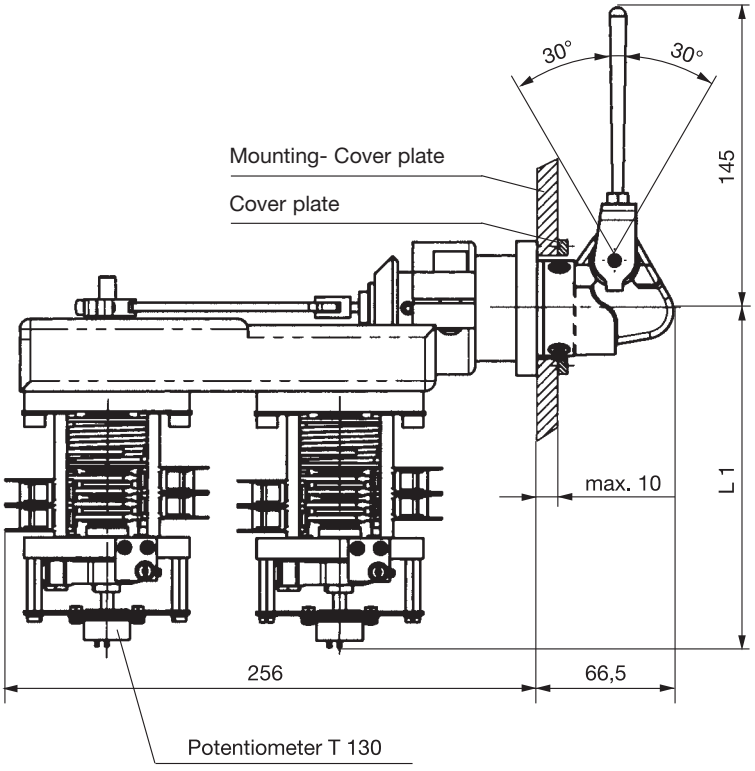
Mechanical life	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

Deflection directions designated to DIN 15025

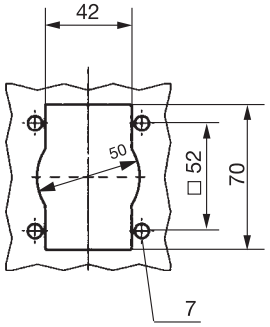
Pos.	V 181	V 18	Type expansion		Weight gramm	Type	Price EURO
1					2800	V 181	
2							
3					3500	V 18	
4							
5							
7.1	Multi-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Multi-axis controller right	(dir. 5-6, 7-8)				R	
10 11 12 13							
20 21 22 23	Control-handle						
30 31 32 33 34 35 36 37	Masterswitch (contact) switching sequenc 2-0-2 Direction 1-2 and 3-4 each 1 masterswitch Switching program according contact-arrangement MS... see catalog 5/001 or to your contact-arrangement		A…	No. of contacts 2 4 6	290 350 410	01 02 03	
38	Spring return in 0-position	(for each direction)			110	Z	
39	Friction brake adjustable	(for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025		…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°				300	(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				300	(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		C…, P…				
50 51 52 53							
60 61 62	Indicating labels not engraved with 2 or 4 arrows Engraving, each 10 characters						
70							





Opto-electronic encoder OEC 2

Type	No. of contacts	Dimension L1	Dimension L2
01	2	151,0	163,0
02	4	163,5	175,5
03	6	176,0	188,0

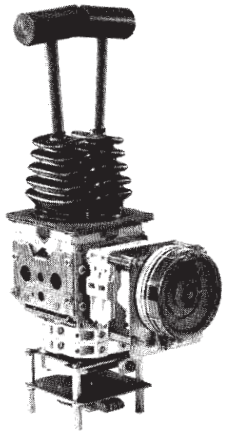


Hole pattern

V18 L P - 02 Z P + 01 R C -X- A050 P024 +A05 C01

- V18: multi-axis controller
- L: installation side L o. R
- P: gate
- 02: contact dir. 1-2 (5-6)
- Z: spring return dir. 1-2 (5-6)
- P: Potentiometer dir. 1-2 (5-6)
- 01: contact dir. 3-4 (7-8)
- R: friction brake dir. 3-4 (7-8)
- C: Potentiometer dir. 3-4 (7-8)
- -X-: special please describe
- A050: Arrangement dir. 1-2 (5-6) see p. 5/001
- P024: Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- +A05: Arrangement dir. 3-4 (7-8) see p. 5/001
- C01: Potentiometer description dir. 3-4 (7-8) see p. 1/240ff

Double-handle controller D 64 / DD 64



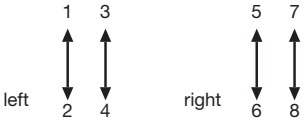
Type D64LQQ-02ZP+02ZP-…

The double-handle controller is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications. The modular design enables the switching device to be used universally. The D 64 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

Mechanical life D 64	10 million (operating cycles)
Mechanical life DD 64	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

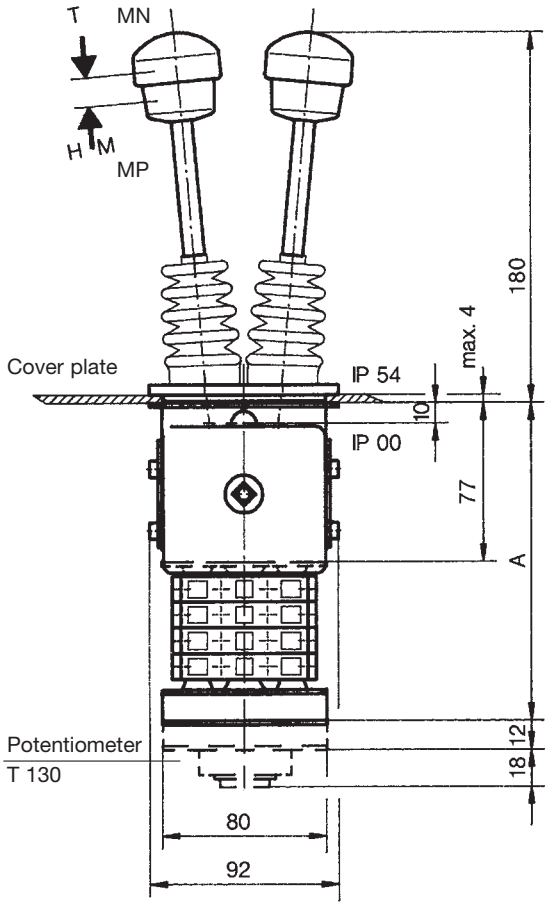
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).



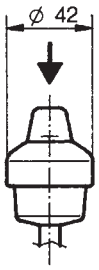
Deflection directions designated to DIN 15025

Pos.	D 64 / DD 64	Type expansion		Weight gramm	Type	Price EURO
1						
2						
3				1100	D 64	
4				1100	DD64	
5						
7.1	Double-handle controller left (dir. 1-2, 3-4)				L	
7.2	Double-handle controller right (dir. 5-6, 7-8)				R	
10						
20	Control-handle with knob solid		(for each			
21	Control-handle with latch for mechanical zero interlock		direction for			
21.1	by lifting		Pos. 20-28)	50	M	
21.2	by lifting, interlocking the gate or the joint bracket			60	MP	
21.3	by pushing down			50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282					
22	Control-handle with dead man's button 1 NO			100	T	
23	Control-handle with signal button 1 NO			100	H	
24	Control-handle with push button 1 NO			110	D	
25	Control-handle with flat push button 1 NO			110	DV	
26	Control-handle with T-grip			40	Q	
27	Control-handle with T-grip and push button side 1 NO			60	QD	
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...					
30	Masterswitch (contact set) switching sequenc 4-0-4		No. of contacts 2	290	01	
31			4	350	02	
32	Direction 1-2 and 3-4 each 1 masterswitch		6	410	03	
33	Switching program according contact-arrangement MS... see catalog 5/001	A…	8	470	04	
34	or to your contact-arrangement		10	530	05	
35			12	590	06	
36	Switching sequence 5-0-5 or 6-0-6					
38	Spring return in 0-position (for each direction)			110	Z	
39	Friction brake adjustable (for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025	…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°				(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	C…, P…				
52	More housing see catalog 1/350					
60	Indicating labels not engraved with 2 or 4 arrows					
61	Engraving, each 10 characters					
70	Command and indicating devices see catalog 1/360					

T = dead man's button
H = signal button
M = latch for mechanical zero interlock

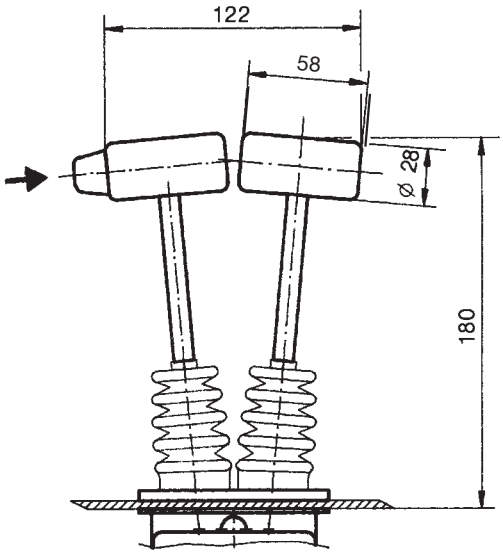


Knob solid
D = -push button

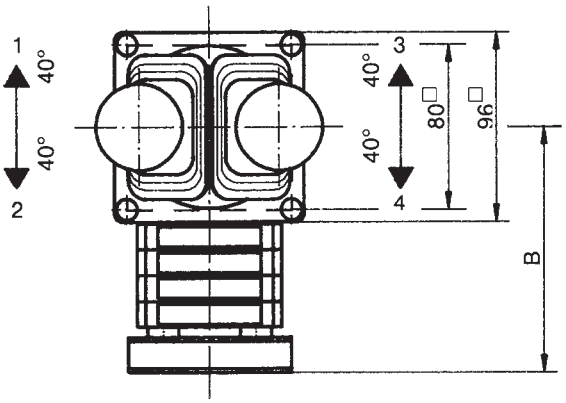


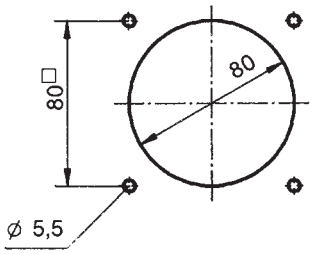
To build in:
direction 1-2
direction 3-4

T-grip
D = -push button



Type	No. of contacts	Dimension A	Dimension 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



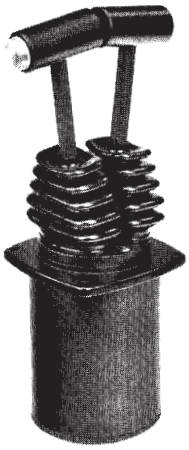


Hole pattern

D64 L S5 QQ - 02 Z P + 01 R P -X- A050 P024 +A05 P022

- double handle controller
- installation side L o. R
- special control handle
- handle
- contact set dir. 1-2 (5-6)
- spring return dir. 1-2 (5-6)
- Potentiometer dir. 1-2 (5-6)
- Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
- Arrangement dir. 3-4 (7-8) see p. 5/001
- Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- Arrangement dir. 1-2 (5-6) see p. 5/001
- special please describe
- Potentiometer dir. 3-4 (7-8)
- friction brake dir. 3-4 (7-8)
- contact set dir. 3-4 (7-8)

Double-handle controller D 8



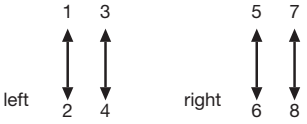
Type D8LQQD-2ZP+2ZP-B...

The double-handle controller D 8 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications. The modular design enables the switching device to be used universally. The D 8 is resistant to oil, maritime climate, ozone and UV radiation.

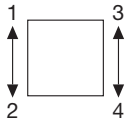
Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)
or I max < 300 mA 0,4 V DC 12 max. capacity 0,12 Watt do not exceed!
I min >0,2 mA 2 V DC 12 max. contact reliability for very low current (special)

Mechanical life	8 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

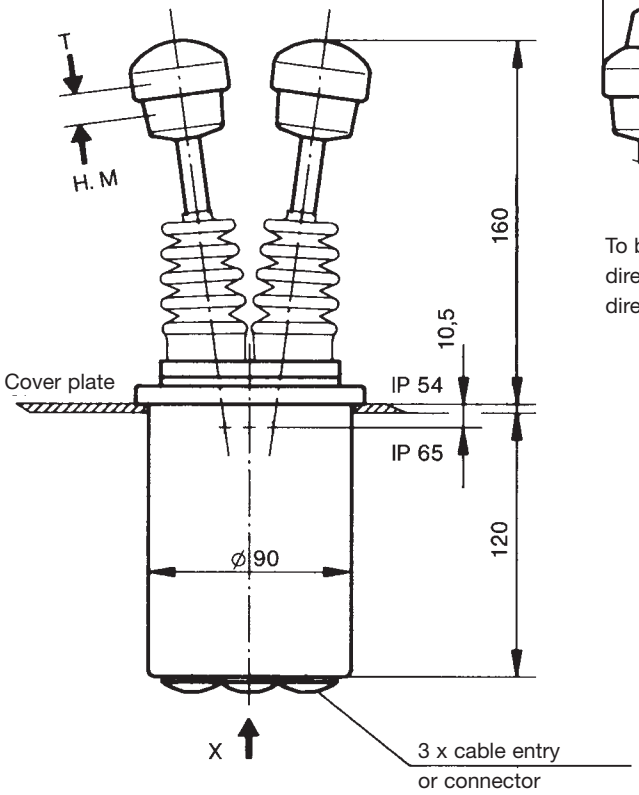


Deflection directions designated to DIN 15025

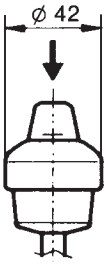
Pos.	D 8	Type expansion		Weight gramm	Type	Price EURO
1						
2						
3				1000	D 8	
4						
5						
7.1	Double-handle controller left (dir. 1-2, 3-4)				L	
7.2	Double-handle controller right (dir. 5-6, 7-8)				R	
10						
20	Control-handle with knob solid		(for each			
21	Control-handle with latch for mechanical zero interlock		direction for			
21.1	by lifting		Pos. 20-28)	50	M	
22	Control-handle with dead man's button 1 NO			100	T	
23	Control-handle with signal button 1 NO			100	H	
24	Control-handle with push button 1 NO			110	D	
25	Control-handle with flat push button 1 NO			110	DV	
26	Control-handle with T-grip			40	Q	
27	Control-handle with T-grip and push button side 1 NO			60	QD	
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...					
30	Masterswitch (contact) switching sequenc -0-		No. of contacts 1	20	1	
31			2	40	2	
32	Direction 1-2 and 3-4 each 1 masterswitch		3	60	3	
33	Switching program according contact-arrangement MS... see catalog 5/001	A...				
34	or to your contact-arrangement					
36	Switching sequence 3-0-3					
38	Spring return in 0-position (for each direction)			30	Z	
39	Friction brake adjustable (for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Conductive-plastic potentiometer T 301, with centre tap linear 0,5 Watt wiper current max. 1 mA resistance 2 x 1k ≙ P182, 2 x 5k ≙ P184	...P18 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 120°					
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	P...			(P)	
45	Electronic (Amplifier, Profi-Bus, CAN-Bus) see catalog 3/510/...	E...				
50	Cover housing			300	B	
51	Filter plug M 20 for air-condition			20		
52	Cable entry M 20 with anti-kink protection and strain relief			30		
53	Plug in socket 14-pole female insert CPC 17 wired			150		
54	Connector 14-pole male insert CPC 17 unwired			150		
55	Wiring plug in socket or connector each wired-connection					
60	Indicating labels not engraved with 2 or 4 arrows					
61	Engraving, each 10 characters					

Double-handle controller D 8

T = dead man's button
H = signal button
M = latch for mechanical zero interlock

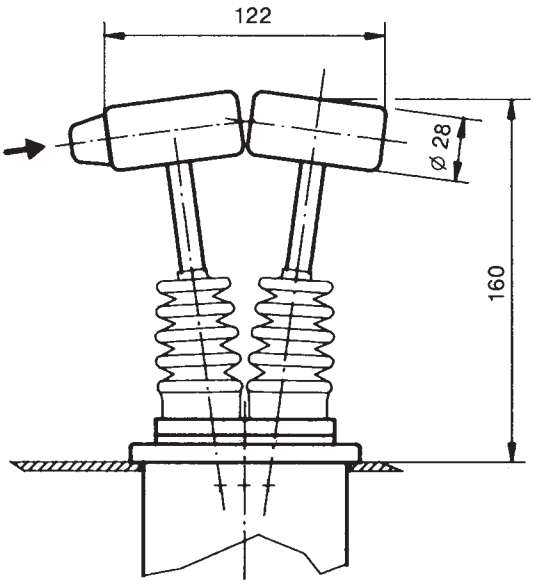


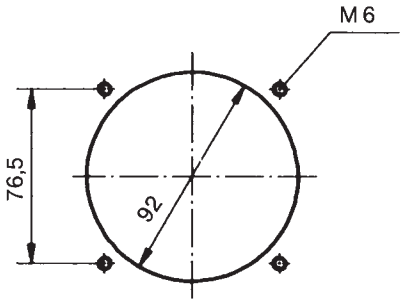
Knob solid
D = push button



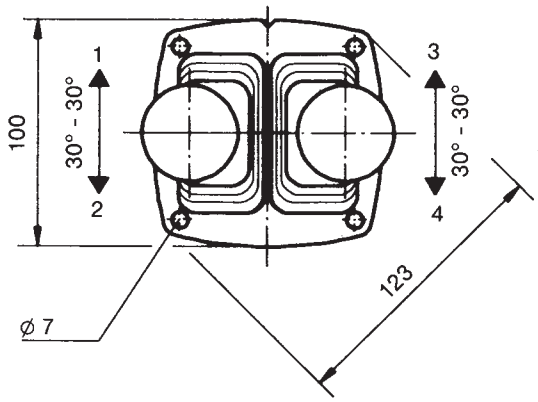
To build in:
direction 1-2
direction 3-4

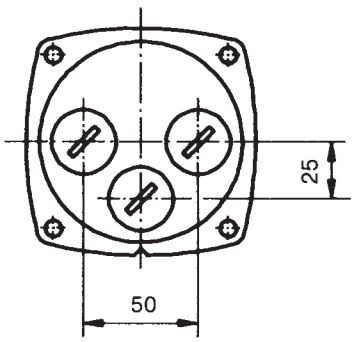
T-grip
D = push button





Hole pattern





View x

D8	L	S5	QDQ -	2	Z	P +	1	R	P	-B-	-X-	A05	P18	+A98	P182	
double handle controller																Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
installation side L o. R																Arrangement dir. 3-4 (7-8) see p. 5/001
special control handle																Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
handle																Arrangement dir. 1-2 (5-6) see p. 5/001
contact dir. 1-2 (5-6)																special please describe
spring return dir. 1-2 (5-6)																housing
Potentiometer dir. 1-2 (5-6)																Potentiometer dir. 3-4 (7-8)
contact dir. 3-4 (7-8)																friction brake dir. 3-4 (7-8)

Double-handle controller D 3

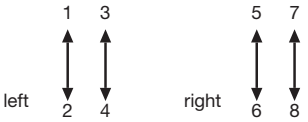
Type D3LQQ-2ZP+2ZP-B…

The double-handle controller D 3 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for nautical navigation applications. The modular design enables the switching device to be used universally. The D 3 is resistant to oil, maritime climate, ozone and UV radiation.

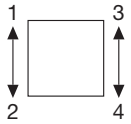
Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Mechanical life	12 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 66 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

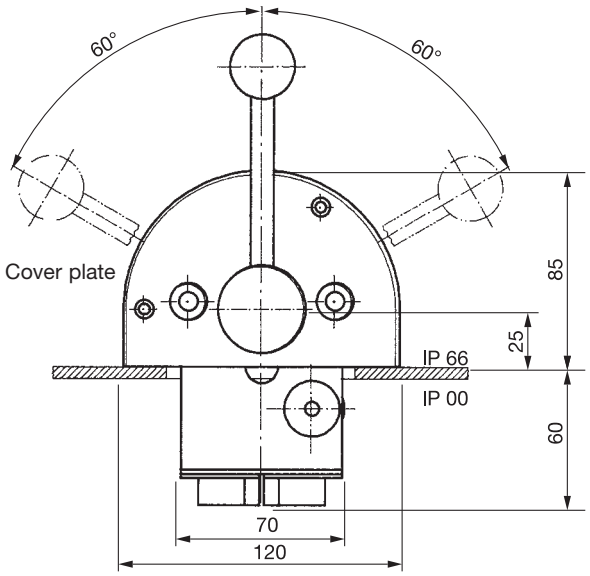


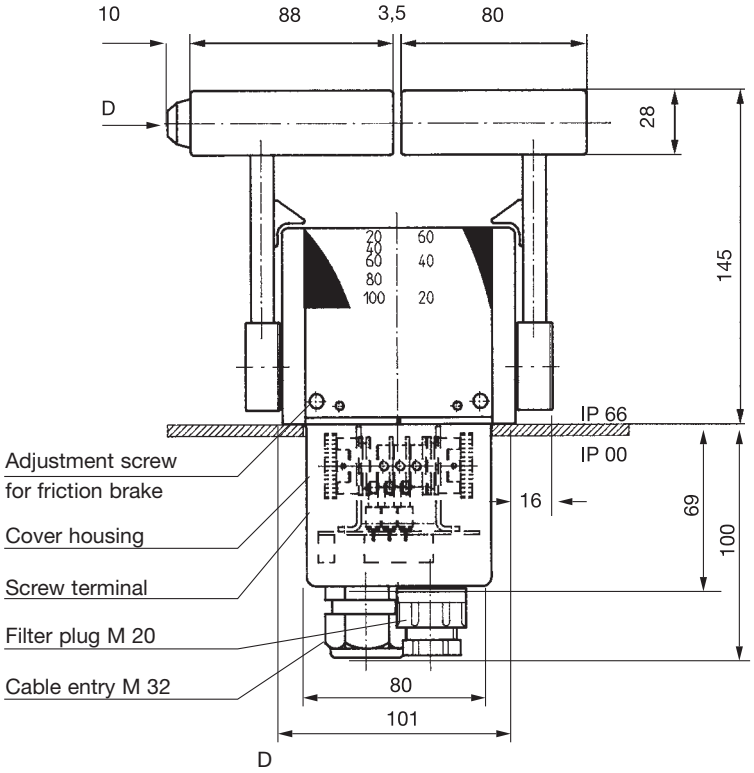
Deflection directions designated to DIN 15025

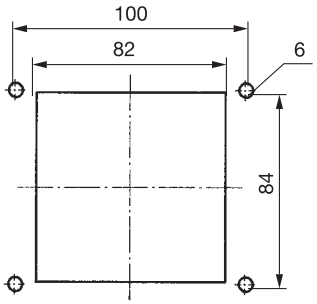
Pos.	D 3	Type expansion		Weight gramm	Type	Price EURO
1						
2						
3				4000	D 3	
4						
5						
7.1	Double-handle controller left (dir. 1-2, 3-4)				L	
7.2	Double-handle controller right (dir. 5-6, 7-8)				R	
10						
20	Control-handle with knob solid					
21						
22						
23						
24	Control-handle with push button 1 NO			110	D	
25						
26	Control-handle with T-grip			40	Q	
27	Control-handle with T-grip and push button side 1 NO			60	QD	
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
29						
30	Masterswitch (contact) switching sequenc -0-		No. of contacts 1	20	1	
31			2	40	2	
32	Direction 1-2 and 3-4 each 1 masterswitch		3	60	3	
33	Switching program according contact-arrangement MS... see catalog 5/001	A…				
34	or to your contact-arrangement					
35						
36	Switching sequence special					
38	Spring return in 0-position (for each direction)			30	Z	
39	Friction brake adjustable (for each direction)			30	R	
	Potentiometer e.t.c. each masterswitch with mounted					
40	Conductive-plastic potentiometer T 246, with centre tap linear 0,5 Watt wiper current max. 1 mA, resistance 2 x 5k ≙ P214	…P21 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 75°					
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	P…			(P)	
50	Cover housing			300	B	
51	Filter plug M 20 for air-condition			20		
52	Cable entry M 32 with anti-kink protection			30		
60	Indicating label eloxal aluminium plate silvery (included in the spindle block)					
61	Engraving, each 10 characters					

T-grip
D = push button

Direction 1-2 Direction 3-4

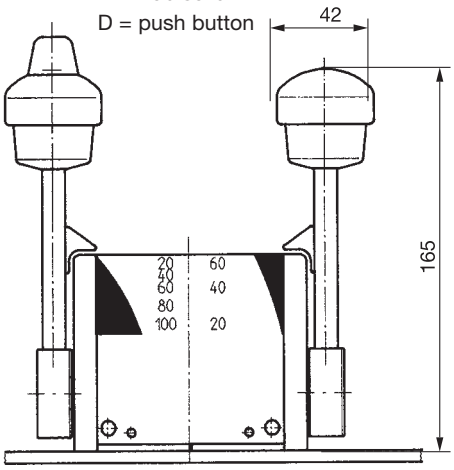






Hole pattern

Knob solid
D = push button



D3	L	S5	QQ	-	2	Z	P	+	1	R	P	-B-	-X-	A05	P214	+A98	P214	
doube handle controller																		Potentiometer description dir. 3-4 (7-8) see p. 1/240ff
	installation side L o. R																	Arrangement dir. 3-4 (7-8) see p. 5/001
		special control handle																Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
			handle															Arrangement dir. 1-2 (5-6) see p. 5/001
					contact set dir. 1-2 (5-6)													special please describe
						spring return dir. 1-2 (5-6)												housing
							Potentiometer dir. 1-2 (5-6)											Potentiometer dir. 3-4 (7-8)
									contact set dir. 3-4 (7-8)									friction brake dir. 3-4 (7-8)

Single-axis controller S 1

Type S1LGS8-00ZP-…

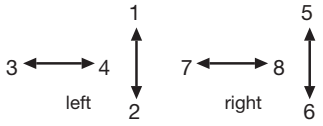
Type S1LGK4-00ZP-…

The single-axis controller S 1 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for remote control and electro-hydraulic applications. The S 1 is resistant to oil, maritime climate, ozone and UV radiation.

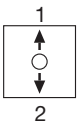
Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Mechanical life	6 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

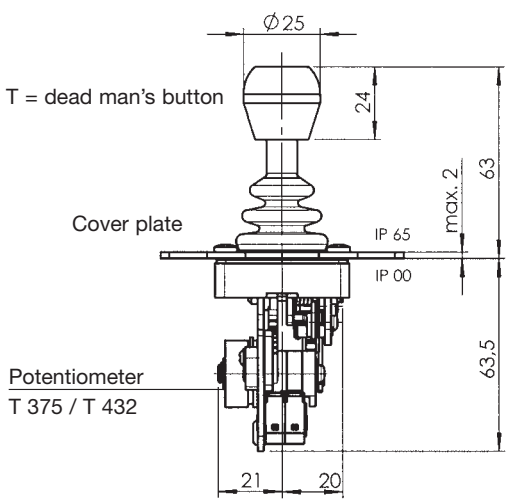
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

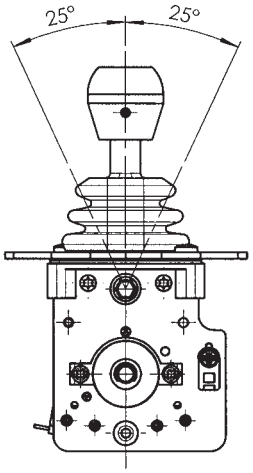


Deflection directions designated to DIN 15025

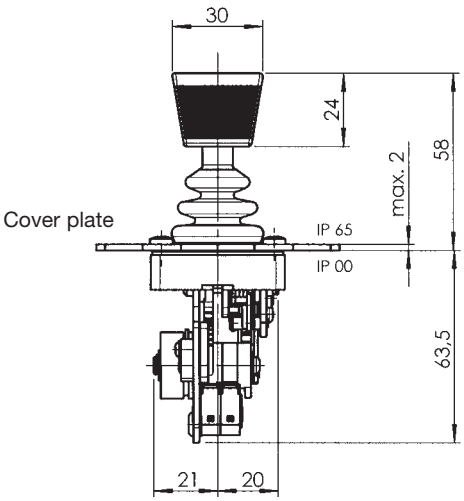
Pos.	S 1	Type expansion		Weight gramm	Type	Price EURO
1				150	S 1	
2						
3						
4						
5						
7.1	Single-axis controller left (dir. 1-2, 3-4)				L	
7.2	Single-axis controller right (dir. 5-6, 7-8)				R	
10						
20	Control-handle with knob solid GK 4					
21	Control-handle with latch for mechanical zero interlock					
21.1	by lifting			50	M	
22	Control-handle with dead man's button 1 NO			80	T	
23						
24	Control-handle with push button 1 NO				D	
25						
26	Control-handle with knob GS 8				GS 8	
30	Masterswitch (contact) switching sequenc -0-		No. of contacts 2	20	01	
			4	40	02	
	Switching program according contact-arrangement	A…				
	MS see catalog 5/001 or to your contact-arrangement					
36	switching sequence 2-0-2					
38	Spring return in 0-position (for each direction)				Z	
39	Friction brake adjustable (for each direction)				R	
	Potentiometer e.t.c. each masterswitch with mounted					
44	Conductive-plastic potentiometer T 375, with centre tap linear	…P37 □		20	P	
	life 10^7 switching cycles resistance 2 x 5 kOhm 0,5 Watt					
	wiper current max. 1 mA					
45	Conductive-plastic potentiometer T 430 with centre tap linear	…P27 □		25	P	
	life 10^7 switching cycles resistance 2 x 5 kOhm					
	2 conductive-plastic-contact way arrangement MSP 21 (catalog 5/001)					
	0,5 Watt wiper current max. 1 mA					
52	Housing see catalog 1/350					
60	Indicating labels not engraved with 2 arrows					
61	Engraving, each 10 characters					
70	Command and indicating devices see catalog 1/360					

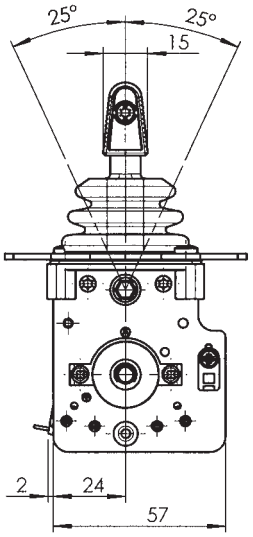
S 1 with knob solid GK 4

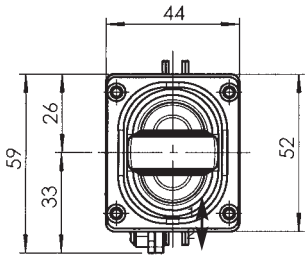


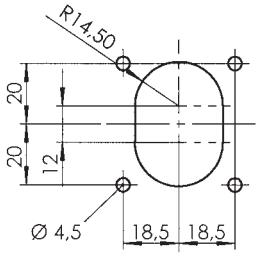


S 1 with knob GS 8









Hole pattern

S1 L GS8 - 02 Z P -X- A050 P374

- single-axis controller
- installation side L o. R
- handle
- contact set dir. 1-2 (5-6)
- spring return dir. 1-2 (5-6)
- Potentiometer dir. 1-2 (5-6)
- Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- Arrangement dir. 1-2 (5-6) see p. 5/001
- special please describe

Single-axis controller S 14

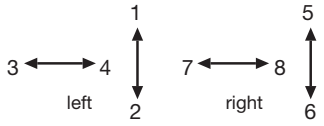
Type S14L-01ZP-…

The single-axis controller S 14 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for remote control and hoisting applications. The S 14 is resistant to oil, maritime climate, ozone and UV radiation.

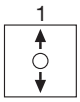
Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13

Mechanical life	6 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

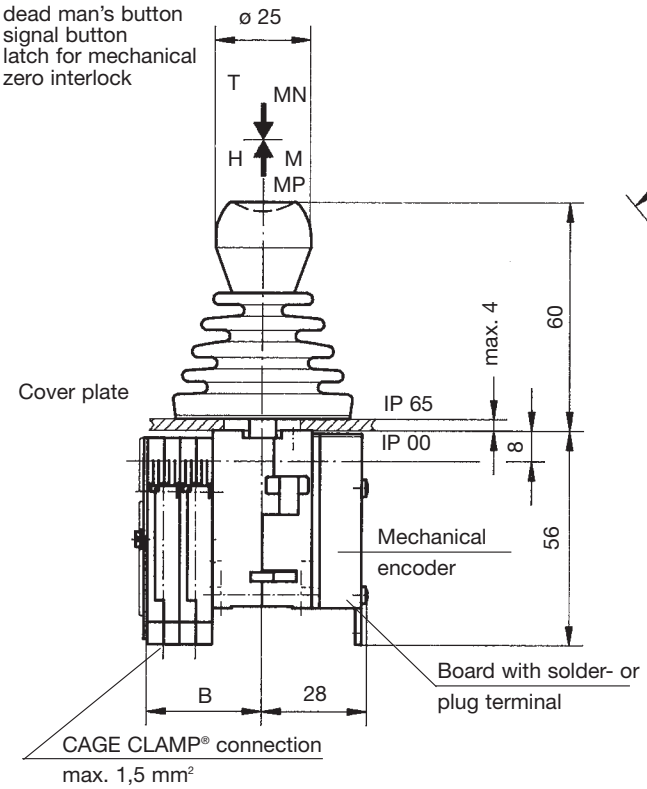
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

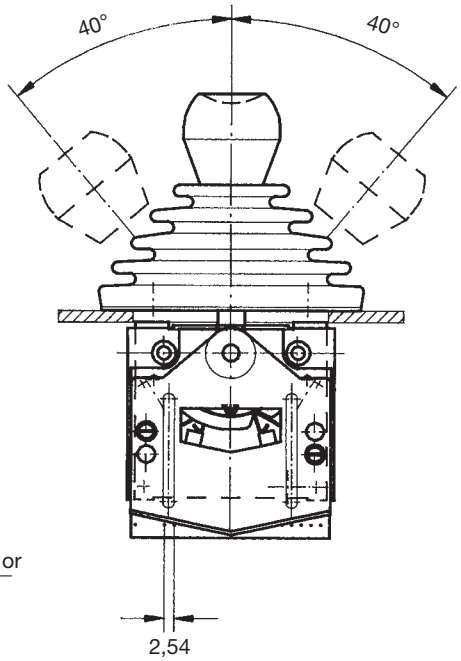


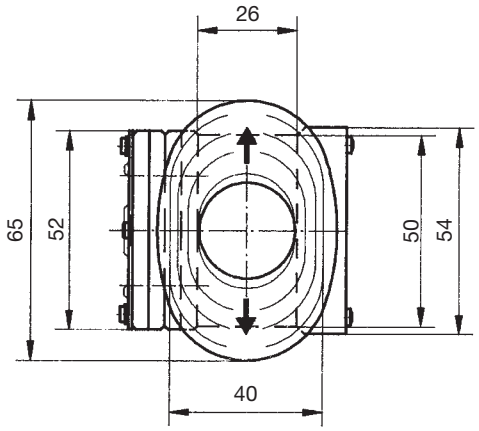
Deflection directions designated to DIN 15025

Pos.	S 14	Type expansion		Weight gramm	Type	Price EURO
1				150	S 14	
2						
3						
4						
5						
7.1	Single-axis controller left (dir. 1-2, 3-4)				L	
7.2	Single-axis controller right (dir. 5-6, 7-8)				R	
10						
20	Control-handle with knob solid					
21	Control-handle with latch for mechanical zero interlock					
21.1	by lifting			50	M	
21.2	by lifting, interlocking in the joint bracket			60	MP	
21.3	by pushing down			50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282					
22	Control-handle with dead man's button 1 NO			80	T	
23	Control-handle with signal button 1 NO			80	H	
28	Control-handle long +20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...					
30	Masterswitch (contact set) switching sequenc 4-0-4 adjustable (with encoder 6-0-6)		No. of contacts 2	70	01	
31			4	130	02	
32	Direction 1-2 or 3-4		6	190	03	
33	Switching program according contact-arrangement MS... see catalog 5/001	A…				
34	or to your contact-arrangement					
38	Spring return in 0-position (for each direction)				Z	
39	Friction brake adjustable (for each direction)				R	
44	Mechanical encoder with mounted direction 1-2 or 3-4 life 5 x 10^6 switching cycles, 0,5 Watt wiper current max. 1 mA Mechanical encoder MEC 1-2 male connector EA/02-10 contact-arrangement MS 26-0 see catalog 5/001 Conductive-plastic potentiometer with centre tap linear resistance 2 x 10 kOhm	C 61		30	C	
45	Mechanical encoder MEC 1-7 male connector EA / 10-10 contact-arrangement MS 26-0-1 see catalog 5/001 Conductive-plastic potentiometer with centre tap linear resistance 2 x 5 kOhm	C 62		20	C	
46	Mechanical encoder MEC 1-6 male connector EA / 09-10, 6 Bit Gray-Code	C 63		30	C	
47	Mechanical encoder MEC 1-6-5 male connector ER / 36-10 Power supply 24 V DC, output power impressed 4-20 mA	C 64		30	C	
48	Mechanical encoder MEC 1-6-8 male connector ER / 36-12 Power supply 24 V DC, output power impressed 0-20 mA	C 65		30	C	
49	Mechanical encoder MEC 1-10 male connector EA / 17-10 contact-arrangement MS21-0 + MS21 see catalog 5/001 Conductive-plastic potentiometer with centre tap Linear resistance 2 x 1,5 kOhm	C 66		30	C	
52	Housing see catalog 1/350					
60	Indicating labels not engraved with 2 arrows					
61	Engraving, each 10 characters					
70	Command and indicating devices see catalog 1/360					

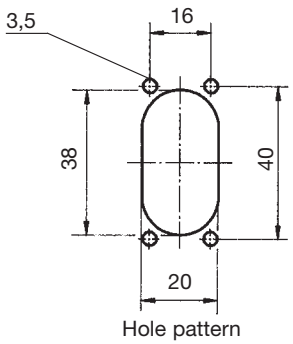
T = dead man's button
H = signal button
M = latch for mechanical zero interlock







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

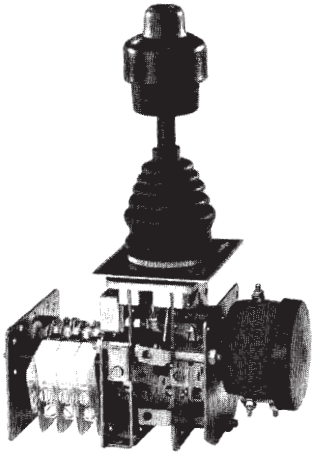


Hole pattern

S14 L S8 T - 01 Z C -X- A05 C61

- S14 — single-axis controller
- L — installation side L o. R
- S8 — special control handle
- T — handle
- 01 — contact set dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- C — Potentiometer dir. 1-2 (5-6)
- -X- — special please describe
- A05 — Arrangement dir. 1-2 (5-6) see p. 5/001
- C61 — Potentiometer description dir. 1-2 (5-6)

Single-axis controller S 2 / SS 2



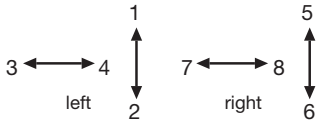
Type S2LD-03ZP-…

The single-axis controller S 2 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications. The modular design enables the switching device to be used universally. The S 2 is resistant to oil, maritime climate, ozone and UV radiation.

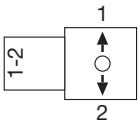
Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

Mechanical life S 2	6 million (operating cycles)
Mechanical life SS 2	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

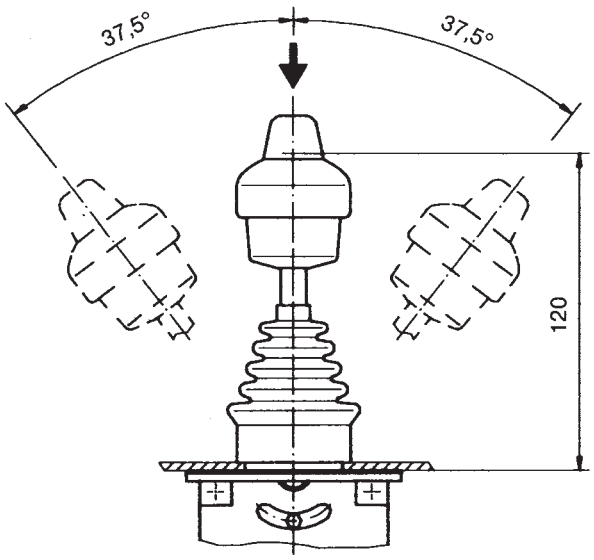


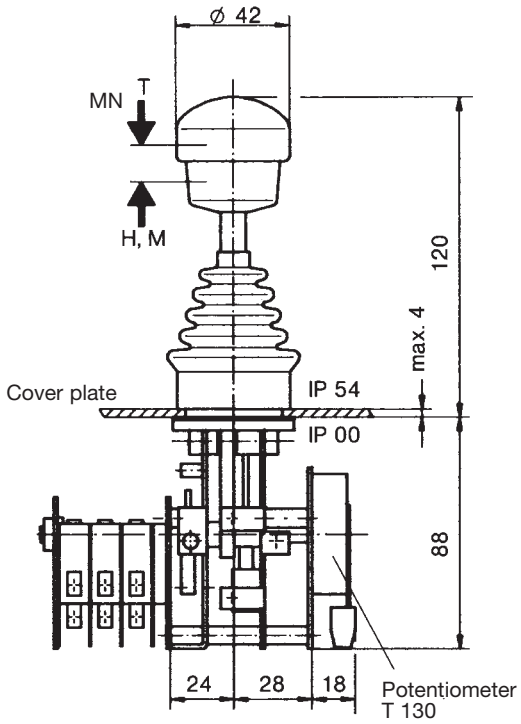
Deflection directions designated to DIN 15025

Pos.	S 2		Type expansion		Weight gramm	Type	Price EURO
1					600	S 2	
2					650	SS 2	
3							
4							
5							
7.1	Single-axis controller left	(dir. 1-2, 3-4)				L	
7.2	Single-axis controller right	(dir. 5-6, 7-8)				R	
11	Gate special-shaped	(for position view) M 1699			60	P	
20	Control-handle with knob solid						
21	Control-handle with latch for mechanical zero interlock						
21.1	by lifting				50	M	
21.3	by pushing down				50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282						
22	Control-handle with dead man's button	1 NO			50	T	
23	Control-handle with signal button	1 NO			50	H	
24	Control-handle with push button	1 NO			60	D	
25	Control-handle with flat push button	1 NO			60	DV	
26	Control-handle with palm grip B 5				40	B 5	
27	Control-handle with palm grip B 5 with push button top 1 NO				60	B 5T	
28	Control-handle long or short						
28.1		-20 mm				S5	
28.2		+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...						
30	Masterswitch (contact) switching sequenc 5-0-5			No. of contacts 3	300	02	
31				5	330	03	
32				7	360	04	
33	Switching program according contact-arrangement MS... see catalog 5/001		A…	9	390	05	
34	or to your contact-arrangement						
35							
37	Micro change over contact (MZT1) positive opening (additional price)			1			
38	Spring return in 0-position	(for each direction)			20	Z	
39	Friction brake adjustable	(for each direction)			20	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025		…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.					(P)	
43	more Potentiometer e.t.c. see catalog 1/240...		C…, P…				
50	Steel sheet housing B 200 masterswitch Gr. 05				1300	B	
52	More housing see catalog 1/350						
60	Indicating labels not engraved with 2 arrows						
61	Engraving, each 10 characters						
70	Command and indicating devices see catalog 1/360						

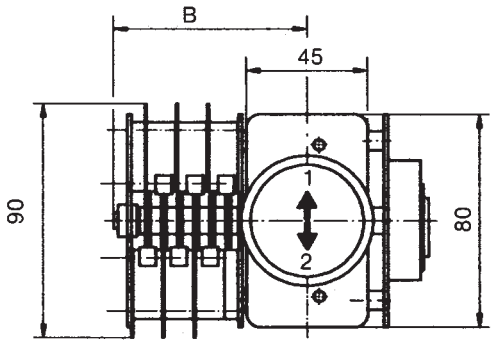
T = dead man's button
H = signal button
M = latch for mechanical zero interlock

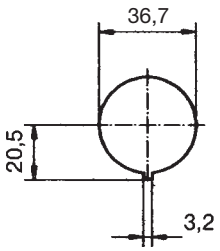
Knob solid D = -push button





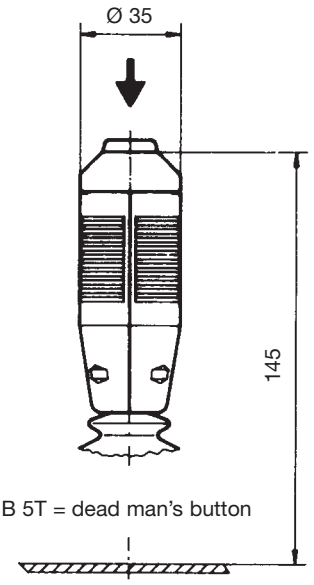
Type	No. of contacts	Dimension B
02	3	62
03	5	72
04	7	83
05	9	93





Hole pattern

Palm grip B 5

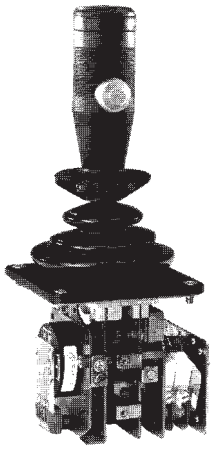


B 5T = dead man's button

S2 L S8 DV - 02 Z P -X- A050 P023

- S2 — single-axis controller
- L — installation side L o. R
- S8 — special control handle
- DV — handle
- 02 — contact dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P023 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- -X- — special please describe

Single-axis controller S 21 / SS 21



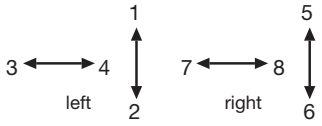
Type S21LB12D-02ZP-…

The single-axis controller S 21 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications.
The modular design enables the switching device to be used universally.
The S 21 is resistant to oil, maritime climate, ozone and UV radiation.

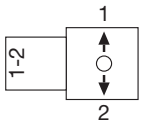
Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

Mechanical life S 21	6 million (operating cycles)
Mechanical life SS 21	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

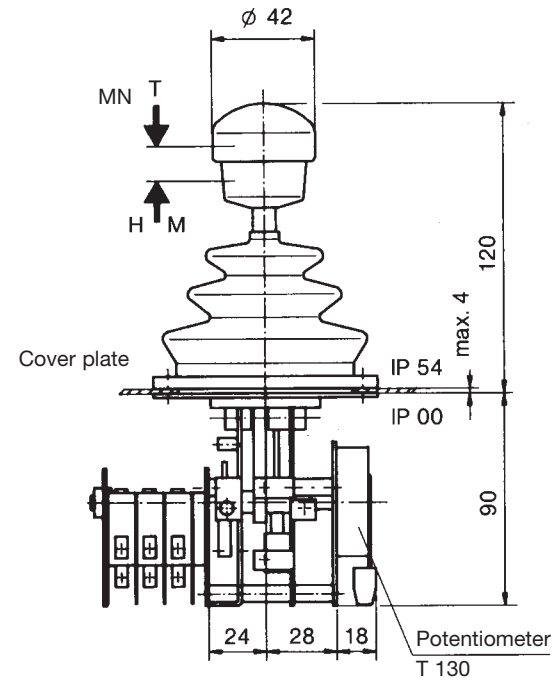
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

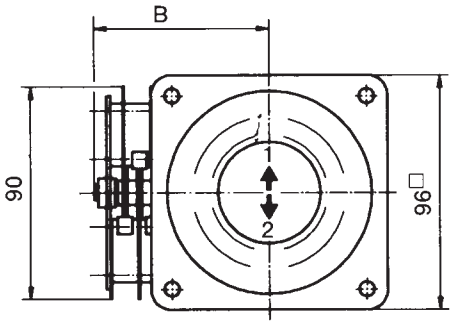


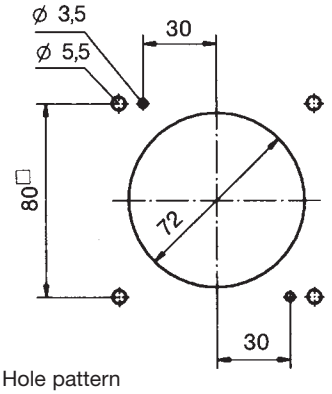
Deflection directions designated to DIN 15025

Pos.	S 21	Type expansion		Weight gramm	Type	Price EURO
1				650	S 21	
2				650	SS 21	
3						
4						
5						
7.1	Single-axis controller left (dir. 1-2, 3-4)				L	
7.2	Single-axis controller right (dir. 5-6, 7-8)				R	
20	Control-handle with knob solid					
21	Control-handle with latch for mechanical zero interlock					
21.1	by lifting			50	M	
21.3	by pushing down			50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282					
22	Control-handle with dead man's button 1 NO			100	T	
23	Control-handle with signal button 1 NO			100	H	
24	Control-handle with push button 1 NO			110	D	
25	Control-handle with flat push button 1 NO			110	DV	
26	Control-handle with palm grip B 1			40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO			60	B 1T	
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...					
30	Masterswitch (contact) switching sequenc 5-0-5		No. of contacts 3	300	02	
31			5	330	03	
32			7	360	04	
33	Switching program according contact-arrangement MS... see catalog 5/001		9	390	05	
34	or to your contact-arrangement	A…				
35						
36						
38	Spring return in 0-position (for each direction)			20	Z	
39	Friction brake adjustable (for each direction)			20	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025	…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°				(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	C…, P…				
50	Steel sheet housing B 200 masterswitch Gr. 05			1300	B	
51						
52	More housing see catalog 1/350					
60	Indicating labels not engraved with 2 arrows					
61	Engraving, each 10 characters					
70	Command and indicating devices see catalog 1/360					

T = dead man's button
H = signal button
M = latch for mechanical zero interlock

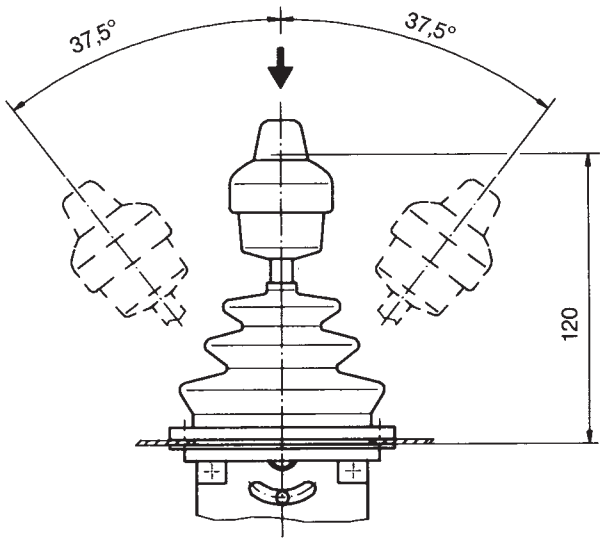




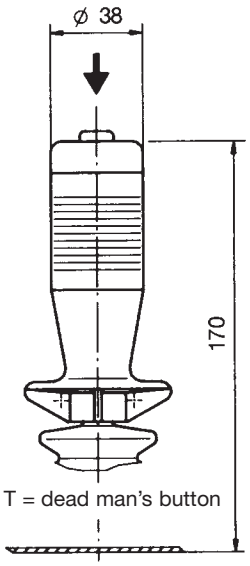


Hole pattern

Knob solid
D = push button



Palm grip B 1



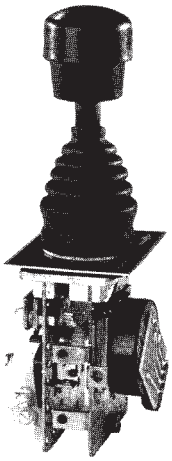
B 1T = dead man's button

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

S21 L S8 T - 02 R P -X- A050 P021

- S21 — single-axis controller
- L — installation side L o. R
- S8 — special control handle
- T — handle
- 02 — contact dir. 1-2 (5-6)
- R — friction brake dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P021 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff

Single-axis controller S 22 / SS 22



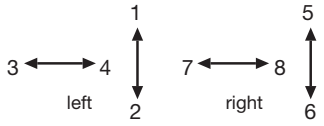
Type S22LT-2ZP-…

The single-axis controller S 22 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications. The modular design enables the switching device to be used universally. The S 21 is resistant to oil, maritime climate, ozone and UV radiation.

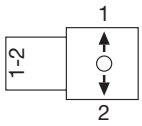
Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

Mechanical life S 22	6 million (operating cycles)
Mechanical life SS 22	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

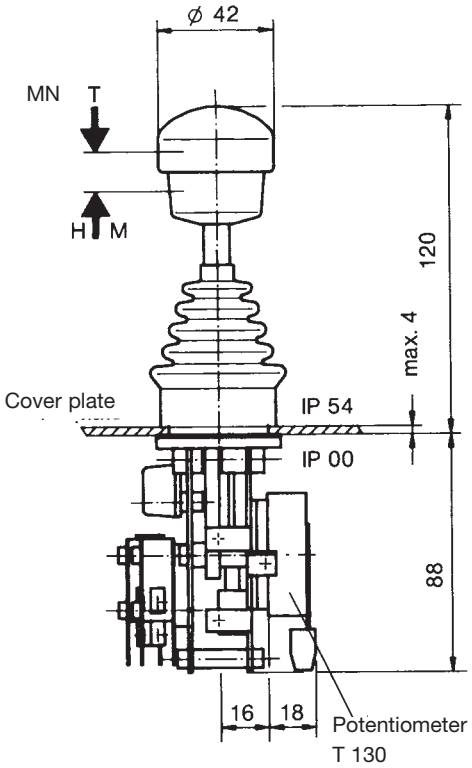
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).



Deflection directions designated to DIN 15025

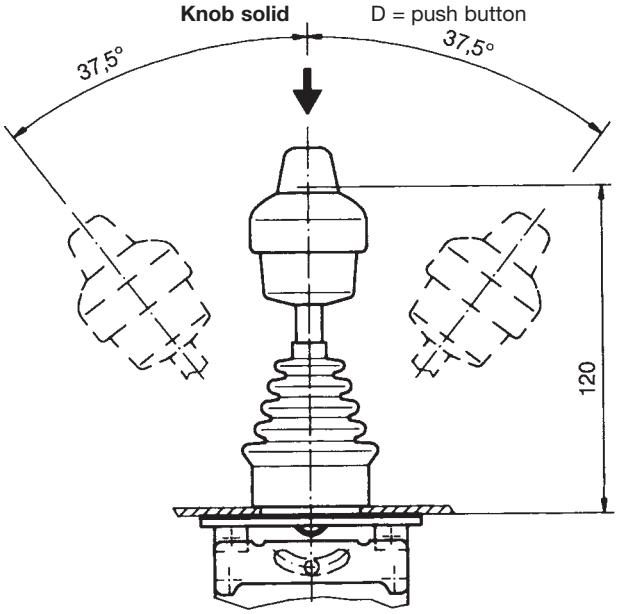
Pos.	S 22	Type expansion		Weight gramm	Type	Price EURO
1				600	S 22	
2				650	SS 22	
3						
4						
5						
7.1	Single-axis controller left (dir. 1-2, 3-4)				L	
7.2	Single-axis controller right (dir. 5-6, 7-8)				R	
20	Control-handle with knob solid					
21	Control-handle with latch for mechanical zero interlock					
21.1	by lifting			50	M	
21.3	by pushing down			50	MN	
21.4	Mechanical zero interlock with command devices see catalog 1/282					
22	Control-handle with dead man's button 1 NO			50	T	
23	Control-handle with signal button 1 NO			50	H	
24	Control-handle with push button 1 NO			60	D	
25	Control-handle with flat push button 1 NO			60	DV	
26	Control-handle with palm grip B 1			40	B 5	
27	Control-handle with palm grip B 1 with push button top 1 NO			60	B 5T	
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
29	More knobs, grips and T-grips with and without signal devices see catalog 1/280...					
30	Masterswitch (contact) switching sequenc -0-		No. of contacts 1	150	1	
31			2	170	2	
32			3	190	3	
33	Switching program according contact-arrangement MS... see catalog 5/001	A…	4	210	4	
34	or to your contact-arrangement					
35						
36	Switching sequence 2-0-2					
38	Spring return in 0-position (for each direction)			20	Z	
39	Friction brake adjustable (for each direction)			20	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025	…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°				(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	C…, P…				
50	Steel sheet housing B 200 masterswitch Gr. 4			1300	B	
51						
52	More housing see catalog 1/350					
60	Indicating labels not engraved with 2 arrows					
61	Engraving, each 10 characters					
70	Command and indicating devices see catalog 1/360					

T = dead man's button
H = signal button
M = latch for mechanical zero interlock

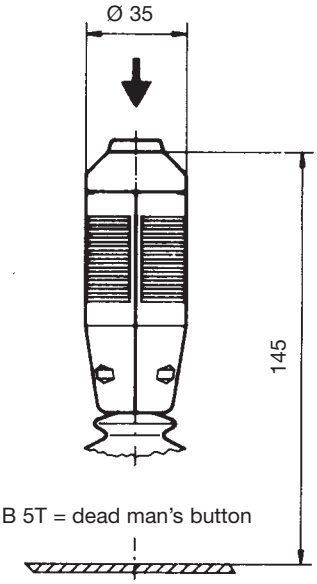


Knob solid

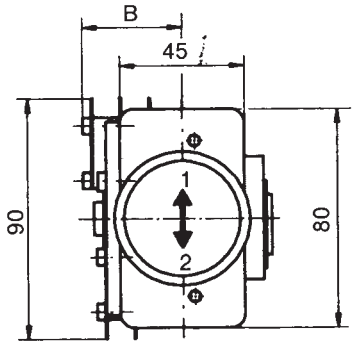
D = push button

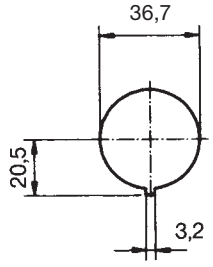


Palm grip B 5



B 5T = dead man's button





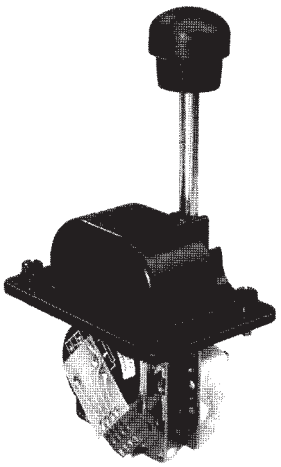
Hole pattern

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

SS22 L S8 H - 2 Z P -X- A050 P025

- SS22 — single-axis controller
- L — installation side L o. R
- S8 — special control handle
- H — handle
- 2 — contact dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P025 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff

Single-axis controller S 23



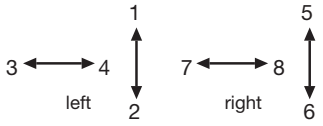
Type S23L-2ZP-…

The single-axis controller S 23 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications and offshore.
The modular design enables the switching device to be used universally.
The S 23 is resistant to oil, maritime climate, ozone and UV radiation.

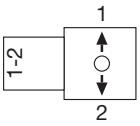
Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

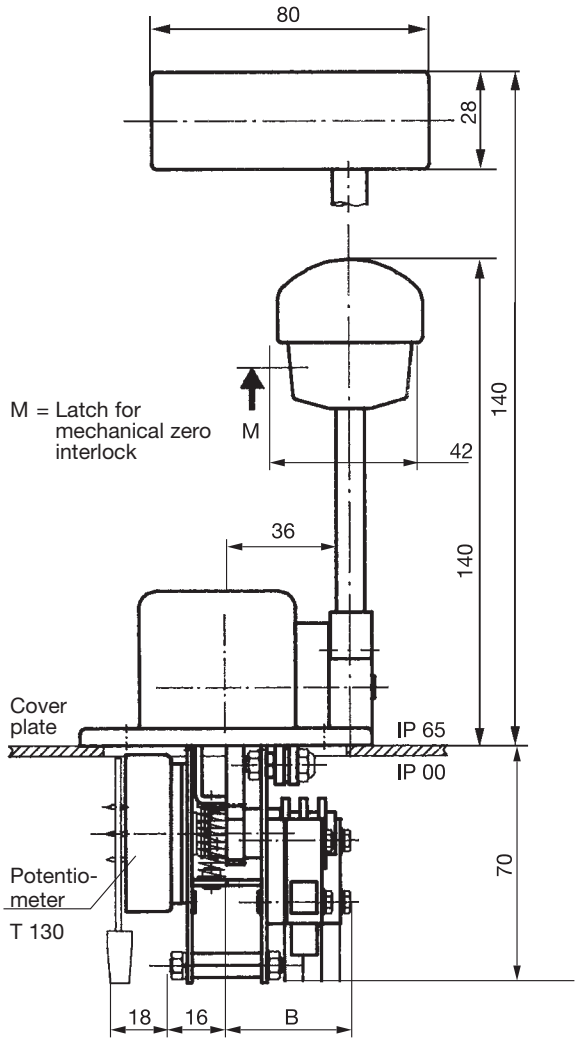
Mechanical life	6 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

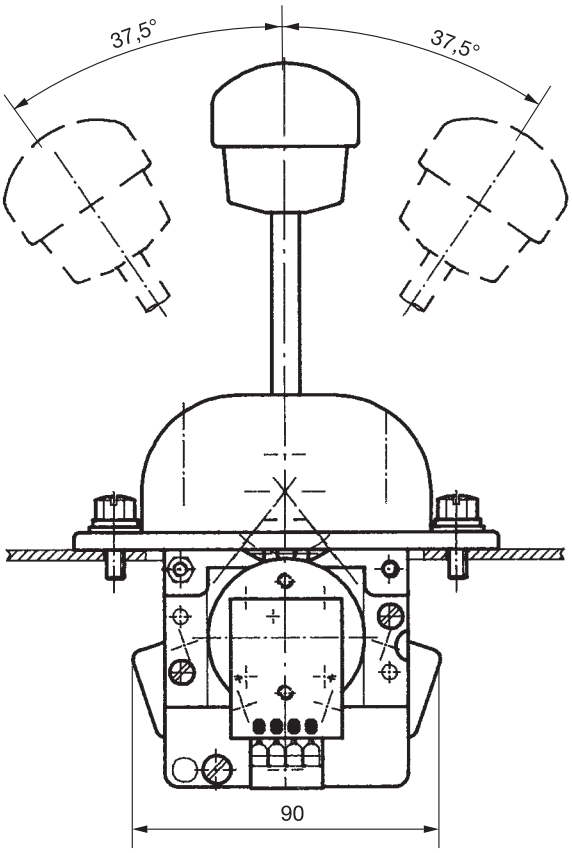
Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

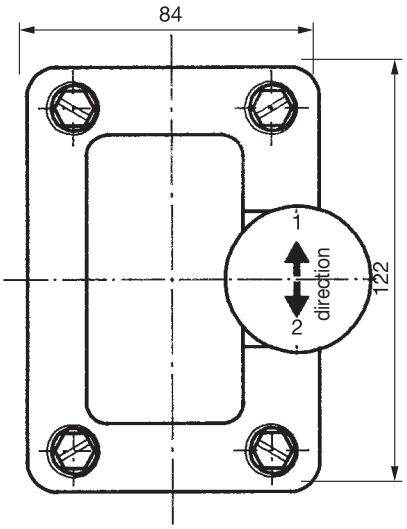


Deflection directions designated to DIN 15025

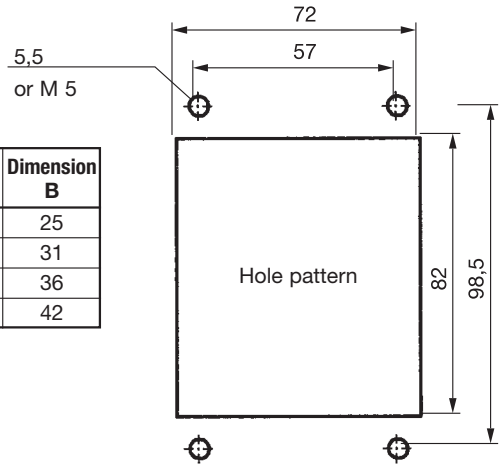
Pos.	S 23	Type expansion		Weight gramm	Type	Price EURO
1				700	S 23	
2						
3						
4						
5						
7.1	Single-axis controller left (dir. 1-2, 3-4)				L	
7.2	Single-axis controller right (dir. 5-6, 7-8)				R	
10						
20	Control-handle with knob solid					
21	Control-handle with latch for mechanical zero interlock					
21.1	by lifting			50	M	
22						
23						
24						
25						
26	Control-handle with T-grip			40	Q	
27						
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
29						
30	Masterswitch (contact) switching sequenc -0-		No. of contacts 1	150	1	
31			2	170	2	
32			3	190	3	
33	Switching program according contact-arrangement MS... see catalog 5/001	A…	4	210	4	
34	or to your contact-arrangement					
35						
36	Switching sequence 2-0-2					
38	Spring return in 0-position (for each direction)			20	Z	
39	Friction brake adjustable (for each direction)			20	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025	…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°				(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	P…				
50	Steel sheet housing B 200 masterswitch Gr. 4			1300	B	
51						
52	More housing see catalog 1/350					
60	Indicating labels not engraved with 2 arrows					
61	Engraving, each 10 characters					
62						
70	Command and indicating devices see catalog 1/360					







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



S23 L S8 11 - 2 Z P -X- A050 P021

- S23 — single-axis controller
- L — installation side L o. R
- S8 — special control handle
- 11 — handle
- 2 — contact set dir. 1-2 (5-6)
- Z — spring return dir. 1-2 (5-6)
- P — Potentiometer dir. 1-2 (5-6)
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- P021 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff

Single-axis controller S 3

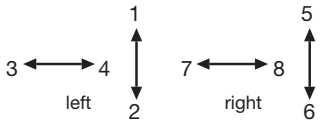
Type S3LQ-2ZP-B…

The single-axis controller S 3 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for nautical navigation applications. The modular design enables the switching device to be used universally. The S 3 is resistant to oil, maritime climate, ozone and UV radiation.

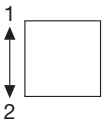
Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

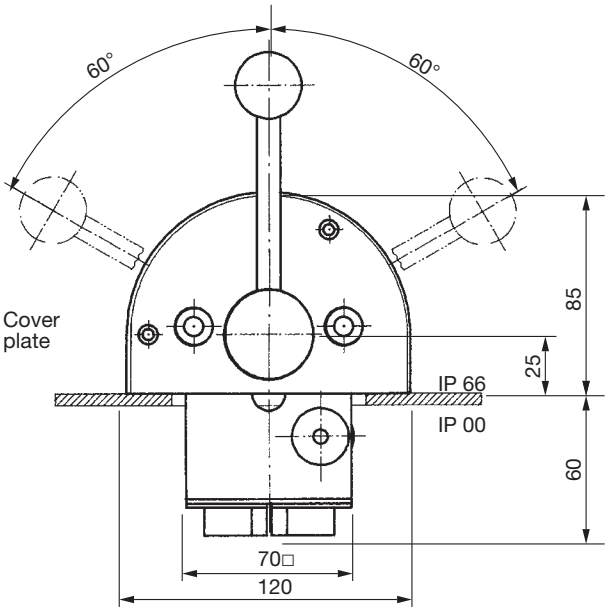
Mechanical life	12 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 66 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).



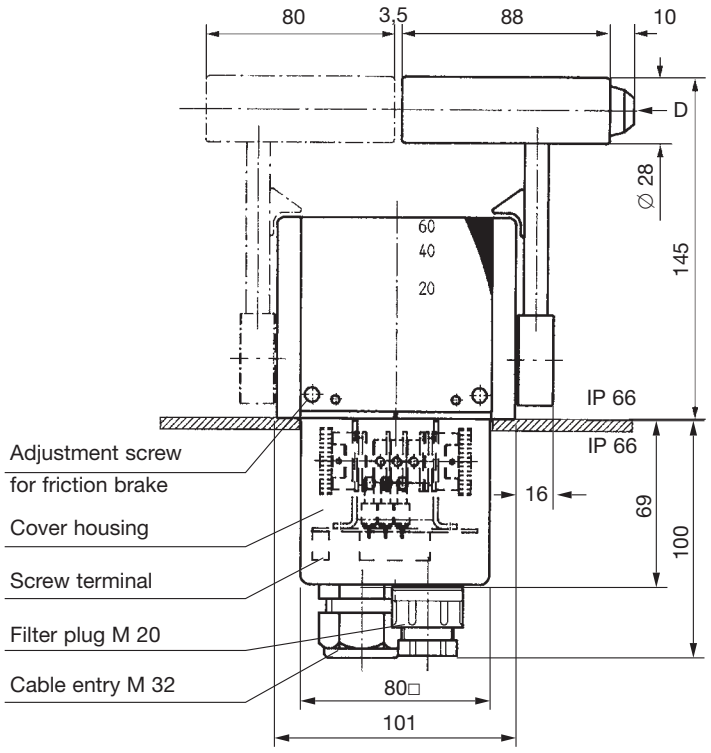
Deflection directions designated to DIN 15025

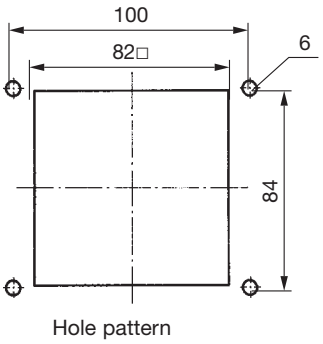
Pos.	S 3	Type expansion		Weight gramm	Type	Price EURO
1				2700	S 3	
2						
3						
4						
5						
7.1	Single-axis controller left (dir. 1-2, 3-4)				L	
7.2	Single-axis controller right (dir. 5-6, 7-8)				R	
10						
20	Control-handle with knob solid					
21						
22						
23						
24	Control-handle with push button 1 NO			110	D	
25						
26	Control-handle with T-grip			40	Q	
27	Control-handle with T-grip and push button side 1 NO			60	QD	
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
30	Masterswitch (contact) switching sequenc -0-		No. of contacts 1	20	1	
31			2	40	2	
32	Direction 1-2 or 3-4		3	60	3	
33	Switching program according contact-arrangement MS... see catalog 5/001	A…				
34	or to your contact-arrangement					
35						
36	Switching sequence special					
38	Spring return in 0-position (for each direction)			30	Z	
39	Friction brake adjustable (for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Conductive-plastic potentiometer T 246, with centre tap linear Life 10^7 switching cycles resistance 2 x 5 kOhm, 0,5 Watt wiper current max. 1 mA	…P214		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 75°				(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	P…				
50	Cover housing			300	B	
51	Filter plug M 20 for air-condition			20		
52	Cable entry M 32 with anti-kink protection			30		
60	Indicating label eloxal aluminium plate silvery (included in the spindle block)					
61	Engraving, each 10 characters					



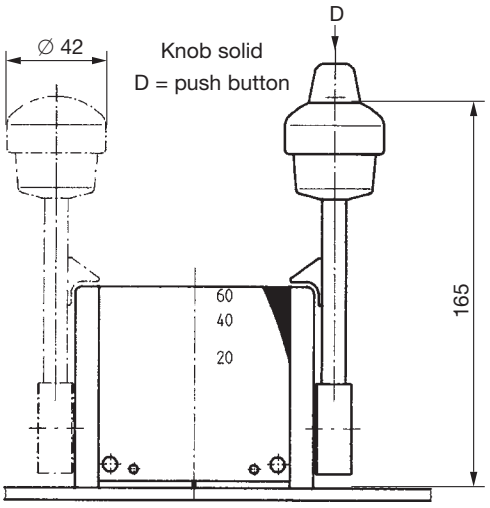
T-grip
D = push button

Direction 1-2



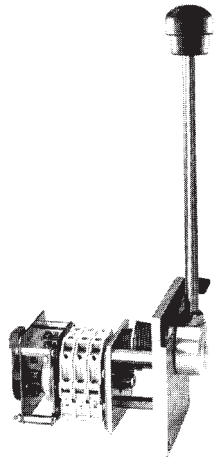


Hole pattern



S3	L	S8	QD	-	2	Z	P	-B-	-X-	A05	P214
single-axis controller											
	installation side L o. R										
		special control handle									
			handle								
					contact set dir. 1-2 (5-6)						
						spring return dir. 1-2 (5-6)					
							Potentiometer dir. 1-2 (5-6)				
								housing			
									special please describe		
										Arrangement dir. 1-2 (5-6) see p. 5/001	
											Potentiometer description dir. 1-2 (5-6) see p. 1/240ff

Single-axis controller S 6



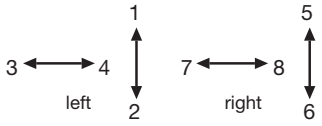
Type S6L-03ZP-…

The single-axis controller S 6 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting applications.
The modular design enables the switching device to be used universally.
The S 6 is resistant to oil, maritime climate, ozone and UV radiation.

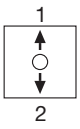
Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

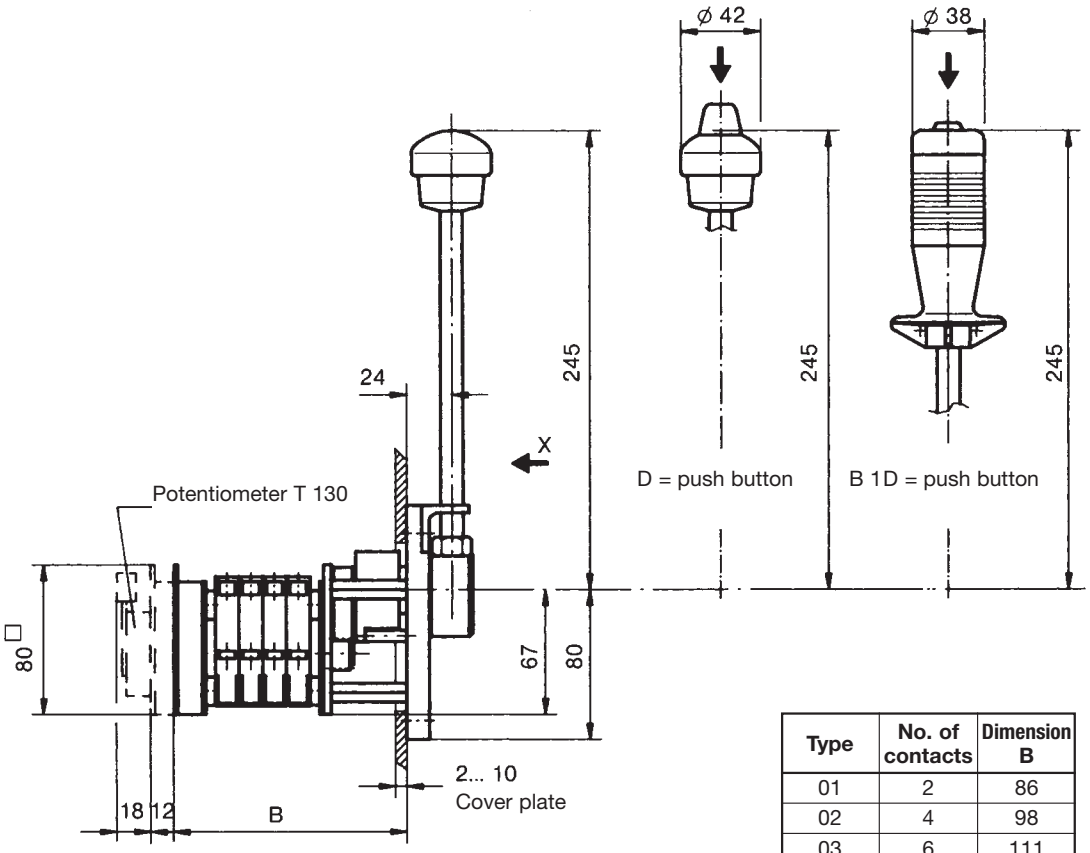
Mechanical life	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050
Technical data see catalog 5/100	
Description data see catalog 5/002	

Spindle block with schematic representation of the master controller installation and deflection directions.
Version shown for left-hand side installation (right-hand side installation is mirror image).

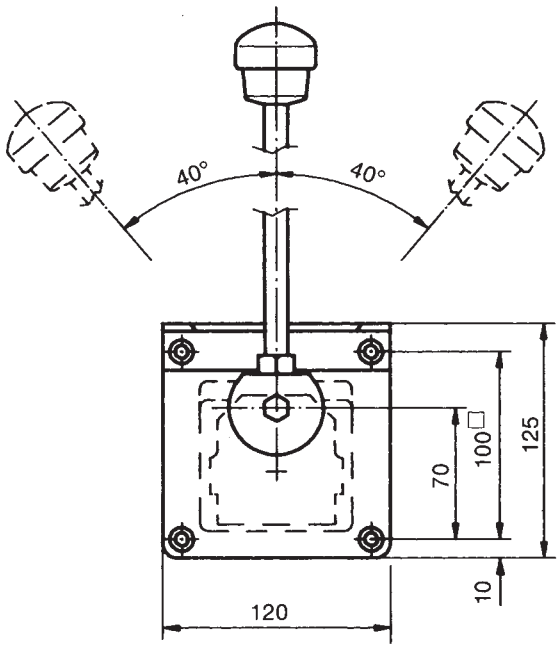


Deflection directions designated to DIN 15025

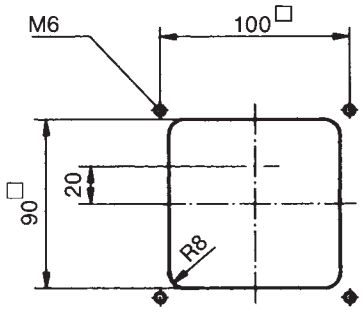
Pos.	S 6	Type expansion		Weight gramm	Type	Price EURO
1				960	S 6	
2						
3						
4						
5						
7.1	Single-axis controller left (dir. 1-2, 3-4)				L	
7.2	Single-axis controller right (dir. 5-6, 7-8)				R	
10						
20						
21						
22						
23						
24	Control-handle with push button 1 NO with flexible cable			110	D	
25						
26	Control-handle with palm grip B 1			40	B 1	
27	Control-handle with palm grip B 1 with push button top 1 NO			60	B 1D	
28	Control-handle long or short					
28.1	-20 mm				S5	
28.2	+20 mm				S8	
30	Masterswitch (contact set) switching sequenc 4-0-4		No. of contacts 2	290	01	
31			4	350	02	
32	Direction 1-2 or 3-4		6	410	03	
33	Switching program according contact-arrangement MS... see catalog 5/001	A…	8	470	04	
34	or to your contact-arrangement		10	530	05	
35			12	590	06	
36	Switching sequence 5-0-5 or 6-0-6					
38	Spring return in 0-position (for each direction)			110	Z	
39	Friction brake adjustable (for each direction)			30	R	
40	Potentiometer e.t.c. each masterswitch with mounted Wire-wound potentiometer T 130, with centre tap, 1,5 Watt wiper current max. 10 mA resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024, 2 x 10k ≙ P025	…P02 □		70	P	
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°					
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	C…, P…			(P)	
50						
51						
52	More housing see catalog 1/350					
60	Indicating labels not engraved with 2 arrows					
61	Engraving, each 10 characters					
70	Command and indicating devices see catalog 1/360					



Type	No. of contacts	Dimension B
01	2	86
02	4	98
03	6	111
04	8	123
05	10	136
06	12	148



View X

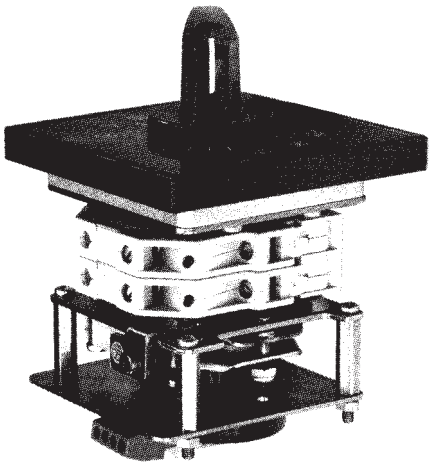


Hole pattern

S6 R S8 D - 02 R C -X- A050 C01

- S6 — single-axis controller
- R — installation side L o. R
- S8 — special control handle
- D — Handle
- 02 — contact set dir. 1-2 (5-6)
- R — friction brake dir. 1-2 (5-6)
- C — Potentiometer dir. 1-2 (5-6)
- -X- — special please describe
- A050 — Arrangement dir. 1-2 (5-6) see p. 5/001
- C01 — Potentiometer description dir. 1-2 (5-6) see p. 1/240ff

Control-switch N 6



Form N6-KN-02RP…

The control-switch N 6 is a rugged switching device according IEC 947-5-1 EN 60947 DIN VDE 0660-200 for hoisting and electro-hydraulic applications.
The modular design enables the switching device to be used universally.
The N 6 is resistant to oil, maritime climate, ozone and UV radiation.

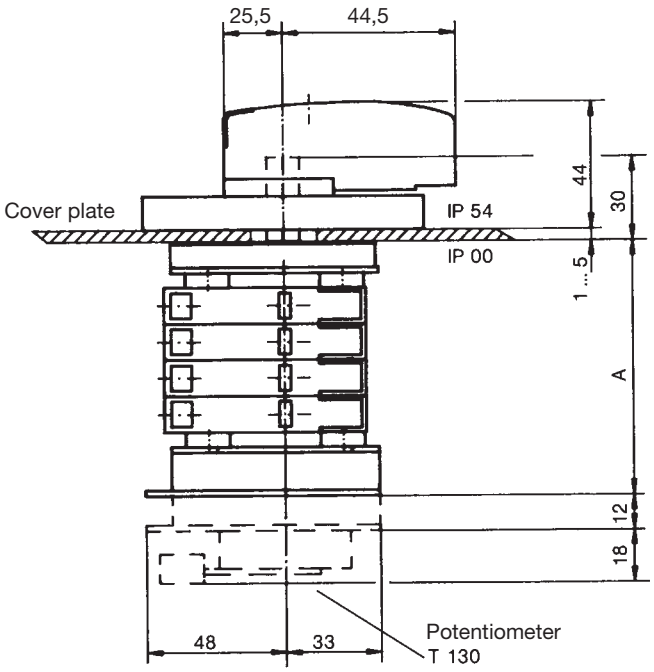
Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

Mechanical life	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

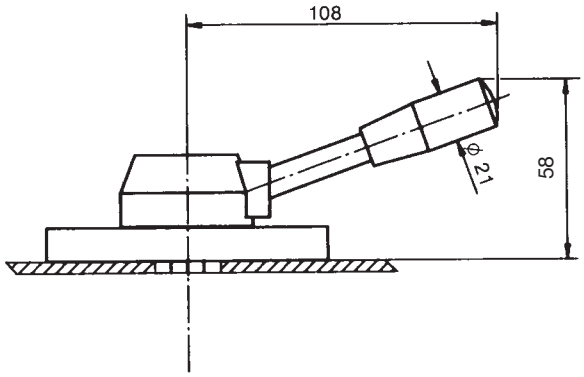
Technical data see catalog 5/100
Description data see catalog 5/002

Pos.		Type expansion		Weight gramm	Type	Price EURO
1	Drive with free shaft end with front plate 88x88 mm				N6	
2	Knob			30	KN	
3	Ball-handle			50	HG	
4	Rotary mechanism			30	DG	
5						
6	Degree of protection, front IP 65 by seal ring					
30	Control-switch insert (contact set)		No. of contacts 2	290	01	
31	with free shaft end		4	350	02	
32	Switching sequence 4-0-4		6	410	03	
33	Switching program according contact-arrangement MS see catalog 5/001	A…	8	470	04	
34	or to your contact-arrangement		10	530	05	
35			12	590	06	
36	Switching sequence 5-0-5 or 6-0-6 or 0-18					
37	Micro changeover contact (MZT1) positive opening (additional price)		2			
38	Spring return in 0-position max. 100 Grad (2 x 70°)			110	Z	
39	Friction brake adjustable max. 260 Grad (2 x 130°)			30	R	
	Potentiometer e.t.c. with mounted					
	Wire-wound potentiometer T 130 with centre tap linear					
40	1,5 Watt wiper current max. 10 mA	…P02 □		70	P	
	resistance 2 x 0,5k ≙ P021, 2 x 1k ≙ P022, 2 x 2k ≙ P023, 2 x 5k ≙ P024,					
	2 x 10k ≙ P025					
41	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 2 x 150°				(P)	
42	Prepared for mounting potentiometer e.t.c. adjusting-angle variable.				(P)	
43	more Potentiometer e.t.c. see catalog 1/240...	C…, P…				
52	Housing see catalog 1/350					
60	Indicating labels not engraved					
61	Engraving, each 10 characters					
70	Command and indicating devices see catalog 1/360					

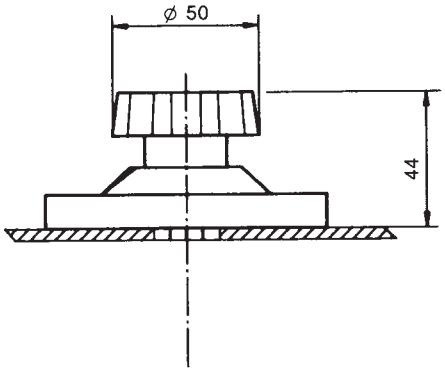
Knob

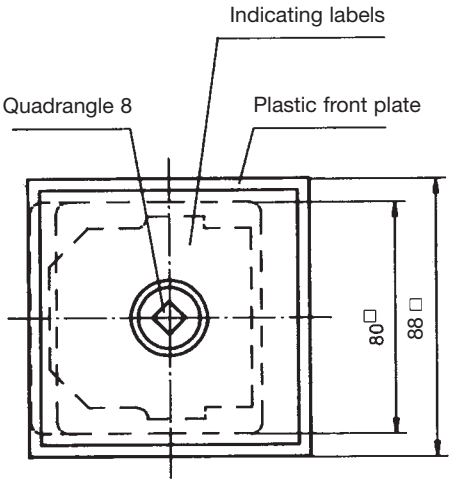


Ball-handle

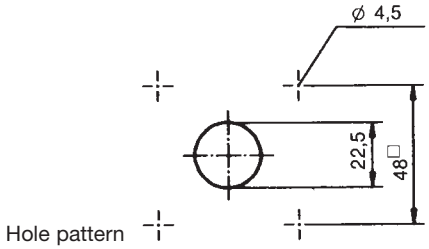


Rotary mechanism





Type	No. of contacts	Dimension A	Spring return
01	2	51	+25
02	4	63	
03	6	76	
04	8	88	
05	10	101	
06	12	113	



N6 - KN - 02 Z P -X- A05 P024

- control switch
- handle
- contact set dir. 1-2 (5-6)
- spring return dir. 1-2 (5-6)
- Potentiometer dir. 1-2 (5-6)
- Potentiometer description dir. 1-2 (5-6) see p. 1/240ff
- Arrangement dir. 1-2 (5-6) see p. 5/001
- special please describe

Potentiometer e.t.c.
with attach to our switching device

□ = resistance value linear and part number ≙
1 = 0.5 kOhm, with centre tap 2 x 0.5 kOhm
2 = 1.0 kOhm, with centre tap 2 x 1.0 kOhm
3 = 2.0 kOhm, with centre tap 2 x 2.0 kOhm
4 = 5.0 kOhm, with centre tap 2 x 5.0 kOhm
5 = 10.0 kOhm, with centre tap 2 x 10.0 kOhm

Pos.	for mounting on: V 6 / D 64 / V 5 / V 3 / S 2 / S 6 / N 6 / P 7 / P 8	Type	Weight gramm	Part No. 5240...	Type	Price EURO
1	Wire-wound potentiometer linear life 10^7 switching cycles 1,5 Watt max. wiper current 10 mA	T 129	60	...00100 □	P01 □	
2	Wire-wound potentiometer linear with centre tap life 10^7 switching cycles 1,5 Watt max. wiper current 10 mA	T 130	60	...00200 □	P02 □	
3	Wire-wound potentiometer linear life 10^7 switching cycles 2,5 Watt max. wiper current 10 mA	T 131	70	...00300 k	P03 □	
4	like T 131 but with oil-filling protection for corrossion	T 131-Oel	80	...00400 □	P04 □	
5	Wire-wound potentiometer linear with centre tap life 10^7 switching cycles 2,5 Watt max. wiper current 10 mA	T 132	70	...00500 □	P05 □	
6	like T 132 but with oil-filling protection for corrossion	T 132-Oel	80	...00600 □	P06 □	
7	Wire-wound potentiometer characteristic progressive with centre tap life 10^7 switching cycles 1,5 Watt max. wiper current 10 mA	T 178	70	...00700 □	P07 □	
8	Wire-wound potentiometer linear with centre tap life 5 x 10^6 switching cycles 1Watt max. wiper current 10 mA	T 238	20	...00800 □	P08 □	
9	Wire-wound potentiometer linear life 5 x 10^6 switching cycles 1 Watt max. wiper current 10 mA	T 237	20	...00900 □	P09 □	
10	Wire-wound potentiometer linear with centre tap life 10^6 switching cycles 60 Watt	T 133	150	...01000 □	P10 □	
11	Wire-wound potentiometer linear life 10^6 switching cycles 60 Watt	T 134	150	...01100 □	P11 □	
12	Conductive-plastic potentiometer linear life 10^7 switching cycles 0,5 Watt max. wiper current 1 mA	T 374	20	...01200 □	P12 □	
13	Conductive-plastic potentiometer linear with centre tap life 10^7 switching cycles 0,5 Watt max. wiper current 1 mA	T 396	20	...01300 □	P13 □	
14						
15						
16						
	for mounting on: V 8 / D 8 / P 10 / P 12					
17	Wire-wound potentiometer linear with centre tap life 5 x 10^6 switching cycles 1 Watt max. wiper current 10 mA	T 239	20	...01700 □	P17 □	
18	Conductive-plastic potentiometer linear with centre tap life 10^7 switching cycles 0,5 Watt max. wiper current 1 mA	T 301	20	...01800 □	P18 □	
19	Conductive-plastic potentiometer linear with centre tap life 10^7 switching cycles; 3 conductive-plastic contact way arrangement MSP 21-0 (catalog 5/001) 0,5 Watt max.wiper current 1 mA	T 426	25	...01900 □	P19 □	
20	Conductive-plastic potentiometer double linear with centre tap life 10^7 switching cycles; 0,5 Watt max. wiper current 1 mA	T 432	25	...02000 □	P20 □	
21	Conductive-plastic potentiometer with centre tap life 10^7 switching cycles	T 246	20	...02100 □	P21 □	
22	Conductive-plastic potentiometer with centre tap life 10^7 switching cycles	T 362	20	...02200 □	P22 □	
23						
	for mounting on: V 10					
24	Wire-wound potentiometer linear with centre tap life 5 x 10^6 switching cycles 1 Watt max. wiper current 10 mA	T 321	20	...02400 □	P24 □	
25	Conductive-plastic potentiometer linear with centre tap life 10^7 switching cycles 0,5 Watt max. wiper current 1 mA	T 320	20	...02500 □	P25 □	
26	Conductive-plastic potentiometer linear life 10^7 switching cycles 0,5 Watt max. wiper current 1 mA	T 337	20	...02600 □	P26 □	
27	Conductive-plastic potentiometer linear with centre tap life 10^7 switching cycles; 2 conductive-plastic contact way arrangement MSP 21 (catalog 5/001) 0,5 Watt max. wiper current 1 mA	T 430	25	...02700 □	P27 □	
28						
29						
30						
	for mounting on: V 11					
31	Wire-wound potentiometer linear with centre tap life 5 x 10^6 switching cycles 1 Watt max. wiper current 10 mA	T 316	20	...03100 □	P31 □	
32	Conductive-plastic potentiometer linear with centre tap life 10^7 switching cycles 0,5 Watt max. wiper current 1 mA	T 365	20	...03200 □	P32 □	
40	Special potentiometer				P99 □	
41	Prepared for mounting potentiometer adjusting-angle switching device ≙ potentiometer			...04100		
42	Prepared for mounting potentiometer adjusting-angle variable			...04200		

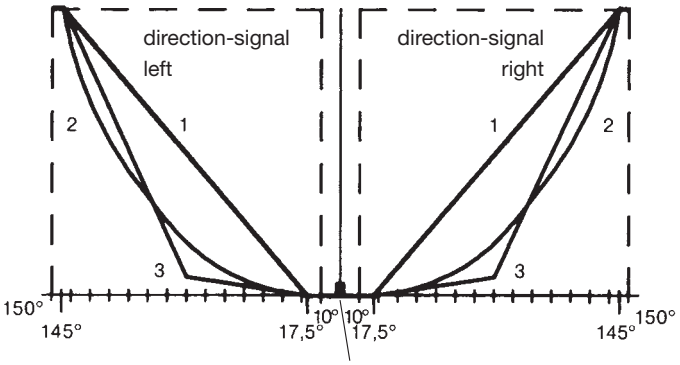
Opto-electronic encoder
Output digital OEC 2
with attach to our switching device

Pos.	for mounting on: V 6 / D 64 / V 11 / S 2 / S 6 / N 6			Type-expansion	Weight gramm	Type	Price EURO
10	Opto-electronic encoder	8 Bit Gray-Code T 359		OEC 2-1-1	410	C01	
11		8 Bit Binary-Code T 359		OEC 2-2-1	410	C02	
12		6 Bit Gray-Code T 359		OEC 2-3-□	410	C03□	
13		6 Bit Binary-Code T 359		OEC 2-4-□	410	C04□	
14		9 Bit Gray-Code T 384		OEC 2-5-□	410	C05□	
15		9 Bit Binary-Code T 384		OEC 2-6-□	410	C06□	
16 17 18 19							

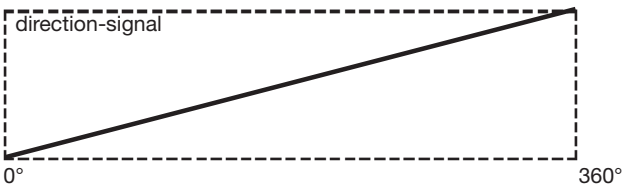
□ = Output characteristic
1 = Linear
2 = Quadratic
3 = Progressive
4 = Linear one sided right turn
5 = Linear one sided left turn

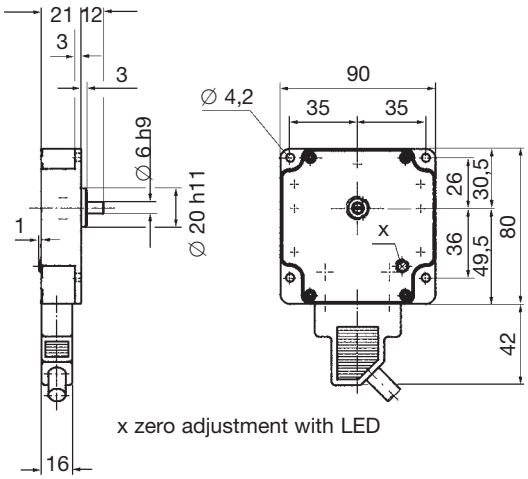
Technical data
Power supply 18-30 V DC
Output PNP 24 V DC 10 mA
Scanning Gray-Code
Rotation angle max. ± 150° (360°)

6 Bit / 8 Bit



9 Bit

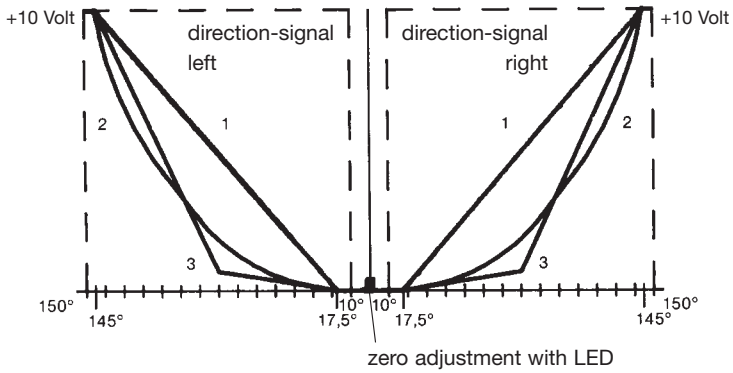
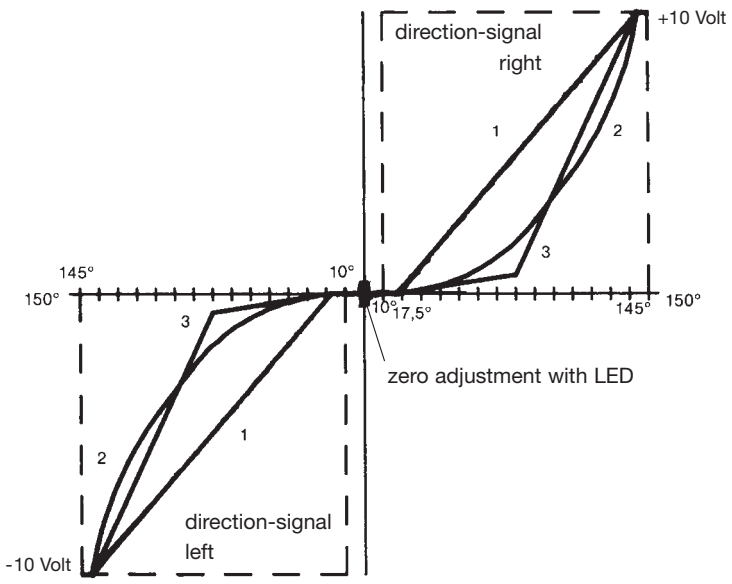




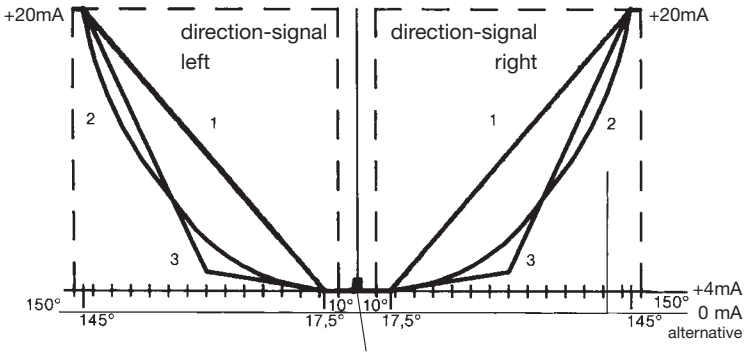
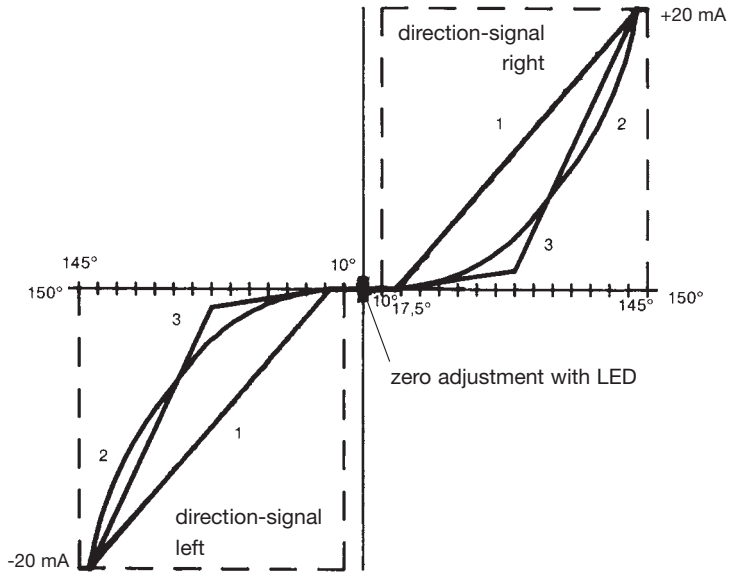
x zero adjustment with LED

40	Cable Llycy 14 x 0,25 mm² 2000 mm long wired on connector DA 15 with end splice						
41	Prepared for mounting encoder adjusting-angle switching-gear ≙ encoder					(C)	
42	Prepared for mounting encoder adjusting-angle variable.					(C)	
43	Additional price per metre cable Llycy 14 x 0,25 mm²						

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

Pos.	for mounting on: V 6 / D 64 / V 11 / S 2 / S 6 / N 6		Type-expansion	Weight gramm	Type	Price EURO
1	Opto-electronic encoder T 366 Output voltage impressed 0 – 10 Volt		OEC 2-3-□-1		C11□	
2						
3						
4						
	□ = Output characteristic 1 = Linear 2 = Quadratic 3 = Progressive **Technical data** Power supply 18-30 V DC Output 0–10 V (+5 mA) Scanning 6 bit Gray-Code Rotation angle max. ± 150°  					
5	Opto-electronic encoder T 367 Output voltage impressed ± 10 Volt		OEC 2-3-□-2		C15□	
6						
7						
8						
	□ = Output characteristic 1 = Linear 2 = Quadratic 3 = Progressive **Technical data** Power supply 18-30 V DC Output ±10 V (±5 mA) Scanning 6 bit Gray-Code Rotation angle max. ± 150°  					
40	Cable Llycy 14 x 0,25 mm² 2000 mm long wired on connector DA 15 with end splice					
41	Prepared for mounting encoder adjusting-angle switching-gear ≙ encoder				(C)	
42	Prepared for mounting encoder adjusting-angle variable				(C)	
43	Additional price per metre cable Llycy 14 x 0,25 mm²					

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

Pos.	for mounting on: V 6 / D 64 / V 11 / S 2 / S 6 / N 6		Type-expansion	Weight gramm	Type	Price EURO
1	Opto-electronic encoder Output power impressed 4 – 20 mA T 368		OEC 2-3-□-5	410	C19□	
2	Opto-electronic encoder Output power impressed 0 – 20 mA T 368		OEC 2-3-□-8	410	C20□	
3						
4						
	□ = Output characteristic 1 = Linear 2 = Quadratic 3 = Progressive **Technical data** Power supply 18-30 V DC Output 4/0–20 mA Scanning 6 bit Gray-Code Rotation angle max. ± 150°  				
5	Opto-electronic encoder T 369 Output power impressed ± 20 mA		OEC 2-3-□-6	410	C23□	
6						
7						
8						
	□ = Output characteristic 1 = Linear 2 = Quadratic 3 = Progressive **Technical data** Power supply 18-30 V DC Output ±20 mA Scanning 6 bit Gray-Code Rotation angle max. ± 150°  				
40	Cable Llycy 14 x 0,25 mm² 2000 mm long wired on connector DA 15 with end splice					
41	Prepared for mounting encoder adjusting-angle switching-gear ≙ encoder				(C)	
42	Prepared for mounting encoder adjusting-angle variable.				(C)	
43	Additional price per metre cable Llycy 14 x 0,25 mm²					

Opto-electronic encoder
Output digital OEC 4 with Profi-Bus System DP
with attach to our switching device

Pos.	for mounting on: V 6 / D 64 / V 11 / S 2 / S 6 / N 6			Type-expansion	Weight gramm	Type	Price EURO
1	Opto-electronic encoder	8 Bit Gray-Code T 496		OEC 4-1-1-2	820	C27	
2		8 Bit Binary-Code T 496		OEC 4-2-1-2	820	C28	
3		6 Bit Gray-Code T 496		OEC 4-3-□-2	820	C29□	
4		6 Bit Binary-Code T 496		OEC 4-4-□-2	820	C30□	
5		9 Bit Gray-Code T 497		OEC 4-5-□-2	820	C31□	
6		9 Bit Binary-Code T 497		OEC 4-6-□-2	820	C32□	

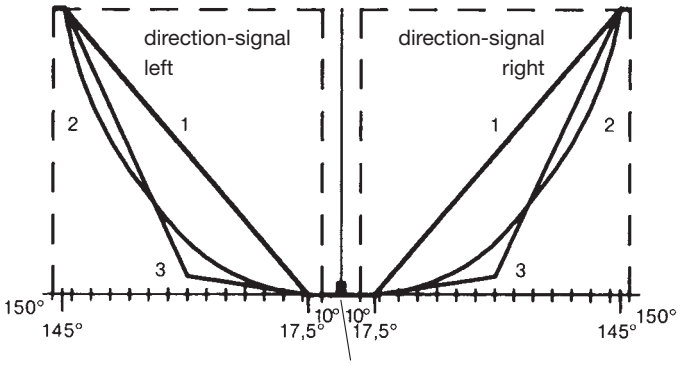
Technical data

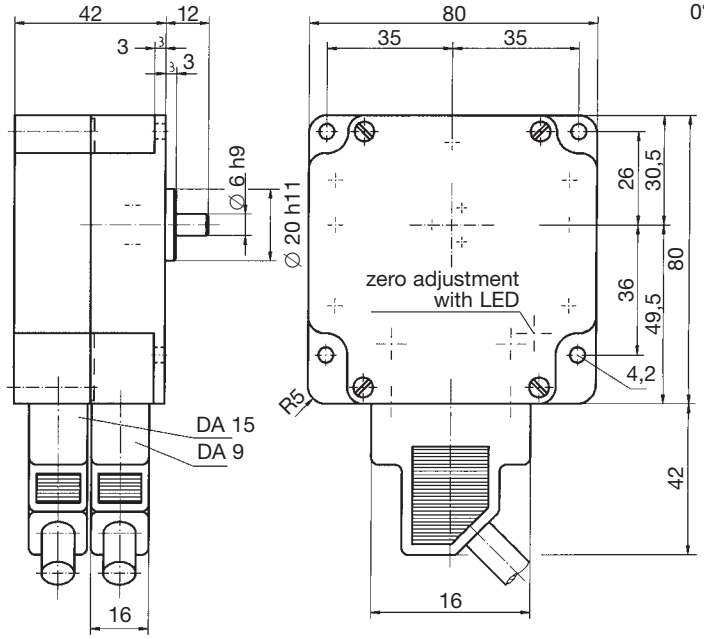
Power supply 18-30 V DC, Output 6, 8 or 9 Bit, Scanning Gray-Code
Communication Profibus DP (DIN 19245 Part 3)
Ident.-No. 045 CH address 0-99 adjustable above selector-switch
Rotation angle max. ± 150° (360°), with connection for OEC 2
see catalog 1/241

□ = Output characteristic
1 = Linear
2 = Quadratic
3 = Progressive
4 = Linear one sided right turn
5 = Linear one sided left turn

for 1 axis-controller 1 PC.OEC4… is required

for 2 axis-controller 1 PC.OEC4… and 1PC.OEC2… see catalog 1/241 are required

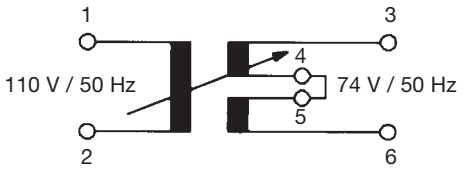




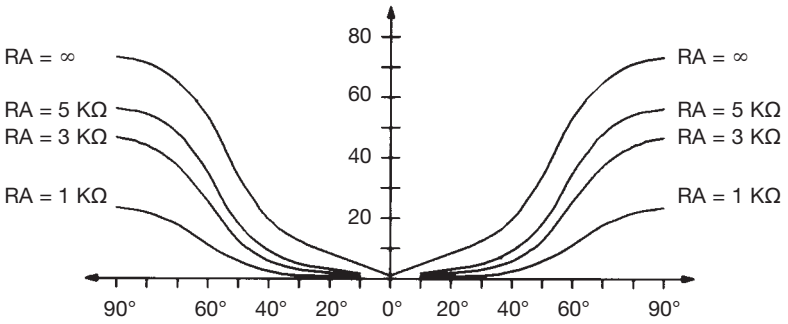
38	Profibus-cable FDPL2/F/P 1x 2 x 0,64mm² 2000mm long wired on 2 connectors DE9						
39	Cable (power supply) for 1 axis-controller Llycy 2 x 0,25mm² 2000mm long wired on connector DA15 with end splice						
40	Cable for 2 axis-controller Llycy 16 x 0,25mm² x 450mm lang wired on 2 connectors DA15 for OEC4/OEC2 with cable (power supply) 2 x 0,25mm² 2000mm long wired with end splice						
41	Prepared for mounting encoder adjusting-angle switching-gear ≙ encoder						
42	Prepared for mounting encoder adjusting-angle variable					(C)	
43	Additional price per metre cable Llycy 14 x 0,25 mm²					(C)	
44	Additional price per metre Profibus-cable FDPL2/F/P 1 x 2 x 0,64mm²						

Inductive transducer with attach to our switching device

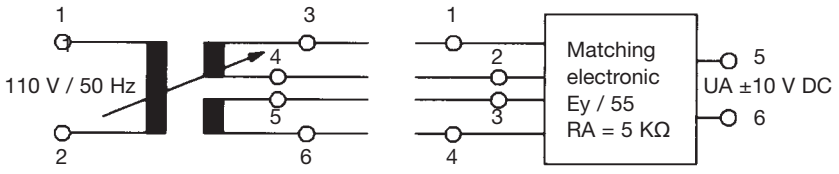
Pos.	for mounting on: V 6 / V 11 / D 64 / S 2 / S 6 / N 6		Type-expansion	Weight gramm	Type	Price EURO
2	Inductive transducer IG 1 T 440			850	I	

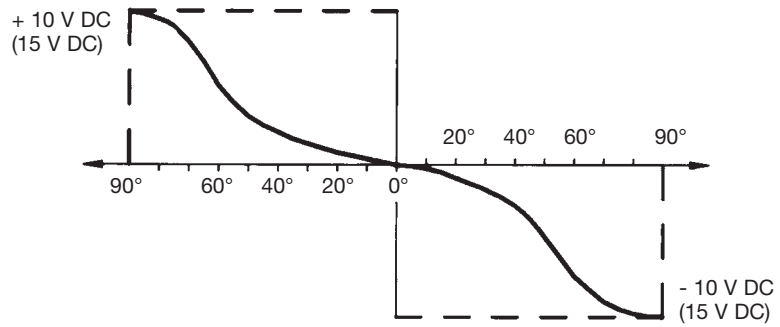


Technical data
Mechanical life $2x10^7$ switching cycles
Input voltage AC 110 V, 50 Hz
Output voltage AC 74 V, 50 Hz
Transfer power max. 3 VA
Rotation angle, max. ± 90°



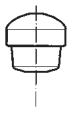
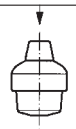
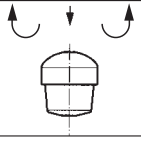
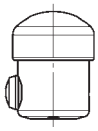
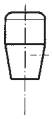
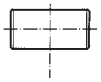
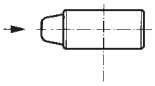
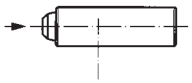
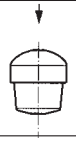
3	Inductive transducer IG 1 with matching electronic Ey / 55 ± 10 V DC T 434				I	





20	Transformer with capacitor 4 mF for connection 220 V 50 Hz		MTD			
41	Prepared for mounting transducer adjusting-angle switching-gear ≙ transducer				(I)	
42	Prepared for mounting transducer adjusting-angle variable.				(I)	

Operator handles with attach to our switching device

Pos.				Contact-complement	Weight gramm	Type	Price EURO
1		Knob solid 42 mm Ø	KBAD 66		35	GK1	
2		Knob 42 mm Ø with push button top	KHS/177	1 change over contact 0,5 A 250 V AC 15 1,5 A 24 V DC 13	25	GK2	
3		Knob 42 mm Ø with 3 push down button operated by twisting the upper knob half	KBAD/230	3 change over contact 0,5 A 250 V AC 15 1,5 A 24 V DC 13	170	GK3	
4		Knob 25 mm Ø with M 6	KBAD 271		10	GK4	
5		Knob 27 mm Ø with M 8	KBAD 302		15	GK5	
6		Knob 42 mm Ø with 1 push button top1NO+1NC 1 push button side 1NO	KBAD/605	0,5 A 250 V AC 15 0,1 A 24 V DC 13	170	GK6	
7		Knob solid 29 mm Ø	KBAD/141		70	GS6	
8		Knob 29 mm Ø with push button top	KBAD/210	1 change over contact 0,5 A 250 V AC 15 1,5 A 24 V DC 13	60	GS7	
9		T-grip solid 28 mm Ø x 58 mm	KBAD 148		50	Q8	
10		T-grip 28 mm Ø x 58 mm with push button side	KBAD 147	1 change over contact 0,5 A 250 V AC 15 1,5 A 24 V DC 13	60	Q9	
11		T-grip solid 28 mm Ø x 80 mm	KBAD 355		50	Q10	
12		T-grip 28 mm Ø x 98 mm with push button side	KBAD 329	1 change over contact 0,5 A 250 V AC 15 1,5 A 24 V DC 13	60	Q11	
13		Knob 42 mm Ø with sensorbutton regulator electronic board EY/92 1NO	KBAD/4 76		150	GSE	
21		Cable 4 x 0,25 mm² x 450 mm long, wired included Pos. 1 – 12 Additional price per metre cable 4-pole					

Operator handles MATRIX with attach to our switching device

Type → operator handles

switch devices ↓

	GK 1	GK2	GK3	GK4	GK5	GK6	GS6	GS7	Q8	Q9	Q10	Q11	GSE	B1	B2	B3	B4	B5	B6	B7/8	B9	B10	B 20
V 6	X		X			X			X	X			X	X		X		X		X	X		X
VV 6	X		X			X			X	X			X	X		X		X		X	X		X
V 11	X		X			X			X	X			X	X			X	X	X				
V 5	X								X					X				X					
VV 5	X		X			X			X	X			X	X		X		X	X	X	X		
V 8/ VV 8	X	X	X			X			X	X			X	X	X	X		X		X	X		X
V 85/ VV 85	X	X	X						X	X			X	X	X	X		X		X	X		X
V 10	X				X	X	X	X					X				X	X	X				
V 14	X	X	X	X		X	X						X				X	X					
V 3	X								X					X				X					
D/ DD 64	X								X	X												X	
D 8	X								X	X												X	
D 3	X										X	X											
S 2/ SS 2	X		X				X	X	X	X			X	X				X	X				
S 21/ SS 21	X		X			X	X	X	X	X			X	X				X	X				
S 22/ SS 22	X		X				X	X	X	X			X	X				X	X				
S 23	X										X												
S 3	X										X	X											
S 14	X	X	X	X		X	X						X				X	X					
S 6	X	X	X						X	X				X				X					

X = DESIGN PRACTICABLE

Mechanical zero interlock with command devices with attach to our switching devices

MATRIX

Type → **Mechanical zero interlock with command devices**

T=dead man's button, H=signal button, D=push button, DV=flat push button, DR=push button operated by twisting

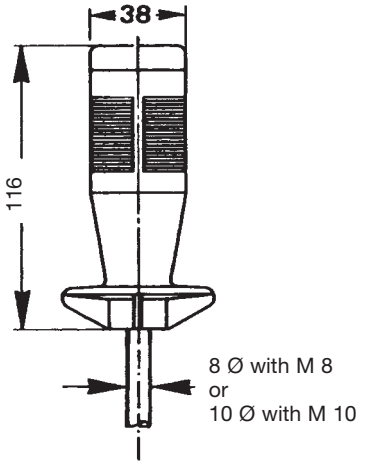
↓ **switch devices**

	MN T	M H	MP H	M D	MP D	M DV	MP DV	MP DR								
V 6	X	X	X		X		X	X								
V 61 V 62	X	X	X	X	X	X	X	X								
VV 6	X	X	X		X		X	X								
VV 61 VV 62	X	X	X	X	X	X	X	X								
V 11	X		X		X		X	X								
V 5 VV 5		X	X	X	X	X	X									
V 8 VV 8	X	X	X		X		X	X								
V 85 VV 85																
V 25																
V 10																
V 14	X	X	X	X	X	X	X	X								
D 64 DD 64	X	X	X	X	X	X	X	X								
D 8																
S 14	X	X	X	X	X	X	X	X								
S 2 SS 2		X		X		X										
S 21 SS 21		X		X		X										
S 22 SS 22		X		X		X										
S 23		X		X		X										

X =DESIGN PRACTIBLE

Notice

Palm grip B 1



Type B1

The palm grip B 1 is an actuating element for our multi-axis and single-axis controller. It can also be used as an actuating element with hydraulic drives. Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements. These devices have micro changeover contacts.

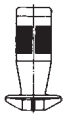
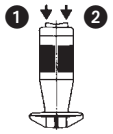
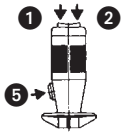
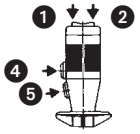
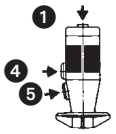
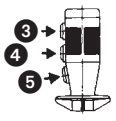
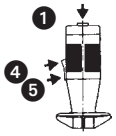
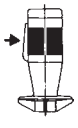
The palm grip has a highly flexible cable 4 (8) x 0,25 mm² x 450 mm long.

The mounting piece for the drive rod can be supplied with a tapped hole M 8 or M 10 (standard = M 10).

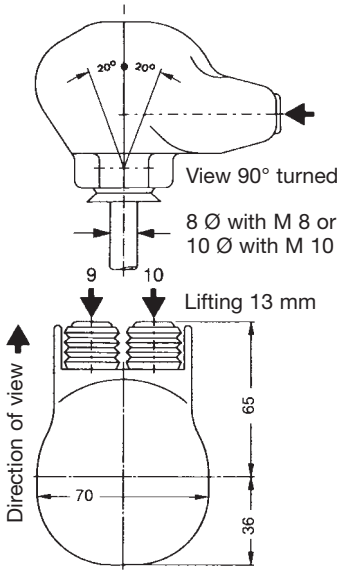
The palm grip B 1 is made of PA plastic and is black in colour.

Contact complement	**2 A**	**250 V**	**AC 15 /**	**3 A**	**24 V**	**DC 13**
or	**0,5 A**	**250 V**	**AC 15 / 1,5 A**		**24 V**	**DC 13**

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

Pos.				Contact-complement	Weight gramm	Type	Price EURO
1		Without built in	KBAD / 22		100	B 1	
2 3 4		Rocker switch top tast-0-tast T-0-T installed Pos. 1+2 Rocker switch top tast-0-rest T-0-R installed Pos. 1+2 Rocker switch top rest-0-rest R-0-R installed Pos. 1+2	KBAD / 46	2 change over contact 2 A 250 V AC 15	120	B 1 W	
5		Rocker switch top tast-0-tast T-0-T installed Pos. 1+2 with push button side installed Pos. 5	KBAD / 49	2 change over contact 2 A 250 V AC 15 1 change over contact 0,5 A 250 V AC 15	130	B 1 WD	
6		Rocker switch top tast-0-tast T-0-T installed Pos. 1+2 with 2 push button side installed Pos. 4+5	KBAD / 67	2 change over contact 2 A 250 V AC 15 2 change over contact 0,5 A 250 V AC 15	140	B 1 W2D	
7 8		Push button top with mechanical operation installed Pos. 1 Push button top	KBAD / 27 KBAD / 25	1 change over contact 0,5 A 250 V AC 15	120 100	B 1 T B 1 D	
9 10		Push button top with installed Pos. 1 1 push button side Push button top with 2 push button side installed Pos. 4+5	KBAD / 47	2 change over contact 0,5 A 250 V AC 15 3 change over contact 0,5 A 250 V AC 15	120 130	B 1 2D B 1 3D	
11 12 13		1 push button side installed Pos. 3 2 push button side installed Pos. 4 3 push button side installed Pos. 5	KBAD / 50	change over contact 0,5 A 250 V AC 15	110 120 130	B 1 D B 1 2D B 1 3D	
14		Push button top installed Pos. 1 with Rocker switch side tast-0-tast (protection IP 41) T-0-T installed Pos. 4+5	KBAD / 75	1 change over contact 0,5 A 250 V AC 15 2 change over contact 0,5A 250V AC 15	120	B 1 DW	
15 16 17		Lever switch side 0-tast mechanical operation Lever switch side 0-tast 1 contact Lever switch side 0-tast 2 contacts	KBAD / 126 KBAD / 54	change over contact 2 A 250 V AC 15	150 120 130	B 1 KT B 1 K B 1 2K	
21 22		Cable 4 res. 8 x 0,25 mm² x 450 mm long wired included Pos. 1-17 Additional price per metre cable 4-pole Additional price per metre cable 8-pole					

Palm grip B 2



Type B2-2PPI-...

The palm grip B 2 is an actuating element for our multi-axis controller V 8.
It can also be used as an actuating element for hydraulic drives.
With each of the two push button one direction-contact (micro change over contact) also one potentiometer pushed. These palm grip realised the 3. direction 9-10 (3. axis) on our multi-axis controller V 8.

The palm grip has a highly flexible cable
8 x 0,25 mm² x 450 mm long.

The mounting piece for the drive rod can be adjusted steplessly up to 20° in all directions.

The palm grip B 2 is made of PA plastic and is black in colour.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

Pos.				Weight gramm	Type	Price EURO
1	Palm grip with mounting piece for control-handle			200	B 2	
2	Latch for mechanical interlock for the push buttons			30	M	
3	2 direction-contacts			30	2	
4	2 wire-wound potentiometer T 239 linear life 5 x 10^6 switching cycles resistance 1,2,5 kOhm 1 Watt wiper current max. 10 mA			60	PP	
5	2 conductive-plastic potentiometer T 301 linear life 10^7 switching cycles resistance 1,2,5 kOhm 0,5 Watt wiper current max. 1 mA			50	PP	
6	more potentiometer e.t.c. see catalog 1/240					
10	Impedance converter Input ±15 Volt, Output ±10 V /5 mA			50	I	
22	Cable 8 x 0,25 mm² x 450 mm long wired included Pos. 1-10 Additional price per metre cable 8-pole					

Example for type-sign **B 2 M - 2 PP I - X**

Palm grip
Mechanical interlock
No. of contacts
Special please describe
Impedance converter
Potentiometer e.t.c.

Palm grip B 3

Type B32DWKPA11-…

The palm grip B 3 is an actuating element for our multi-axis controller V 8, VV 8, V 6, VV 6, VV 5.
It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements.
The drives with potentiometer PA 11/12 and PA 13 realised the direction 11-12
resp. 13-14 (3. resp. 4 axis) on our multi-axis controllers.

The palm grip has a highly flexible single wire 0,1 mm^2 x 450 mm long.

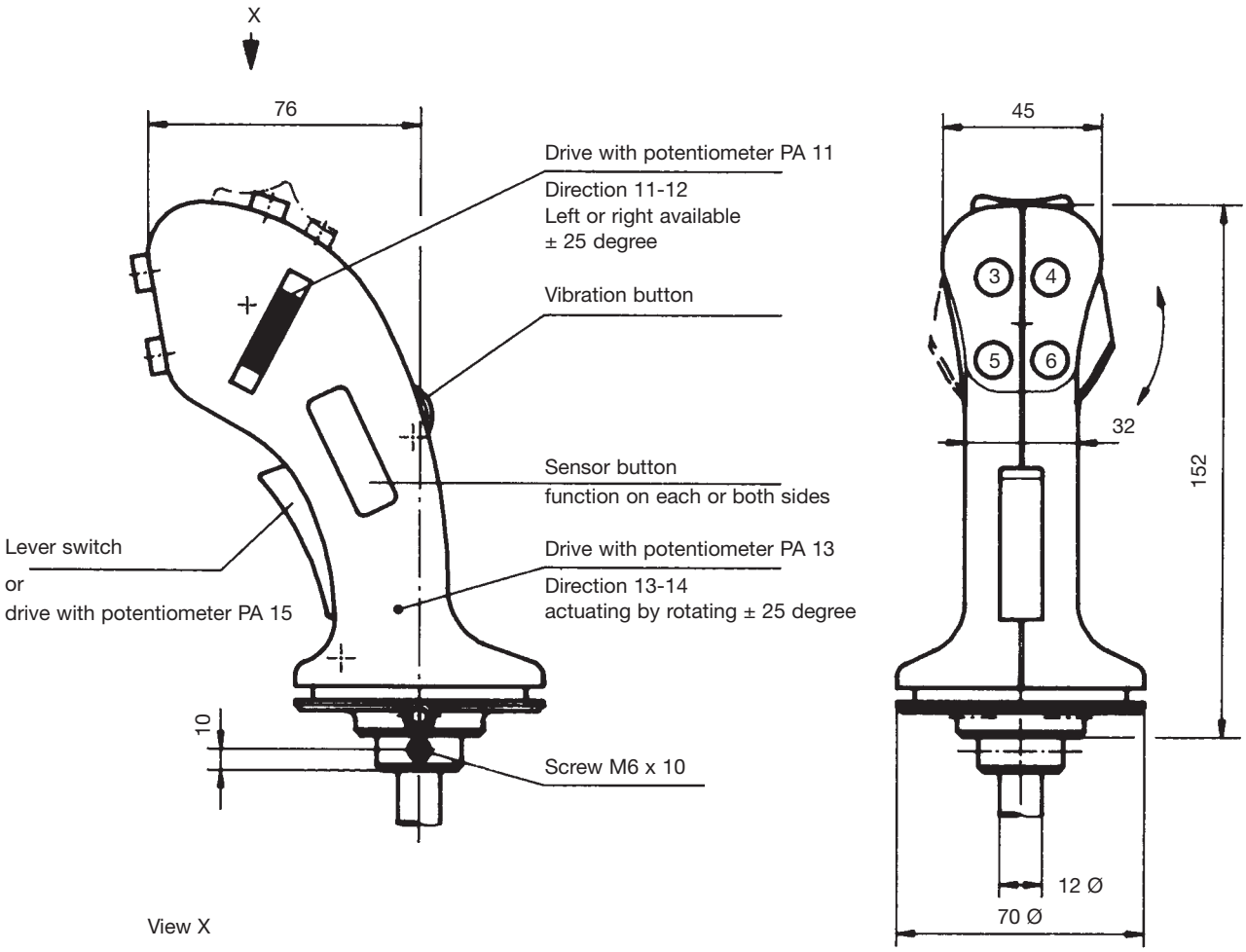
The mounting piece for the drive rod can be supplied with a tapped hole 12 or 10 mm
(standard = 12 mm).
The palm grip B 3 is made of PA plastic and is black in colour.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

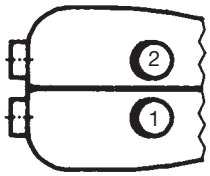
Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050

Pos.				Weight gramm	Type	Price EURO
1	Palm grip with mounting piece for control-handle			200	B 3	
2	Push button 1 NO installed Pos. 1, 2, 3, 4, 5, 6 color red RD, black BK, yellow YE, green GN, blue BU			20	D	
3	Rocker switch tast-0-tast T-0-T 2 NO installed Pos. 1 + 2			30	W	
4	Rocker switch tast-0-rest T-0-R 2 NO installed Pos. 1 + 2			30	W	
5	Rocker switch rest-0-rest R-0-R 2 NO installed Pos. 1 + 2			30	W	
6	Lever switch 1 NO			30	K	
7	Sliding switch tast-0-tast T-0-T 2 NO installed Pos. 13 + 14			40	ST	
8	Sliding switch rest-0-rest R-0-R 2 NO installed Pos. 13 + 14			40	SR	
9	Push button with 2 steps Latch for mechanical installed Pos. 11 + 12 zero interlock 4 contacts arrangement MS 212 see catalog 5/001			90	ZD	
11	Drive with potentiometer PA 11 actuating by rocker wheel installed Pos. left or right with spring return in the centre position 1 conductive-plastic potentiometer T 375 with centre tap Linear 10^7 switching cycles resistance 2 x 5 kOhm 0,5 Watt wiper-current max. 1 mA 2 direction-contacts			90	PA 11	
12	Drive with potentiometer PA 12 actuating installed Pos. 11 + 12 by push button (details exactly PA 11)			90	PA 12	
13	Drive with potentiometer PA 13 actuating by rotating palm grip left resp. right with spring return in the centre position 1 conductive-plastic potentiometer T 375 with centre tap Linear 10^7 switching cycles resistance 2 x 5 kOhm 0,5 Watt wiper current max. 1 mA, 2 direction-contacts			90	PA 13	
15	Drive with potentiometer PA 15 actuating by lever switch with spring return in 0-position, 1 conductive-plastic potentiometer T 375 Linear 10^7 switching cycles resistance 5 kOhm 0,5 Watt wiper current max. 1 mA, 1 direction-contact			90	PA 15	
20	Vibrator button actuating through solenoid 24 V DC impulse signal 100% duty cycle factor (e.g. indication of cable movement)			60	V	
21	Sensor button and res. or annexed with a regulator electronic board EY/42-10 or -11 24 V DC (separate)			20	SE	
22						
23						
30	Bellow for palm grip B 3 drawing No. KMD 109 required for multi-axis controller V 8, VV 8					
31	Bellow for palm grip B 3 drawing No. KMD 190 and front plate with 4 screws M5 x 15 (for mounting the bellow) drawing No. KBF 905 required for multi-axis controller V 6, VV 6, VV 5					
32						
33						

Palm grip B 3

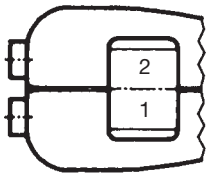


View X

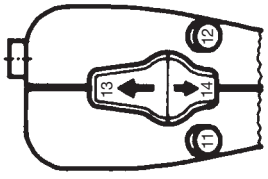


Edition:
Push button

Edition:
Vibrator button only one
Drive with potentiometer PA 13 version
Drive with potentiometer PA 15 possible



Edition:
Rocker switch
(installed Pos. 3, 4 inapplicable)



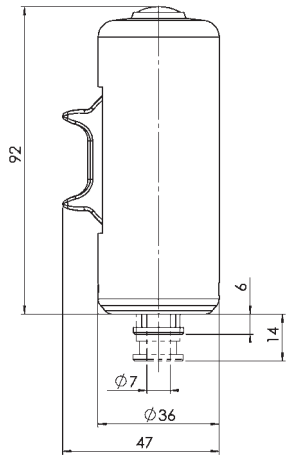
Edition:
Sliding switch installed Pos. 13, 14
installed Pos. 1, 2, 4, 6 inapplicable
Drive with potentiometer PA 12 direction 11 - 12 installed Pos. 11, 12
PA 11 inapplicable
Push button with 2 steps ZD installed Pos. 11 - 12
PA 11, 12 inapplicable

Example for type-sign B 3 D W K SE PA 11 PA 13 – X

Palm grip
Push button
Rocker switch
Lever switch

Special please describe
Drive with potentiometer PA 13
Drive with potentiometer PA 11
Sensor button

Palm grip B 4



Type B4DPA11-…

The palm grip B 4 is an actuating element for our multi-axis controller V 10, V 11, V 14.
It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements.
The drive with potentiometer PA 11 realised the direction 11-12 (3. axis) on our multi-axis controllers.

The palm grip has a highly flexible single wire 0,1 mm^2 x 450 mm long.

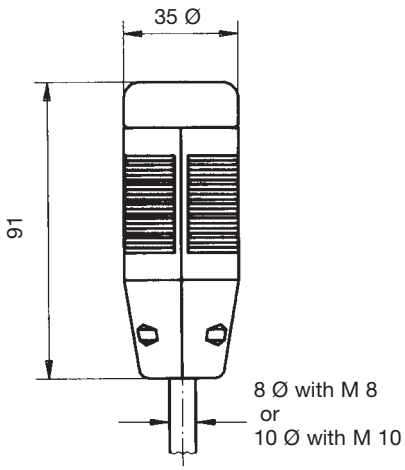
The mounting piece for the drive rod can be supplied with a tapped hole 8 mm.
The palm grip B 4 is made of PA plastic and is black in colour.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050

Pos.				Weight gramm	Type	Price EURO
1	Palm grip with mounting piece for control-handle			120	B 4	
2 3 5 6 10	Push button 1 NO 100 mA 24 V DC 13			20	D	
11	Drive with potentiometer PA 11 actuating by rocker wheel with spring return in the centre position 1 conductive-plastic potentiometer T 394 with centre tap Linear 10^7 switching cycles resistance 2 x 5 kOhm 0,5 Watt wiper current max. 1 mA 2 direction-contacts			90	PA 11	
30 31 32 33						

Palm grip B 5



Type B5

The palm grip B 5 is an actuating element for our multi-axis and single-axis controller.
It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements.

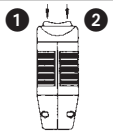
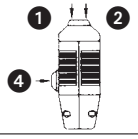
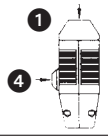
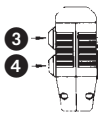
The palm grip has a highly flexible cable 4 (8) x 0,25 mm² x 450 mm long.

The mounting piece for the drive rod can be supplied with a tapped hole M 8 or M 10 (standard = M 10).

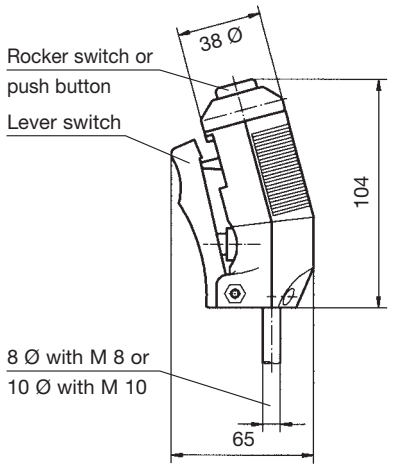
The palm grip B 5 is made of PA plastic and is black in colour.

Contact complement 2 A 250 V AC 15 / 3 A 24 V DC 13
or 0,5 A 250 V AC 15 / 1,5 A 24 V DC 13

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

Pos.						Contact-complement	Weight gramm	Type	Price EURO
1		without built in			KBAD / 254			B 5	
2 3 4		Rocker switch top tast-0-tast Rocker switch top tast-0-rest Rocker switch top rest-0-rest	T-0-T T-0-R R-0-R	installed Pos. 1+2 installed Pos. 1+2 installed Pos. 1+2	KBAD / 248	2 change over contact 2 A 250 V AC 15		B 5 W	
5		Rocker switch top tast-0-tast with push button side	T-0-T	installed Pos. 1+2 installed Pos. 4	KBAD / 294	2 change over contact 2 A 250 V AC 15 1 change over contact 0,5 A 250 V AC 15		B 5 WD	
7 8		Push button top Push button top	mechanical operation	installed Pos. 1	KBAD / 311 KBAD / 250	 1 change over contact 0,5 A 250 V AC 15		B 5 T B 5 D	
9		Push button top with 1 push button side		installed Pos. 1 installed Pos. 4	KBAD / 252	2 change over contact 0,5 A 250 V AC 15		B 5 2D	
11 12		1 push button side 2 push button side		installed Pos. 3 installed Pos. 4	KBAD / 246	change over contact 0,5 A 250 V AC 15		B 5 D B 5 2D	
21 22		Cable 4 res. 8 x 0,25 mm² x 450 mm long wired included in Pos. 1-12 Additional price per metre cable 4-pole Additional price per metre cable 8-pole							

Palm grip B 6



Type B6KW-…

The palm grip B 6 is an actuating element for our multi-axis and single-axis controller. It can also be used as an actuating element with hydraulic drives. Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements. These devices have micro changeover contacts.

The palm grip has a highly flexible cable 4 (8) x 0,25 mm² x 450 mm long.

The mounting piece for the drive rod can be supplied with a tapped hole M 8 or M 10 (standard = M 10).

The palm grip B 6 is made of PA plastic and is black in colour.

Contact complement	**2 A**	**250 V**	**AC 15 /**	**3 A**	**24 V**	**DC 13**
or	**0,5 A**	**250 V**	**AC 15 / 1,5 A**		**24 V**	**DC 13**

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

Pos.				Contact-complement	Weight gramm	Type	Price EURO
1		with built in lever switch side 0-tast		1 change over contact 0,5 A 250 V AC 15	120	B 6 K	
2 3 4		Lever switch side 0-tast with rocker switch top tast-0-tast T-0-T with rocker switch top tast-0-rest T-0-R with rocker switch top rest-0-rest R-0-R		3 change over contact 0,5 A 250 V AC 15	130	B 6 KW	
5		Lever switch side 0-tast with push button top		2 change over contact 0,5 A 250 V AC 15	130	B 6 KD	
21 22		Cable 4 res. 8 x 0,25 mm² x 450 mm long wired included Pos. 1-5 Additional price per metre cable 4-pole Additional price per metre cable 8-pole					

Notice

Palm grip B 7 / B 8

Type B76DV-…

Type B86DV-…

The palm grip B 7 is an actuating element for our multi-axis controller V 8, VV 8, V 6, VV 6, VV 5 design left, B 8 for design right.
It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements.

The palm grip has a highly flexible single wire 0,1 mm² x 450 mm long.

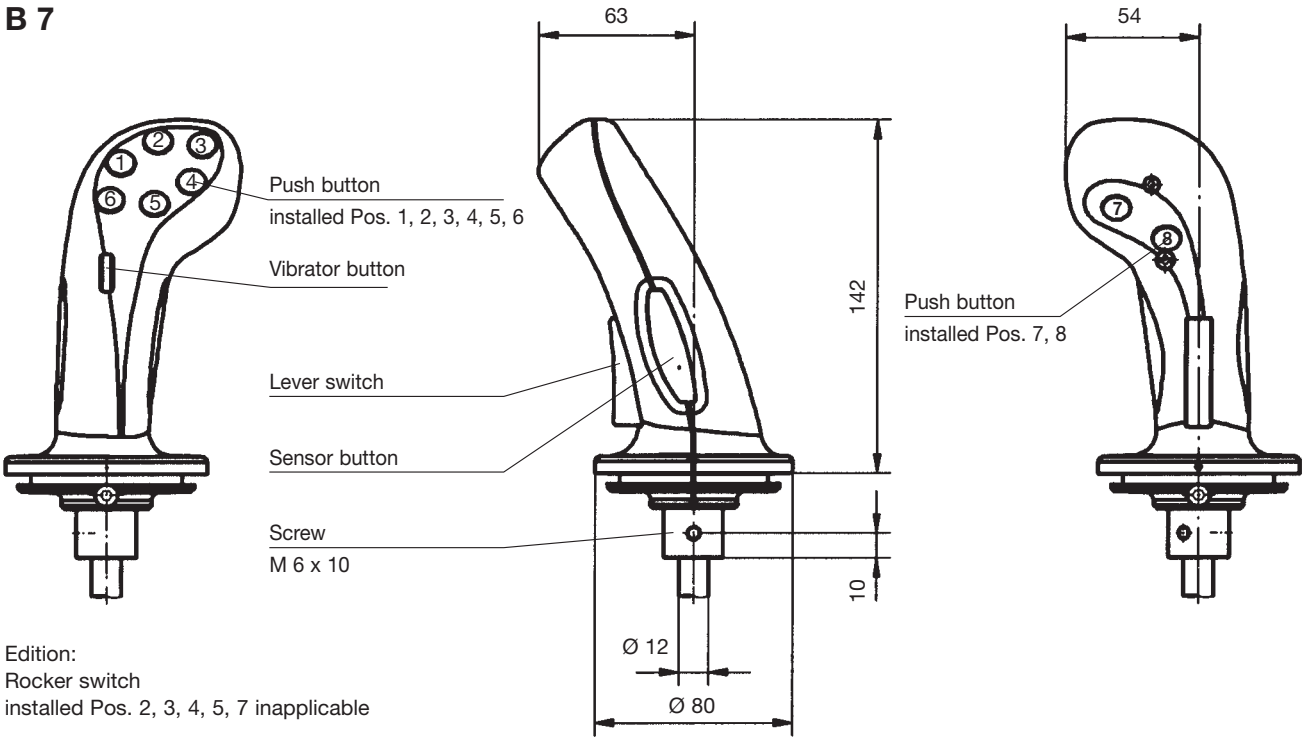
The mounting piece for the drive rod can be supplied with a tapped hole 12 or 10 mm (standard = 12 mm).
The palm grip B 7/8 is made of PA plastic and is black in colour.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050

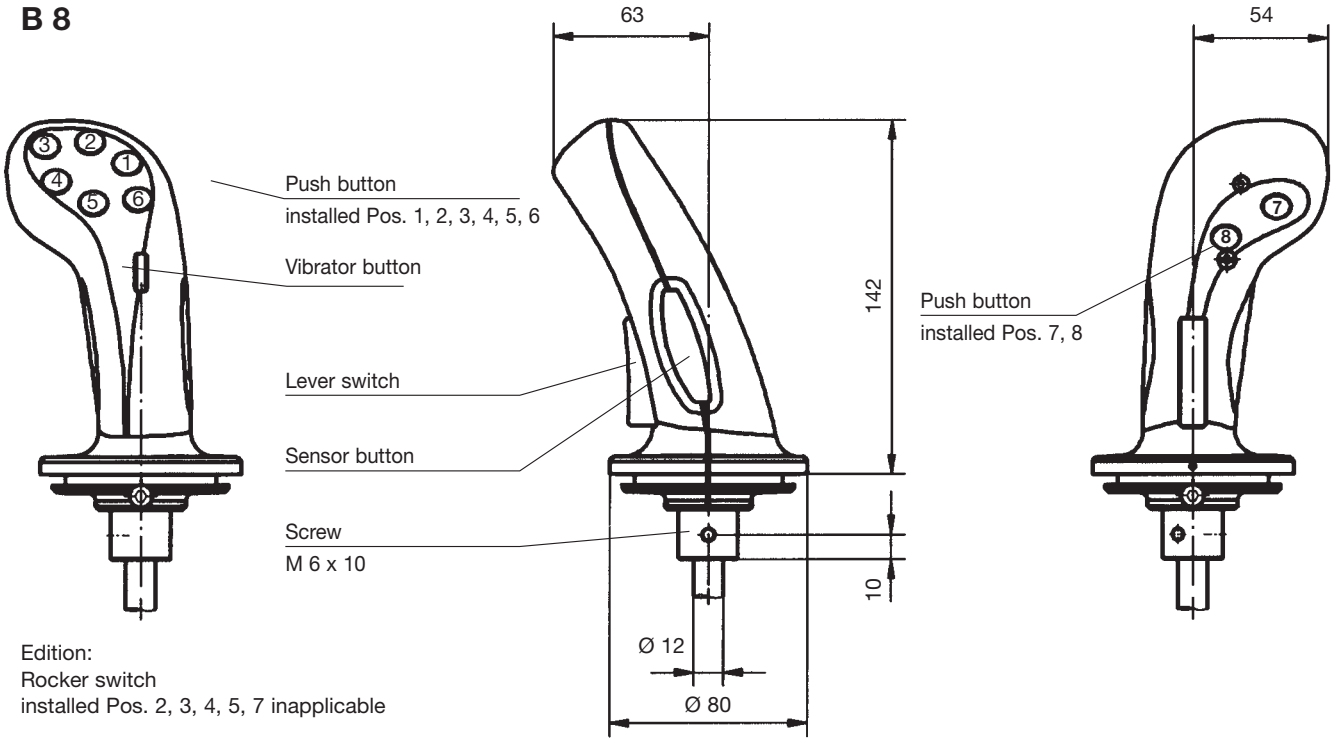
Pos.			Contact-complement	Weight gramm	Type	Price EURO
1	Palm grip with mounting piece for control-handle design left			200	B 7	
2	Palm grip with mounting piece for control-handle design right			200	B 8	
3	Push button 1 NO installed Pos. 1, 2, 3, 4, 5, 6, 7, 8 color red RD, black BK, yellow YE, green GN, blue BU, white WH			20	D	
4	Rocker switch tast-0-tast T-0-T 2 NO installed Pos. 2, 3, 4			30	W	
5	Rocker switch tast-0-rest T-0-R 2 NO installed Pos. 2, 3, 4			30	W	
6	Rocker switch rest-0-rest R-0-R 2 NO installed Pos. 2, 3, 4			30	W	
7	Lever switch 1 NO			30	K	
20	Vibrator button actuating through solenoid 24 V DC impulse signal 100% duty cycle factor			60	V	
21	Sensor button and res. or annexed with a regulator electronic board EY / 42-10 or -11 24 V DC (separate)			20	SE	
22						
23						
30	Bellow for palm grip B 7/8 drawing No. KMD 109 required for multi-axis controller V 8, VV 8					
31	Bellow for palm grip B 7/8 drawing No. KMD 190 and front plate with 4 screws M5 x 15 (for mounting the bellow) drawing No. KBF 905 required for multi-axis controller V 6, VV 6, VV 5					
32						
33						

B 7



Edition:
Rocker switch
installed Pos. 2, 3, 4, 5, 7 inapplicable

B 8



Edition:
Rocker switch
installed Pos. 2, 3, 4, 5, 7 inapplicable

Example for type-sign

B 7 D K V SE – X

Palm grip
Push button
Lever switch
Special please describe
Sensor button
Vibrator button

Palm grip B 9

Type B96DKT-…

The palm grip B 9 is an actuating element for our multi-axis controller V 8, VV 8, V 6, VV 6, VV 5.
It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements.
The drives with potentiometer PA 11 and PA 13 realised the direction 11-12
resp. 13-14 (3. resp. 4 axis) on our multi-axis controllers.

The palm grip has a highly flexible single wire 0,1 mm^2 x 450 mm long.

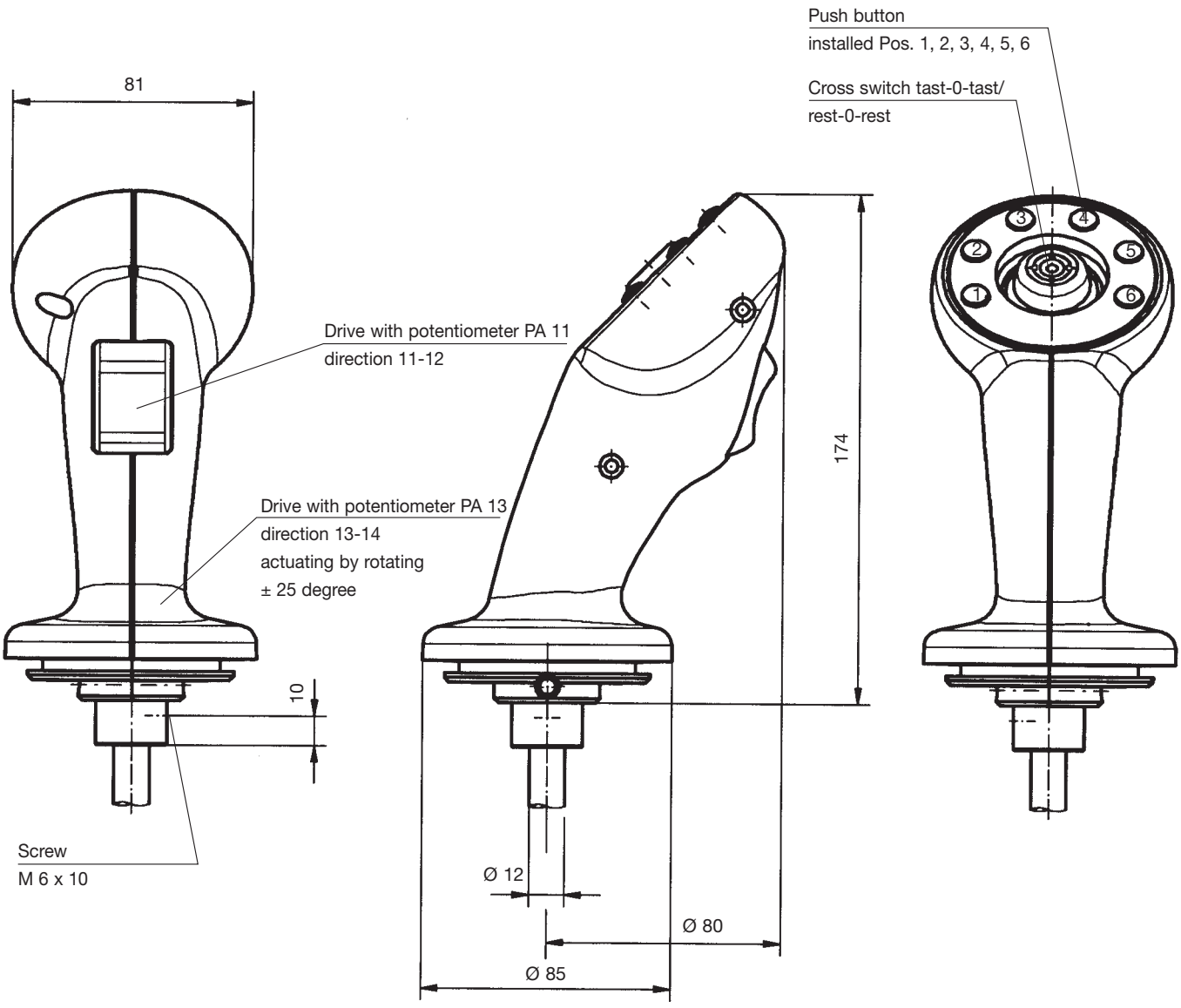
The mounting piece for the drive rod can be supplied with a tapped hole 12 or 10 mm
(standard = 12 mm).
The palm grip B 9 is made of PA plastic and is grey in colour.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050

Pos.			Contact-complement	Weight gramm	Type	Price EURO
1	Palm grip with mounting piece for control-handle			230	B 9	
2	Push button 1 NO installed Pos. 1, 2, 3, 4, 5, 6 color red RD, black BK, yellow YE, green GN, blue BU, white WH			20	D	
3	Cross switch tast-0-tast T-0-T / T-0-T 4 NO			60	KT	
5	Cross switch rest-0-rest R-0-R / R-0-R 4 NO			60	KR	
6						
10						
11	Drive with potentiometer PA 11 actuating by rocker wheel with spring return in the centre position 1 conductive-plastic potentiometer T 394 with centre tap Linear 10^7 switching cycles resistance 2 x 5 kOhm 0,5 Watt wiper current max. 1 mA, 2 direction-contacts			90	PA 11	
13	Drive with potentiometer PA 13 actuating by rotating palm grip left resp. right with spring return in the centre position 1 conductive-plastic potentiometer T 375 with centre tap Linear 10^7 switching cycles resistance 2 x 5 kOhm 0,5 Watt wiper current max. 1 mA, 2 direction-contacts			90	PA 13	
30	Bellow for palm grip B 9 drawing No. KMD 109 required for multi-axis controller V 8, VV 8					
31	Bellow for palm grip B 9 drawing No. KMD 190 and front plate with 4 screws M5 x 15 (for mounting the bellow) drawing No. KBF 905 required for multi-axis controller V 6, VV 6, VV 5					
32						
33						

Palm grip B 9



Example for type-sign

B 9	D	KT	PA 11	PA 13	–	X
Palm grip	**Push button**	**Cross switch**				**Special please describe**
				Drive with potentiometer PA 13		
			Drive with potentiometer PA 11			

Palm grip B 10-1 / B 10-2

Type B10.1-13DW-…

The palm grip B 10-1 is an actuating element for double-handle controller D 64, DD 64, D8.
Control-handle left, B10-2 for control-handle right.
It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements.

The palm grip has a highly flexible single wire 0,1 mm² x 450 mm long.

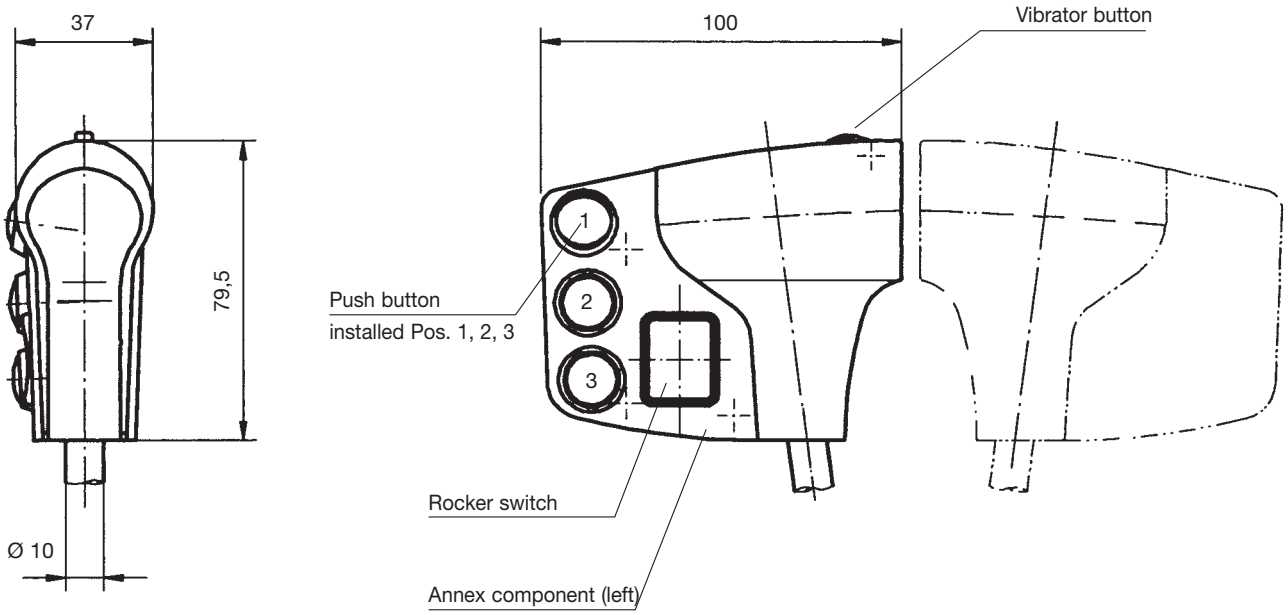
The mounting piece for the drive rod can be supplied with a tapped hole 10 mm.
The palm grip B 10 is made of PA plastic and is black in colour.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

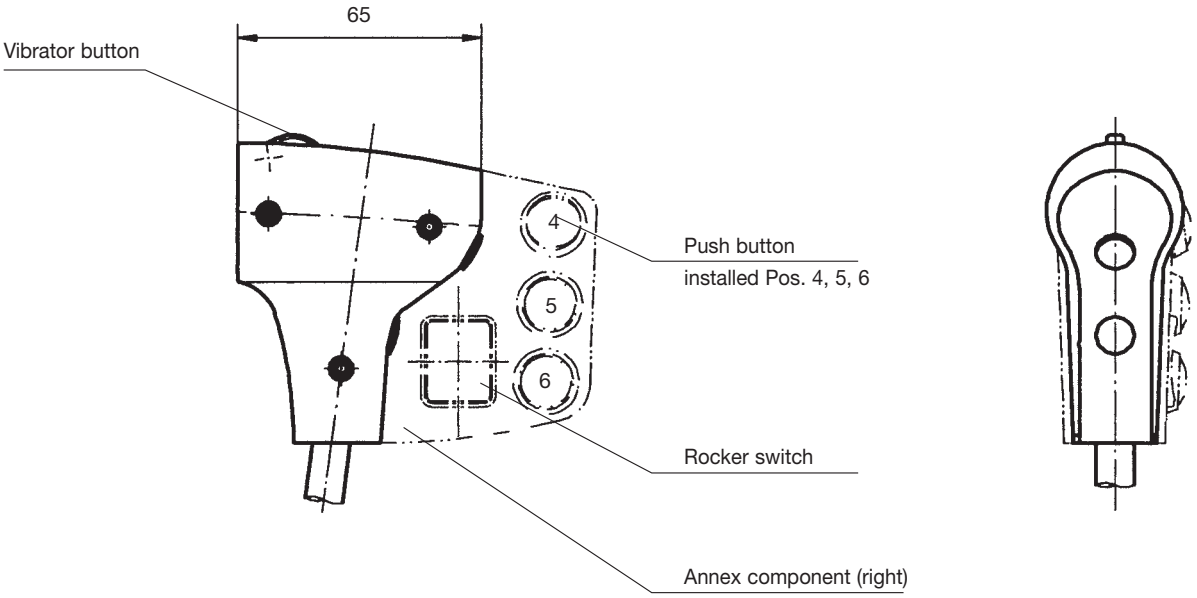
Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050

Pos.			Contact-complement	Weight gramm	Type	Price EURO
1	Palm grip with mounting piece for control-handle left			100	B 10-1	
2	Palm grip with mounting piece for control-handle left with annex component			130	B 10-1-1	
3	Palm grip with mounting piece for control-handle right			100	B 10-2	
4	Palm grip with mounting piece for control-handle right with annex component			130	B 10-2-2	
5	Push button 1 NO B 10-1 installed Pos. 1, 2, 3 B 10-2 installed Pos. 4, 5, 6			30	D	
6	Rocker switch tast-0-tast T-0-T 2 NO			30	W	
7	Rocker switch tast-0-rest T-0-R 2 NO			30	W	
8	Rocker switch rest-0-rest R-0-R 2 NO			30	W	
20	Vibrator button actuating through solenoid 24 V DC impulse signal 100% duty cycle factor			60	V	

B 10-1



B 10-2



Example for type-sign **B 10-1 – 1 D W V – X**

Palm grip	**Special please describe**
Palm grip with annex component	**Vibrator button**
Push button	**Rocker switch**

Palm grip B 14 / B 15

Type B142D-…

Type B152D-…

The palm grip B 14 is an actuating element for our multi-axis controller V 8, VV 8, V 6, VV 6, VV 5 design left, B 15 for design right.
It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, e.t.c., can also be fitted to suit appropriate requirements.

The palm grip has a highly flexible single wire 0,1 mm² x 450 mm long.

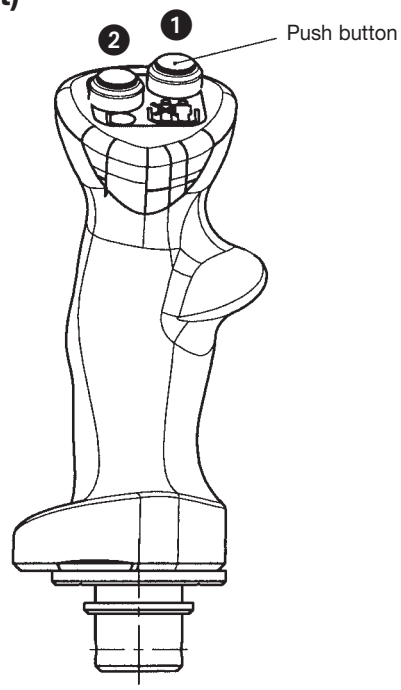
The mounting piece for the drive rod can be supplied with a tapped hole 12 or 10 mm (standard = 12 mm).
The palm grip B 14/15 is made of PA plastic and is black in colour.

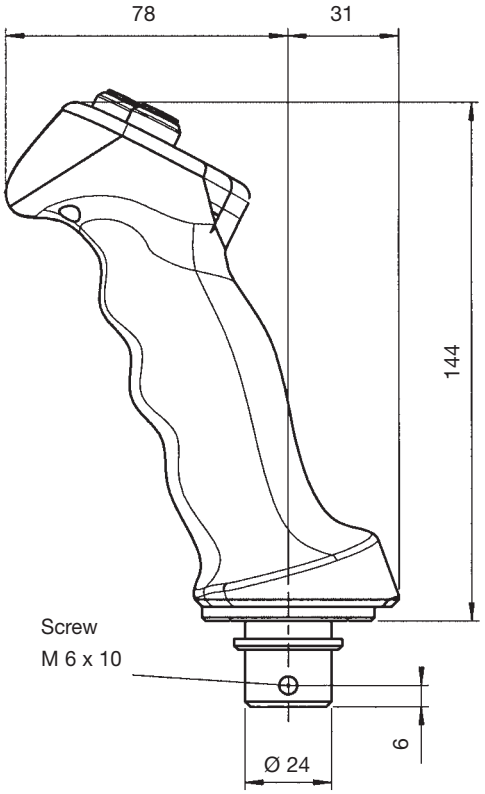
Contact complement 0,125 A 110 V AC 15 res. 0,1 A 24 V DC 13

Permissible ambient temperature	Operating -40°C to +60°C Storage -50°C to +80°C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 65 IEC 529 DIN 40050

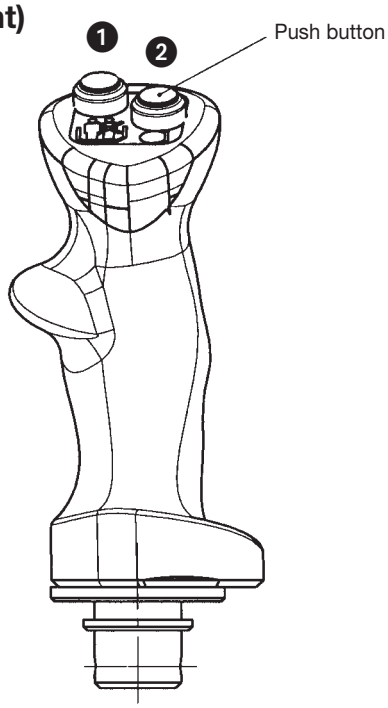
Pos.			Contact-complement	Weight gramm	Type	Price EURO
1	Palm grip with mounting piece for control-handle design left			200	B 14	
2	Palm grip with mounting piece for control-handle design right			200	B 15	
3	Push button 1 NO installed Pos. 1, 2 color red RD, black BK, yellow YE, green GN, blue BU, white WH			20	D	
30						
31						
32						
33						

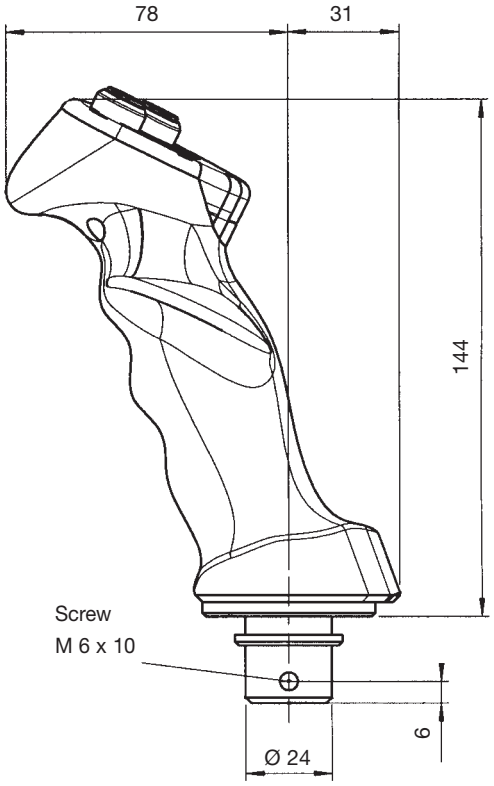
B 14 (left)





B 15 (right)





Example for type-sign B 14 D X

Palm grip

Push button

Special please describe

Palm grip B 20

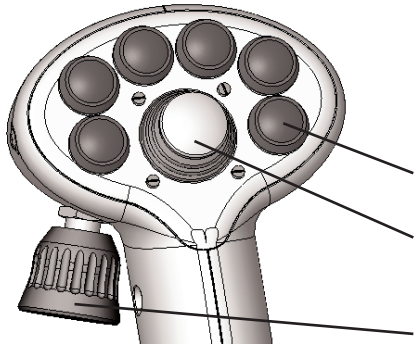
Type B 20

The Palm grip B 20 is an actuating element for our multi-axis controller V 8, VV 8, V 85, VV 85, V6, VV6. It can also be used as an actuating element for hydraulic drives.
Push buttons, rocker switches, etc. can also be fitted to suit appropriate requirements
The palm grip has a highly felxible wire 0,1 mm² x 450 mm long.
The mounting piece for the drive rod can be supplied with a tapped hole 12 mm.
The palm grip B 20 is made of PAGF35 plastic and is black in colour.

permissible ambient temperature	operating -40° C bis +60° C storage -50° C bis +80° C
climate resistance	
damp heat constant	DIN IEC 68 part 2-3
damp heat cyclic	DIN IEC 68 part 2-30
degree of protection front	IP 65 IEC 529 DIN 40050

Pos.			Type-expansion	Weight gramm	Type	Pice EURO
1	Palm grip with mounting piece for control handle with hand rest left or right				B 20	
2	Push button 1 NO		1,5 A 24 V DC 13		D	
3	Push button 1 NO	S 59	0,4 A 24 V DC 13		D	
4						
5						
6						
7	colour red RD, black BK, yellow YE, green GN, blue BU					
8	Rocker switch tast-0-tast T-O-T 2 NO	KEM 92	1,5 A 24 V DC 13		VV	
9	Rocker switch tast-0-rest T-O-R 2 NO	KEM 92	1,5 A 24 V DC 13		VV	
10	Rocker switch rest-0-rest R-O-R 2 NO	KEM 92	1,5 A 24 V DC 13		VV	
11	Lever switch 1 NO		1,5 A 24 V DC 13		K	
12	Cross switch tast-0-tast T-O-T / T-O-T 4 NO color red RD, black BK, grey GR	T 4	1 A 24 V DC 13		KT	
14	Drive with potentiometer PA9, actuating by rotary mechanism 1 wire-wound potentiometer T… 5 kOhm 2 Watt	KBAD 670			PA 9	
17	Drive with Hall sensors HA 11, actuating by rocker wheel installed with spring return in centre position, with electronic redundant Voltage output impressed Power supply 4,6-5,5 Volt output 0,5-2,5-4,5 Volt +5 mA output characteristic linear				HA 11	
18	Drive with potentiometer PA 12, actuating by rocker wheel installed with spring return in centre position, 1 conductive plastic potentiometer T 375 with centre tap 10^7 switching cycles, resistance 2 x 5 kOhm 0,5 Watt wiper current max 1 mA, 2 direction contacts				PA 12	
19	Drive with Hall sensors HA 12, actuating by rocker wheel installed with spring return in centre position, with electronic redundant Voltage output impressed Power supply 4,6-5,5 Volt output 0,5-2,5-4,5 Volt +5 mA output characteristic linear				HA 12	
20	Drive with potentiometer PA 13, actuating by rotating palm grip left resp. right with spring return in centre position, 1 conductive plastic potentiometer T 375 with centre tap 10^7 switching cycles, resistance 2x5 kOhm 0,5 Watt wiper current max 1 mA, 2 direction contacts				PA 13	
21	Drive with Hall sensors HA 13, actuating by rotating palm grip left resp. right with spring return in centre position, with electronic redundant Voltage output impressed Power supply 4,6-5,5 Volt output 0,5-2,5-4,5 Volt +5 mA output characteristic linear				HA 13	
22	Multi-axis controller V 21 look Catalog 1/146				V 21	
25	Vibrator button actuating through solenoid 24V DC impulse signal 100% duty cycle (e.g. indication of cable movement)				V	
30	Bellow for palm grip B 20 required for multi-axis controller V 8, VV 8, V 85, VV 85	KMD 109				
31	Bellow for palm grip B 20 and front plate with 4 screws M5 x 15 (for mounting the bellow) required for multi-axis controller V 6, VV 6	KMD 229 KBF 905				

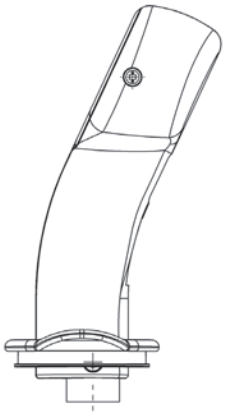
Palm grip B 20

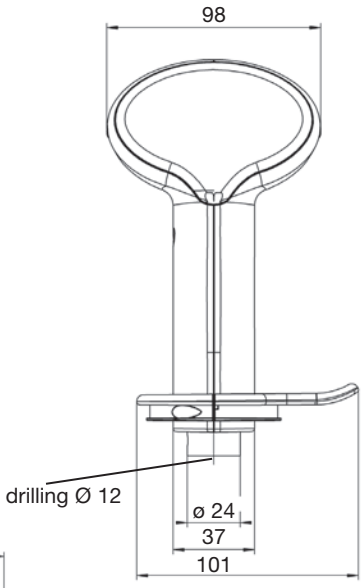


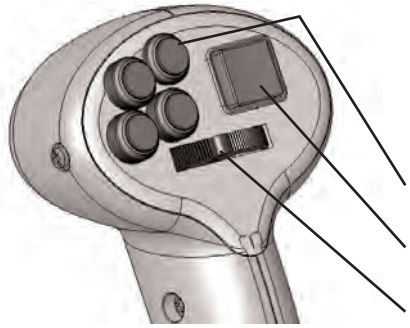
6 push buttons

1 multi-axis controller V21
look catalog 1/146

1 drive with potentiometer PA 9



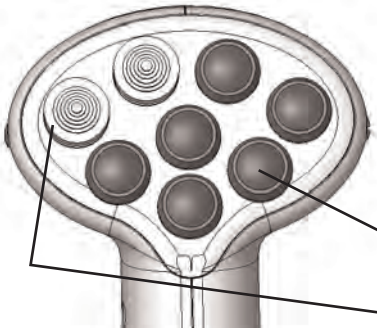




4 push buttons

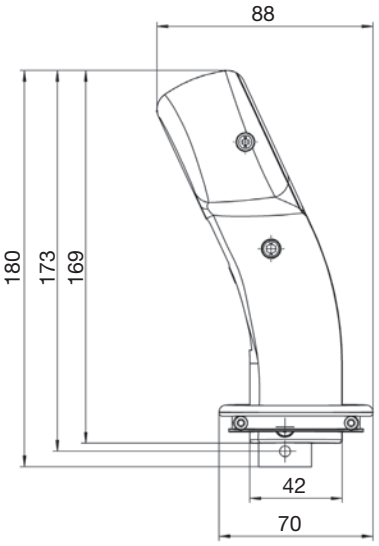
1 rocker switch

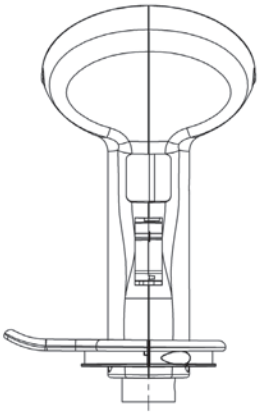
1 drive with potentiometer PA 12

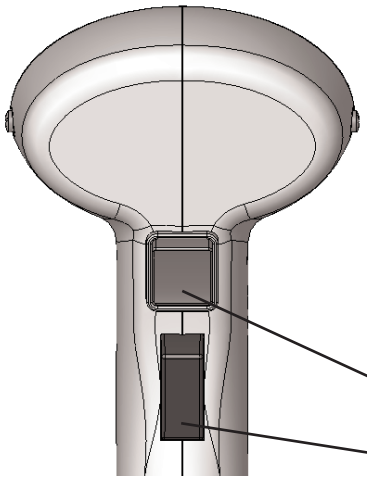


6 push buittons

2 cross switches







1 rocker switch or drive with Hall sensors HA 11

1 lever switch

more variants available upon request

Example for type-sign

B 20 6D V21 PA9 W K -X

palm grip

push button

multi-axis controller V 21

special please describe

lever switch

rocker switch

drive with potentiometer PA9

Notice

Housing for our switching device

Pos.	Dimension outside in mm	Dimension inside in mm		Remarks	Weight kg	Type	Price EURO
	Steel sheet housing material thickness 1/1,5 mm Protection IP 54 painting RAL 7032 pebble-grey textured varnish						
1	200 x 200 x 92	166 x 166 x 90			1,3	B 200	
2	230 x 230 x 105	196 x 196 x 102			1,4	B 230	
3	230 x 340 x 105	196 x 306 x 102			1,5	B 230 x 340	
4	230 x 440 x 105	196 x 406 x 102			1,6	B 230 x 440	
5	250 x 250 x 150	216 x 216 x 147			1,6	B 250 x 250	
6							
7	150 x 400 x 105	116 x 366 x 102			3,2	B 150 x 400	
8	150 x 500 x 105	116 x 466 x 102			3,5	B 150 x 500	
9	150 x 600 x 105	116 x 566 x 102			3,8	B 150 x 600	
10	260 x 500 x 105	226 x 466 x 102			3,8	B 260 x 500	
11	260 x 600 x 105	226 x 566 x 102			4,2	B 260 x 600	
12	Dimensions special			on enquiry			
	Plastic housing polycarbonat Protection IP 65 colour RAL 7035 fair-grey						
13	120 x 122 x 105	113 x 115 x 98			0,35	I 120 x 122	
14	120 x 160 x 140	113 x 134 x 133			0,6	I 120 x 160	
15	160 x 240 x 120	153 x 215 x 114			0,8	I 160 x 240	
16	160 x 360 x 100	153 x 352 x 94			1,0	I 160 x 360	
17	230 x 300 x 110	223 x 293 x 103			1,15	I 230 x 300	
18							
19							
20							
21							
22							
	Plastic housing polyester Protection IP 65 colour RAL 7000 grey						
23	220 x 335 x 115	200 x 292 x 108		colour alternative RAL 9011 black	1,65	I 220 x 335	
24	220 x 465 x 115	200 x 432 x 108		colour alternative RAL 9011 black	2,24	I 220 x 465	
25	250 x 255 x 120	236 x 243 x 110			2,65	I 250 x 255	
26	250 x 400 x 120	236 x 386 x 110			3,65	I 250 x 400	
27	250 x 600 x 120	236 x 586 x 110			5,24	I 250 x 600	
28							
29							
30							
31							
32							
	Accessory parts						
33	Hinges each housing (2 pcs.)				0,2		
34	Armrest with clamp adjustable straps				0,5		
35	Chest panel and straps				0,6		
36	Base bracket each housing (2 pcs.)				0,3		
37	Filter plug M 20			for air-condition	0,15		
38	Cable entry M 20 cable 7–13 mm			with anti-kink protection and strain relief	0,15		
39	Cable entry M 32 cable 11–21 mm			with anti-kink protection and strain relief	0,2		
40	Cable entry M 40 cable 19–28 mm			with anti-kink protection and strain relief	0,25		
41	Pillar with flange 100 x 100 x 535 mm high			flange 150 x 150 mm	14,0		
42	Indicating labels not engraved						
43	Engraving, each 10 characters						
44							
45							

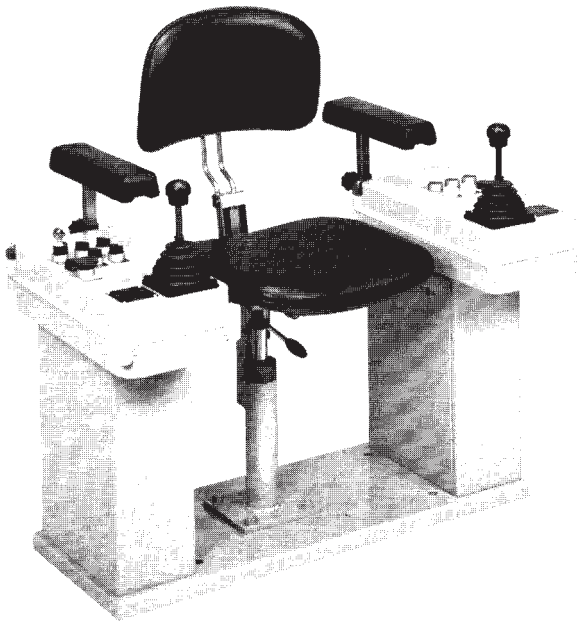
Command and indicating devices for 22 mm mounting diameter to install in our housing

Manufacture Siemens 3 SB 22 mm

Pos.	Command devices				Weight gramm	Type	Price EURO
1	Push button			1 NO + 1 NC	40	D	
2	Selector switch 0-1	2 positions		1 NO + 1 NC	50	W	
3	Selector switch 1-0-2	3 positions		2 NO + 2 NC	60	W	
4							
5							
6	Key switch 0-1	2 positions		1 NO + 1 NC	130	S	
7	Key switch 1-0-2	3 positions		2 NO + 2 NC	140	S	
8							
9							
10	Mushroom key switch latching			1 NO + 1 NC	80	PS	
11	Mushroom head push button latching			1 NC	60	PV	
12							
13							
14							
15	Contact block additional (max. 3 pcs.)			1 NO + 1 NC	10		
	Command and indicating devices						
16	Illuminated push button lamp 24 V AC			1 NO + 1 NC	40	LD	
17	Illuminated push button lamp 110 V operating voltage 220 V AC			1 NO + 1 NC	40	LD	
18	Illuminated push button lamp 24 V with transformer 220/24 V AC			1 NO + 1 NC	50	LD	
19							
20	Contact block additional (max. 3 pcs.)			1 NO + 1 NC	10		
	Indicating devices						
21	Indicator light lamp 24 V AC				40	L	
22	Indicator light lamp 110 V operating voltage 220 V AC				40	L	
23	Indicator light lamp 24 V with transformer 220/24 V AC				50	L	
24							
25							
	Special devices						
26	Drilling diameter 22 mm						
27	Blind plug 22						
28							
29	Push button with 2 steps SES 2			2 NO + 1 NC	300		
30	Push button with 2 steps ST 1-3-2			2 NO + 1 NC	300		
31	Push button with 3 steps ST 1-4-3			3 NO + 1 NC	350		
32	Push button with 4 steps ST 1-5-4			4 NO + 1 NC	400		
33	Push button with potentiometer PT 1-2-P			1 NO + 1 NC	350		
34	Wire-wound potentiometer T 237 linear Life 10^6 switching cycles						
35	resistance 0,5/1,0/2,0/5,0 kOhm 1 Watt wiper current max. 10 mA						
36	Drive for potentiometer M4168 with friction brake, switching sequence -0-, contact (potentiometer look 1/240)				250		
37	Summer EKS 24 V DC / 48 V AC / 220 V AC				250		
38	Knee button FAK-S/KC/I			1 NO + 1 NC	350		
39	Foot button 3SE 3902-OAB20			1 NO + 1 NC	450		
40							

Notice

Crane control unit KST 3



Type KST3KFS2-…

The crane control unit KST 3 combines in its design the crane driver's seat and the control and monitoring devices. Ready wired, it can be easily and quickly installed in the crane cabin.

Equipment boxes: Plastic polyester.
The equipment boxes with the devices fitted have hinged tops that can be locked in position. They contain the termination and connection facilities and a lockable plug-in cover on the inside.

Seat KFS 2: The seat backrest can be tipped forwards and further tipped together with the cushion.
The cushion and seat backrest are padded.

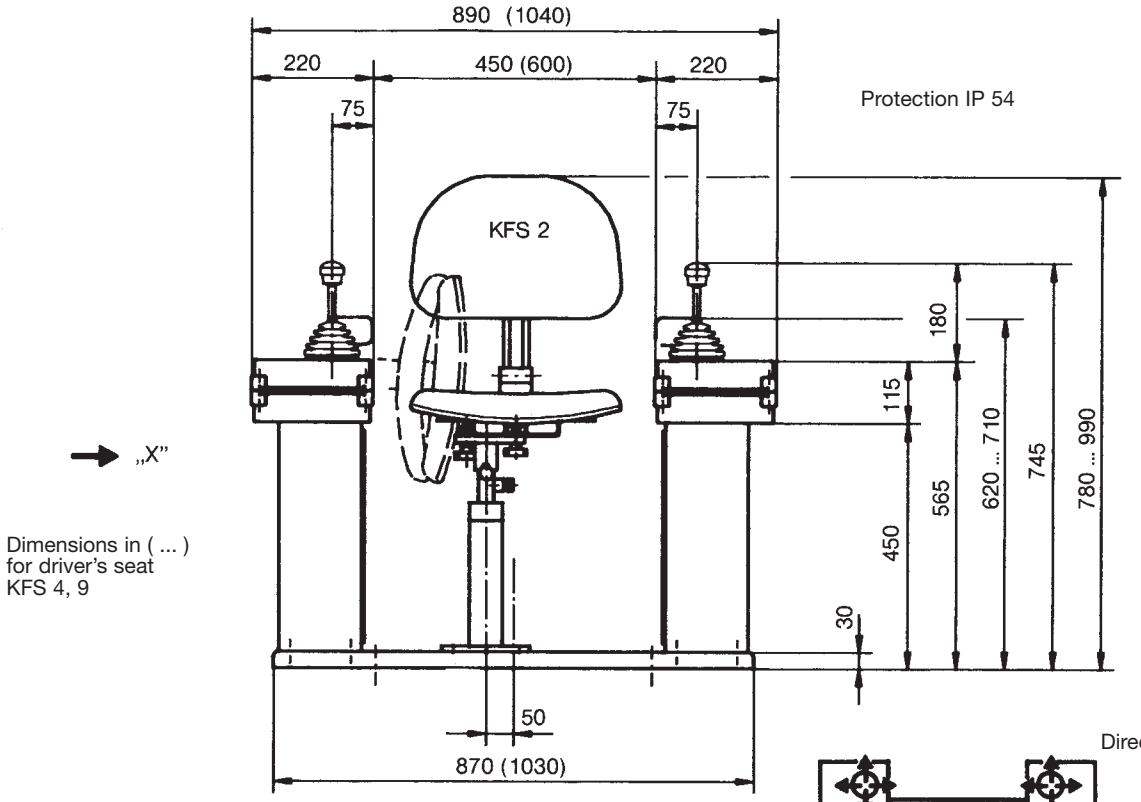
Adjusting possibilities: Cushion horizontally and vertically.
Height adjustment via a gas-loaded spring in the seat base.
Seat backrest horizontally and vertically to the cushion.
Armrests padded and adjustable in height.
Fixed to the equipment boxes.

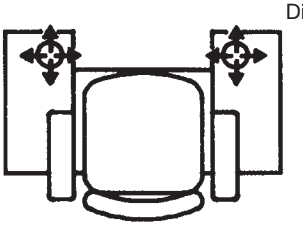
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pebble-grey. textured Varnish
All non-painted metal parts are electrogalvanized and chromed.

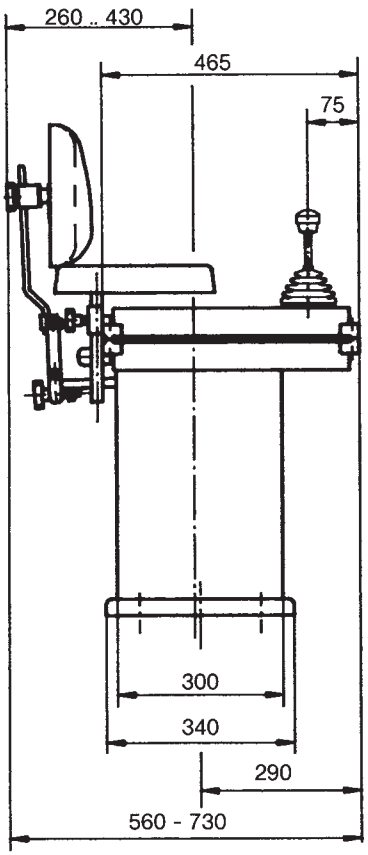
Description data see catalog 5/003/004

Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

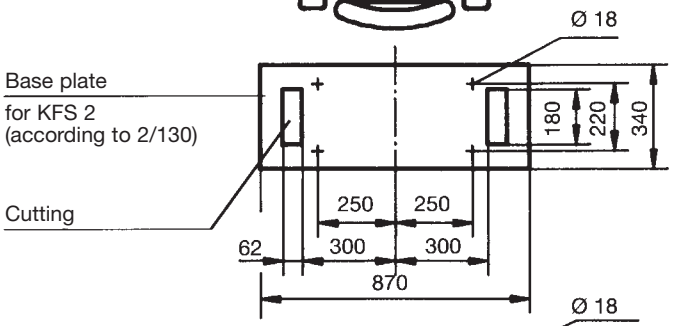
Pos.						Weight kp	Type	Price EURO
1	Crane control unit with driver's seat	KFS 2	with base plate			36	KST 3	
2	Crane control unit with driver's seat	KFS 2	without base plate			31	KST 31	
3	Crane control unit without driver's seat	KFS 2	with base plate			21	KST 32	
4	Crane control unit without driver's seat	KFS 2	without base plate			16	KST 33	
5								
10	Driver's seat	see catalog 2/130 (picture shows)					KFS 2	
11								
12	Driver's seat	see catalog 2/132					KFS 4	
13								
14								
15	Driver's seat	see catalog 2/140					KFS 9	
20	Multi-axis controller	see catalog 1/100						
21	Single-axis controller	see catalog 1/200						
22								
23	Control-switch	see catalog 1/220						
24	Command and indicating devices	see catalog 1/360						
25								
30	Terminal block 4 mm² without wiring each terminal						KL	
31	Terminal block 4 mm² with wiring wire 1,5 mm² each terminal						KL	
32	External wiring single wire highly flexible 1,5 mm² 5 metre long							
33	Additional or subtract price each metre							
34								
35								
40	Special painted							
41	Indicating labels not engraved with 2 or 4 arrows							
42	Engraving, each 10 characters							
43								

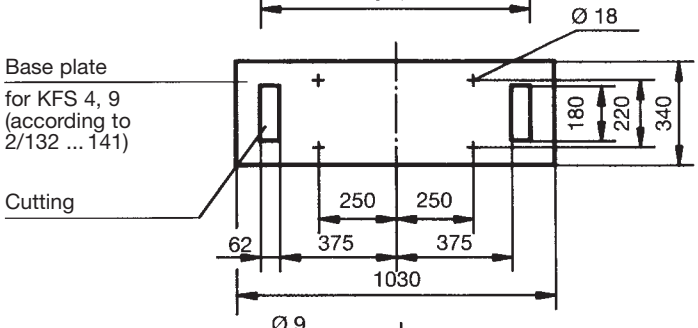


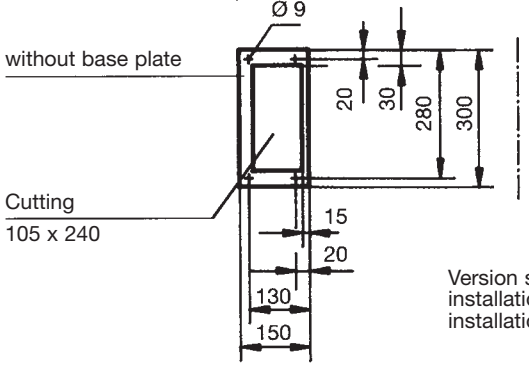




View „X"







Version shown for left-hand installation (right-hand side installation is mirror image)

Crane control unit KST 4 swivelling manual adjustment

Type KST41KFS92-…

The swivelling crane control unit KST 4 is ergonomically designed and provides a high degree of comfort.

The standard design includes following:

Equipment boxes: Sheet steel.
The equipment boxes with the devices can be vertically and horizontally adjusted together with the armrests. Cabling is run through aduct in the cross-member. (Terminal block).

Seat: Comfortable spring mounted seat KFS 6, with an oilhydraulic vibration absorption system, weight adjustment and air-permeable artificial leather or textil material, with headrest.

Adjusting possibilities: Seat horizontally and vertically.
Inclination of cushion, backrest and armrest also adjustable.
Weight setting for optimum spring suspension, right equipment box turnable.

Cross-member: Steel selection, top of which can be raised to lay cabling. The seat can be tilted backwards so that the cable duct in the cross-member is accessible.

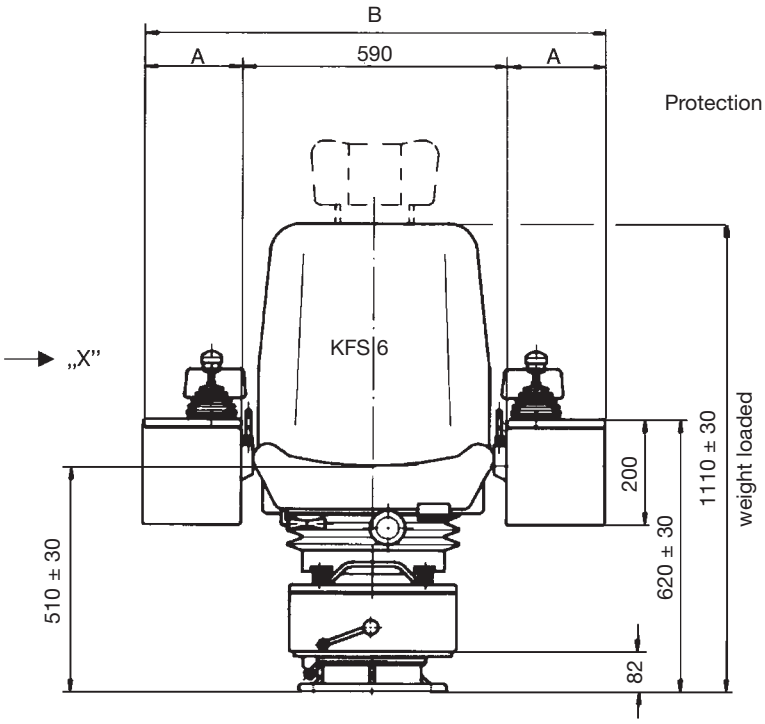
Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 9011 black.
textured varnish
All non-painted metal parts are electrogalvanized and chromed.

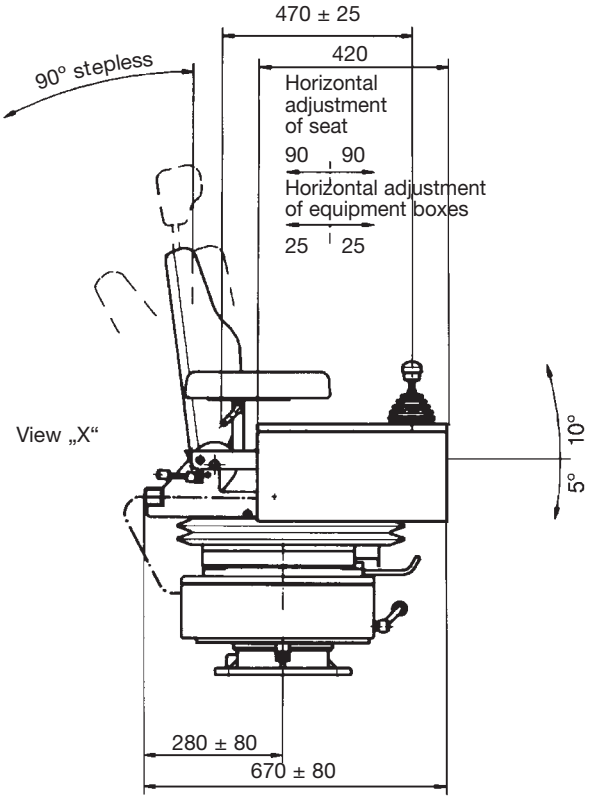
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

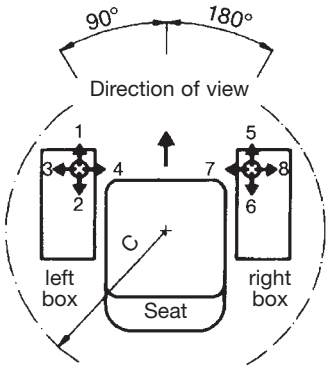
Description data see catalog 5/003/004

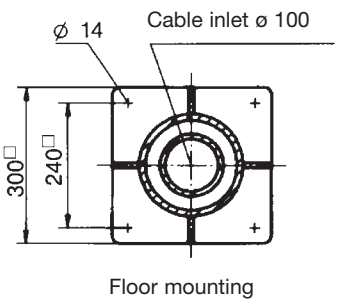
Pos.					Weight kp	Type	Price EURO
1	Crane control unit standard design	Equipment boxes 160 x 420 mm			58	KST 41	
2	Crane control unit standard design	Equipment boxes 200 x 420 mm			60	KST 42	
3							
4							
5	Crane control unit standard design	Equipment boxes special dimensions				KST 4x	
6	additional variations for driver's seat KFS 6	see catalog 2/134				KFS 6	
7	Driver's seat KFS 9	see catalog 2/140				KFS 9	
8							
9							
10	Footrest mounted onto swivel base adjustable ± 30 mm				8		
11							
12							
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm						
14							
15							
16							
17							
18							
19	Heating 2 x 2 kW with ventilator 230 V 50 Hz airvolume ca. 300 m^3/h mounted on the swivel base sidewise						
20	Multi-axis controller	see catalog 1/100					
21	Single-axis controller	see catalog 1/200					
22	Double-handle controller	see catalog 1/160					
23	Control-switch	see catalog 1/220					
24	Command and indicating devices	see catalog 1/360					
30	Terminal block 4 mm^2 without wiring each terminal					KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal					KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long						
33	Additional or subtract price each metre						
40	Special painted						
41	Indicating labels not engraved with 2 or 4 arrows						
42	Engraving, each 10 characters						



Type	Dimension A	Dimension B	Dimension C
KST 41	160	910	<625 >700
KST 42	200	990	<655 >730







Floor mounting

Crane control unit KST 5 swivelling manual adjustment

Type KST51KFS92-…

The swivelling crane control unit KST 5 is ergonomically designed and provides a high degree of comfort.

The standard design includes following:

Equipment boxes: Sheet steel. The top panel of the equipment boxes with the devices can be raised and locked in position. The terminal strip is easily accessible via an opening on the inside that can be closed with a lockable cover.

Seat: Comfortable spring mounted seat KFS 6, with an oilhydraulic vibration absorption system, weight adjustment and air-permeable artificial leather or textil material, with headrest, with armrests.

Adjusting possibilities: Seat horizontally and vertically. Inclination of cushion, backrest and armrest also adjustable. Weight setting for optimum spring suspension.

Cross-member: Steel section, top of which can be raised to lay cabling. The seat can be tilted backwards so that the cable duct in the cross-member is accessible.

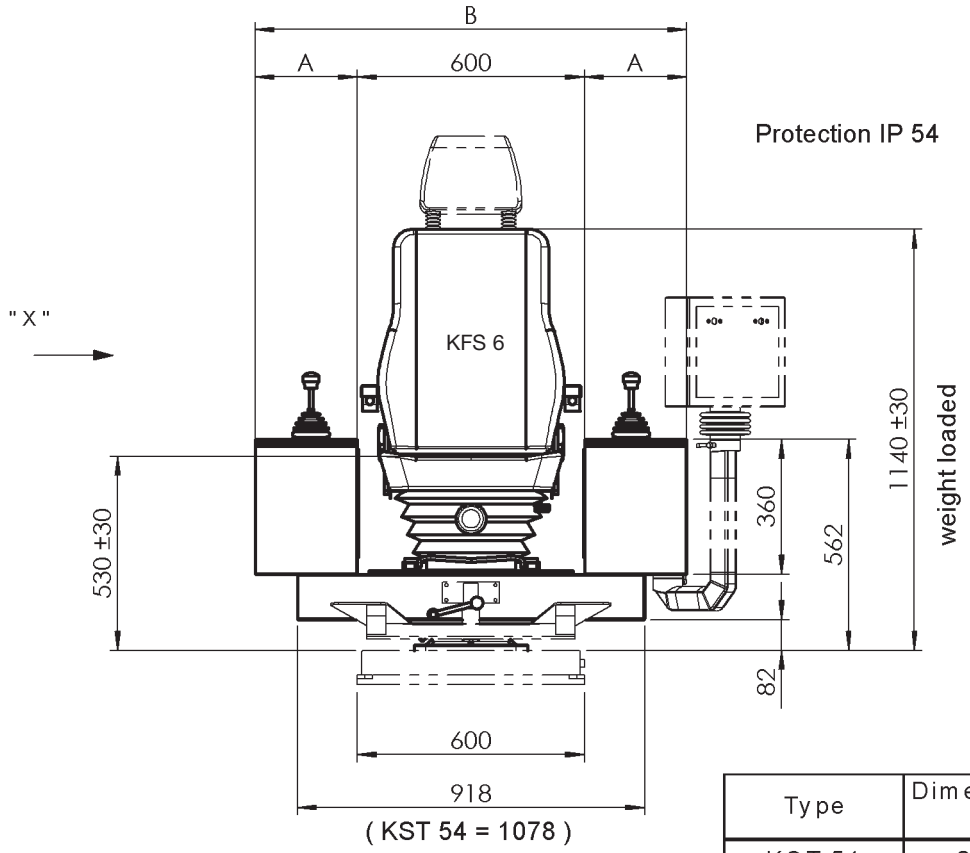
Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pepple-grey. textured varnish
All non-painted metal parts are electrogalvanized and chromed.

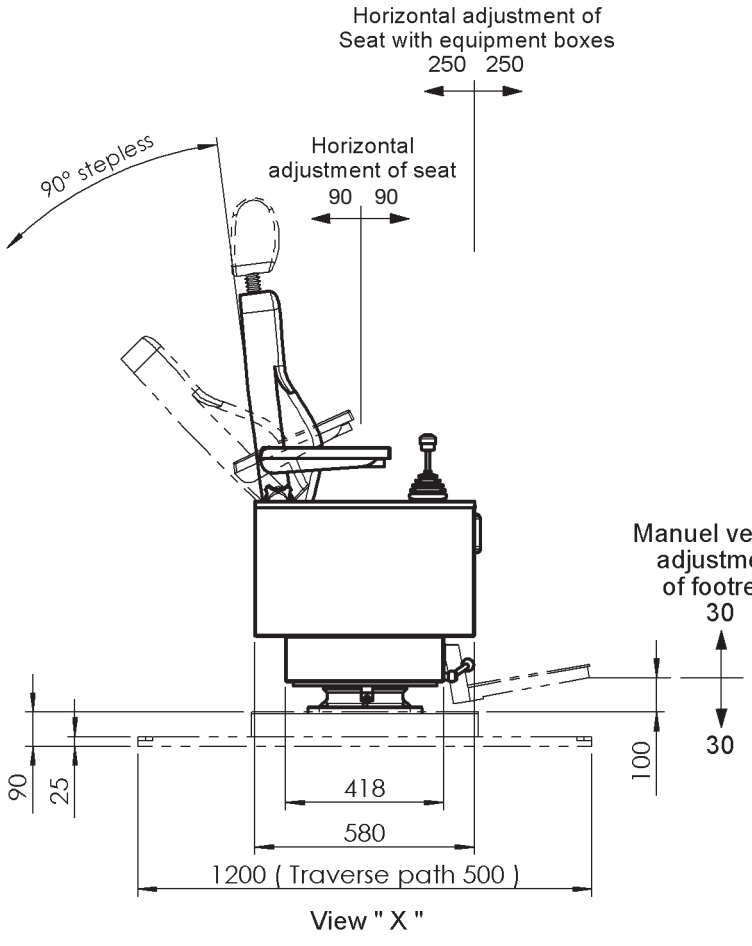
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

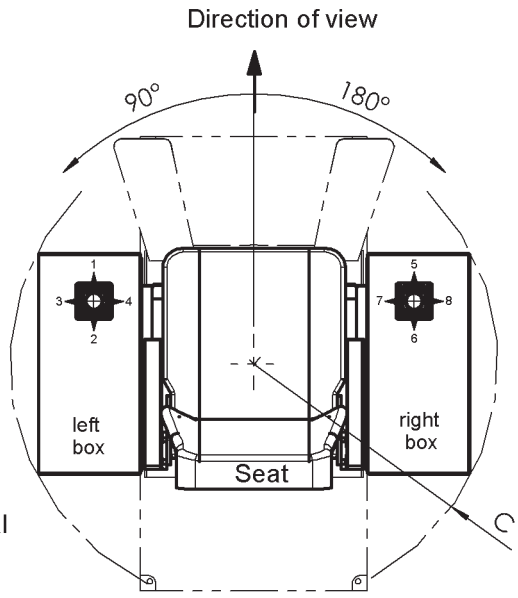
Description data see catalog 5/003/004

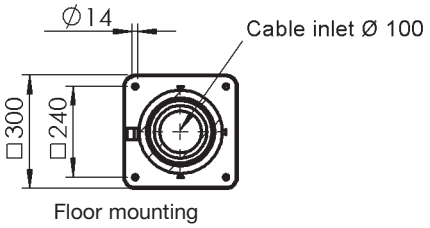
Pos.					Weight kp	Type	Price EURO
1	Crane control unit standard design	Equipment boxes 200 x 580 mm			84	KST 51	
2	Crane control unit standard design	Equipment boxes 270 x 580 mm			88	KST 52	
3							
4	Crane control unit standard design	Equipment boxes 320 x 580 mm			92	KST 54	
5	Crane control unit standard design	Equipment boxes special dimensions				KST 5x	
6	additional variations for driver's seat KFS 6	see catalog 2/134				KFS 6	
7	Driver's seat KFS 9	see catalog 2/140				KFS 9	
8	Driver's seat KFS 10	see catalog 2/142				KFS 10	
9	Monitor mounting support left or right T 478				10		
10	Footrest mounted onto swivel base adjustable ± 30 mm				8		
11							
12	Manual adjustment of equipment boxes horizontal adjustable ± 75 mm						
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm				95		
14	Manual adjustment of control unit vertical (gas loaded spring) adjustable 80 mm				25		
15							
16							
17							
18	Motorized adjustment of control unit swivelling (drive 24 V DC seat height + 30 mm)				8		
19	Heating 2 x 2 kW with ventilator 230 V 50 Hz airvolume ca. 300 m^3/h mounted on the swivel base sidewise						
20	Multi-axis controller	see catalog 1/100					
21	Single-axis controller	see catalog 1/200					
22	Double-handle controller	see catalog 1/160					
23	Control-switch	see catalog 1/220					
24	Command and indicating devices	see catalog 1/360					
30	Terminal block 4 mm^2 without wiring each terminal					KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal					KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long						
33	Additional or subtract price each metre						
40	Special painted						
41	Indicating labels not engraved with 2 or 4 arrows						
42	Engraving, each 10 characters						



Type	Dimension A	Dimension B	Dimension C
KST 51	200	1000	580
KST 52	270	1140	640
KST 54	320	1240	690







Crane control unit KST 6 swivelling manual adjustment

Type KST6KFS92-…

The swivelling crane control unit KST 6 is ergonomically designed and provides a high degree of comfort.

The standard design includes following:

Equipment boxes: plastic PU foam
The equipment boxes with the devices can be vertically and horizontally adjusted together with the armrests. Cabling is run through aduct in the cross-member. (Terminal block).

Seat: Comfortable spring mounted seat KFS 6, with an oilhydraulic vibration absorption system, weight adjustment and air-permeable artificial leather or textil material, with headrest, with armrests.

Adjusting possibilities: Seat horizontally and vertically. Inclination of cushion, backrest and armrest also adjustable. Weight setting for optimum spring suspension.

Cross-member: Steel section, top of which can be raised to lay cabling. The seat can be tilted backwards so that the cable duct in the cross-member is accessible.

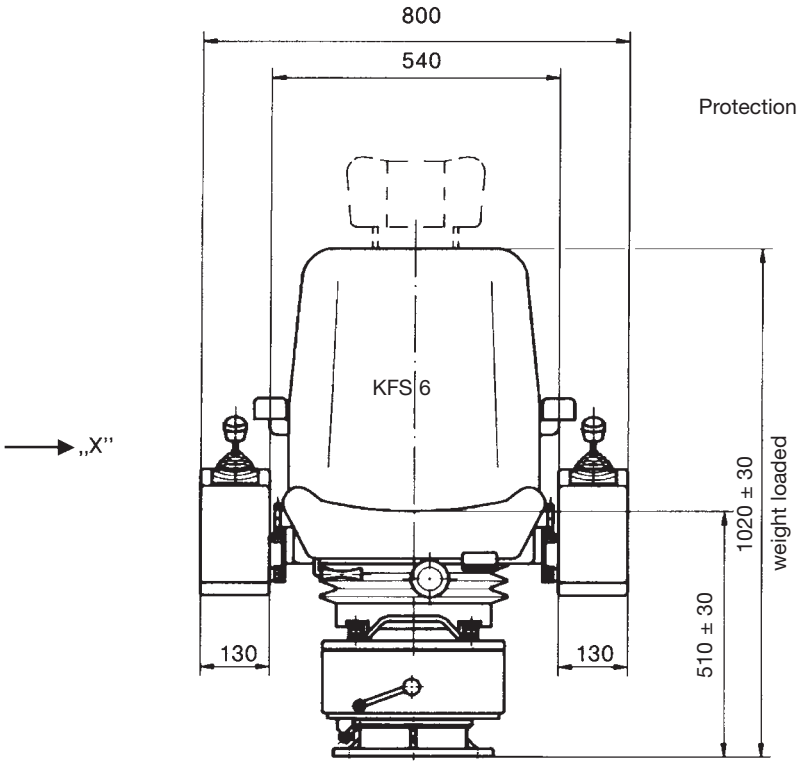
Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

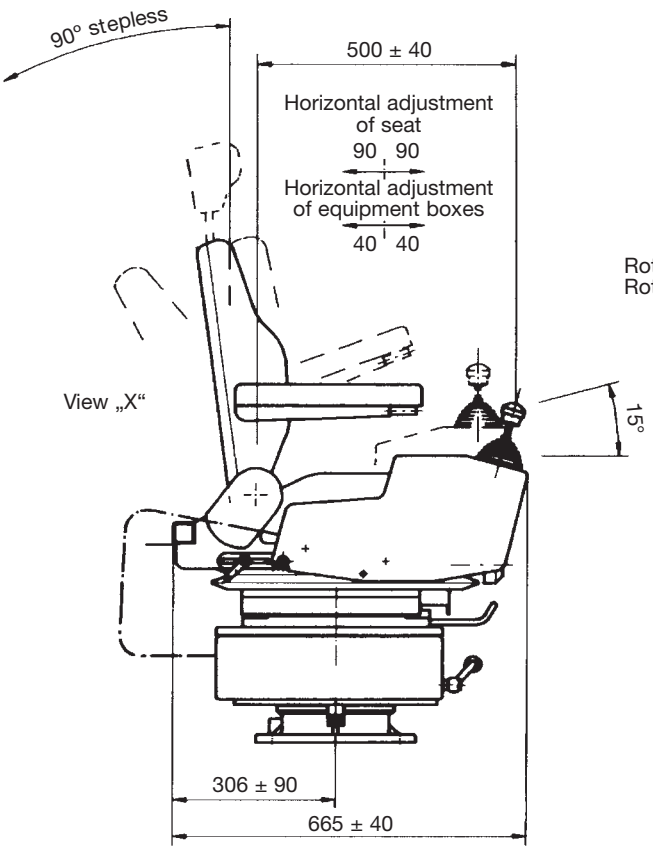
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 9011 black. textured varnish
All non-painted metal parts are electrogalvanized and chromed.

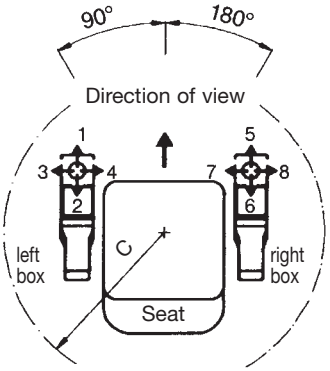
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

Description data see catalog 5/003/004

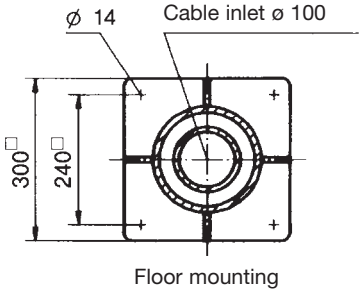
Pos.				Weight kp	Type	Price EURO
1	Crane control unit standard design			48	KST 6	
2	Crane control unit standard design	not swivelled		48	KST 61	
3	Crane control unit standard design	without swivel base and cross-member		38	KST 62	
4						
5						
6	additional variations for driver's seat KFS 6 see catalog 2/134				KFS 6	
7	Driver's seat KFS 9	see catalog 2/140			KFS 9	
8						
9						
10	Footrest mounted onto swivel base adjustable ± 30 mm			8		
11						
12						
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm			95		
14						
15						
16						
17						
18						
19	Heating 2 x 2 kW with ventilator 230 V 50 Hz airvolume ca. 300 m^3/h mounted on the swivel base sidewise					
20	Multi-axis controller	see catalog 1/100				
21	Single-axis controller	see catalog 1/200				
22	Double-handle controller	see catalog 1/160				
23	Control-switch	see catalog 1/220				
24	Command and indicating devices	see catalog 1/360				
30	Terminal block 4 mm^2 without wiring each terminal				KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal				KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long					
33	Additional or subtract price each metre					
40	Special painted					
41	Indicating labels not engraved with 2 or 4 arrows					
42	Engraving, each 10 characters					



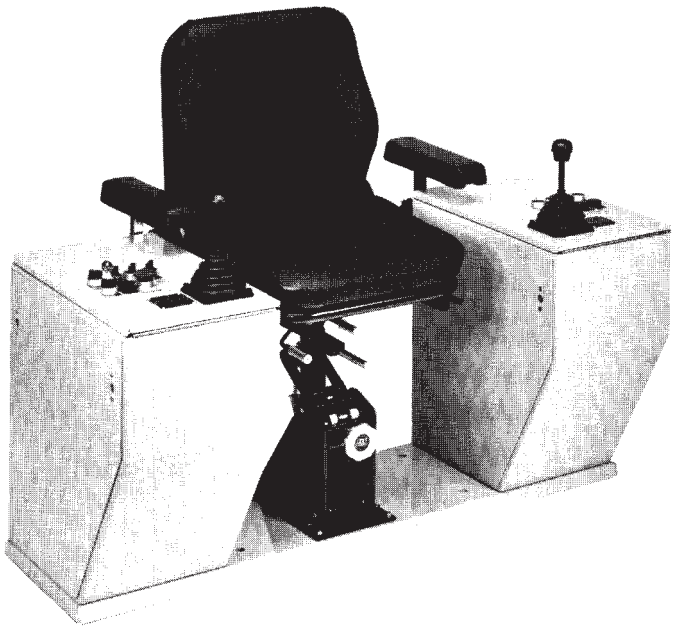




Rotation radius ‚C' - bei minimal adjusting = 520 mm
Rotation radius ‚C' - bei maximal adjusting = 620 mm



Crane control unit KST 7



Type KST72KFS4-…

The crane control unit KST 7 combines in its design the crane driver's seat and the control and monitoring devices. Ready wired, it can be easily and quickly installed in the crane cabin.

Equipment boxes: Sheet steel.
The equipment boxes with the devices fitted have hinged tops that can be locked in position. They contain the termination and connection facilities and a lockable plug-in cover on the inside.

Seat KFS 2: The seat backrest can be tipped forwards and further tipped together with the cushion.
The cushion and seat backrest are padded.

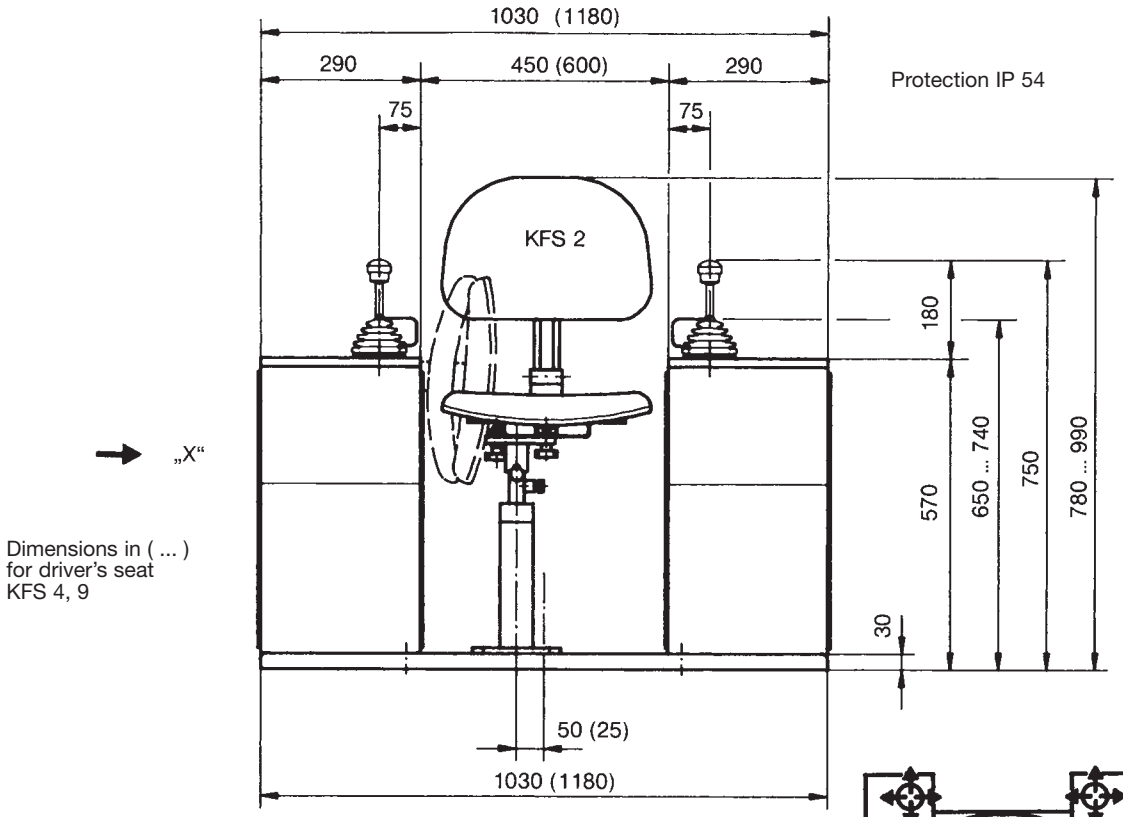
Adjusting possibilities: Cushion horizontally and vertically.
Height adjustment via a gas-loaded spring in the seat base.
Seat backrest horizontally and vertically to the cushion.
Armrests padded and adjustable in height.
Fixed to the equipment boxes.

Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pebble-grey. textured varnish
All non-painted metal parts are electrogalvanized and chromed.

Description data see catalog 5/003/004

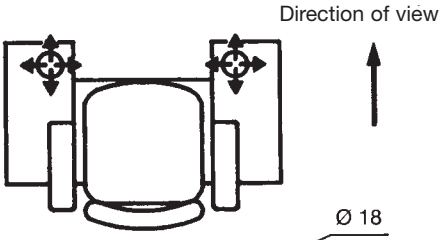
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

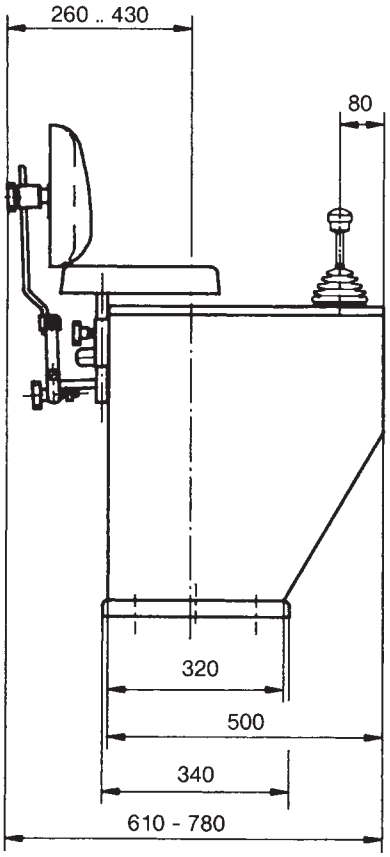
Pos.						Weight kp	Type	Price EURO
1	Crane control unit with driver's seat	KFS 2	with base plate			51	KST 7	
2	Crane control unit with driver's seat	KFS 2	without base plate			46	KST 71	
3	Crane control unit without driver's seat	KFS 2	with base plate			36	KST 72	
4	Crane control unit without driver's seat	KFS 2	without base plate			31	KST 73	
5								
10	Driver's seat	see catalog 2/130					KFS 2	
11								
12	Driver's seat	see catalog 2/132 (picture shows)					KFS 4	
13								
14								
15	Driver's seat	see catalog 2/140					KFS 9	
20	Multi-axis controller	see catalog 1/100						
21	Single-axis controller	see catalog 1/200						
22	Double-handle controller	see catalog 1/160						
23	Control-switch	see catalog 1/220						
24	Command and indicating devices	see catalog 1/360						
25								
30	Terminal block 4 mm^2 without wiring each terminal						KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal						KL	
32	External wiring single wire highly flexible 1,5 mm^2 x 5 metre long							
33	Additional or subtract price each metre							
34								
35								
40	Special painted							
41	Indicating labels not engraved with 2 or 4 arrows							
42	Engraving, each 10 caracters							
43								



Protection IP 54

Dimensions in (...) for driver's seat KFS 4, 9





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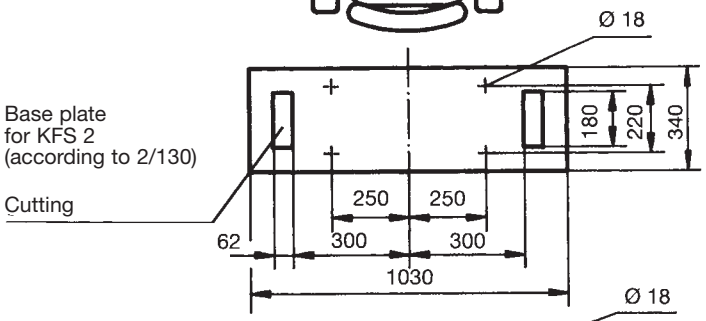
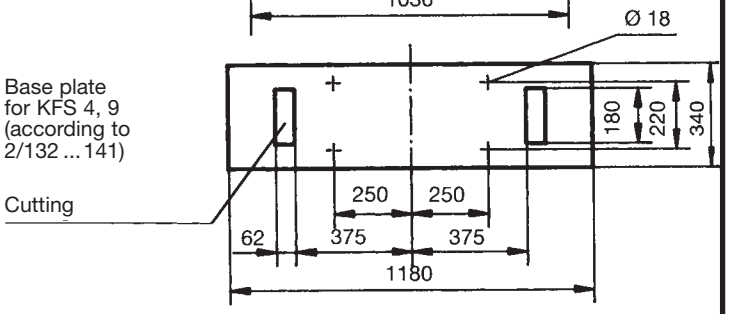
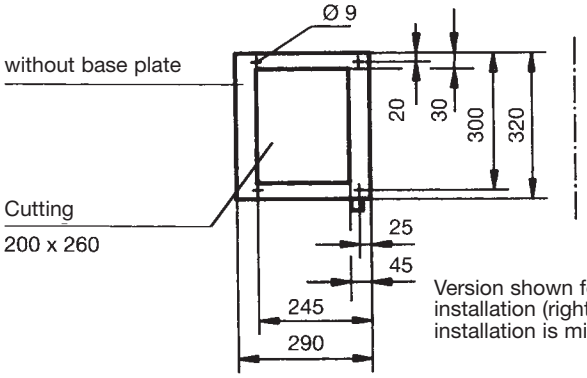






Version shown for left-hand installation (right-hand side installation is mirror image)

Crane control unit KST 75

Type KST75KFS2-…

The crane control unit KST 75 combines in its design the crane driver's seat and the control and monitoring devices. Ready wired, it can be easily and quickly installed in the crane cabin.

Equipment boxes: Sheet steel.
The equipment boxes with the devices fitted have hinged tops that can be locked in position.
They contain the termination and connection facilities and a lockable plug-in cover on the inside.

Seat KFS 2: The seat backrest can be tipped forwards and further tipped together with the cushion.
The cushion and seat backrest are padded.

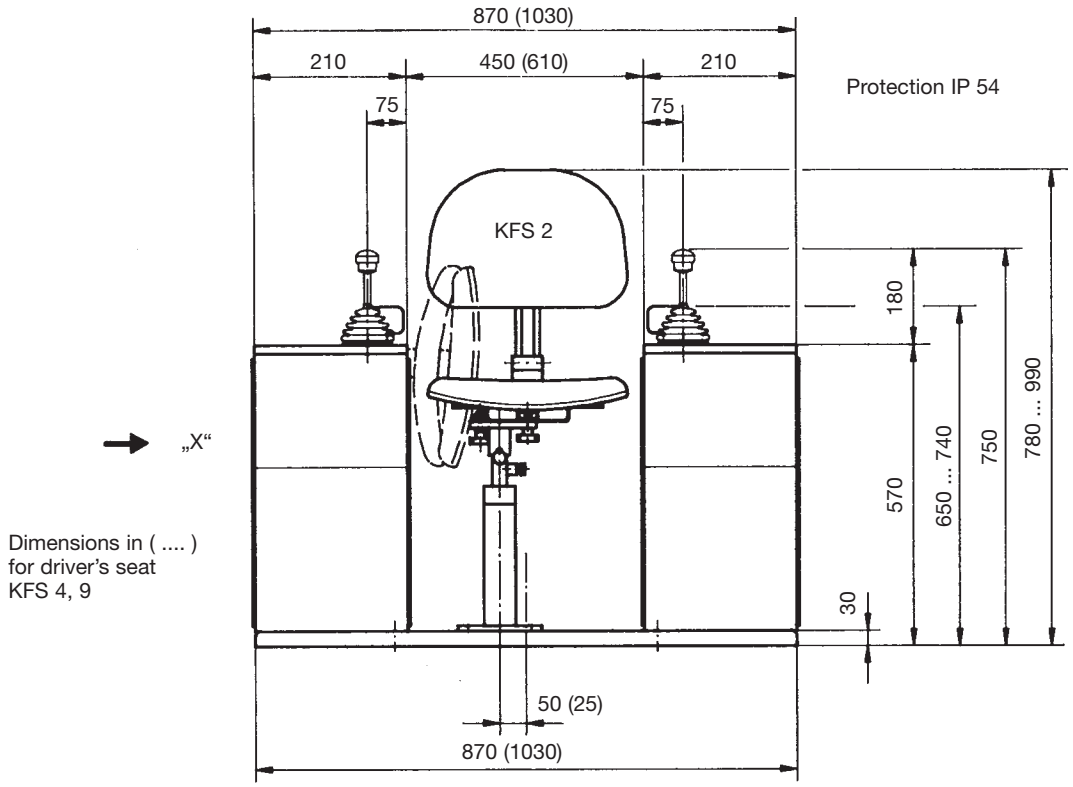
Adjusting possibilities: Cushion horizontally and vertically.
Height adjustment via a gas-loaded spring in the seat base.
Seat backrest horizontally and vertically to the cushion.
Armrests padded and adjustable in height.
Fixed to the equipment boxes.

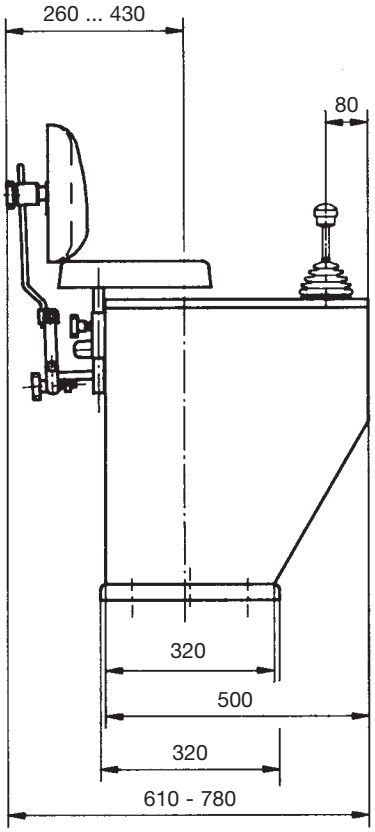
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pebble-grey. textured varnish
All non-painted metal parts are electrogalvanized and chromed.

Description data see catalog 5/003/004

Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

Pos.						Weight kp	Type	Price EURO
1	Crane control unit with driver's seat	KFS 2	with base plate			51	KST 75	
2	Crane control unit with driver's seat	KFS 2	without base plate			46	KST 76	
3	Crane control unit without driver's seat	KFS 2	with base plate			36	KST 77	
4	Crane control unit without driver's seat	KFS 2	without base plate			31	KST 78	
5								
10	Driver's seat	see catalog 2/130 (picture shows)					KFS 2	
11								
12	Driver's seat	see catalog 2/132					KFS 4	
13								
14								
15	Driver's seat	see catalog 2/140					KFS 9	
20	Multi-axis controller	see catalog 1/100						
21	Single-axis controller	see catalog 1/200						
22	Double-handle	see catalog 1/160						
23	Control-switch	see catalog 1/220						
24	Command and indicating devices	see catalog 1/360						
25								
30	Terminal block 4 mm² without wiring each terminal						KL	
31	Terminal block 4 mm² with wiring wire 1,5 mm² each terminal						KL	
32	External wiring single wire highly flexible 1,5 mm² x 5 metre long							
33	Additional or subtract price each metre							
34								
35								
40	Special painted							
41	Indicating labels not engraved with 2 or 4 arrows							
42	Engraving, each 10 characters							
43								





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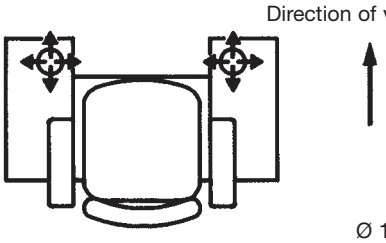
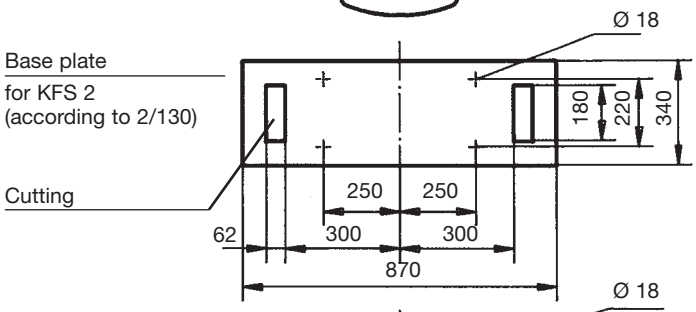
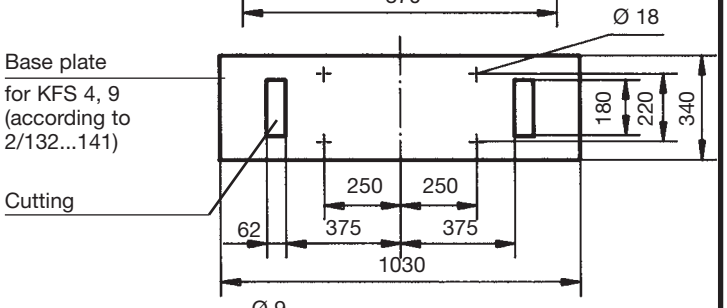
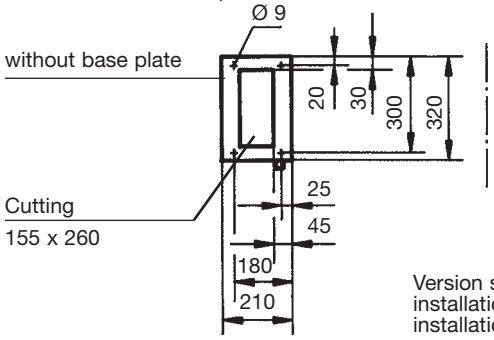








Version shown for left-hand installation (right-hand side installation is mirror image)

Crane control unit KST 8 swivelling manual adjustment

Type KST8KFS62-…

The swivelling crane control unit KST 8 is ergonomically designed and provides a high degree of comfort.

The standard design includes following:

Equipment boxes: plastic PU foam
The equipment boxes with the devices can be vertically and horizontally adjusted together with the armrests. Cabling is run through aduct in the cross-member. (Terminal block).

Seat: Comfortable spring mounted seat KFS 6, with an oilhydraulic vibration absorption system, weight adjustment and air-permeable artificial leather or textil material.

Adjusting possibilities: Seat horizontally and vertically.
Inclination of cushion, backrest and armrest also adjustable.
Weight setting for optimum spring suspension.
Right equipment box turnable.

Cross-member: Steel section, top of which can be raised to lay cabling. The seat can be tilted backwards so that the cable duct in the cross-member is accessible.

Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

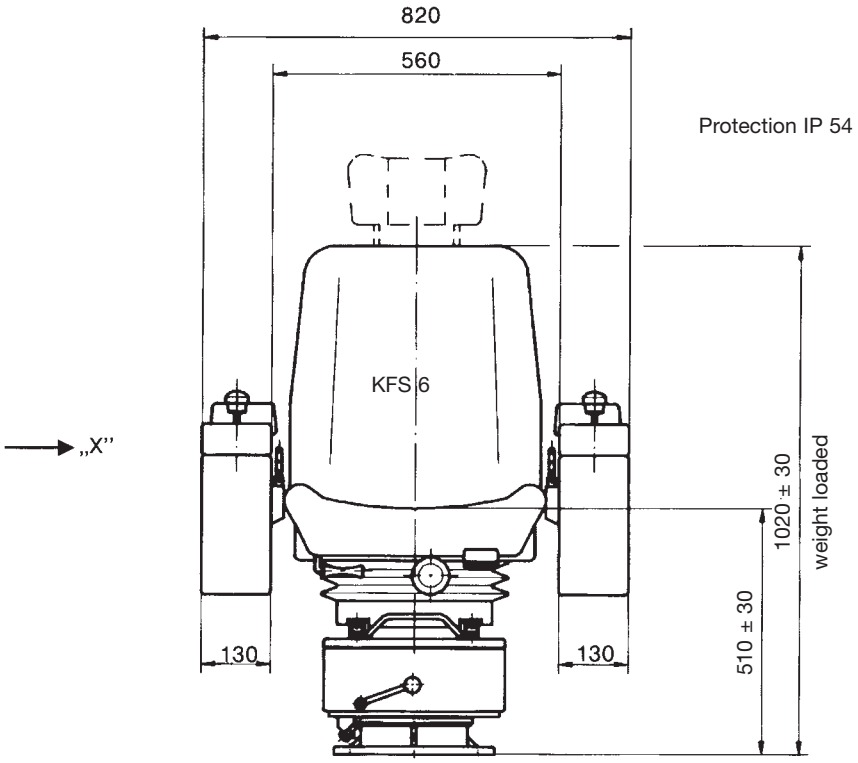
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 9011 black.
textured varnish
All non-painted metal parts are electrogalvanized and chromed.

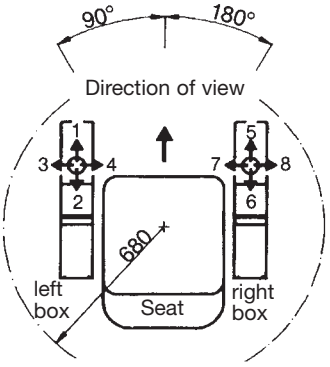
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

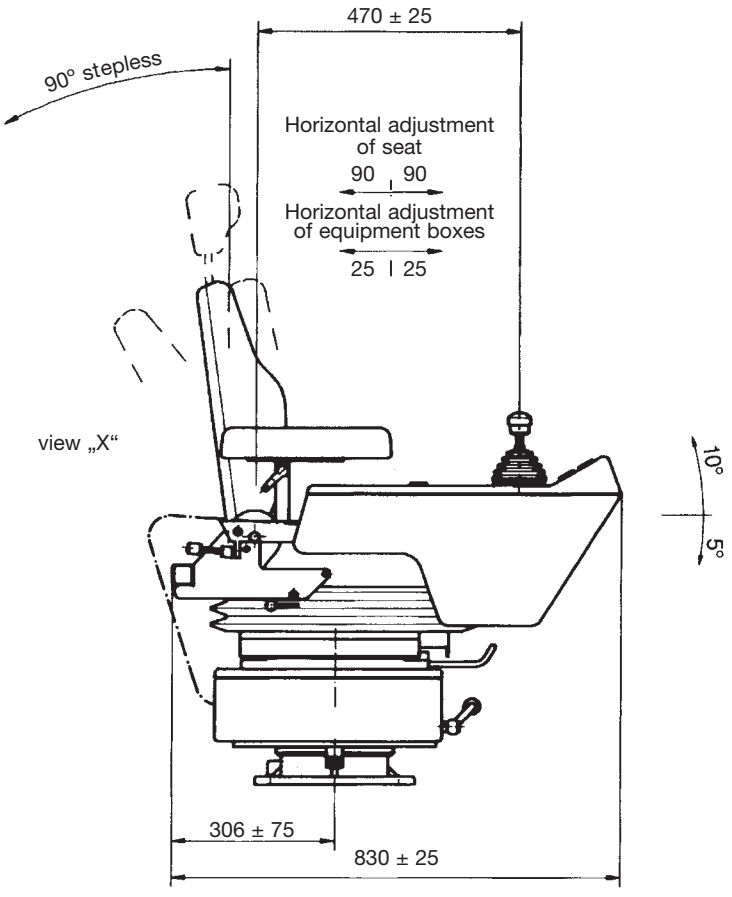
Description data see catalog 5/005

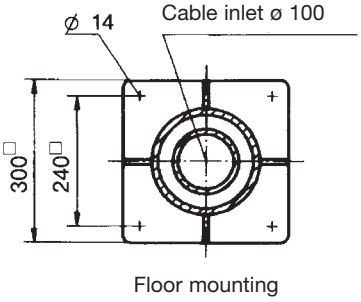
Pos.				Weight kp	Type	Price EURO
1	Crane control unit standard design			48	KST 8	
2	Crane control unit standard design	not swivelled		48	KST 81	
3	Crane control unit standard design	without swivel base and cross-member		38	KST 82	
4						
5						
6	additional variations for driver's seat KFS 6 see catalog 2/134				KFS 6	
7	Driver's seat KFS 9	see catalog 2/140			KFS 9	
8						
9						
10	Footrest mounted onto swivel base adjustable ± 30 mm			8		
11						
12						
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm			95		
14						
15						
16						
17						
18						
19	Heating 2 x 2 kW with ventilator 230 V 50 Hz airvolume ca. 300 m^3/h mounted on the swivel base sidewise					
20	Multi-axis controller	see catalog 1/100				
21	Single-axis controller	see catalog 1/200				
22	Double-handle controller	see catalog 1/160				
23	Control-switch	see catalog 1/220				
24	Command and indicating devices	see catalog 1/360				
30	Terminal block 4 mm^2 without wiring each terminal				KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal				KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long					
33	Additional or subtract price each metre					
40	Special painted					
41	Indicating labels not engraved with 2 or 4 arrows					
42	Engraving, each 10 characters					

Crane control unit KST 8 swivelling manual adjustment









Crane control unit KST 85
manual adjustment

Type KST85KFS8-…

The crane control unit KST 85 is ergonomically designed and provides a high degree of comfort.

The standard design includes following.

Equipment boxes: plastic PU foam
The equipment boxes with the devices can be vertically and horizontally adjusted together with the armrest. Cabling is run through aduct on the terminal block. (The terminal block housing is mounting behind the seat)

Seat: Comfortable static mounted seat KFS 8, covered with air-permeable artificial leather or with textil material and with roller-bearing swivel system, with headrest.

Adjusting possibilities: Seat horizontally and vertically.
Inclination of cushion, backrest and armrest also adjustable.
Seat with the equipment boxes swivelled 90° one sided.
Endpoints to look. Right equipment box turnable.

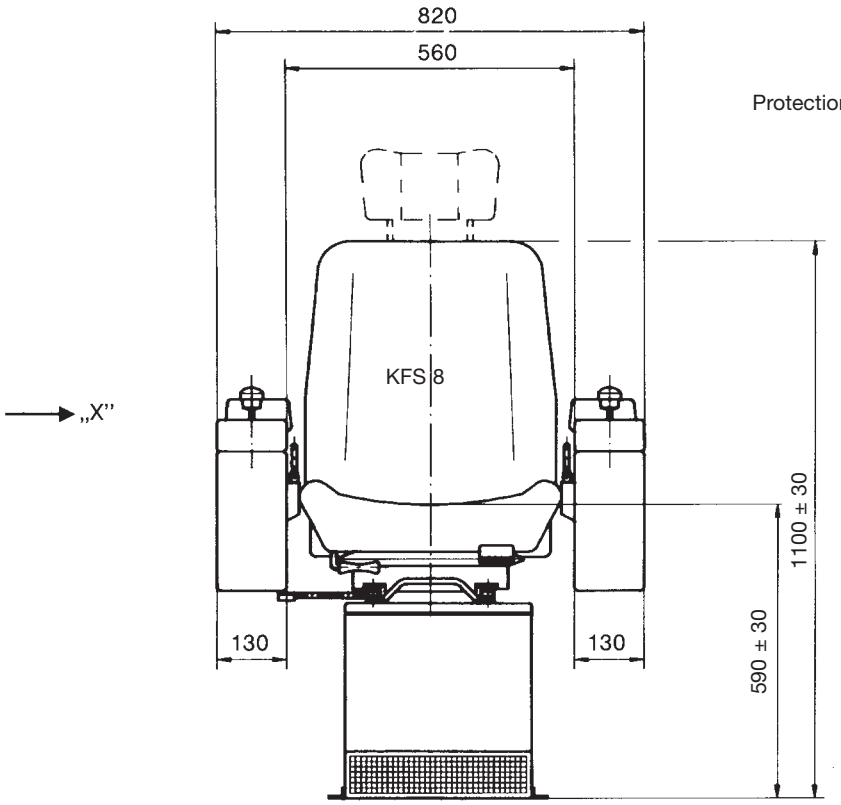
Console: Heating 2 steps 2 x 2 kW 380 V AC
Ventilator 380 V AC air volume ca 1000 m^3/h air circulation (opening in the rear side of the console) fresh air circulation (opening in the underside of the console). Selector switch for heating/ventilator are in the box. The seat can be tilted forward to reach the terminal block of the heating / ventilator.

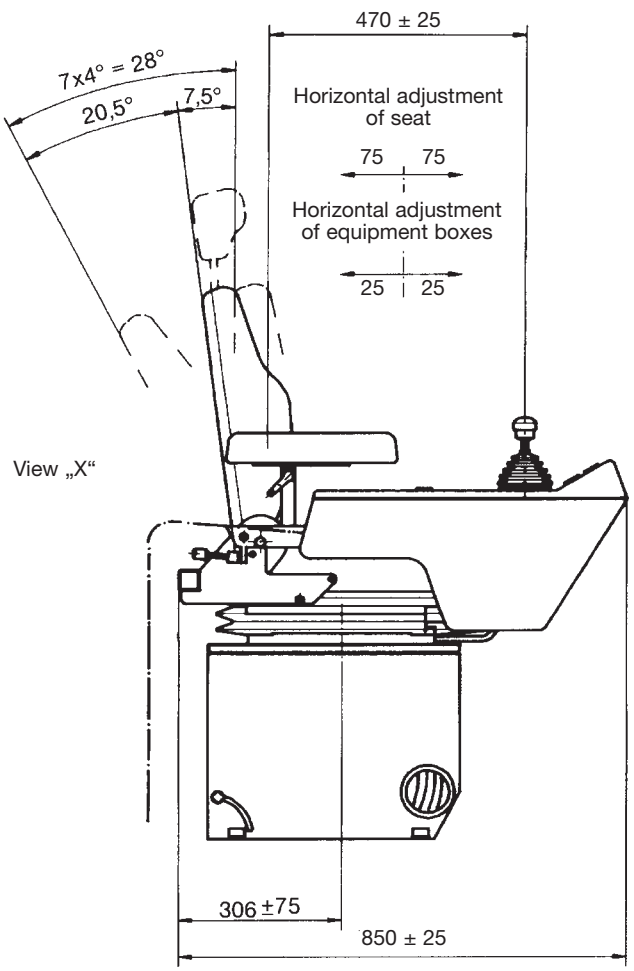
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 9011 black.
textured varnish
All non-painted metal parts are electrogalvanized and chromed.

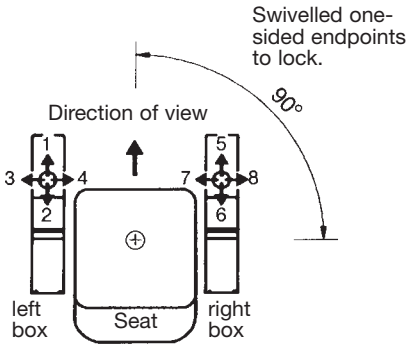
Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

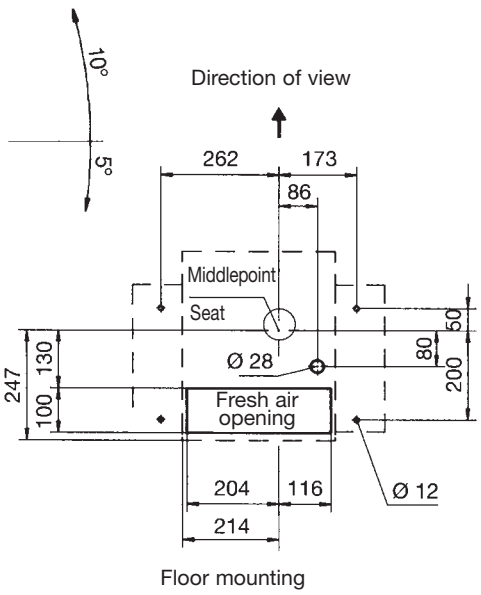
Description data see catalog 5/005

Pos.				Weight kp	Type	Price EURO
1	Crane control unit standard design with heating/ventilator			48	KST 85	
2						
3	Crane control unit standard design without heating/ventilator			45	KST 87	
4						
5						
6	additional variations for driver's seat KFS 8 see catalog 2/138				KFS 8	
7						
8						
9						
10	Footrest mounted onto console adjustable ± 30 mm			8		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20	Multi-axis controller see catalog 1/100					
21	Single-axis controller see catalog 1/200					
22	Double-handle controller see catalog 1/160					
23	Control-switch see catalog 1/220					
24	Command and indicating devices see catalog 1/360					
30	Terminal block 4 mm^2 without wiring each terminal				KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal				KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long					
33	Additional or subtract price each metre					
40	Special painted					
41	Indicating labels not engraved with 2 or 4 arrows					
42	Engraving, each 10 characters					









Floor mounting

Crane control unit KST 9 swivelling manual adjustment

Type KST9KFS92-…

The swivelling crane control unit KST 9 is ergonomically designed and provides a high degree of comfort.

The standard design includes following:

Equipment boxes: plastic PU foam
The equipment boxes with the devices can be vertically and horizontally adjusted together with the armrests. Cabling is run through aduct in the cross-member. (Terminal block).

Seat: Comfortable spring mounted seat KFS 6, with an oilhydraulic vibration absorption system, weight adjustment and air-permeable artificial leather or textil material, with headrest.

Adjusting possibilities: Seat horizontally and vertically.
Inclination of cushion, backrest and armrest also adjustable.
Weight setting for optimum spring suspension.
Right equipment box turnable.

Cross-member: Steel section, top of which can be raised to lay cabling. The seat can be tilted backwards so that the cable duct in the cross-member is accessible.

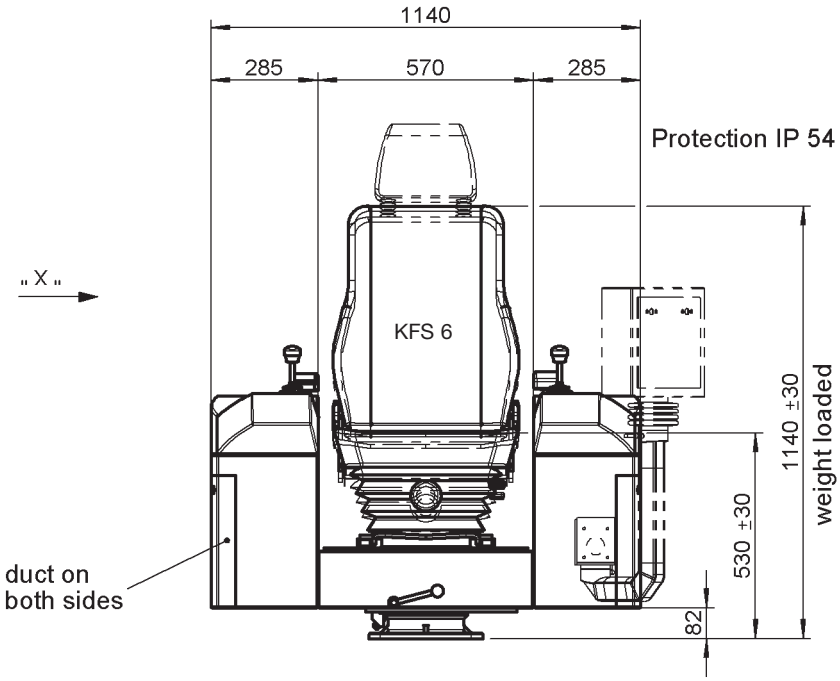
Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

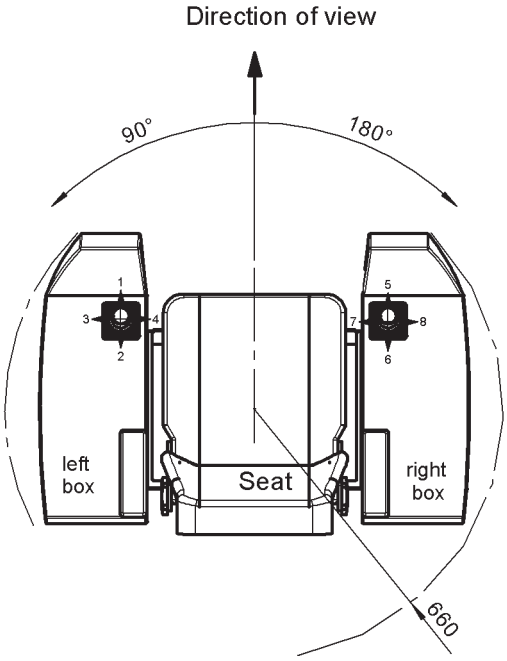
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 9011 black.
textured varnish
All non-painted metal parts are electrogalvanized and chromed.

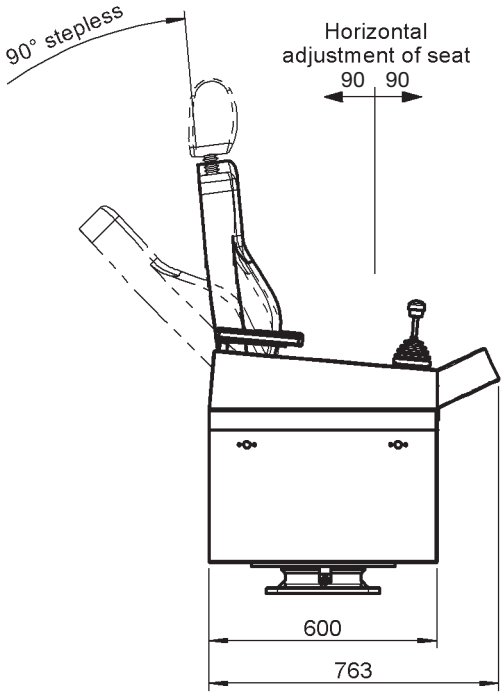
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

Description data see catalog 5/006/007

Pos.				Weight kp	Type	Price EURO
1	Crane control unit standard design			48	KST 9	
2						
3						
4						
5						
6	additional variations for driver's seat KFS 6	see catalog 2/134			KFS 6	
7	Driver's seat KFS 9	see catalog 2/140			KFS 9	
8	Driver's seat KFS 10	see catalog 2/142			KFS 10	
9	Monitor mounting support left or right T 478			10		
10	Footrest mounted onto swivel base adjustable ± 30 mm			8		
11						
12						
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm					
14	Manual adjustment of control unit vertical (gas loaded spring) adjustable 80 mm					
15						
16						
17						
18	Motorized adjustment of control unit swivelling (drive 24 V DC, seat height + 30 mm)					
19						
20	Multi-axis controller	see catalog 1/100				
21	Single-axis controller	see catalog 1/200				
22	Double-handle controller	see catalog 1/160				
23	Control-switch	see catalog 1/220				
24	Command and indicating devices	see catalog 1/360				
30	Terminal block 4 mm2 without wiring each terminal				KL	
31	Terminal block 4 mm2 with wiring wire 1,5 mm2 each terminal				KL	
32	External wiring single wire highly flexible 1,5 mm2 5 metre long					
33	Additional or subtract price each metre					
40	Special painted					
41	Indicating labels not engraved with 2 or 4 arrows					
42	Engraving, each 10 characters					







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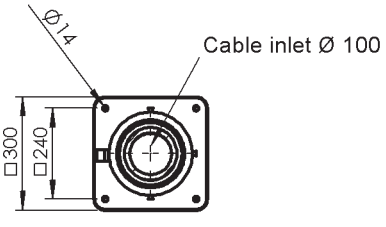


Floor mounting

Crane control unit KST 10 swivelling manual adjustment

Type KST10KFS6-…

The swivelling crane control unit KST 10 is ergonomically designed and provides a high degree of comfort.

The standard design includes following:

Equipment boxes: plastic PU foam
The equipment boxes with the devices can be vertically and horizontally adjusted together with the armrests. Cabling is run through aduct in the cross-member. (Terminal block).

Seat: Comfortable spring mounted seat KFS 6, with an oilhydraulic vibration absorption system, weight adjustment and air-permeable artificial leather or textil material, with headrest.

Adjusting possibilities: Seat horizontally and vertically. Inclination of cushion, backrest and armrest also adjustable. Weight setting for optimum spring suspension.

Cross-member: Steel section, top of which can be raised to lay cabling. The seat can be tilted backwards so that the cable duct in the cross-member is accessible.

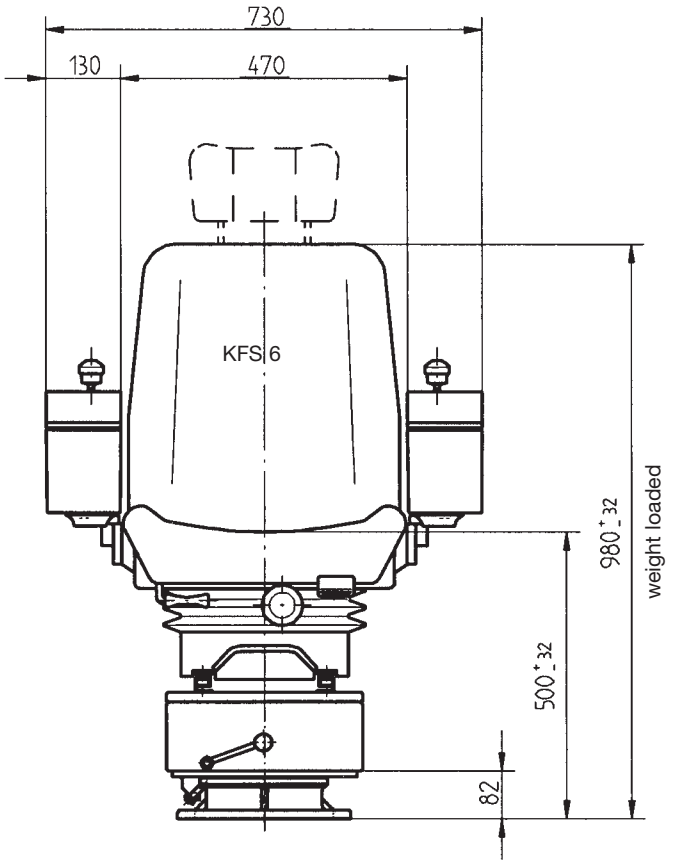
Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

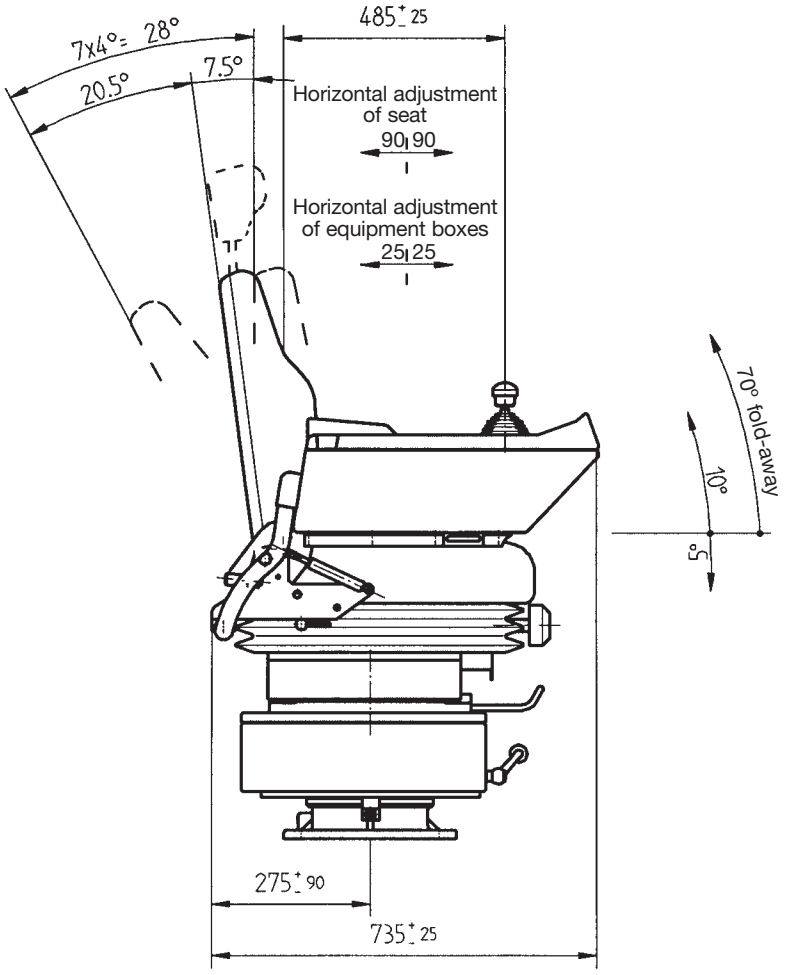
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 9011 black.
textured varnish
All non-painted metal parts are electrogalvanized and chromed.

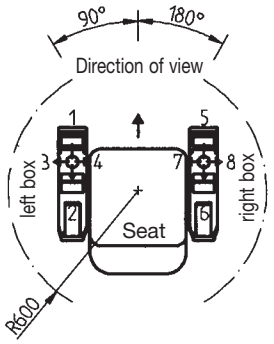
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

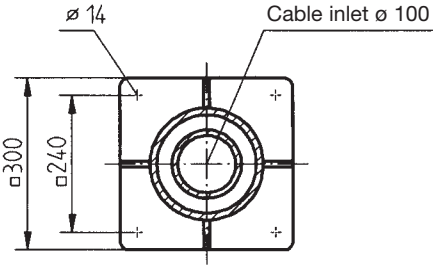
Description data see catalog 5/008

Pos.					Weight kp	Type	Price EURO
1	Crane control unit standard design				48	KST 10	
2	Crane control unit standard design	not swivelled			48	KST 101	
3	Crane control unit standard design	without swivel base and cross-member			38	KST 102	
4							
5							
6	additional variations for driver's seat KFS 6 see catalog 2/134					KFS 6	
7							
8							
9							
10	Footrest mounted onto swivel base adjustable ± 30 mm				8		
11							
12							
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm				95		
14							
15							
16							
17							
18							
19	Heating 2 x 2 kW with ventilator 230 V 50 Hz airvolume ca. 300 m^3/h mounted on the swivel base sidewise						
20	Multi-axis controller	see catalog 1/110					
21	Multi-axis controller	see catalog 1/130					
22	Double-handle controller	see catalog 1/162					
23	Control-switch	see catalog 1/220					
24	Command and indicating devices	see catalog 1/360					
30	Terminal block 4 mm^2 without wiring each terminal					KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal					KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long						
33	Additional or subtract price each metre						
40	Special painted						
41	Indicating labels not engraved with 2 or 4 arrows						
42	Engraving, each 10 characters						









Floor mounting

Crane control unit KST 15 swivelling manual and/or motorized adjustment

Type KST15XKFS92-…

Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

The swivelling crane control unit KST 15 is ergonomically designed and provides a high degree of comfort.

The standard design includes following:

Equipment boxes: Sheet steel. The top panel of the equipment box with the devices can be raised and locked in position. The terminal strip is easily accessible via an opening on the inside that can be closed with a lockable cover. The external wiring is run through aduct from the equipment boxes in the cross-member.

Seat: Comfortable spring mounted seat KFS 10, with a pneumatic vibration absorption system by compressor 24 V DC, weight adjustment and airpermeable artificial leather or textil material, with headrest, with armrests.

Manual adjustments: Seat horizontally and vertically. Inclination of cushion, backrest and armrest also adjustable. Weight setting for optimum spring suspension.

Motorized adjustments: Seat with equipment boxes vertical (inclinations adjustments forward/backward). Seat with equipment boxes horizontal. Selector switches for motorized-drives are in the equipment box. Motor 24 V DC ca. 15 ampere.

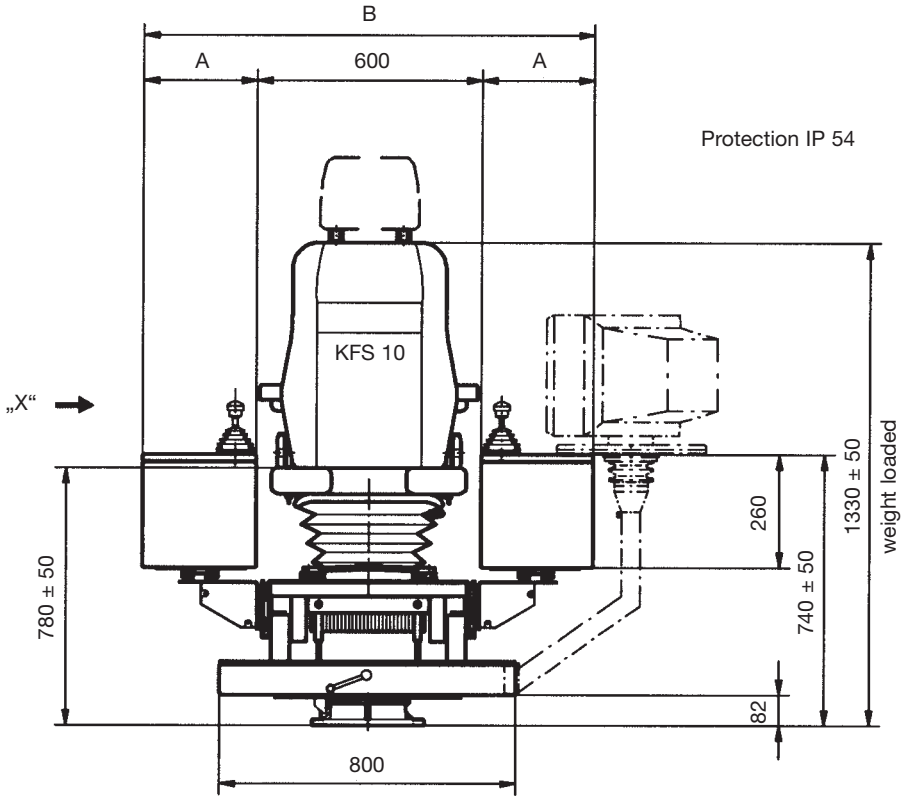
Cross-member: Steel section, top of which can be raised to lay cabling. The seat with the boxes can be tilted forwards so that the cable duct in the cross-member is accessible.

Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

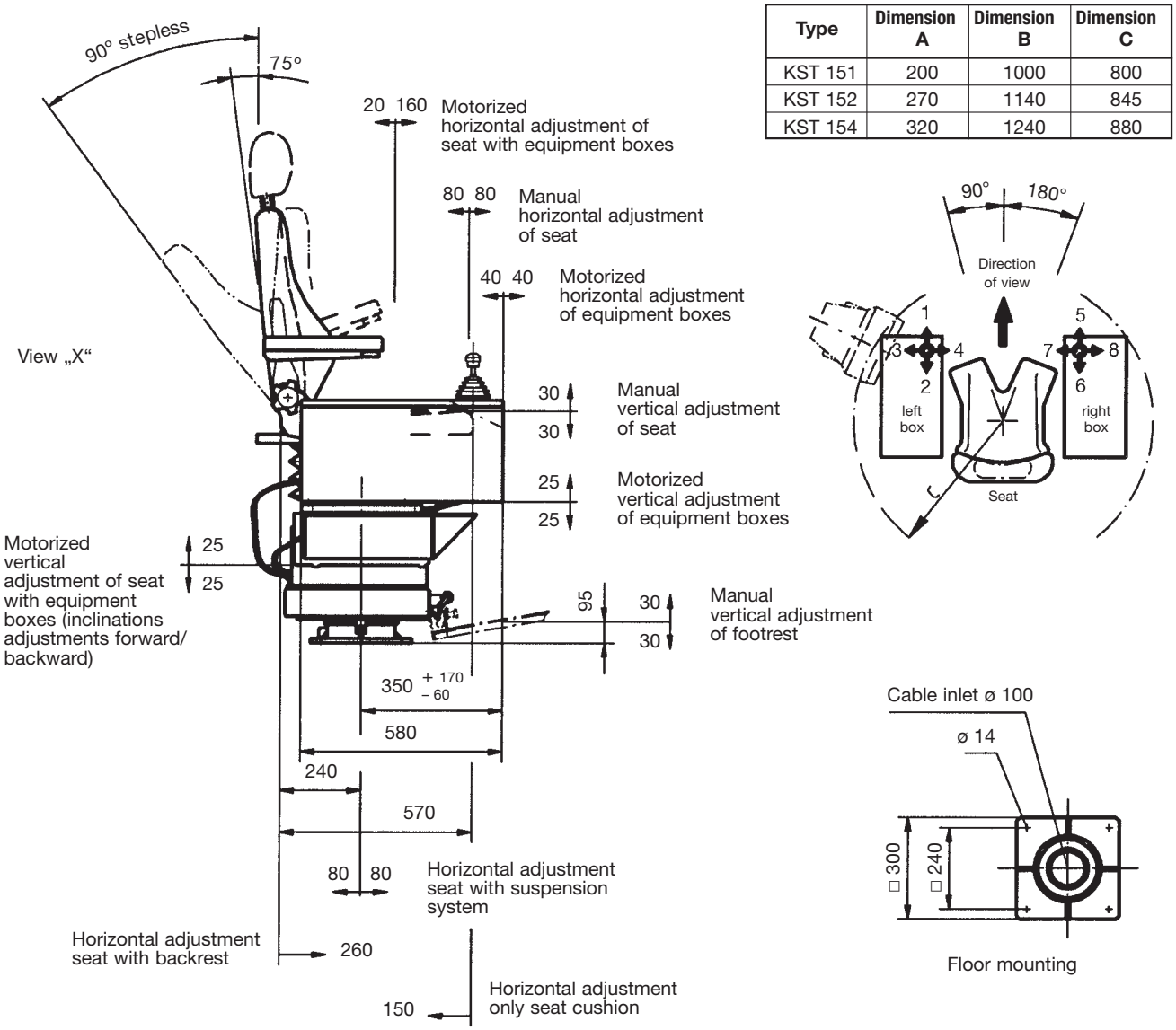
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pepple-grey. textured varnish
All non-painted metal parts are electrogalvanized and chromed.

Description data see catalog 5/003/004

Pos.					Weight kp	Type	Price EURO
1	Crane control unit standard design	Equipment boxes 200 x 580 mm			236	KST 151	
2	Crane control unit standard design	Equipment boxes 270 x 580 mm			240	KST 152	
3							
4	Crane control unit standard design	Equipment boxes 320 x 580 mm			244	KST 154	
5	Crane control unit standard design	Equipment boxes special dimensions				KST 15x	
6	additional variations for driver's seat KFS 10	see catalog 2/142				KFS 10	
7	Driver's seat KFS 6	see catalog 2/134				KFS 6	
8	Driver's seat KFS 9	see catalog 2/140				KFS 9	
9	Monitor mounting support left or right				10		
10	Footrest (required) mounted onto swivel base adjustable ± 30 mm				8		
11							
12							
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm				95		
14							
15	Motorized adjustment of equipment boxes vertical adjustable ± 25 mm 24 V DC						
16	Motorized adjustment of equipment boxes horizontal adjustable ± 40 mm 24 V DC						
17							
18	Motorized adjustment of control unit swivelling (drive 24 V DC, seat height + 70 mm)				18		
19	Heating 2 x 2 kW with ventilator 230 V 50 Hz airvolume ca. 300 m^3/h mounted on the swivel base sidewise						
20	Multi-axis controller	see catalog 1/100					
21	Single-axis controller	see catalog 1/200					
22	Double-handle controller	see catalog 1/160					
23	Control-switch	see catalog 1/220					
24	Command and indicating devices	see catalog 1/360					
30	Terminal block 4 mm^2 without wiring each terminal					KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal					KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long						
33	Additional or subtract price each metre						
40	Special painted						
41	Indicating labels not engraved with 2 or 4 arrows						
42	Engraving, each 10 characters						



Type	Dimension A	Dimension B	Dimension C
KST 151	200	1000	800
KST 152	270	1140	845
KST 154	320	1240	880



Crane control unit KST 18 swivelling manual and/or motorized adjustment

Type KST181KFS92-…

Permissible ambient temperature	Operation -40° C to +60° C
	Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

The swivelling crane control unit KST 18 is ergonomically designed and provides a high grade of comfort.

The standard design includes following:

Equipment boxes: Sheet steel. The top panel of the equipment box with the devices can be raised and locked in position and is provided with armrests. Cabling is run through aduct from the equipment boxes in the cross-member. (Terminal block).

Seat: Comfortable spring mounted seat KFS 9, with an oilhydraulic vibration absorption system, weight adjustment and airpermeable artificial leather or textil material, with headrest.

Manual adjustments: Seat horizontally and vertically.
Inclination of cushion, backrest and armrest also adjustable.
Weight setting for optimum spring suspension.
Equipment boxes horizontally and vertically.

Motorized adjustments: Seat with equipment boxes vertical (inclinations adjustments forward/backward).
Seat with equipment boxes horizontal.
Selector switches for motorized-drives are in the equipment box.
Motor 24 V DC ca. 15 ampere.

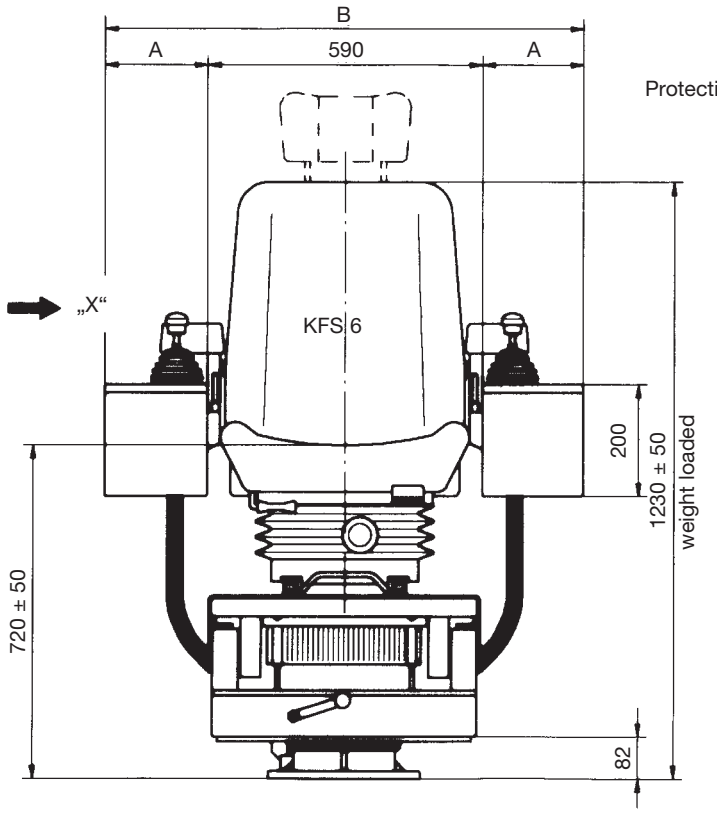
Cross-member: Steel section, top of which can be raised to lay cabling. The seat with the boxes can be tilted forwards so that the cable duct in the cross-member is accessible.

Swivel base: Zero-end-float spring-loaded bearing. Rotational movement 180° right, 90° left, stopped by friction brake.

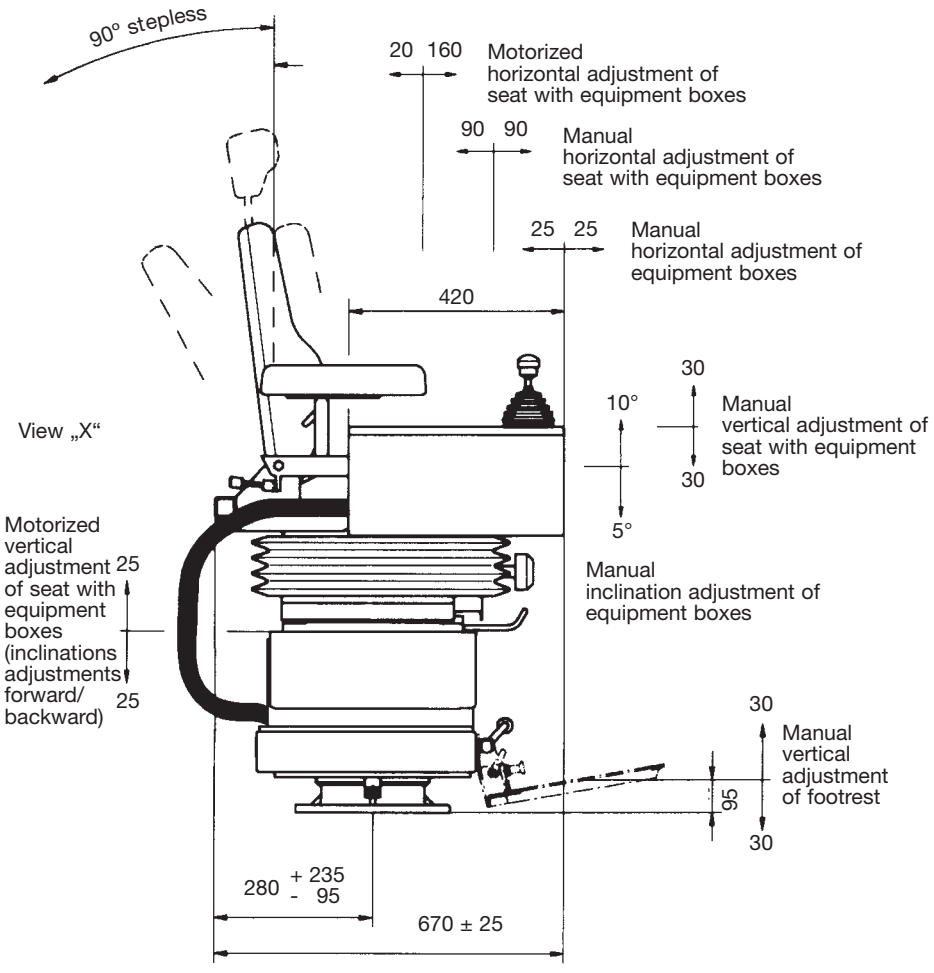
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pepple-grey. textured varnish
All non-painted metal parts are electrogalvanized and chromed.

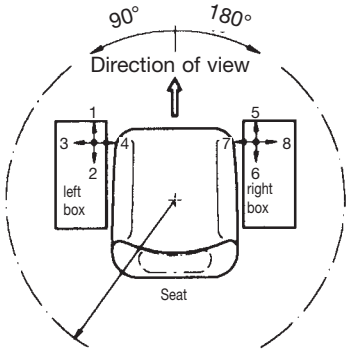
Description data see catalog 5/003/004

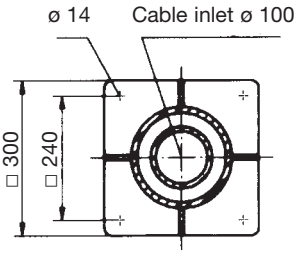
Pos.					Weight kp	Type	Price EURO
1	Crane control unit standard design	Equipment boxes 160 x 420 mm			148	KST 181	
2	Crane control unit standard design	Equipment boxes 200 x 420 mm			150	KST 182	
3							
4							
5	Crane control unit standard design	Equipment boxes special dimensions				KST 18x	
6	additional variations for driver's seat KFS 6	see catalog 2/134				KFS 6	
7	Driver's seat KFS 9	see catalog 2/140				KFS 9	
8							
9							
10	Footrest (required) mounted onto swivel base adjustable ± 30 mm				8		
11							
12							
13	Plate for horizontal manual adjustment of control unit adjustable ± 250 mm				95		
14							
15							
16							
17							
18	Motorized adjustment of control unit swivelling (drive 24 V DC, seat height + 30 mm)				16		
19	Heating 2 x 2 kW with ventilator 230 V 50 Hz airvolume ca. 300 m^3/h mounted on the swivel base sidewise						
20	Multi-axis controller	see catalog 1/100					
21	Single-axis controller	see catalog 1/200					
22	Double-handle controller	see catalog 1/160					
23	Control-switch	see catalog 1/220					
24	Command and indicating devices	see catalog 1/360					
30	Terminal block 4 mm^2 without wiring each terminal					KL	
31	Terminal block 4 mm^2 with wiring wire 1,5 mm^2 each terminal					KL	
32	External wiring single wire highly flexible 1,5 mm^2 5 metre long						
33	Additional or subtract price each metre						
40	Special painted						
41	Indicating labels not engraved with 2 or 4 arrows						
42	Engraving, each 10 characters						



Type	Dimension A	Dimension B	Dimension C
KST 181	160	910	<625 >815
KST 182	200	990	<655 >835







Floor mounting

Driver's seat KFS 2

Type KFS2

The crane driver's seat KFS 2 has stepless high adjustment by means of a gas-loaded spring.

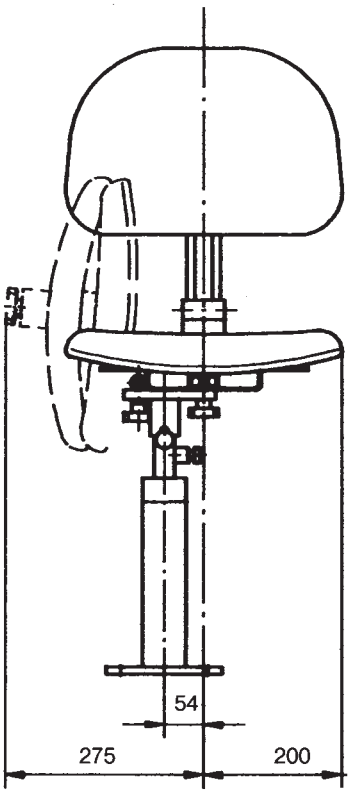
The backrest can be tilted, forwards onto the cushion, which in turn can then be tilted 90° sideways.

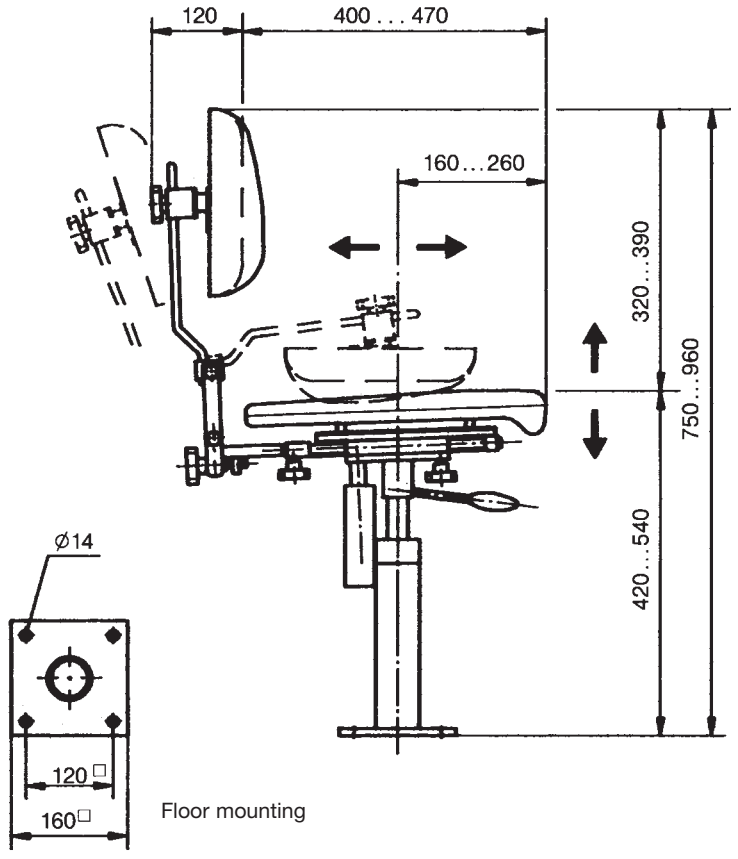
All these functions are performed easily via levers.

The metal parts are protected against corrosion and painted black.

Technical details:

Horizontal adjustment	100 mm
Backrest adjustment, fine control inclination backwards	max. 10°
Height adjustment	120 mm

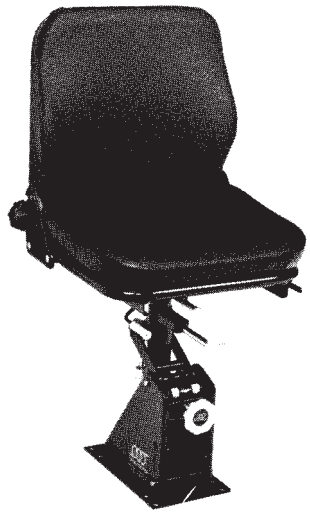




Floor mounting

Pos.				Weight kp	Type	Price EURO
1	Driver's seat with air-permeable artificial leather cover black			15	KFS 21	
2	Driver's seat with textil cover grey / black			14	KFS 22	
3						
4						
5						
6						
7						
8						
9						
10						

Driver's seat KFS 4



Type KFS4

The crane driver's seat KFS 4 has stepless high adjustment by means of a gas-loaded spring and an oilhydraulic vibration absorption system with weight adjustment.

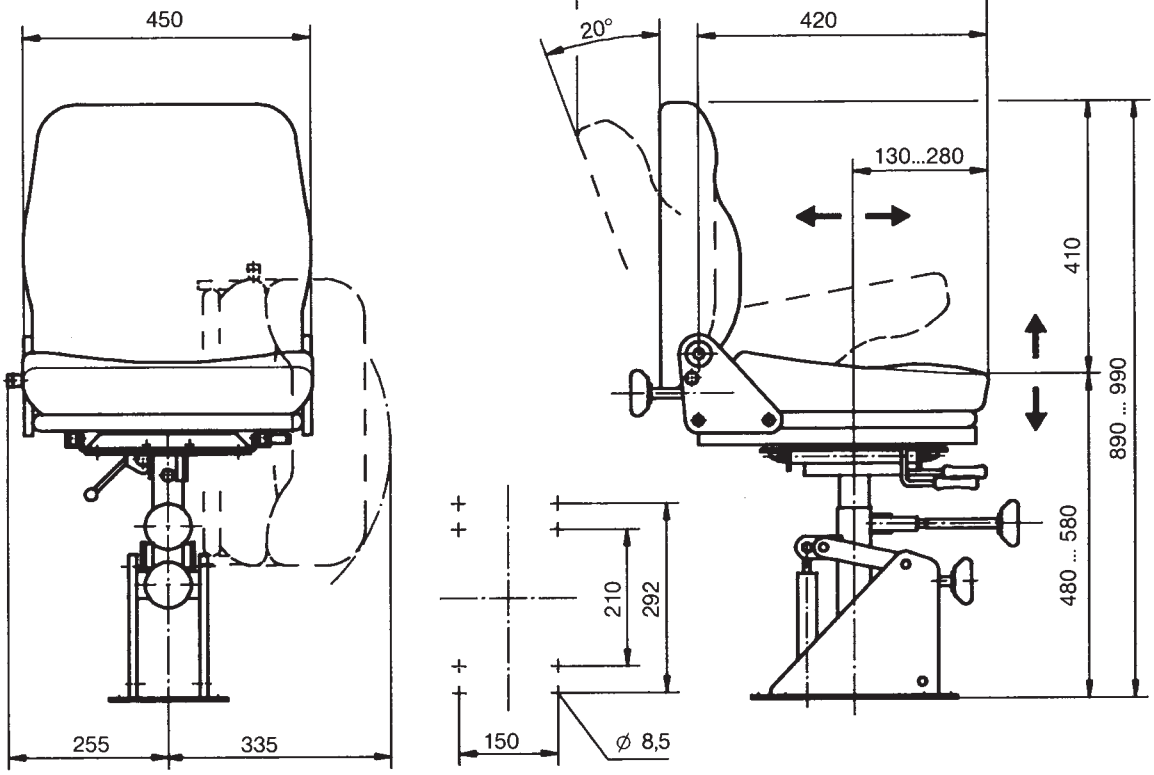
The backrest can be tilted, forwards onto the cushion, which in turn can then be tilted 90° sideways.

All these functions are performed easily via levers.

The metal parts are protected against corrosion and painted black.

Technical details:

Suspension stoke	80 mm
Weight adjustment	50-130 kg
Horizontal adjustment	150 mm
Backrest adjustment, fine control inclination backwards	max. 20°
Height adjustment	100 mm



Floor mounting

Pos.				Weight kp	Type	Price EURO
1	Driver's seat with air-permeable artificial leather cover black			24	KFS 41	
2	Driver's seat with textil cover grey / black			24	KFS 42	
3						
4	Armrest fully adjustable (2 pieces) 50 mm wide					
5	Armrest fully adjustable (2 pieces) 100 mm wide					
6						
7						
8						
9						
10						

Driver's seat KFS 6

Type KFS62-2-5-6-24

The crane driver's seat KFS 6 is ergonomically designed and provides a high grade of comfort.

The driver's seat is a low level mechanical suspension seat with an oilhydraulic vibration absorption system with weight adjustment.

All adjustment controls are positioned ergonomically within easy access.

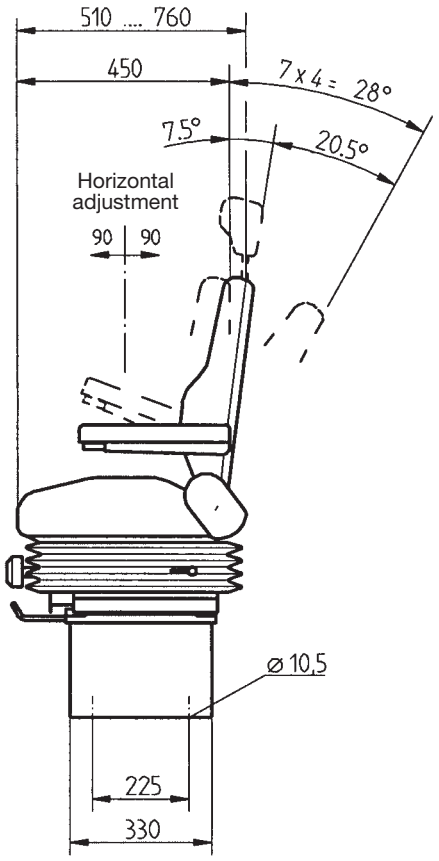
For this comfort driver's seat KFS 6 a lot of efficient accessories are available look Pos. 5-25.

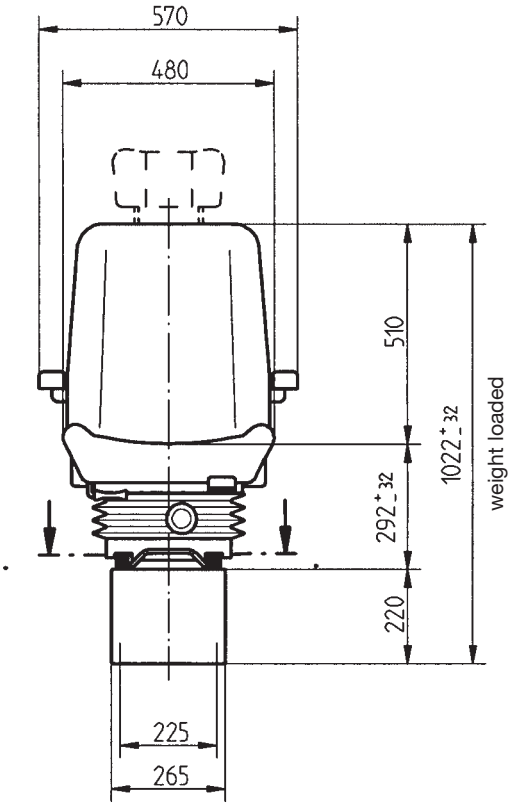
The metal parts are protected against corrosion and painted black.

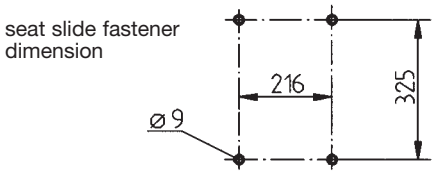
Technical detail:

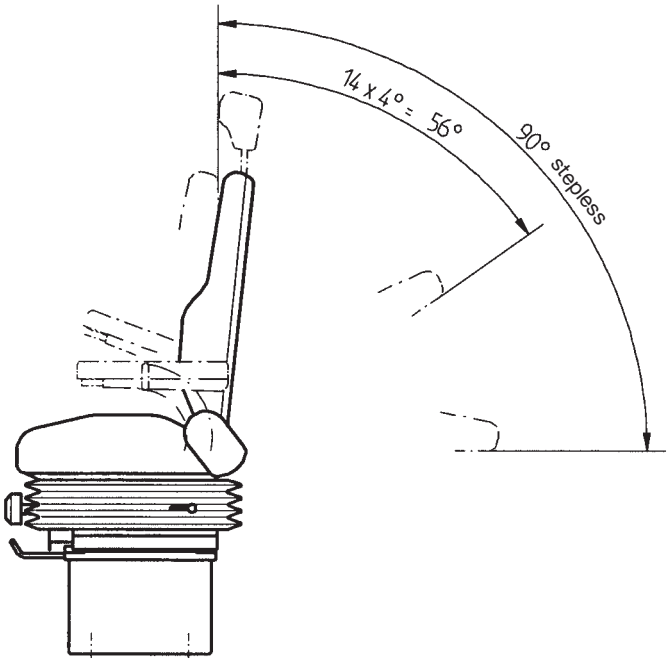
Suspension stoke	95 mm
Weight adjustment	40-130 kg
Horizontal adjustment	180 mm
Backrest adjustment, fine control inclination backwards	28° (90°)
Height and slope adjustment	65 mm

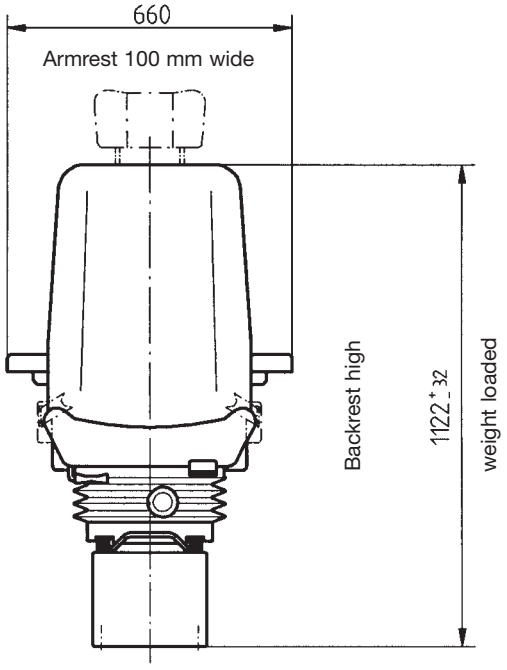
Pos.				Weight kp	Type	Price EURO
1	Driver's seat standard design with air-permeable artificial leather cover black			25	KFS 61	
2	Driver's seat standard design with textil cover grey / yellow			25	KFS 62	
3						
4						
5	Headrest raint					
6	Armrest fully adjustable (2 pieces) 50 mm wide					
7	Armrest fully adjustable (2 pieces) 100 mm wide					
8	Backrest high + 100 mm inclination backwards max. 90°					
9	Backrest standard with lumbar support manual adjustment					
10						
11	Seat cushion deep adjustment mechanical 60 mm					
12						
13	Seat contact 1 NO 1,5 A 24 V DC					
14	Seat cushion and backrest standard with heating element 24 V DC 42 Watt					
15						
16	Safety belt 2 point fixing					
17	Safety belt 4 point fixing (trouser braces belt) (Pos. 5 additionally required)					
18						
19						
20						
21						
22						
23						
24	Console			10		
25						


510 760
450
7 x 4 = 28°
7.5°
20.5°
Horizontal adjustment
90
90
ø 10,5
225
330


570
480
510
1022 +32
292 +32
220
weight loaded
225
265


seat slide fastener dimension
216
325
ø 9


14 x 4° = 56°
90° stepless


660
Armrest 100 mm wide
Backrest high
1122 +32
weight loaded

Driver's seat KFS 7

Type KFS72-2-5-7-24

The crane driver's seat KFS 7 is ergonomically designed and provides a high grade of comfort.

The driver's seat is a low level mechanical suspension seat with an oilhydraulic vibration absorption system with weight adjustment.

All adjustment controls are positioned ergonomically within easy access.

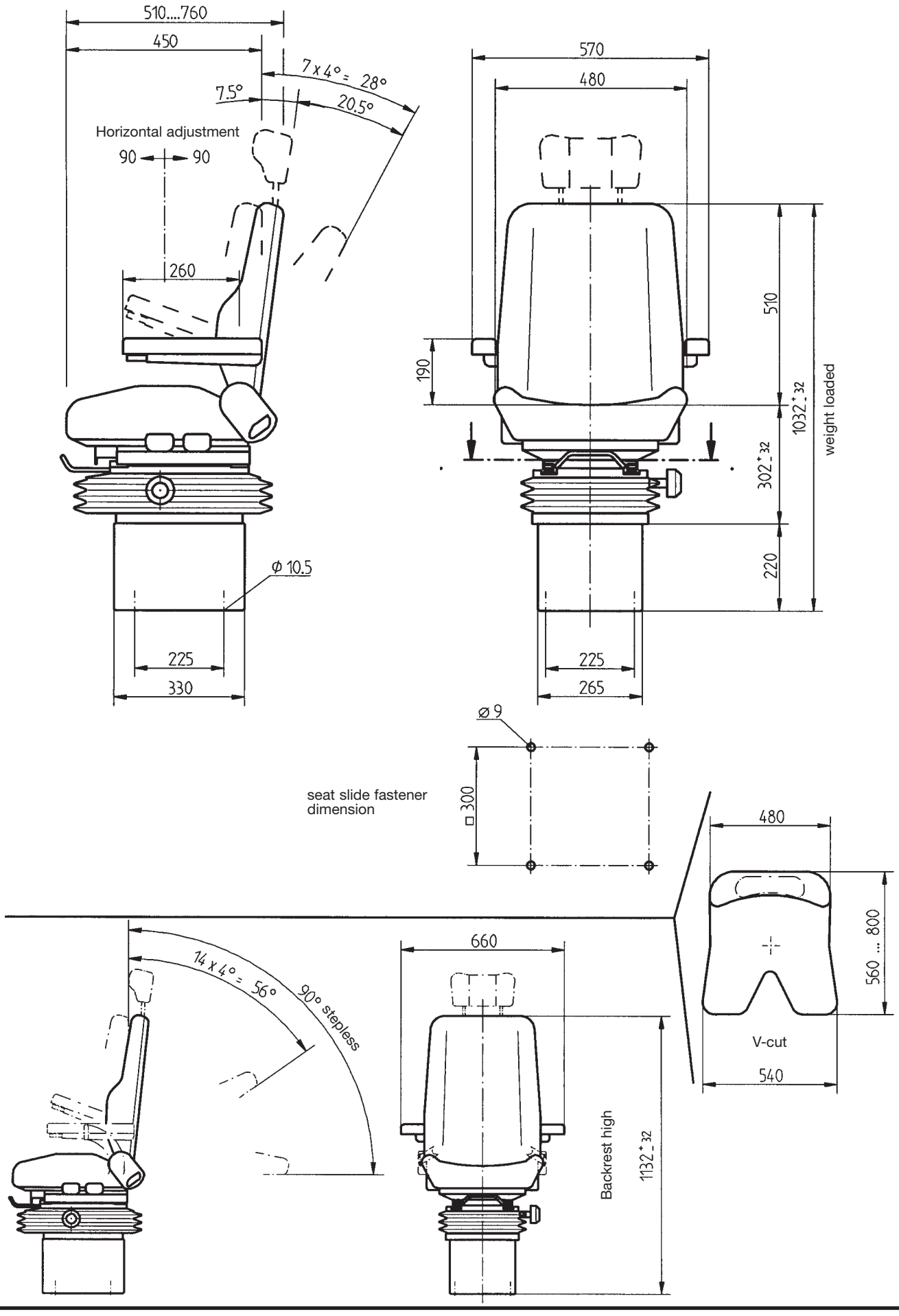
For this comfort driver's seat KFS 7 a lot of efficient accessories are available look Pos. 5-25.

The metal parts are protected against corrosion and painted black.

Technical detail:

Suspension stoke	60 mm
Weight adjustment	40-130 kg
Horizontal adjustment	180 mm, dual 300 mm
Backrest adjustment, fine control inclination backwards	28° (90°)
Height and slope adjustment	65 mm

Pos.				Weight kp	Type	Price EURO
1	Driver's seat standard design with air-permeable artificial leather cover black			25	KFS 71	
2	Driver's seat standard design with textil cover grey / yellow			25	KFS 72	
3						
4						
5	Headrest raint					
6	Armrest fully adjustable (2 pieces) 50 mm wide					
7	Armrest fully adjustable (2 pieces) 100 mm wide					
8	Backrest high + 100 mm inclination backwards max. 90°					
9	Backrest standard with lumbar support manual adjustment					
10						
11	Seat cushion deep adjustment mechanical 60 mm					
12	Seat cushion V-cut (free sight to down)					
13	Seat contact 1 NO 1,5 A 24 V DC					
14	Seat cushion and backrest standard with heating element 24 V DC 42 Watt					
15						
16	Safety belt 2 point fixing					
17	Safety belt 4 point fixing (trouser braces belt) (Pos. 5 additionally required)					
18						
19	Horizontal adjustment dual 180 + 120 mm (total 300 mm)					
20						
21						
22						
23						
24	Console			10		
25						


510....760
450
7 x 4° = 28°
7.5°
20.5°
Horizontal adjustment
90 90
260
ϕ 10.5
225
330
570
480
190
510
1032 +32
302 +32
220
weight loaded
225
265
ø 9
□ 300
seat slide fastener dimension
480
560 ... 800
V-cut
540
14 x 4° = 56°
90° stepless
660
Backrest high
1132 +32

Driver's seat KFS 8

Type KFS82-2-5-6-24-25

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 KFS 8 is equipped with roller-bearing swivel system.

All adjustment controls are positioned ergonomically within easy access.

For this comfort driver's seat KFS 8 a lot of efficient accessories are available look Pos. 5-25.

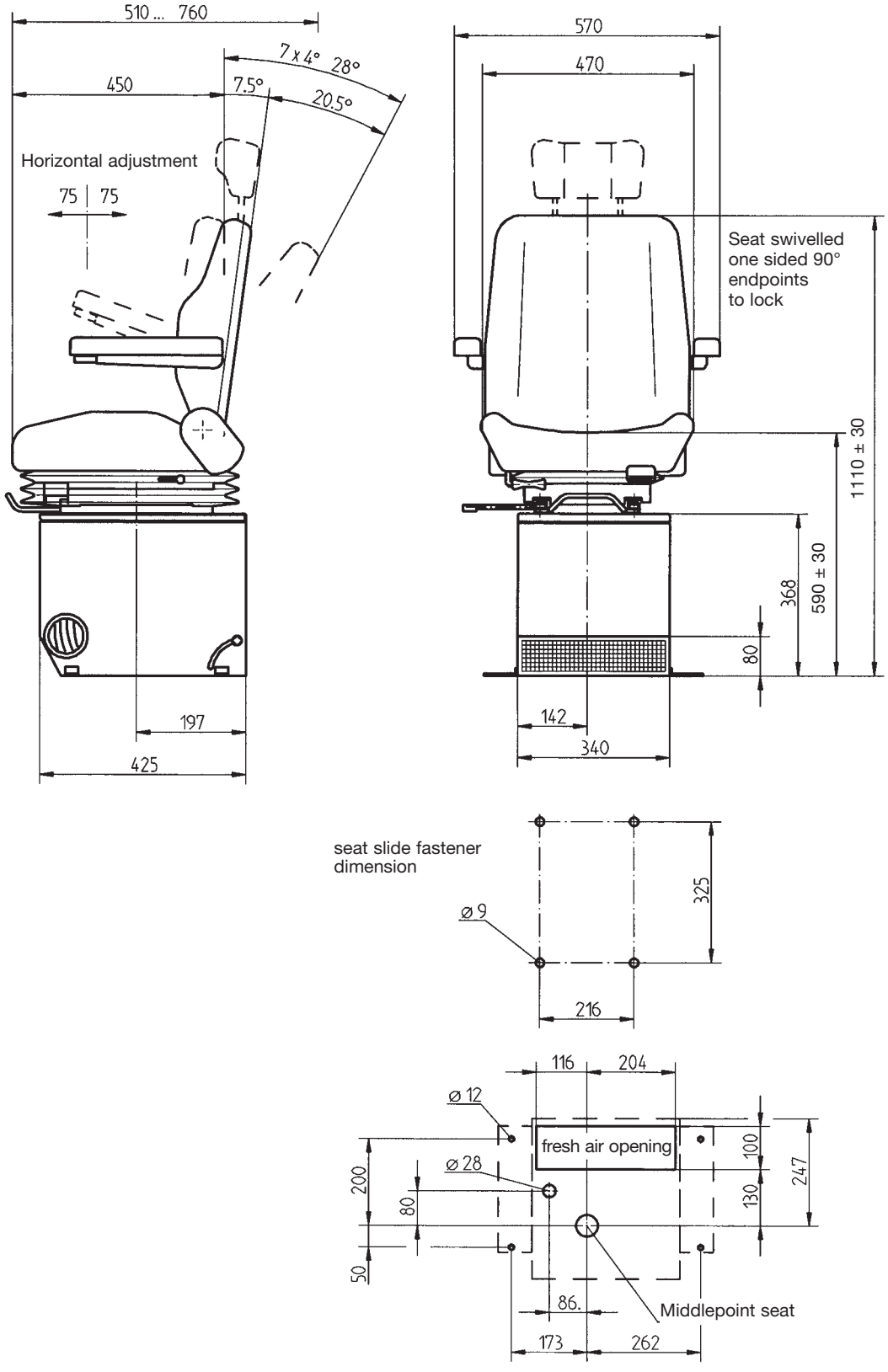
The console are available to build in the heating 2-steps 2 x 2 kW 380 V AC, ventilator 380 V AC, airvolume ca. 1000 m^3/h, air circulation (opening in the underside of the console), selector switch for heating / ventilator.

The metal parts are protected against corrosion and painted black.

Technical detail:

Horizontal adjustment	150 mm
Backrest adjustment, fine control inclination backwards	28°
Height and slope adjustment	65 mm

Pos.				Weight kp	Type	Price EURO
1	Driver's seat standard design with air-permeable artificial leather cover black			25	KFS 81	
2	Driver's seat standard design with textil cover grey / black			25	KFS 82	
3						
4						
5	Headrest raint					
6	Armrest fully adjustable (2 pieces) 50 mm wide					
7	Armrest fully adjustable (2 pieces) 100 mm wide					
8	Backrest high + 100 mm inclination backwards max. 90°					
9	Backrest with lumbar support manual adjustment					
10						
11	Seat cushion deep adjustment mechnical 60 mm					
12						
13						
14	Seat cushion and backrest standard with heating element 24 V DC 42 Watt					
15						
16	Safety belt 2 point fixing					
17	Safety belt 4 point fixing (trouser braces belt) (Pos. 5 additionally required)					
18						
19						
20						
21						
22						
23	Roller-bearing swivel system for seat (included in Pos. 1, 2)					
24	Console			10		
25	Heating 2 steps 2 x 2 kW 380 V AC with ventilator 380 V AC airvolume ca. 1000 m^3/h with selector switch for heating / ventilator mounting into the console			10		


510 ... 760
7 x 4° 28°
450
7.5°
20.5°
Horizontal adjustment
75 | 75
197
425
570
470
Seat swivelled
one sided 90°
endpoints
to lock
1110 ± 30
590 ± 30
368
80
142
340
seat slide fastener
dimension
ø 9
325
216
116
204
ø 12
fresh air opening
100
247
ø 28
200
80
130
50
86.
Middlepoint seat
173
262

Driver's seat KFS 9

Type KFS92-2-5-6-24

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 oilhydraulic vibration absorption system with weight adjustment.

All adjustment controls are positioned ergonomically within easy access.

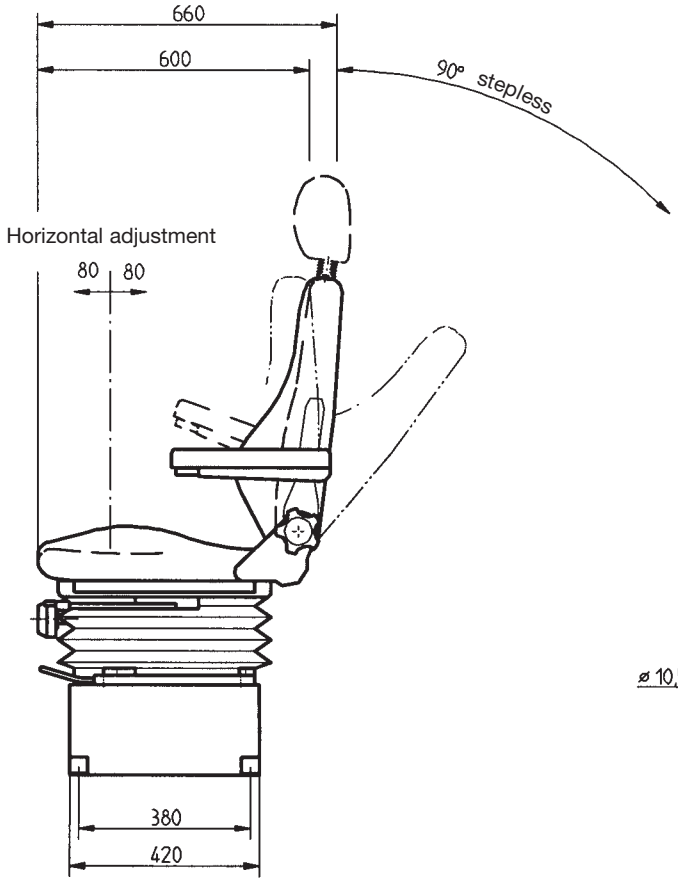
For this comfort driver's seat KFS 9 a lot of efficient accessories are available look Pos. 5-25.

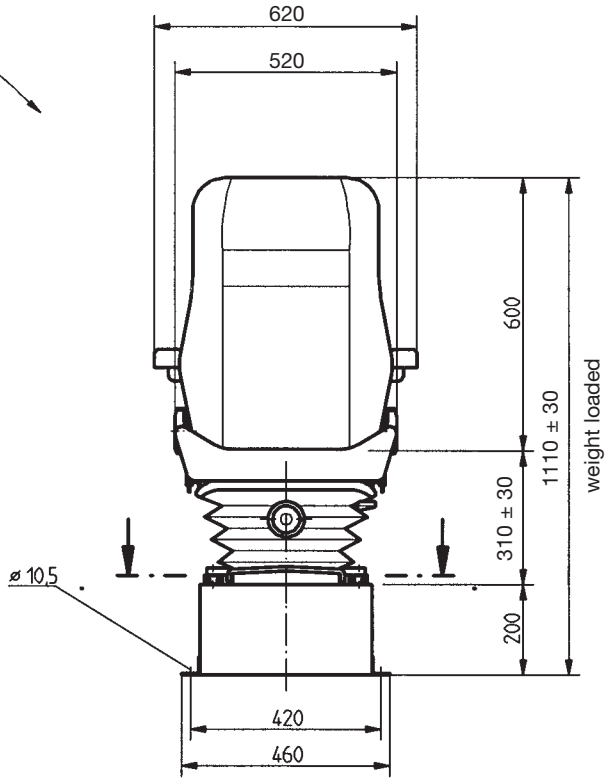
The metal parts are protected against corrosion and painted black.

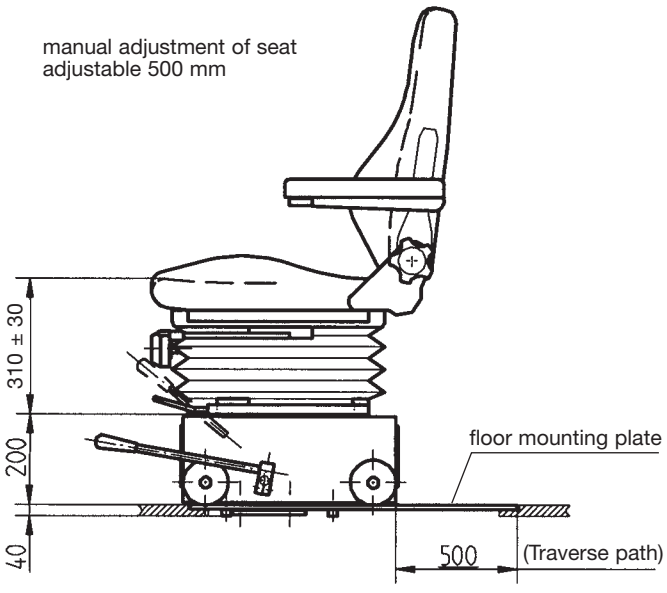
Technical detail:

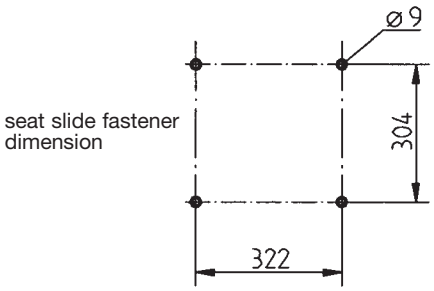
Suspension stoke	80 mm
Weight adjustment	50–120 kg
Horizontal adjustment	160 mm
Backrest adjustment stepless inclination backwards	90°
Height and slope adjustment	60 mm

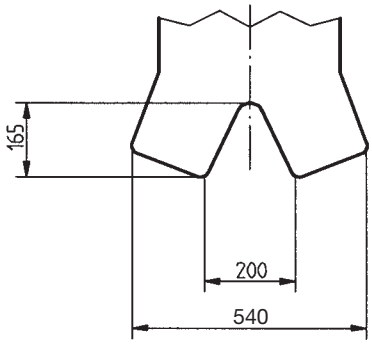
Pos.				Weight kp	Type	Price EURO
1	Driver's seat standard design with air-permeable artificial leather cover black			25	KFS 91	
2	Driver's seat standard design with textil cover grey / black			25	KFS 92	
3						
4						
5	Headrest raint					
6	Armrest adjustable (2 pieces) 50 mm wide					
7	Armrest adjustable (2 pieces) 100 mm wide					
8						
9	Backrest with lumbar support manual adjustment 2 movement					
10	Backrest with lumbar support manual adjustment 4 movement					
11						
12	Seat cushion V-cut (free sight to down) (Pos. 19 required)					
13	Seat contact 1 NO 1,5 A 24 V DC					
14	Seat cushion and backrest standard with heating element 24 V DC 47 Watt					
15	Seat cushion deep prolongation + 35 mm					
16	Safety belt 2 point fixing					
17	Safety belt 4 point fixing (trouser braces belt) (Pos. 5 additionally required)					
18						
19	Horizontal adjustment dual 160 + 120 mm (total 280 mm seat height + 30 mm)					
20	Pneumatic vibration absorption system with weight adjustment by compressor 24 V DC 8 Ampere					
21	Plate for horizontal manual adjustment of seat adjustable 500 mm with floor mounting plate					
22						
23	Loose cover					
24	Console			10		
25						



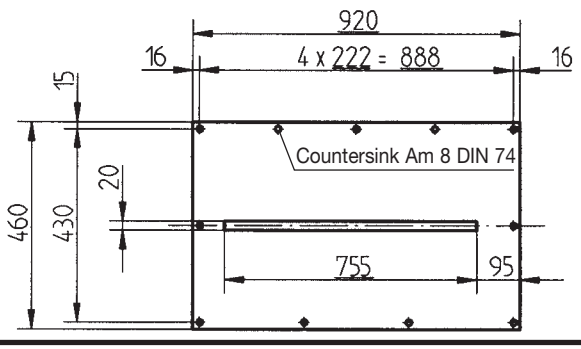








Seat cushion V-cut



Driver's seat KFS 10

Type KFS102-2-5-7-12-24

The crane driver's seat KFS 10 is ergonomically designed and provides a high grade of comfort.

The driver's seat is a low level mechanical suspension seat with a pneumatic vibration absorption system with weight adjustment by compressor 24 V DC 8 Ampere.

All adjustment controls are positioned ergonomically within easy access.

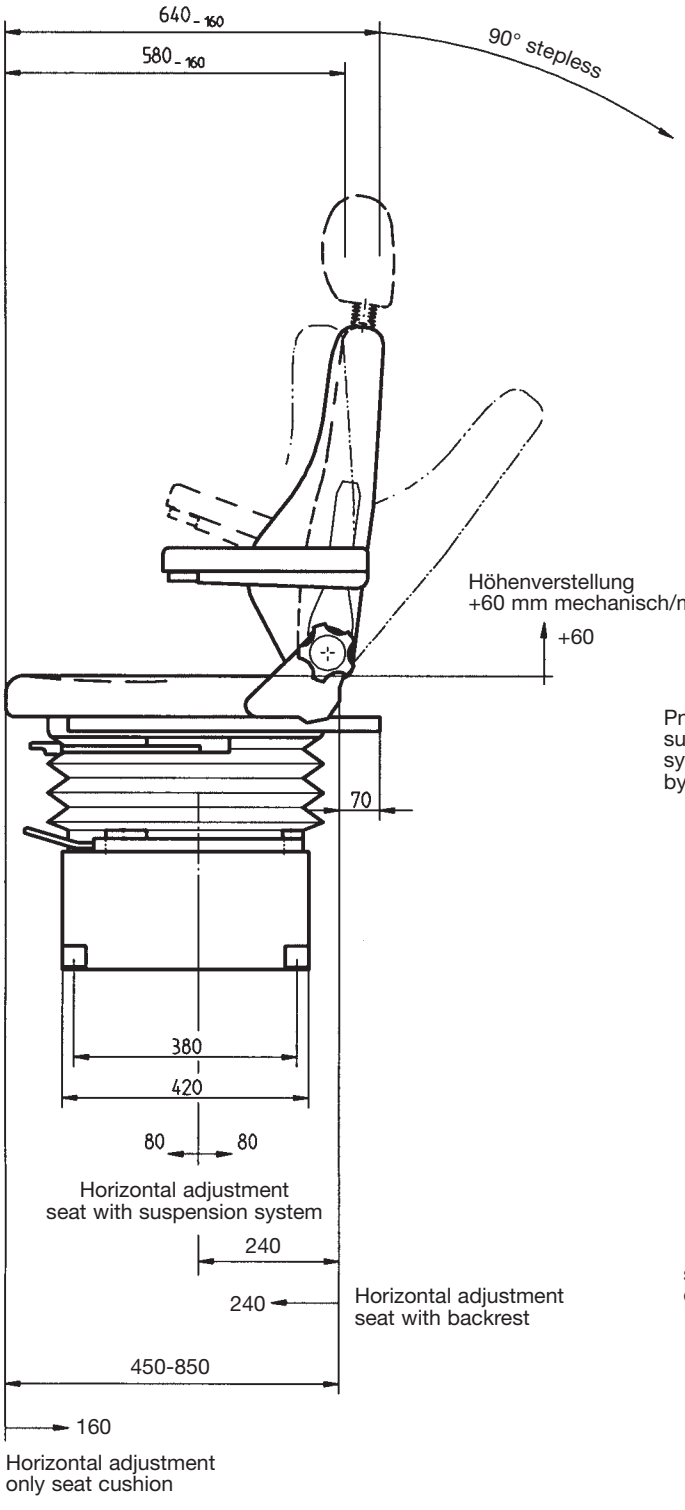
For this comfort driver's seat KFS 10 a lot of efficient accessories are available look Pos. 5-25.

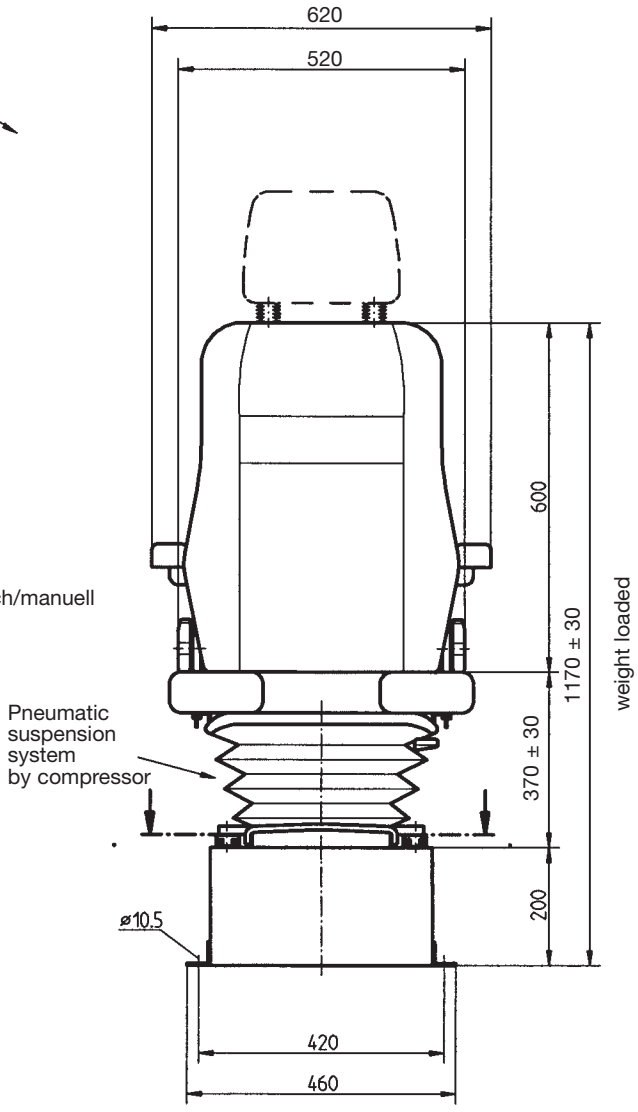
The metal parts are protected against corrosion and painted black.

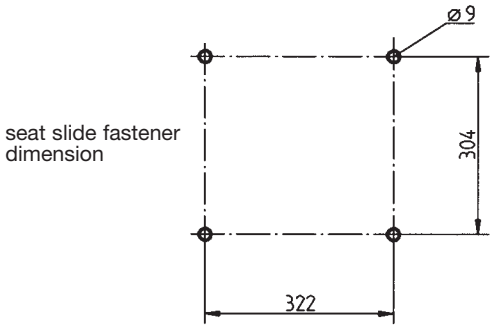
Technical detail:

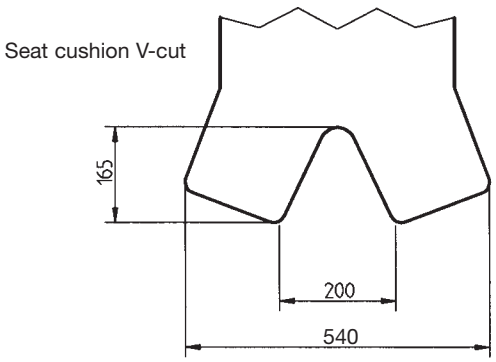
Suspension stoke pneumatic	80 mm
Weight adjustment	50–130 kg
Horizontal adjustment seat with suspension system	160 mm
Horizontal adjustment seat with backrest	260 mm
Horizontal adjustment only seat cushion	150 mm
Backrest adjustment stepless inclination backwards	90°
Height and slope adjustment mechanical	60 mm

Pos.				Weight kp	Type	Price EURO
1	Driver's seat standard design with air-permeable artificial leather cover black			25	KFS 101	
2	Driver's seat standard design with textil cover grey / black			25	KFS 102	
3						
4						
5	Headrest raint					
6	Armrest adjustable (2 pieces) 50 mm wide					
7	Armrest adjustable (2 pieces) 100 mm wide					
8						
9	Backrest with lumbar support manual adjustment 2 movement					
10	Backrest with lumbar support manual adjustment 4 movement					
11						
12	Seat cushion V-cut (free sight to down)					
13	Seat contact 1 NO 1,5 A 24 V DC					
14	Seat cushion and backrest standard with heating element 24 V DC 47 Watt					
15						
16	Safety belt 2 point fixing					
17	Safety belt 4 point fixing (trouser braces belt) (Pos. 5 additionally required)					
18						
19						
20						
21						
22						
23						
24	Console			10		
25						


640 - 160
580 - 160
90° stepless
Höhenverstellung
+60 mm mechanisch/manuell
+60
70
380
420
80
80
Horizontal adjustment
seat with suspension system
240
240
Horizontal adjustment
seat with backrest
450-850
160
Horizontal adjustment
only seat cushion


620
520
600
1170 ± 30
370 ± 30
200
weight loaded
Pneumatic
suspension
system
by compressor
ø10.5
420
460


ø 9
304
322
seat slide fastener
dimension


Seat cushion V-cut
165
200
540

Portable control unit TS 1

Type TS1-1-5

The portable control unit TS 1 accommodates all the devices necessary for control and monitoring. 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.

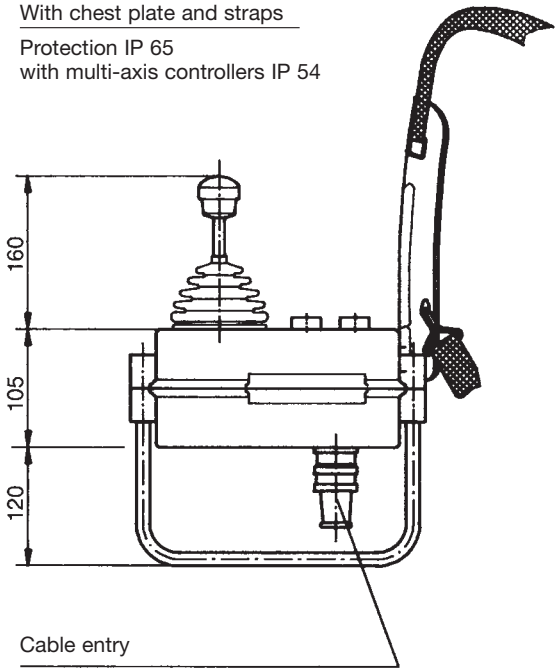
The control console is made of polyester (glass fibre reinforced plastic).
Colour RAL 7032 pepple-grey.
It can also be supplied as RAL 1021 yellow.

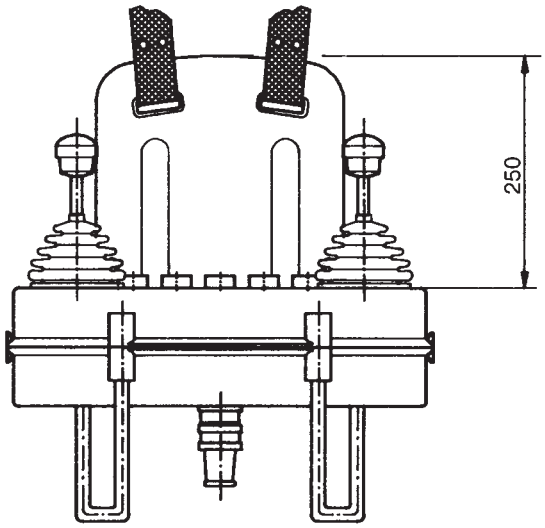
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	control unit IP 65 with multi-axis controller IP 54 to IEC 529 DIN 40050

Pos.								Weight gramm	Type	Price EURO
1	Control unit with chest plate and straps							3300	TS 1	
2	Control unit with straps							3000	TS 11	
3										
4	Plastic housing with surface resistance of less than < 10^9 Ohm/cm									
5	Legs for control unit alu-tube 2 pieces							320		
6	Legs for control unit stainless steel-tube V2 A 2 pieces							600		
7	Reeling hooks for control unit stainless steel V2 A							1200		
8	Cable entry M 32 for cable 11-21 mm or M 40 for cable 19-28 mm							80		
9										
10	Multi-axis controller			see catalog 1/100						
11	Single-axis controller			see catalog 1/200						
12										
13	Control-switch			see catalog 1/220						
14	Command and indicating devices			see catalog 1/360						
15	Plug in socket	16-pole male insert		HAN 16 E without wiring				200		
16	Connector	16-pole female insert		HAN 16 E without wiring				250		
17	Plug in socket	24-pole male insert		HAN 24 E without wiring				320		
18	Connector	24-pole female insert		HAN 24 E without wiring				340		
19	Plug in socket	32-pole male insert		HAN 32 A without wiring				380		
20	Connector	32-pole female insert		HAN 32 A without wiring				400		
21	Cable Oelflex	18 x 1 mm^2	13,4 mm ø	-5° C to +80° C	each metre			320		
22	Cable Oelflex	25 x 1 mm^2	15,4 mm ø	-5° C to +80° C	each metre			450		
23	Cable Oelflex	34 x 1 mm^2	18,6 mm ø	-5° C to +80° C	each metre			600		
24	Cable Neoflex	18 x 1 mm^2	19,2 mm ø	-30° C to +80° C	each metre			470		
25	Cable Neolflex	24 x 1 mm^2	22,1 mm ø	-30° C to +80° C	each metre			650		
26	Cable Neoflex	36 x 1 mm^2	26,1 mm ø	-30° C to +80° C	each metre			910		
27										
30	Terminal block 2,5 mm^2 without wiring each terminal								KL	
31	Terminal block 2,5 mm^2 with wiring wire 1,5 mm^2 each terminal								KL	
32	Wired plug in socket, connector or cable each wire terminal									
33										
34										
40	Indicating labels not engraved with 2 or 4 arrows									
41	Engraving, each 10 characters									

With chest plate and straps

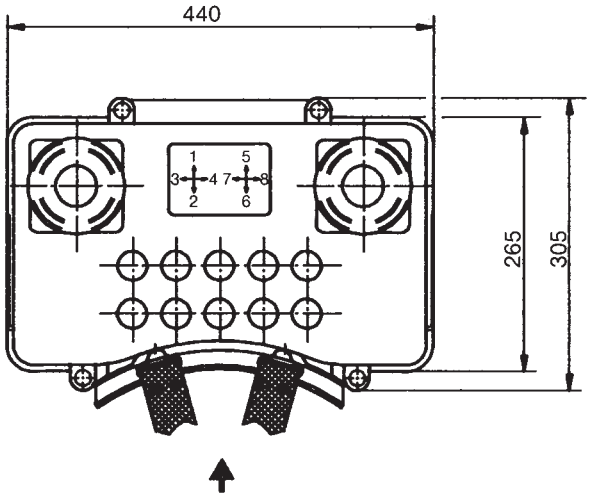
Protection IP 65
with multi-axis controllers IP 54





Cable entry

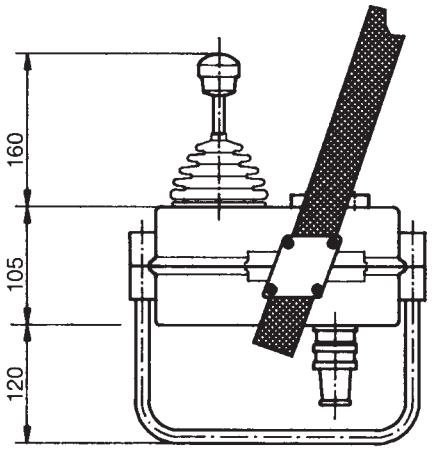
with anti-kink protection and
stain relief or connectors

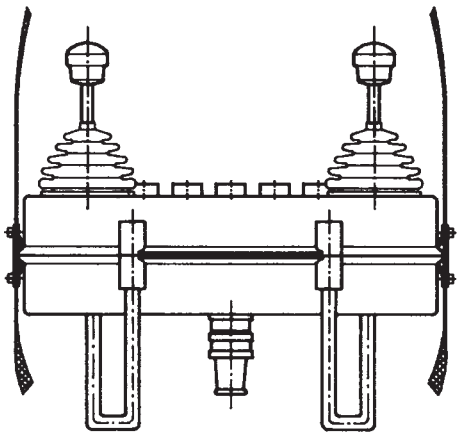


Direction of view

With adjustable carrying strap

Protection IP 65
with multi-axis controllers IP 54





Portable control unit TS 2

Type TS22-3-9-…

The portable control unit TS 2 accommodates all the devices necessary for control and monitoring. 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.

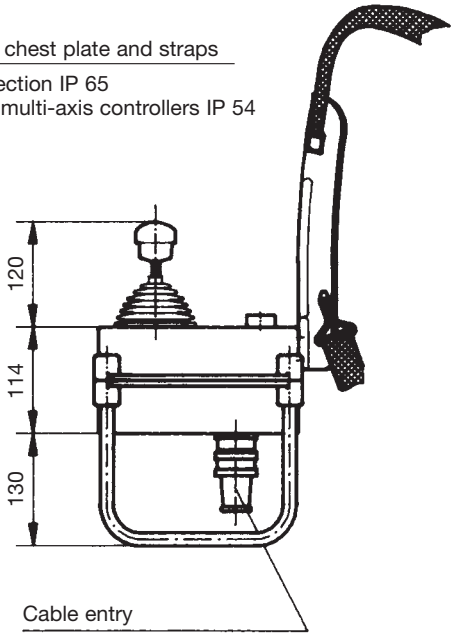
The control console is made of polyester (glass fibre reinforced plastic).
Colour RAL 7032 pepple-grey.
It can also be supplied as RAL 1021 yellow.

Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	control unit IP 65 with multi-axis controller IP 54 to IEC 529 DIN 40050

Pos.							Weight gramm	Type	Price EURO
1	Control unit with chest plate and straps						2400	TS 2	
2	Control unit with straps						2100	TS 21	
3	Control unit with bracket and straps						2400	TS 22	
4	Plastic housing with surface resistance of less than < 10^9 Ohm/cm								
5	Legs for control unit alu-tube 2 pieces						320		
6	Legs for control unit stainless steel-tube V2 A 2 pieces						600		
7	Reeling hooks for control unit stainless steel V2 A						1200		
8	Cable entry M 32 for cable 11-21 mm or M 40 for cable 19-28 mm						80		
9	Cable entry 180° swivelling M 32 for cable 11-21 mm or M 40 for cable 19-28 mm						190		
10	Multi-axis controller			see catalog 1/100					
11	Single-axis controller			see catalog 1/200					
12									
13	Control-switch			see catalog 1/220					
14	Command and indicating devices			see catalog 1/360					
15	Plug in socket	16-pole male insert		HAN 16 E without wiring			200		
16	Connector	16-pole female insert		HAN 16 E without wiring			250		
17	Plug in socket	24-pole male insert		HAN 24 E without wiring			320		
18	Connector	24-pole female insert		HAN 24 E without wiring			340		
19	Plug in socket	32-pole male insert		HAN 32 E without wiring			380		
20	Connector	32-pole female insert		HAN 32 E without wiring			400		
21	Cable Oelflex	18 x 1 mm²	13,4 mm ø	-5° C to +80° C	each metre		320		
22	Cable Oelflex	25 x 1 mm²	15,4 mm ø	-5° C to +80° C	each metre		450		
23	Cable Oelflex	34 x 1 mm²	18,6 mm ø	-5° C to +80° C	each metre		600		
24	Cable Neoflex	18 x 1 mm²	19,2 mm ø	-30° C to +80° C	each metre		470		
25	Cable Neolflex	24 x 1 mm²	22,1 mm ø	-30° C to +80° C	each metre		650		
26	Cable Neoflex	36 x 1 mm²	26,1 mm ø	-30° C to +80° C	each metre		910		
27									
30	Terminal block 2,5 mm² without wiring each terminal							KL	
31	Terminal block 2,5 mm² with wiring wire 1,5 mm² each terminal							KL	
32	Wired plug in socket, connector or cable each wire-connection								
33									
34									
40	Indicating labels not engraved with 2 or 4 arrows								
41	Engraving, each 10 characters								

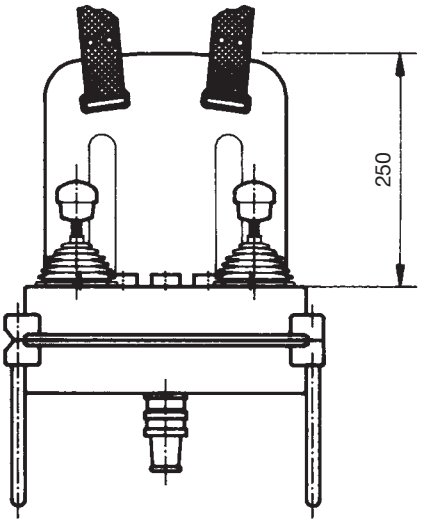
With chest plate and straps

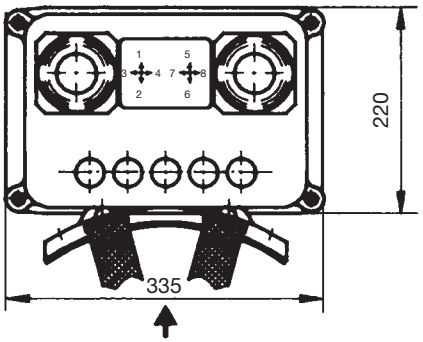
Protection IP 65
with multi-axis controllers IP 54



Cable entry

with anti-kink protection and
stain relief or connectors

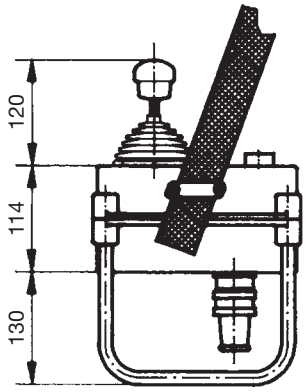


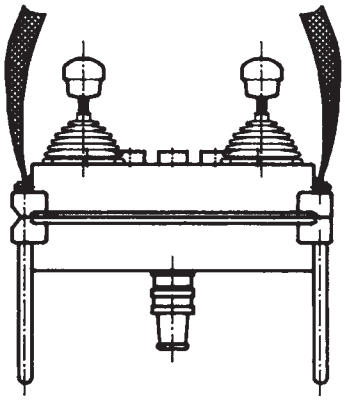


Direction of view

With adjustable carrying strap

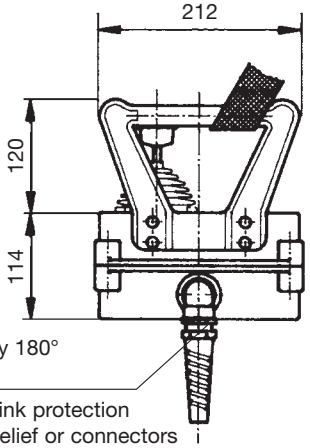
Protection IP 65
with multi-axis controllers IP 54





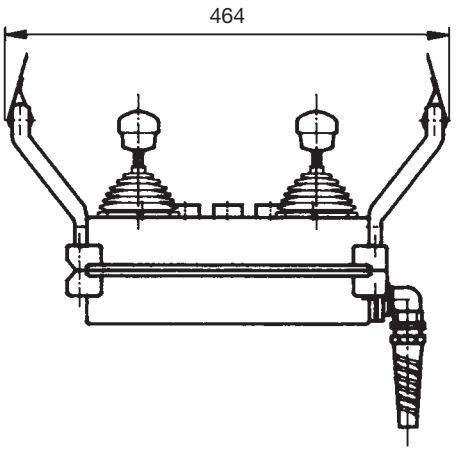
With bracket and cable entry swivelling

Protection IP 65 with multi-axis controllers IP 54

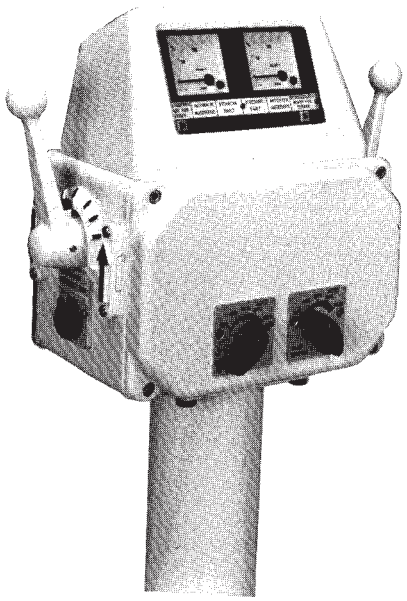


Cable entry 180°
swivelling

with anti-kink protection
and stain relief or connectors



Control pedestal for offshore U 22 / 32



Type U22/32/FD/HD/IA/RS/-…

The control pedestal U 22/32 accomodates 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.

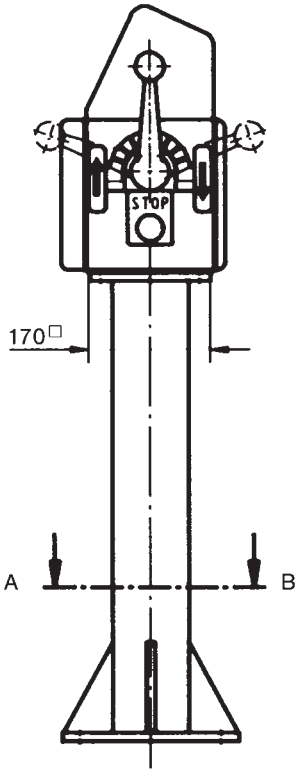
Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

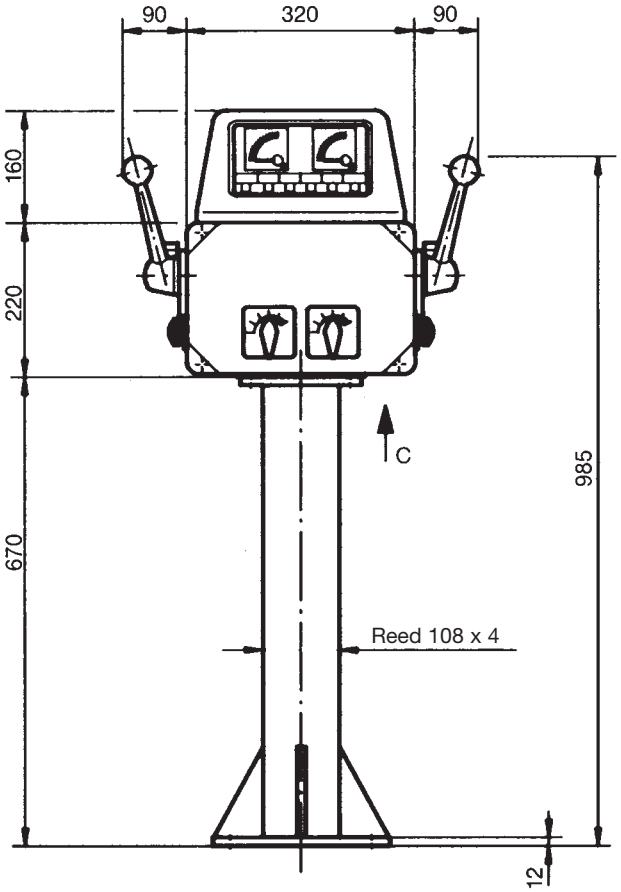
Surface treatment: Anti-corrosion primer, top coat: two coats of epoxy-resin paint, standard colour RAL 7032 pepple-grey textured varnish

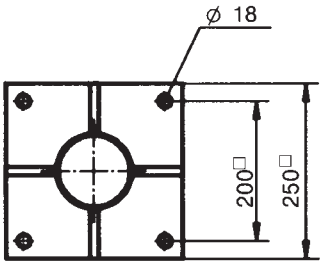
All non-painted metal parts are electrogalvanized and chromed.
All mechanical operating parts are made of non-rusting materials.

Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 66 IEC 529 DIN 40050

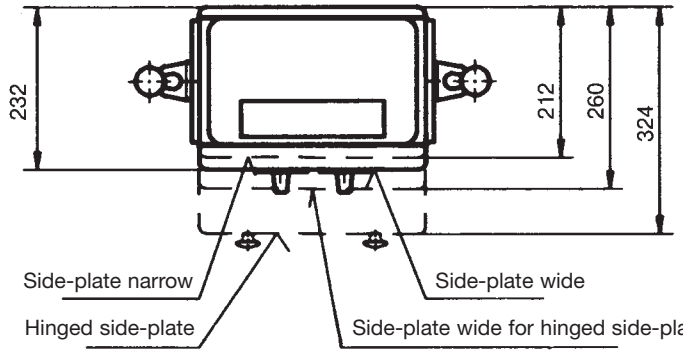
Pos.					Weight kp	Type	Price EURO
1	Housing U 22 / 32 with 1 narrow side-plate with pillar-gasket				6,8	U22/32	
2	Side-plate narrow gasket				1,8	FD	
3	Side-plate wide with gasket (required for command and indicating devices Pos. 22-26)				2,4	HD	
4	Hinged side-plate with gasket that can be locked in position (cover for command and indicating devices)				4,0	KD	
5	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				2,9	IA	
6	Pillar 108 mm ø 670 mm height with flange quadratic or round				18,8	RS	
10	Masterswitch with 6 contacts, with spring return in 0-position with ball handle and indicating labels drive				2,0	N61-03Z-HG	
11	Control-switches with 4 contacts with knob and indicating label				0,7	N62-02-KN	
12	Additional or subtract price each 2 contacts					± 01	
13	more variants see catalog 1/220						
14	Wire-wound potentiometer T 130 with centre tap linear life 10^7 switching cycles resistance 2 x 0,5 / 1 / 2 / 5 / 10 kOhm 1,5 Watt wiper current max. 10 mA				0,07	P	
15	more potentiometer see catalog 1/240...						
16	Control-switch with 4 contacts with knob and indicating label			protection IP67	0,4	NWSE	
17	Additional or subtract price each 2 contacts						
20	Heating	20 Watt 220 or 110 V / 50/60 Hz			0,15	H	
21	Mushroom head push button latching	22 with indicating label		1 NC protection IP67	0,1	PV	
22	Mushroom head push button	22 with indicating label		1 NO protection IP67	0,1	P	
23	Push button	22 with indicating label		1 NO protection IP67	0,1	D	
24	Selector switch	22 with indicating label		1 NO protection IP67	0,1	W	
25	Indicator light	22 with indicating label		Diode 24 Volt protection IP67	0,1	L	
26	Indicator light	22 with indicating label		Diode 220 Volt AC protection IP67	0,1	L	
27	Contact block additional			1 NO or 1 NC			
28	Indicator light	22 with indicating label		24 Volt protection IP65	0,05	L	
29	Indicator light	10 with indicating label		Diode 24 Volt protection IP67	0,03	L	
35	Power monitoring	PQ 72	1 mA DC	Engraved your instructions	0,2	PQ	
36	Power monitoring	PQ 72 x 36	1 mA DC	Engraved your instructions	0,3	PQ	
37	Ampere monitoring	EQ 72	100 / 200 / 1 A	Engraved your instructions	0,2	EQ	
38	Ampere monitoring	EQ 72 x 36	100 / 200 / 1 A	Engraved your instructions	0,3	EQ	
39	Monitoring illuminated			24 Volt			
40	Another electrical value are available						
45	Terminal block 2,5 mm^2 without wiring			each terminal		KL	
46	Terminal block 2,5 mm^2 with wiring wire 0,75 mm^2			each terminal		KL	
47							
48							
49							
50	Engraving, each 10 characters						

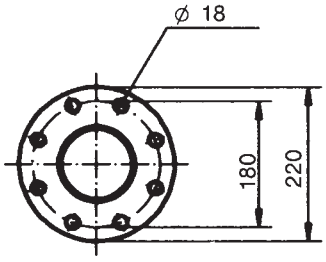




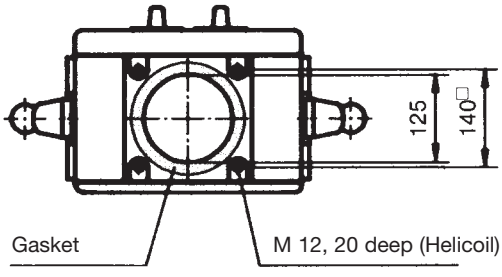


View A - B



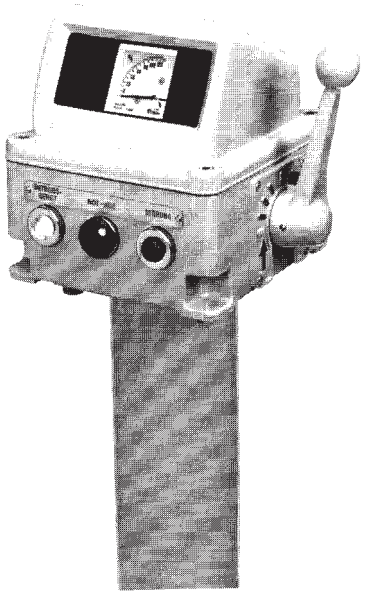


View A - B
(option flange NW 100, DIN 2633)



View C

Control pedestal for offshore U 23 / 23



Type U23/23/IA/RS/…

The control pedestal U 23/23 accomodates 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.

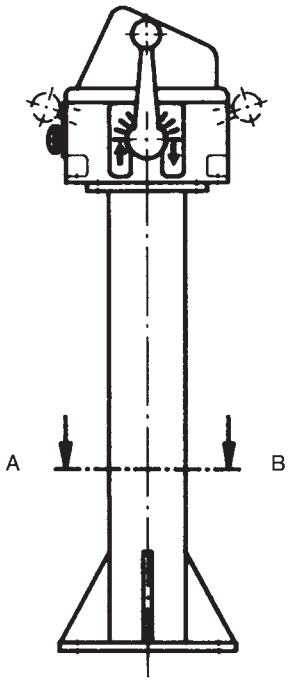
Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

Surface treatment: Anti-corrosion primer, top coat: two coats of epoxy-resin paint, standard colour RAL 7032 pepple-grey textured varnish

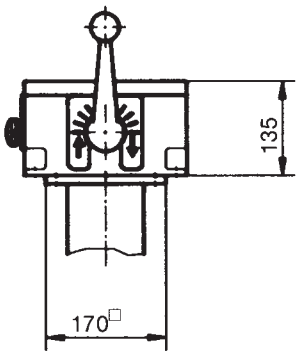
All non-painted metal parts are electrogalvanized and chromed.
All mechanical operating parts are made of non-rusting materials.

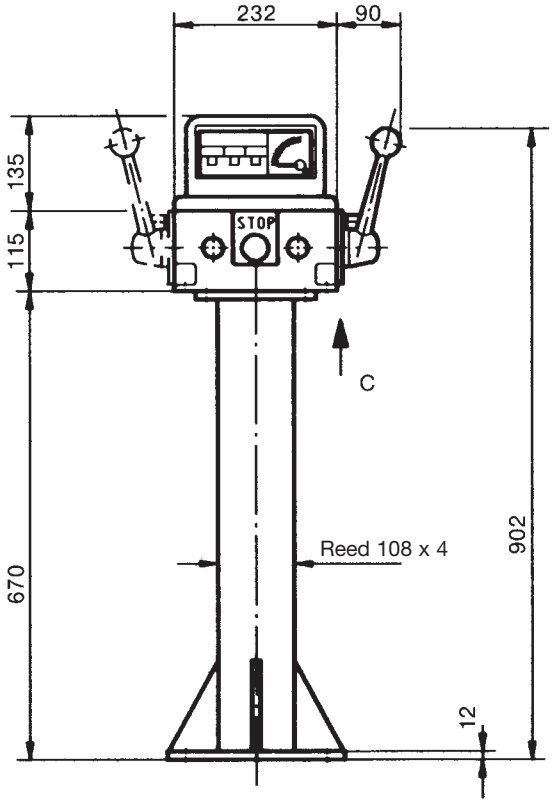
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 66 IEC 529 DIN 40050

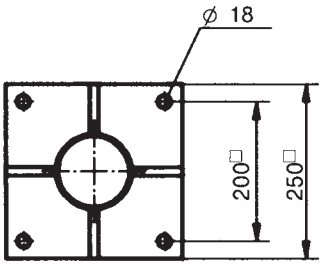
Pos.					Weight kp	Type	Price EURO
1	Housing U 23 / 23 with 1 narrow cover with pillar-gasket				5,3	U23/23	
2	Housing U 23 / 23 with 1 narrow cover without thrilling in the housing				5,4	U23/23	
3							
4							
5	Monitoring devices cover with gasket for max. 2 monitors 72 x 72 mm or				2,3	IA	
	1 monitors 72 x 72 mm and max. 6 indicating devices Pos. 28, 29						
6	Pillar 108 mm ø 670 mm height with flange quadratic or round				18,8	RS	
10	Masterswitch with 6 contacts, with spring return				2,0	N61-03Z-HG	
	in 0-position, with ball handle and indicating labels drive						
11	Control switches with 4 contacts with knob and indicating label				0,7	N62-02-KN	
12	Additional or subtract price each 2 contacts					± 01	
13	more variants see catalog 1/220						
14	Wire-wound potentiometer T 130 with centre tap linear life 10^7 switching cycles				0,07	P	
	resistance 2 x 0,5 / 1 / 2 / 5 / 10 kOhm 1,5 Watt wiper current max. 10 mA						
15	more potentiometer see catalog 1/240...						
16	Control-switch with 4 contacts with knob and indicating label			protection IP67	0,4	NWSE	
17	Additional or subtract price each 2 contacts						
20	Heating	20 Watt 220 V or 110 V / 50/60 Hz			0,15	H	
21	Mushroom head push button latching	22 with indicating label		1 NC protection IP67	0,1	PV	
22	Mushroom head push button	22 with indicating label		1 NO protection IP67	0,1	P	
23	Push button	22 with indicating label		1 NO protection IP67	0,1	D	
24	Selector switch	22 with indicating label		1 NO protection IP67	0,1	W	
25	Indicator light	22 with indicating label		Diode 24 Volt protection IP67	0,1	L	
26	Indicator light	22 with indicating label		Diode 220 Volt AC protection IP67	0,1	L	
27	Contact block additional			1 NO or 1 NC			
28	Indicator light	22 with indicating label		24 Volt protection IP65	0,05	L	
29	Indicator light	10 with indicating label		Diode 24 Volt protection IP67	0,03	L	
35	Power monitoring	PQ 72	1 mA DC	Engraved your instructions	0,2	PQ	
36							
37	Ampere monitoring	EQ 72	100 / 200 / 1 A	Engraved your instructions	0,2	EQ	
38							
39	Monitoring illuminated			24 Volt			
40	Another electrical value available						
45	Terminal block 2,5 mm^2 without wiring			each terminal		KL	
46	Terminal block 2,5 mm^2 with wiring wire 0,75 mm^2			each terminal		KL	
47							
48							
49							
50	Engraving, each 10 characters						



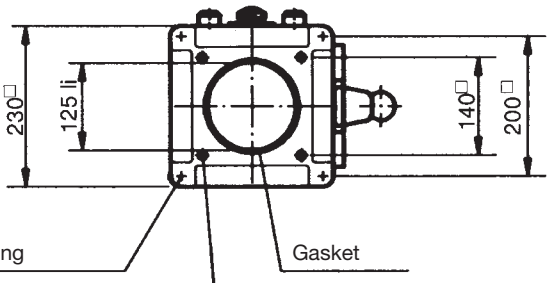
Protection with
narrow cover



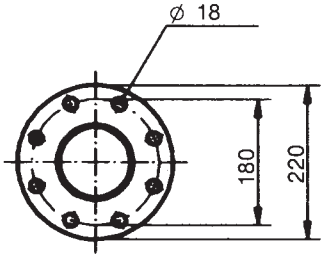




View A - B



View C



View A - B
(option flange NW 100, DIN 2633)

Control pedestal for offshore U 25 / 32

Type U25/32/IA/RS/…

The control pedestal U 25/32 accomodates 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.

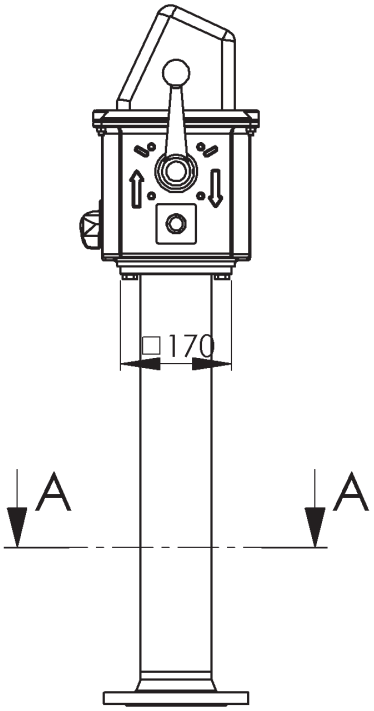
Contact complement 2 A 250 V AC 15 res. 1 A 24 V DC 13 (standard)
or 4 A 250 V AC 15 (special)

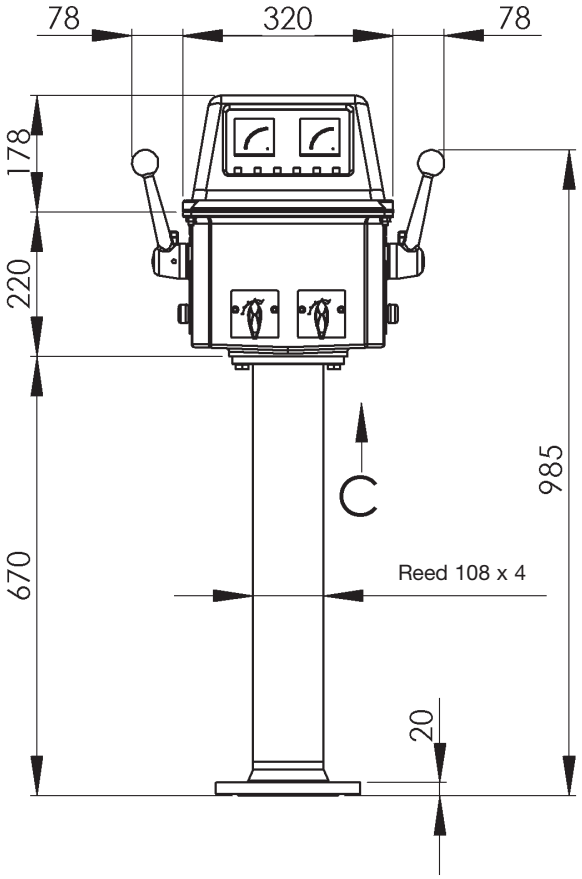
Surface treatment: Anti-corrosion primer, top coat: two coats of epoxy-resin paint, standard colour RAL 7032 pepple-grey textured varnish

All non-painted metal parts are electrogalvanized and chromed.
All mechanical operating parts are made of non-rusting materials.

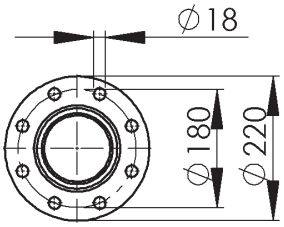
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 66 IEC 529 DIN 40050

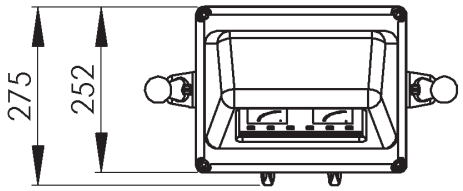
Pos.					Weight kp	Type	Price EURO
1	Housing U 25 / 32 with 1 narrow side-plate with pillar-gasket				6,8	U25/32	
2							
3							
4							
5	Monitoring devices cover with gasket for max. 2 monitors 72 x 72 mm or				2,9	IA	
	4 monitors 72 x 36 mm and max. 6 indicating devices Pos. 28, 29						
6	Pillar 108 mm ø 670 mm height with flange quadratic or round				18,8	RS	
10	Masterswitch with 6 contacts, with spring return in 0-position				2,0	N61-03Z-HG	
	with ball handle and indicating labels drive						
11	Control-switches with 4 contacts with knob and indicating label				0,7	N62-02-KN	
12	Additional or subtract price each 2 contacts					± 01	
13	more variants see catalog 1/220						
14	Conductive-plastic potentiometer T… with centre tap linear life 10^7 switching cycles				0,07	P	
	resistance 2 x 1 / 5 / 10 kOhm 0,5 Watt wiper current max. 1 mA						
15	more potentiometer see catalog 1/240...						
16	Control-switch with 4 contacts with knob and indicating label			protection IP67	0,4	NWSE	
17	Additional or subtract price each 2 contacts						
20	Heating	20 Watt 220 V or 110 V / 50/60 Hz			0,15	H	
21	Mushroom head push button latching	22 with indicating label		1 NC protection IP67	0,1	PV	
22	Mushroom head push button	22 with indicating label		1 NO protection IP67	0,1	P	
23	Push button	22 with indicating label		1 NO protection IP67	0,1	D	
24	Selector switch	22 with indicating label		1 NO protection IP67	0,1	W	
25	Indicator light	22 with indicating label		Diode 24 Volt protection IP67	0,1	L	
26	Indicator light	22 with indicating label		Diode 220 Volt AC protection IP67	0,1	L	
27	Contact block additional			1 NO or 1 NC			
28	Indicator light	22 with indicating label		24 Volt protection IP65	0,05	L	
29	Indicator light	10 with indicating label		Diode 24 Volt protection IP67	0,03	L	
35	Power monitoring	PQ 72	1 mA DC	Engraved your instructions	0,2	PQ	
36	Power monitoring	PQ 72 x 36	1 mA DC	Engraved your instructions	0,3	PQ	
37	Ampere monitoring	EQ 72	100 / 200 / 1 A	Engraved your instructions	0,2	EQ	
38	Ampere monitoring	EQ 72 x 36	100 / 200 / 1 A	Engraved your instructions	0,3	EQ	
39	Monitoring illuminated			24 Volt			
40	Another electrical value are available						
45	Terminal block 2,5 mm^2 without wiring			each terminal		KL	
46	Terminal block 2,5 mm^2 with wiring wire 0,75 mm^2			each terminal		KL	
47							
48							
49							
50	Engraving, each 10 characters						



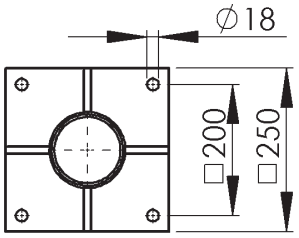


View A - A
Flange NW 100 DIN 2633

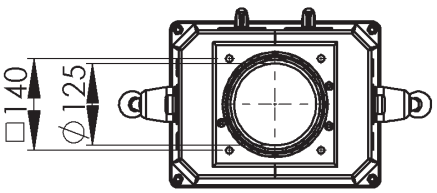




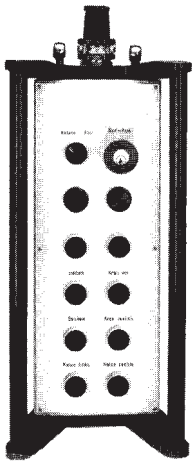
option flange 250 x 250



View C
(without pedestal)



Pedant control unit HT 1 and HT 2



Type HT11…

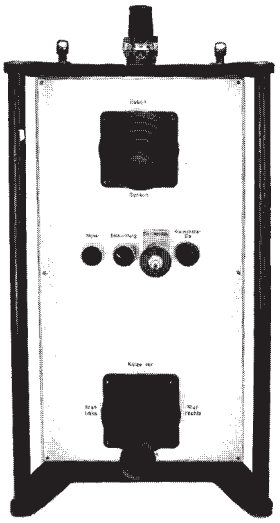
The pedant control units HT 1 and HT 2 contain the control and monitoring devices.

The units are easy to grasp and are protected against damage and unintentional operation of the controls.

Cable entry has anti-kink protection and strain relief.
The pedants are made of sheet steel.

Device arrangements:

HT 11	max. 12 command or indicating devices	double-row
HT 12	max. 16 command or indicating devices	double-row
HT 13	max. 20 command or indicating devices	double-row
HT 21	max. 32 command or indicating devices	four-row
HT 22	max. 40 command or indicating devices	four-row



Type HT21…

The multi-axis controller V 11 with 2 x 6 contacts to take away the mounting positions of 6 command or indicating devices.

The multi-axis controller V 62 with 2 x 6 contacts to take away the mounting positions of 8 command or indicating devices.

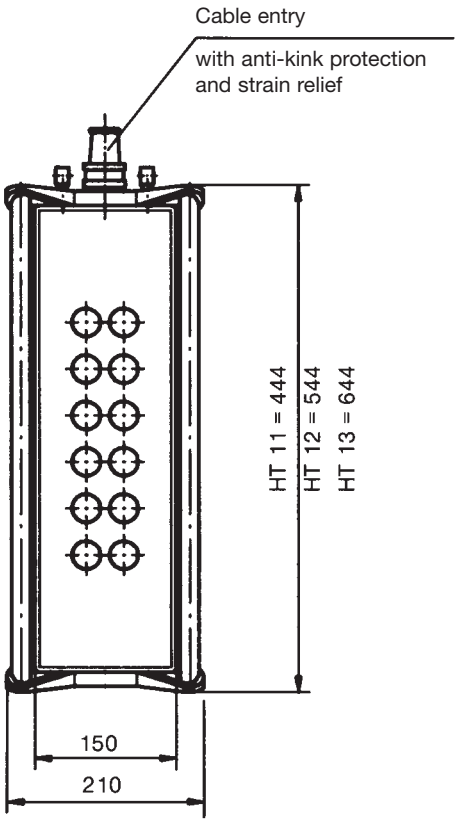
Surface treatment: Anti-corrosion primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pepple-grey. textured varnish

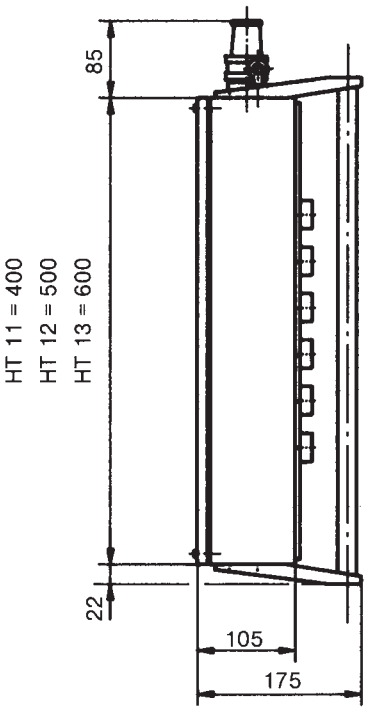
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 54 IEC 529 DIN 40050

Pos.					Weight kp	Type	Price EURO
1	Pedant control unit	150 x 400 x 105 mm				HT 11	
2	Pedant control unit	150 x 500 x 105 mm				HT 12	
3	Pedant control unit	150 x 600 x 105 mm				HT 13	
4							
5	Pedant control unit	260 x 500 x 105 mm				HT 21	
6	Pedant control unit	260 x 600 x 105 mm				HT 22	
7							
8							
9							
10	Cable entry M 32 with anti-kink protection and strain relief		cable 11 – 21 mm				
11	Cable entry M 40 with anti-kink protection and strain relief		cable 19 – 28 mm				
13	Cable entry M 50 with anti-kink protection and strain relief		cable 27 – 35 mm				
14							
15	Multi-axis controller V 6 or V 11 see catalog 1/100		1/110				
16	Control-switch		see catalog 1/220				
17	Command and indicating devices		see catalog 1/360				
18							
19							
20	Terminal block 2,5 mm² without wiring			each terminal		KL	
21	Terminal block 2,5 mm² with wiring wire 1,5 mm²			each terminal		KL	
22							
23							
24							
25	Eloxal aluminium front plate silvery for HT 1						
26	Eloxal aluminium front plate silvery for HT 2						
27	Indicating labels not engraved with 2 or 4 arrows						
28	Engraving, each 10 characters						

HT 1

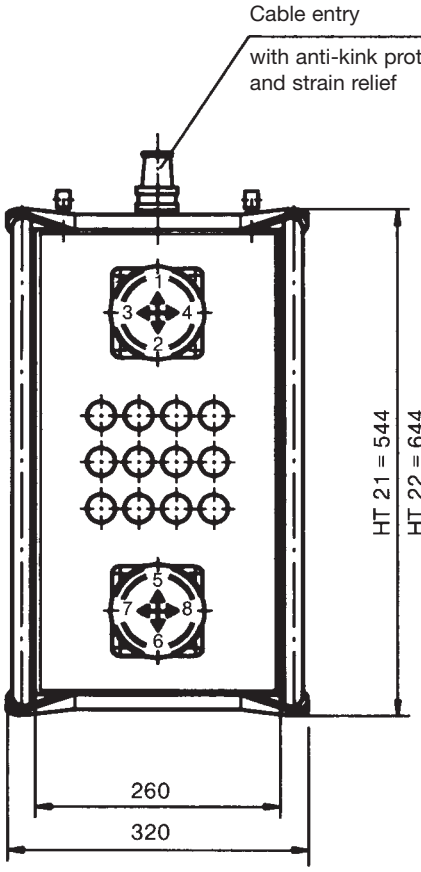
Protection IP 54

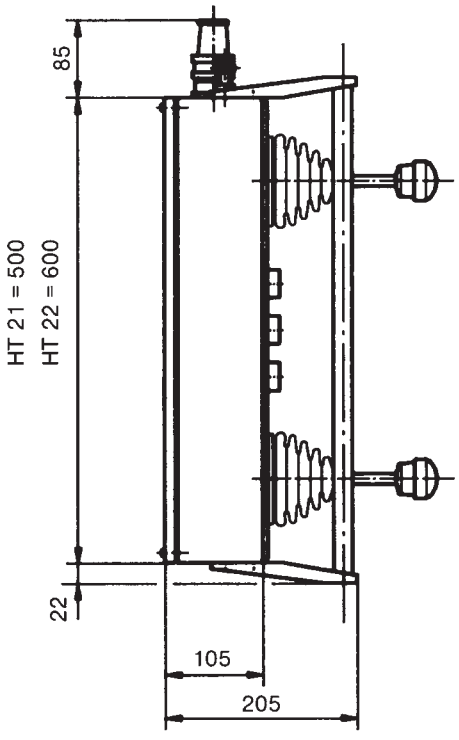




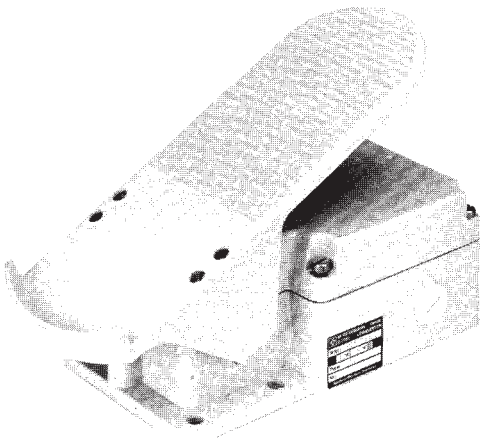
HT 2

Protection IP 54





Pedal-controller P 7 / PP 7

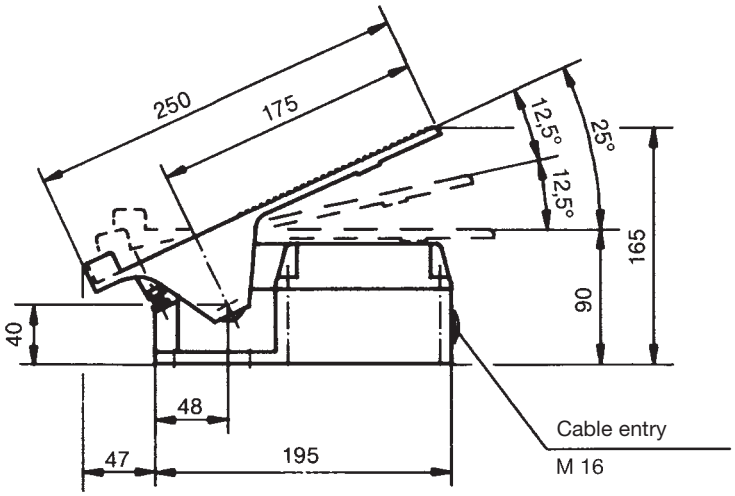


Type P7-1ZP-…

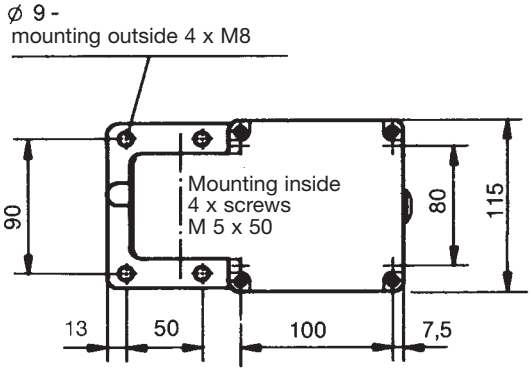
The pedal-controller P 7 and PP 7 is a rugged switching devices to IEC 947-5-1 EN 60 947 DIN VDE 0660-200, for footing applications.

Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

Surface treatment		Primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pebble-grey textured varnish
Mechanical life	P 7	6 million operating cycles
	PP 7	10 million operating cycles
Permissible ambient temperature		Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance		
Damp heat constant		DIN IEC 68 part 2-3
Damp heat cyclic		DIN IEC 68 part 2-30
Degree of protection	P 7	IP 54 IEC 529 DIN 40050
	PP 7	IP 65 IEC 529 DIN 40050



View at the top without rocker

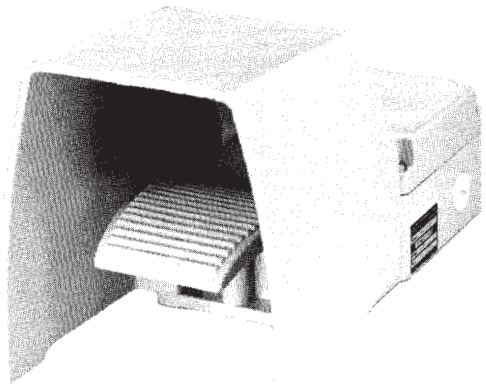


Example for type-sign **P7 -1 Z P -X -A01 P012**

Pedal-controller	
No. of contacts	**Arrangement**
Spring return	**special pleaee describe**
	Potentiometer e.t.c.
	Potentiometer description

Pos.		Type-expansion		Weight gramm	Type	Price EURO
1	Pedal-controller standard version			1700	P 7	
2	Pedal-controller heavy-duty version			1800	PP 7	
4	Switching sequence max. 0-4 or max. 2-0-2			150		
8	No. of contacts (microswitch) max. 6 pcs.			30	1	
9	Switching program according contact-arrangement MS look catalog 5/001	A…		40	2	
10	or to your contact-arrangement			50	3	
11	Spring return in 0-position			100	Z	
12	Friction brake			50	R	
15	Potentiometer e.t.c. with mounted Wire-wound potentiometer T 129 linear 1,5 Watt wiper current max. 10 mA resistance 1k ≙ P012, 2k ≙ P013, 4k ≙ P014, 10k ≙ P015	P01 □		70	P	
16	Prepared for mounting potentiometer shaft 6 mm adjusting-angel 300°				(P)	
17	More potentiometer e.t.c. look catalog 1/240...	P…				

Pedal-controller P 8 / PP 8

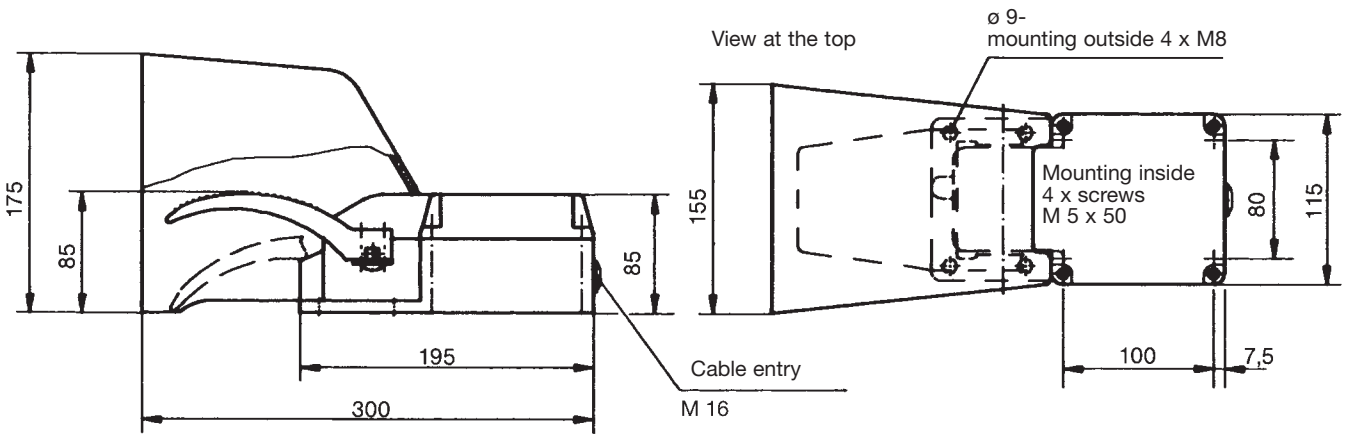


Type P8-1ZP-…

The pedal-controller P 8 and PP 8 is a rugged switching devices to IEC 947-5-1 EN 60 947 DIN VDE 0660-200, for footing applications.

Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

Surface treatment:		Primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pebble-grey textured varnish
Mechanical life	P 8	6 million (operating cycles)
	PP 8	10 million (operating cycles)
Permissible ambient temperature		Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance		
Damp heat constant		DIN IEC 68 part 2-3
Damp heat cyclic		DIN IEC 68 part 2-30
Degree of protection	P 8	IP 54 IEC 529 DIN 40050
	PP 8	IP 65 IEC 529 DIN 40050



Example for type-sign P8 -1 Z P -X -A01 P013

Pedal-controller

No. of contacts

Spring return

Potentiometer description

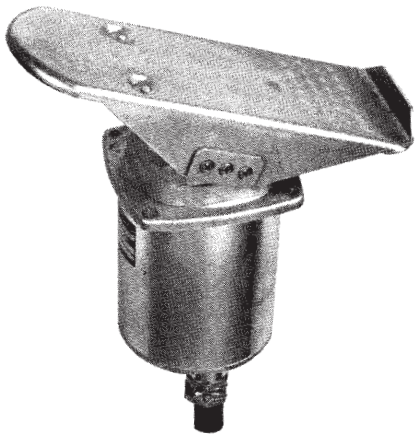
Arrangement

special pleaee describe

Potentiometer e.t.c.

Pos.		Type-expansion		Weight gramm	Type	Price EURO
1	Pedal-controller standard version			2500	P 8	
2	Pedal-controller heavy-duty version			2600	PP 8	
4	Switching sequence max. 0-4			150		
8	No. of contacts (microswitch) max. 6 pcs.			30	1	
9	Switching program according contact-arrangement MS look catalog 5/001	A…		40	2	
10	or to your contact-arrangement			50	3	
11	Spring return in 0-position			100	Z	
12	Friction brake adjustable			50	R	
15	Potentiometer e.t.c. with mounted Wire-wound potentiometer T 129 linear 1,5 Watt wiper current max. 10 mA resistance 1k ≙ P012, 2k ≙ P013, 4k ≙ P014, 10k ≙ P015	P01 □		70	P	
16	Prepared for mounting potentiometer shaft 6 mm adjusting-angle 300°				(P)	
17	More potentiometer e.t.c. look catalog 1/240...	P…				

Pedal-controller P 10 / P 11



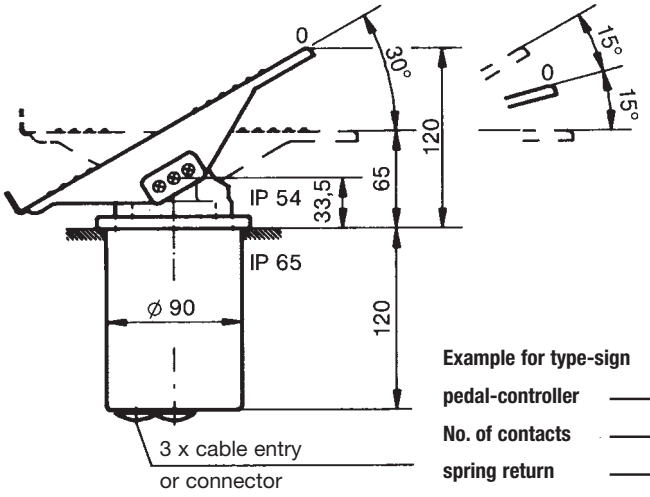
Type P10-1ZP-B...

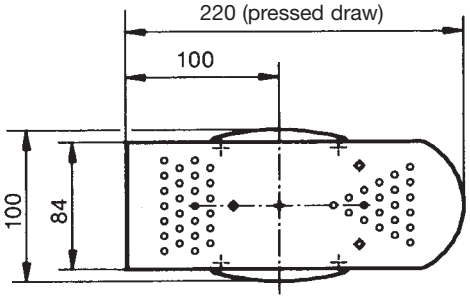
The pedal-controller P 10 / P 11 is a rugged switching device to IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications. The modular design enables the switching device to be used universally. The P 10 / P 11 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

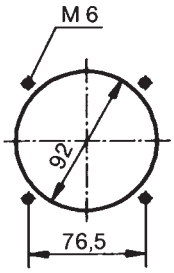
Mechanical life	8 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

Technical data look catalog 5/100





View at the top



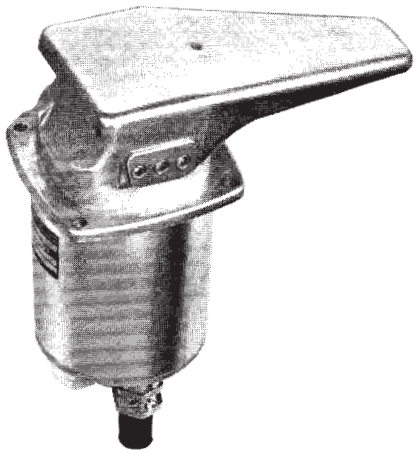
Hole pattern

Example for type-sign **P10 -1 Z P -B- -X- A01 P224**

- **pedal-controller** (P10)
- **No. of contacts** (-1)
- **spring return** (Z)
- **Potentiomter description** (P224)
- **Arrangement** (A01)
- **speacial please describe** (-X-)
- **cover housing** (-B-)
- **Potentiometer e.t.c.** (P)

Pos.		Type-expansion		Weight gramm	Type	Price EURO
1	Pedal-controller standard version			1300	P 10	
2	Pedal-controller centre position notching max. 1-0-1			1300	P 11	
3	Switching sequence max. 0-3					
7	No. of contacts (microswitch) max. 3 pcs.			20	1	
8	Switching program according contact-arrangement MS look catalog 5/001	A...		40	2	
9	or to your contact-arrangement			60	3	
11	Spring return in 0-position			30	Z	
12	Friction brake adjustable			30	R	
15	Potentiometer e.t.c. with mounted Conductive-plastic potentiometer T 362 linear with centre tap life 10^7 switching cycles Resistance 2 x 5 kOhm 0,5 Watt wiper current max. 1 mA	P224 □		70	P	
16	Prepared for mounting potentiometershaft 6 mm adjusting angle 120°	P...			(P)	
17	More potentiometer e.t.c. look catalog 1/240...					
18	Impedance converter Input ± 15 Volt, output ± 10 Volt / 5 mA	I...			I	
20	Cover housing			300	B	
21	Filter plug M 20 for air-condition			20		
22	Cable entry M 20			30		
23	Plug in socket 14-pole female insert CPC 17 wired			150		
24	Connector 14-pole male insert CPC 17 unwired			150		
25	Wiring plug in socket or connector each wired-connection					
26	Electronic (Amplifier, Profi-Bus, CAN-Bus) look catalog 3/510/...	E...				

Pedal-controller P 12



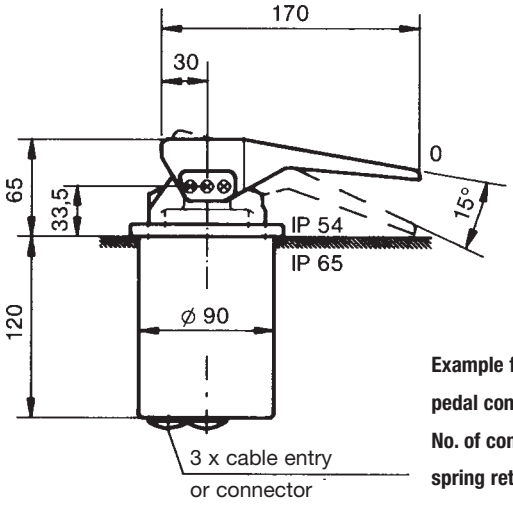
Type P12-1ZP-B...

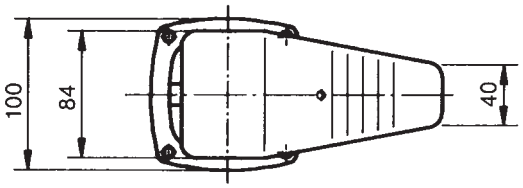
The pedal-controller P 12 is a rugged switching device to IEC 947-5-1 EN 60947 DIN VDE 0660-200 for electro-hydraulic applications. The modular design enables the switching device to be used universally. The P 12 is resistant to oil, maritime climate, ozone and UV radiation.

Contact complement 0,5 A 110 V AC 15 res. 1,5 A 24 V DC 13
I min > 0,2 mA 2 V DC 12 Gold plated for max. load of 0,12 Watt (standard)

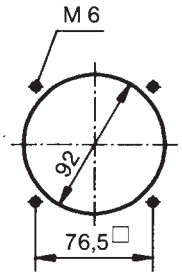
Mechanical life	8 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection front	IP 54 IEC 529 DIN 40050

Technical data look catalog 5/100





View at the top



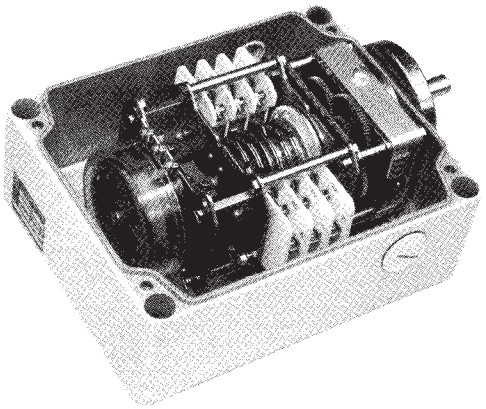
Hole pattern

Example for type-sign **P12 -1 Z P -B- -X- A01 P224**

- **pedal controller** — P12
- **No. of contacts** — -1
- **spring return** — Z
- **Potentiometer e.t.c.** — P
- **cover housing** — -B-
- **special please describe** — -X-
- **Arrangement** — A01
- **Potentiometer description** — P224

Pos.		Type-expansion		Weight gramm	Type	Price EURO
1 2	Pedal-controller standard version			1300	P 12	
3	Switching sequence max. 0-3					
7 8 9	No. of contacts (microswitch) max. 3 pcs. Switching program according contact-arrangement MS look catalog 5/001 or to your contact-arrangement	A...		20 40 60	1 2 3	
11 12	Spring return in 0-position Friction brake adjustable			30 30	Z R	
15	Potentiometer e.t.c. with mounted Conductive-plastic potentiometer T 362 linear life 10^7 switching cycles Resistance 5 kOhm 0,5 Watt wiper current max. 1 mA	P224 □		70	P	
16 17	Prepared for mounting potentiometershaft 6 mm adjusting angle 120° More potentiometer e.t.c. look catalog 1/240...	P...			(P)	
18	Impedance converter Input + 15 Volt, output + 10 Volt / 5 mA	I...			I	
20 21 22 23 24 25 26	Cover housing Filter plug M 20 for air-condition Cable entry M 20 with anti-kink protection and strain relief Plug in socket 14-pole female insert CPC 17 wired Connector 14-pole male insert CPC 17 unwired Wiring plug in socket or connector each wired-connection Electronic (Amplifier, Profi-Bus, CAN-Bus) look catalog 3/510/...	E...		300 20 30 150 150	B	

Gear limit switch GE 1 / GE 2



Type GE1-40-6P-U...

The gearing limit switch GE 1 / GE 2 is a rugged switching device to IEC 947-5-1 EN 60947 DIN VDE 0660-200 designed for hoisting applications. The modular micro changeover contacts are positive opening to VDE 0113.

Contact complement 2 A 250 V AC 15 res. 3 A 24 V DC 13

The device is programmed by means of stepless adjustment of double cam disks, which can be provided from 18° to 192° contact disks according to the switching program required.

The type GE 1 includes a double cam disk conjointly lockable.
The type GE 2 includes a double cam disk individually lockable.

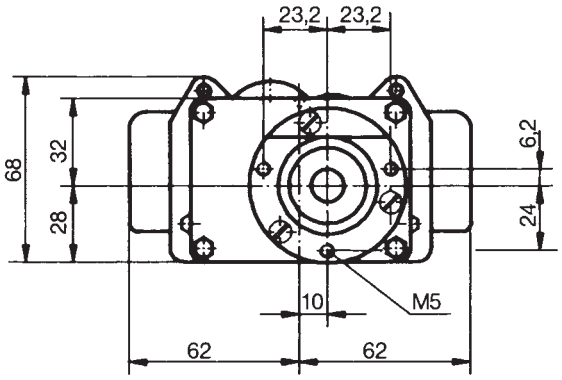
The following gear ratios (n:1) are possible:
from 2 to 320
Further ratios can be provided as required.
The maximum usable rotational angle at the spindle is 342°.

Surface treatment	Primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pebble-grey textured varnish
Mechanical life	10 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection (in housing)	IP 65 IEC 529 DIN 40050

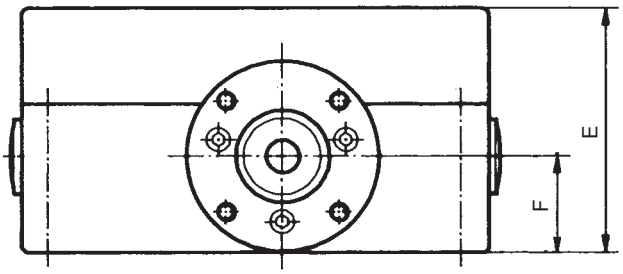
Technical data look catalog 5/100, GE 1 T 576, GE 2 T 577

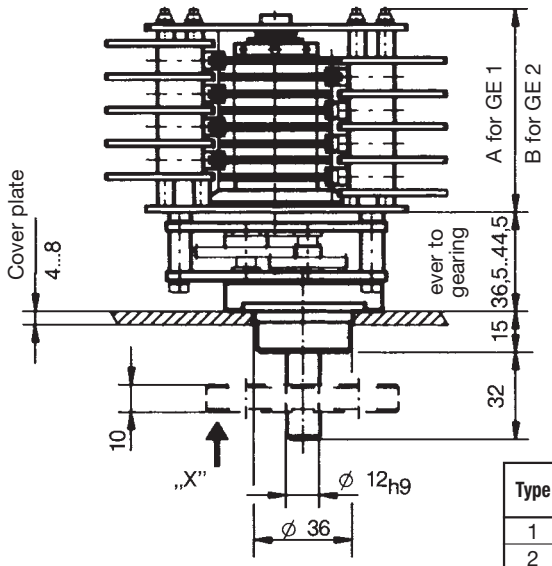
Pos.		Type-expansion		Weight gramm	Type	Price EURO
1	Drive with drive shaft, with mounting flange			350	GE1	
2	Drive with drive shaft, with mounting flange			350	GE2	
3	Gearing Ratios (n : 1) 2 : 1 to 10 : 1			400		
4	11 : 1 to 20 : 1			450		
5	21 : 1 to 40 : 1			500		
6	41 : 1 to 80 : 1			550		
7	81 : 1 to 160 : 1			600		
8	161 : 1 to 320 : 1			650		
9	or ratios to your instructions					
10	Limit switch		No. of contacts 2	350	2	
11			3	400	3	
12	Switching program with 18°, 24°, 30°, 36°, 45°, 60°, 75°, 90°, 110°, 120°,		4	450	4	
13	176° or 192° contact ways program-disks (please select)		5	500	5	
14			6	550	6	
15	The program-disks are infinitely adjustable within 360°.		7	600	7	
16			8	650	8	
17	0° 360°		9	700	9	
18	1 4 2 18°–36°		10	750	10	
19			11	800	11	
20	1 4 2		12	850	12	
21			13	900	13	
22	192°– 360°		14	950	14	
23			15	1000	15	
24	or to your contact-arrangement		16	1050	16	
25	Double cam disk individually lockable for GE 2		1			
27	Potentiometer e.t.c. with mounted Wire-wound potentiometer PW 70 d linear, 5 Watt wiper current max. 30 mA resistance 1k ≙ P992, 2k ≙ P993, 5k ≙ P994, 10k ≙ P995	P99 □		100	P	
28	Prepared for mounting potentiometer (gearing metal)				(P)	
29	Prepared for mounting potentiometer e.t.c. adjusting angle variable				(P)	
	More potentiometer e.t.c. look catalog 1/240...	P...				
30	Aluminium housing U 17 / 13 for max. 8 contacts GE 1			1500	U5	
31	Aluminium housing U 16 / 16 for max. 12 contacts GE 1 , max. 6 contacts GE 2			2000	U6	
32	Aluminium housing U 16 / 20 for max. 16 contacts GE 1 , max. 10 contacts GE 2			2500	U7	
33	Aluminium housing U 16 / 26 for max 16 contacts GE 1			3000	U8	
34	Aluminium housing U 16 / 35			3500	U9	

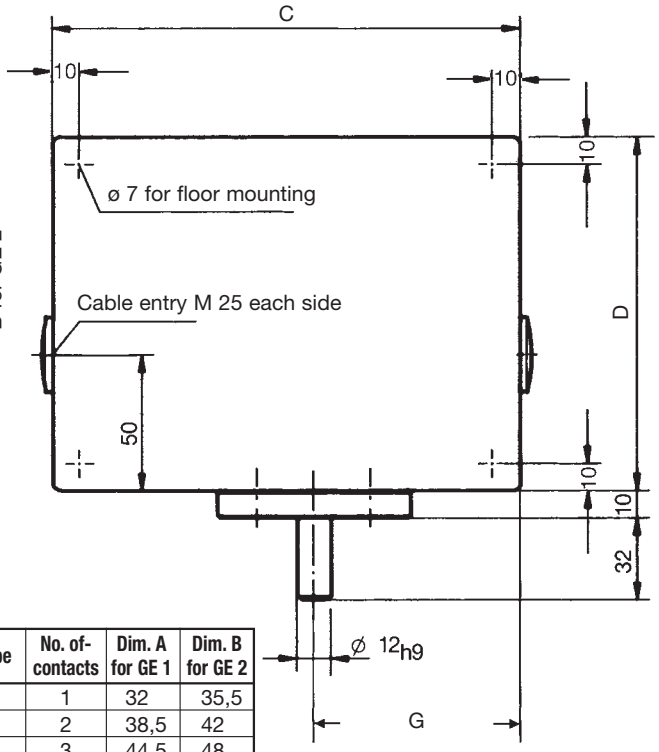
View without build-on flange

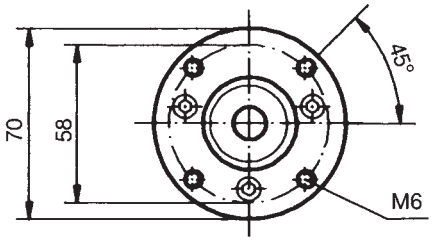


Protection IP 65









Build-on flange, view „X"

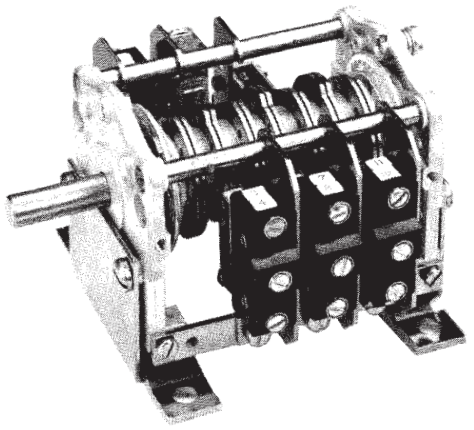
Type	No. of-contacts	Dim. A for GE 1	Dim. B for GE 2
1	1	32	35,5
2	2	38,5	42
3	3	44,5	48
4	4	50,5	54
5	5	56,5	60
6	6	63	66,5
7	7	69	72,5
8	8	75	78,5
9	9	81	84,5
10	10	87	90,5
11	11	93	96,5
12	12	99	102,5
13	13	105,5	109
14	14	111,5	115
15	15	117,5	121
16	16	123,5	127

Type	Dim. C	Dim. D	Dim. E	Dim. F	Dim. G
U17/13	170	130	90	35,5	75
U16/16	160	160	91	45	70
U16/20	160	200	100	45	70
U16/26	160	260	91	45	70
U16/35	160	350	100	45	70

Example for type-sign GE1 -40 8 P -U- -X- P994-18-24

- GE1 — **gear limit switch**
- -40 — **gear ratios**
- 8 — **No. of contacts**
- P — **Potentiometer e.t.c.**
- -U- — **aluminium housing**
- -X- — **special please describe**
- P994-18-24 — **Potentiometer description**
- -24 — **program-disk contact 1, 2...**

Copy-cam controller KVS



Type KVS-03-…

The copy-cam controller KVS is a rugged switching device to IEC 947-5-1 EN 60947 DIN VDE 0660-200 and is designed for packing machines. The free spindle end is intended for a gearwheel, sprocket wheel or for direct coupling to the driven machine.
Gearing for matching rotational speed can be supplied (see 3/200).

The work sequence of the machine is “copied“. The drum controller is supported in a bearing, is extremely accurate and has a long service life. The contact blocks, micro-switches, proximity initiators (items 15-19) can be replaced individually or can be combined.

The unit is programmed via double cam disks which can be adjusted steplessly and which have a 180° contact deck.

Surface treatment	Primer, top coat: 2 coats of epoxy-resin paint, standard colour RAL 7032 pebble-grey textured varnish
Mechanical life	20 million (operating cycles)
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection (in housing)	IP 65 IEC 529 DIN 40050

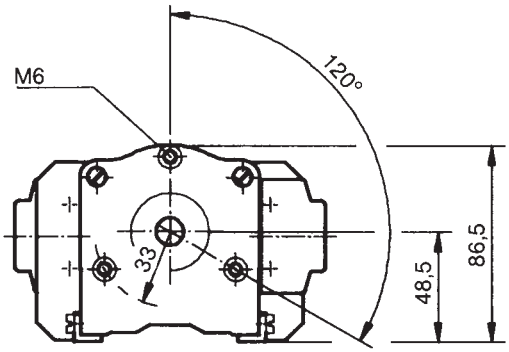
Technical data look catalog 5/100, T 104

Proximity initator
Type IN 5002-FPKG plus switching
Type IN 5002-FNKG minus switching

Connection voltage	18-30 V DC
Current loading	100 mA
Current consumption, not switched	10 mA
Ambient temperature, compensated	-25° C/+80° C

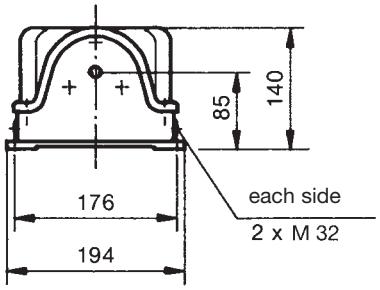
Output: contact-free, short-circuit proof an protected against polarity reversal, switching state displayed via LED

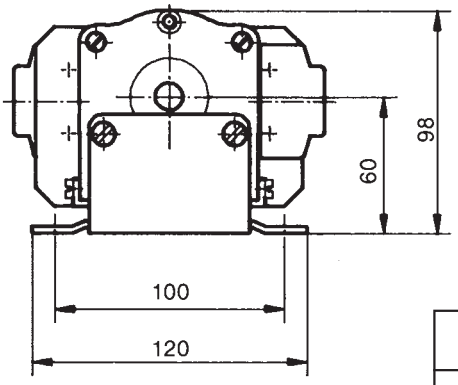
Pos.				Weight kp	Type	Price EURO
1	Copy-cam controller		No. of contacts 3	0,7	01	
2	with free shaft end 12 mm ø		5	0,9	02	
3	without contacts		7	1,1	03	
4	without proximity initiator		9	1,3	04	
5			11	1,5	05	
6	Switching program 180° each contact way		13	1,7	06	
7			15	1,9	07	
8	The program-disks are infinitely adjustable within 360°.		17	2,1	08	
9	0° 360°		19	2,3	09	
10	1 – 4 / 1 – 2		21	2,5	10	
11	180° – 360°		23	2,7	11	
12						
15	Cam operated switch 4 A 350 V AC 15	1 NC	1	0,08	5	
16						
17	Microswitch 8 A 250 V AC 15	1 NC + 1 NO	1	0,08	7	
18	Proximity initiator plus switching	1 NC or 1 NO	1	0,08	8	
19	Proximity initiator minus switching	1 NC or 1 NO	1	0,08	8	
20	Impulse device hall generator 15 Imp./rev via slot disk			0,08	I	
25	Second, free shaftend 12 mm ø				F	
26	Mounting angles 2 pieces each copy-cam controller			0,1	W	
30	Aluminium housing U 15 / 14 IP 54 up to type 03			1,7	U1	
31						
32	Aluminium housing U 15 / 30 IP 54 up to type 11			2,9	U3	



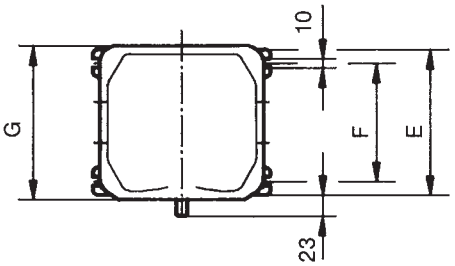
Mounting at the top

U 15 / ..
Protection IP 54

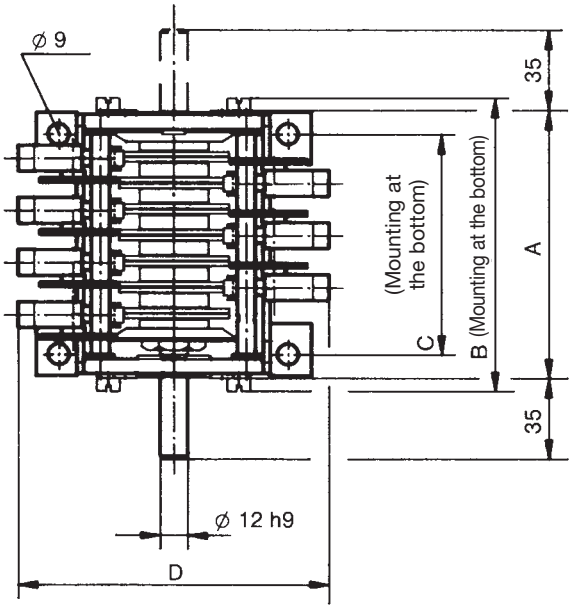




Mounting at the bottom
(with mounting angles)



U 15 / ..	Dimension E	Dimension F	Dimension G
/14	160	130	169
/30	320	290	329



Type	No. of contact	Dimension A	Dimension B	Dimension C
01	3	72	87	51
02	5	95	110	74
03	7	118	133	97
04	9	141	156	120
05	11	164	180	143
06	13	187	202	166
07	15	210	225	189
08	17	233	248	212
09	19	256	271	235
10	21	279	294	258
11	23	302	317	281

Type	Dimension D	Screw-connection
KVS 5	125	M 4
KVS 7	145	M 3
KVS 8	140	M 3

Example for type-sign **KVS 7 -03 -U- -X**

Copy-cam controller

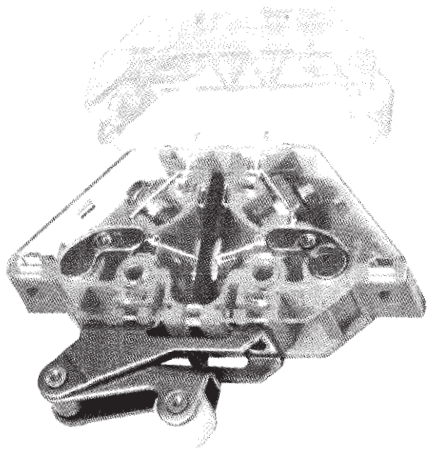
No. of contacts

Contact-type

Special please describe

Aluminium housing

DC-contact
SO 1.10 Normally closed (NC) SS 1.10 Normally open (NO)



Type SO1.10-R-…

The DC contact block to IEC 947-5-1 EN 60947 DIN VDE 0660-200 and VDE 0670/4 § 20 is used for signalling and announciation 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 (see diagram below left).

The contact blocks may only be installed on non-magnetizable materials with screws, 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. 0,2 µ), 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.

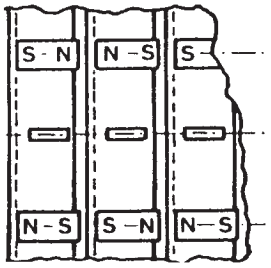
Several contact blocks can be plugged on top of each other and operated jointly.
The plug-type terminals are then only accessible on the top unit.
The contact blocks can be provided with shock protection to DIN VDE 0106 Part 100.

Please consult our technical department in the event of:
application in extreme nuisance, confined switching points or increased breaking currents.

	Switching capacity NC	NO	Time constant
250 V DC	2 A	1 A	20 ms
125 V DC	4 A	3 A	20 ms
50 V DC	6 A	6 A	20 ms
30 V DC	10 A	10 A	20 ms
250 V AC 15	6 A	6 A	

Mechanical life	2 million operating cycles
Electrical service life	50.000 operating cycles at 2 A 250 V DC L/R 20 ms
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection	IP 40 IEC 529 DIN 40050

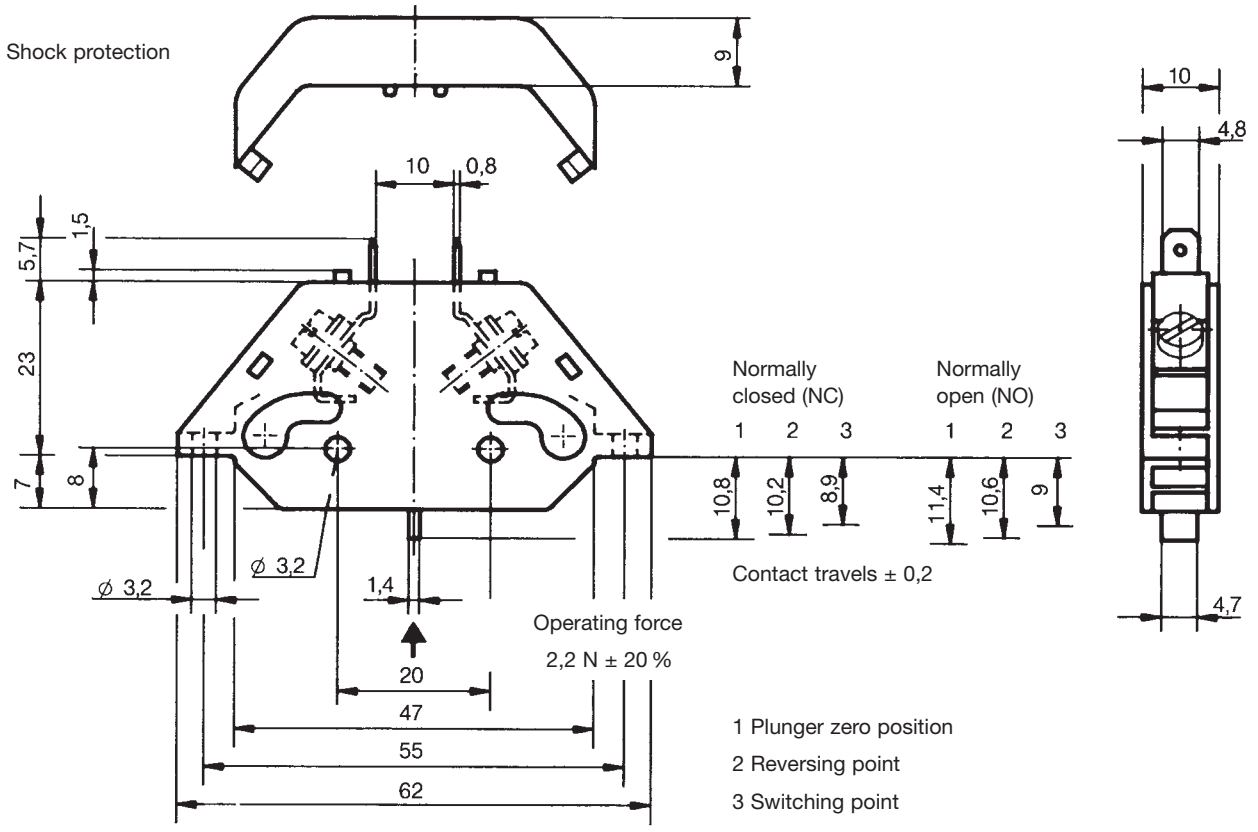
blue grey blue ——— Normally closed (NC)
green yellow green ——— Normally open (NO)

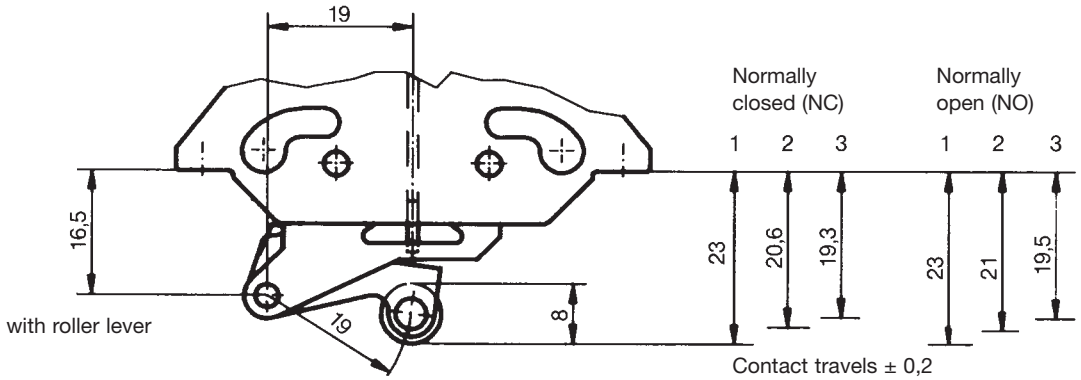


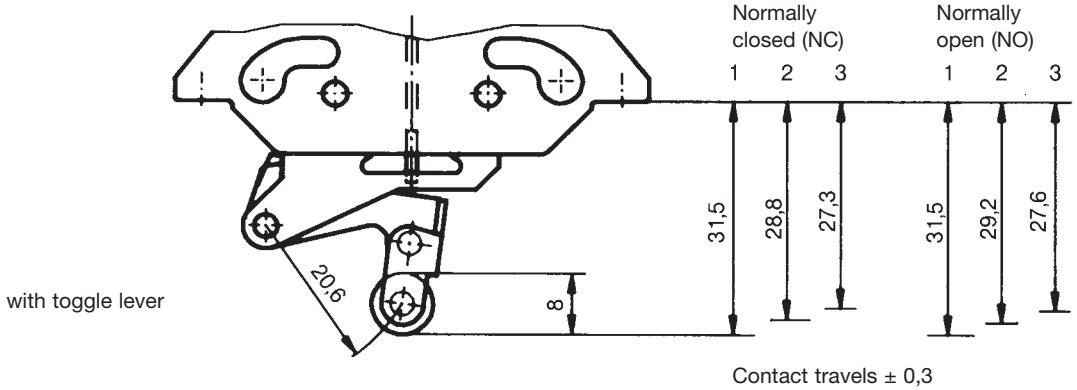
Unless otherwise requested, equal quantities grey/blue or yellow/green will be supplied.

Pos.				Weight gramm	Type	Price EURO
1	DC-contact	normally closed (NC)		20	SO 1.10	
	Colour code	grey or blue				
2	DC-contact	normally open (NO)		20	SS 1.10	
	Colour code	yellow or green				
3	Shock protection KEG 142 to DIN VDE 0106 Part 100				B	
4	Roller lever			10	R	
5	Toggle lever (switching in one direction only)			15	K	
6	Plug-in connection at side 4,8 x 0,8 mm (2 pieces)				F	
7	Contacts gold-coated approx. 0,2 mµ				AU	
8	Contact without quenching magnets (for AC only) subtract price					
9	Contact without quenching magnets (for AC only) and without snap-action mechanism subtract price					

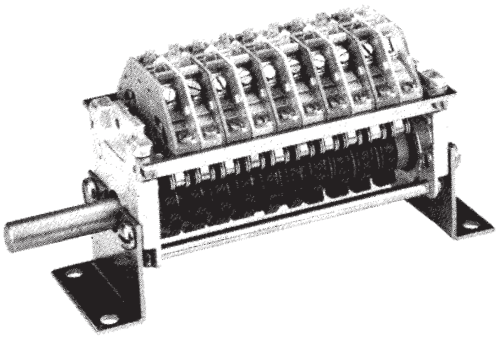
DC-contact
SO 1.10 Normally closed (NC) SS 1.10 Normally open (NO)







Signal-cam controller NU 1



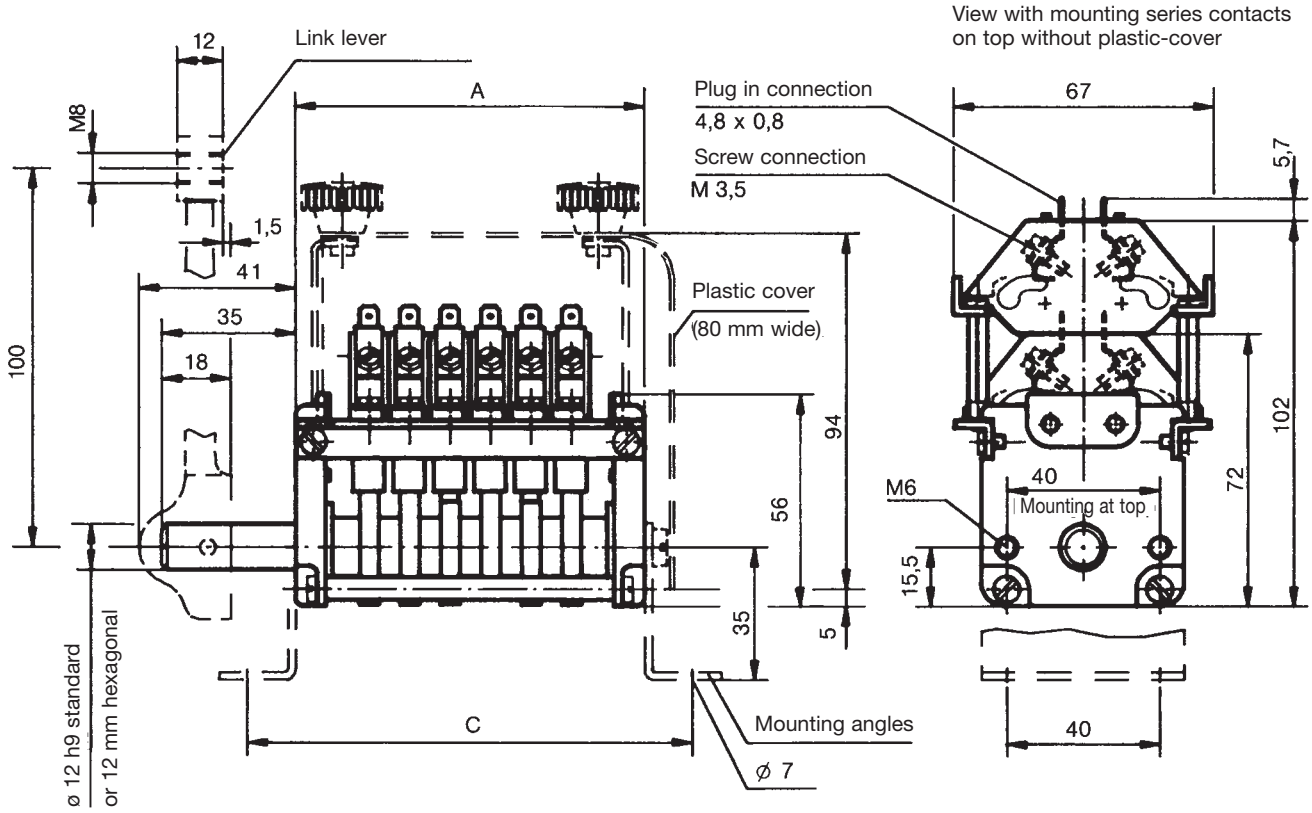
Type NU1-10-W...

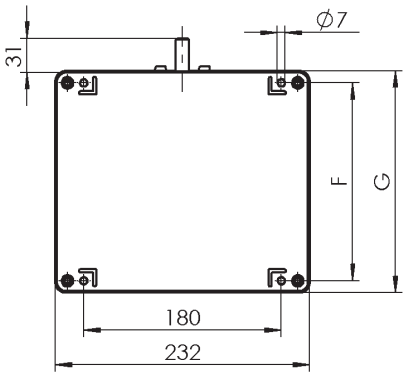
The cam controller NU 1 is used as a signal and announciation switch in HV systems. This rugged switching device to IEC 947-5-1 EN 60947 DIN VDE 0660-200 and VDE 0670/4 § 20 has cam disks made of insulation material that can be set at 10° intervals. **The switching rating of the contacts (NC with snap-action mechanism) is 6 A 250 V AC 15 or 2 A 250 V DC. Time constant L/R = 20 ms.** NO contacts can also be supplied. The DC contact blocks are designed to permit series assembly, which can then be operated simultaneously. This requires additional components for mounting the contacts.

Mechanical life	2 million operating cycles
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection (in housing)	IP 65 IEC 529 DIN 40050

Technical data look catalog 5/100

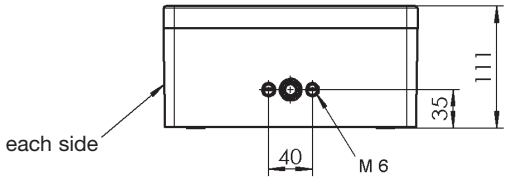
Pos.				Weight gramm	Type	Price EURO
1	Signal-cam controller	No. of contacts 2		350	2	
2	with free shaftend 12 mm ø standard	4		460	4	
3	or 12 mm hexagonal	6		570	6	
4	Switching program	8		680	8	
5		10		790	10	
6		12		900	12	
7		14		1010	14	
8	or to your contact-arrangement	16		1120	16	
9	Switching program to your contact-arrangement	2				
10	Components for mounting series contacts on top	4		110	+4	
11	with DC-contacts	8		200	+8	
12		12		290	+12	
13		16		380	+16	
14						
15	Second free shaftend 12 mm ø standard or 12 mm hexagonal				F	
16	Spring return in 0-position			110	Z	
17	Switching sequence 4-0-4					
18	Mounting angles 2 pieces each signal-cam controller			80	W	
19	Link lever for shaft 12 mm ø standard or 12 mm hexagonal			70	GH	
21	Plastic-cover (Astralon)	up to max 4			A	
22	(Dust and shock protection)	8			A	
23		12			A	
24		16			A	
25	Shock protection KEG 142 for DC-contacts to DIN VDE 0106 Part 100					
30	Aluminium housing U 23 / 20 up to type 10			2500	U11	
31	Aluminium housing U 23 / 28 up to type 16			3000	U12	





Aluminium housing
protection IP 65

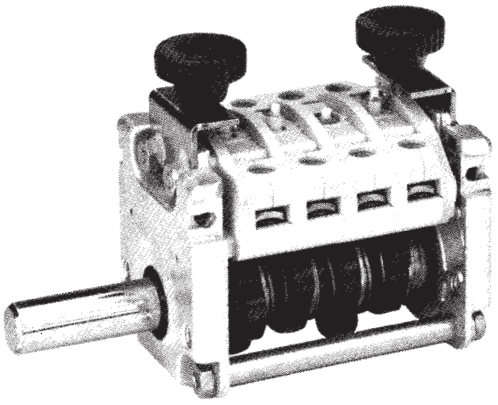
Type	No. of contact	Dimens. A	Dimens. C	Housing	Dimens. F	Dimens. G
2	2	49	74	U 23/20	180	202
4	4	70	95			
6	6	91	117			
8	8	113	138			
10	10	134	159			
12	12	155	180	U 23/28	260	280
14	14	176	201			
16	16	197	222			



Example for type-sign **NU1-4 W GH- A - X**

Signal-cam controller	
No. of contacts	**Special please describe**
Link rod	**Plastic-cover**
	Mounting angles

Signal-cam controller NU 2



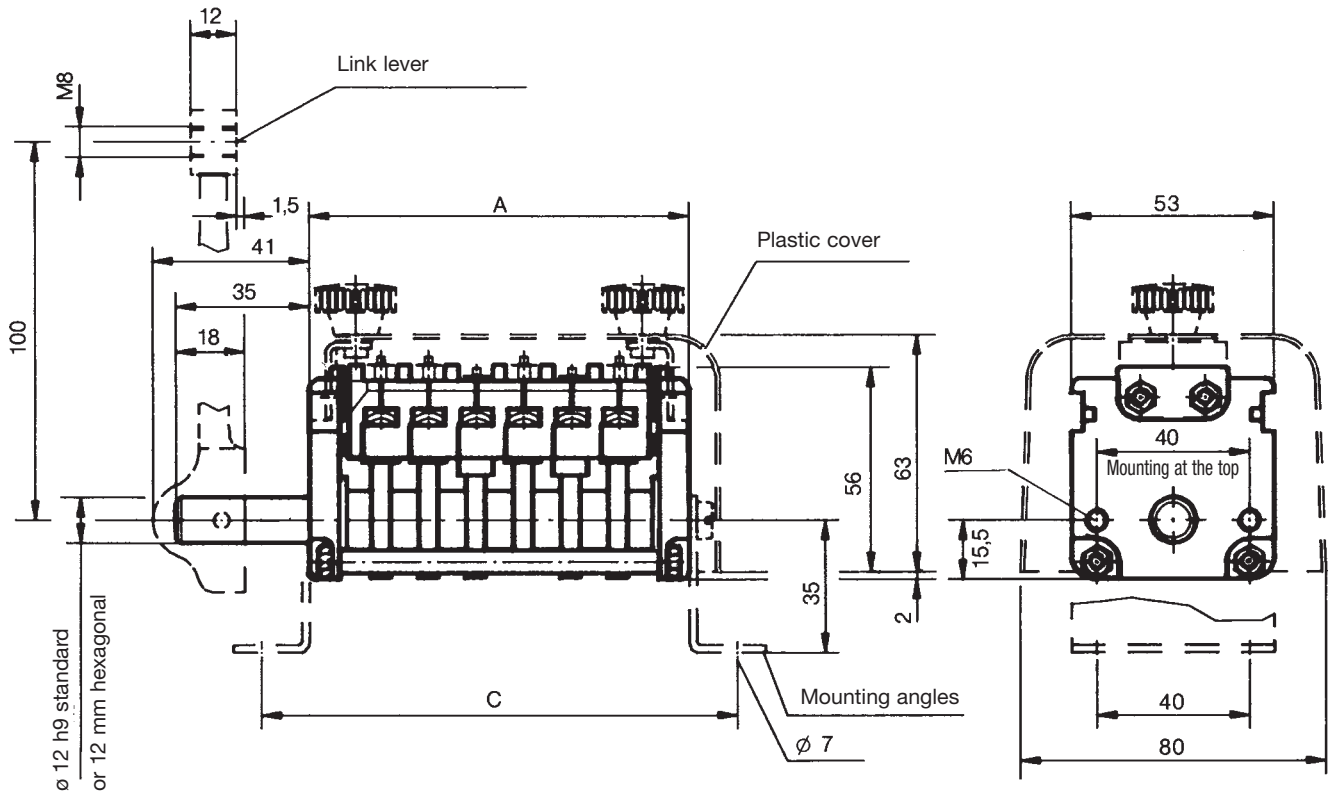
Type NU2-14-...

The cam controller NU 2 is used as a signal and announciation switch in HV systems. This rugged switching device to IEC 947-5-1 EN 60947 DIN VDE 0660-200 has cam disks made of insulation material that can be set at 10° intervals.
The switching rating of the contacts (positively opened) is 4 A 350 V AC 15 res. 1 A 24 V DC 13.

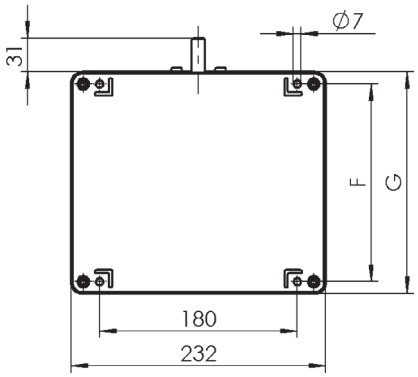
Mechanical life	6 million operating cycles
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection (in housing)	IP 65 IEC 529 DIN 40050

Technical data look catalog 5/100

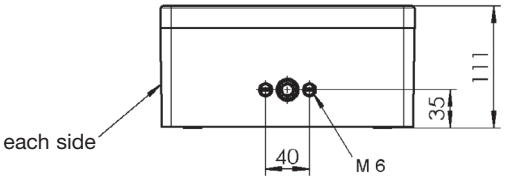
Pos.				Weight gramm	Type	Price EURO
1	Signal-cam controller	No. of contact 2		280	2	
2	with free shaftend 12 mm ø standard	4		380	4	
3	or 12 mm hexagonal	6		480	6	
4	Switching program	8		580	8	
5		10		680	10	
6		12		780	12	
7		14		880	14	
8	or to your contact-arrangement	16		980	16	
9	Switching program to your contact-arrangement	2				
10						
11	Second free shaftend 12 mm ø standard or 12 mm hexagonal				F	
12	Spring return in 0-position			110	Z	
13	Switching sequence 4-0-4					
14	Mounting angles 2 pieces each signal-cam controller			80	W	
15	Link lever for shaft 12 mm ø standard or 12 mm hexagonal			70	GH	
21	Plastic-cover (Astralon)	up to max. 4			A	
22	(Dust and shock protection)	8			A	
23		12			A	
24		16			A	
25						
30	Aluminium housing U 23 / 20 up to type 10			2500	U11	
31	Aluminium housing U 23 / 28 up to type 16			3000	U12	



Type	No. of contact	Dimens. A	Dimens. C	Housing	Dimens. F	Dimens. G
2	2	50	75	U 23/20	180	202
4	4	75	100			
6	6	100	125			
8	8	125	150			
10	10	152	177			
12	12	177	202	U 23/28	260	280
14	14	202	227			
16	16	227	252			



Aluminium housing
protrection IP 65



Example for type-sign NU2-4 - Z GH -U- X

Signal-cam controller

No. of contacts

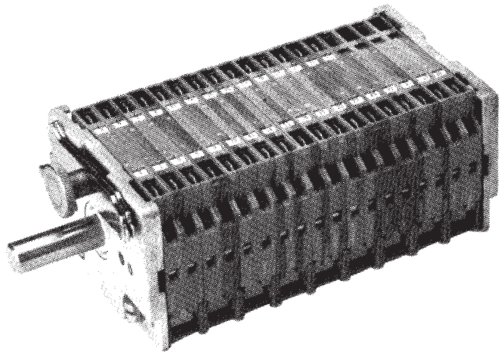
Spring return

Special please describe

Aluminium housing

Link rod

Signal-cam controller NU 3



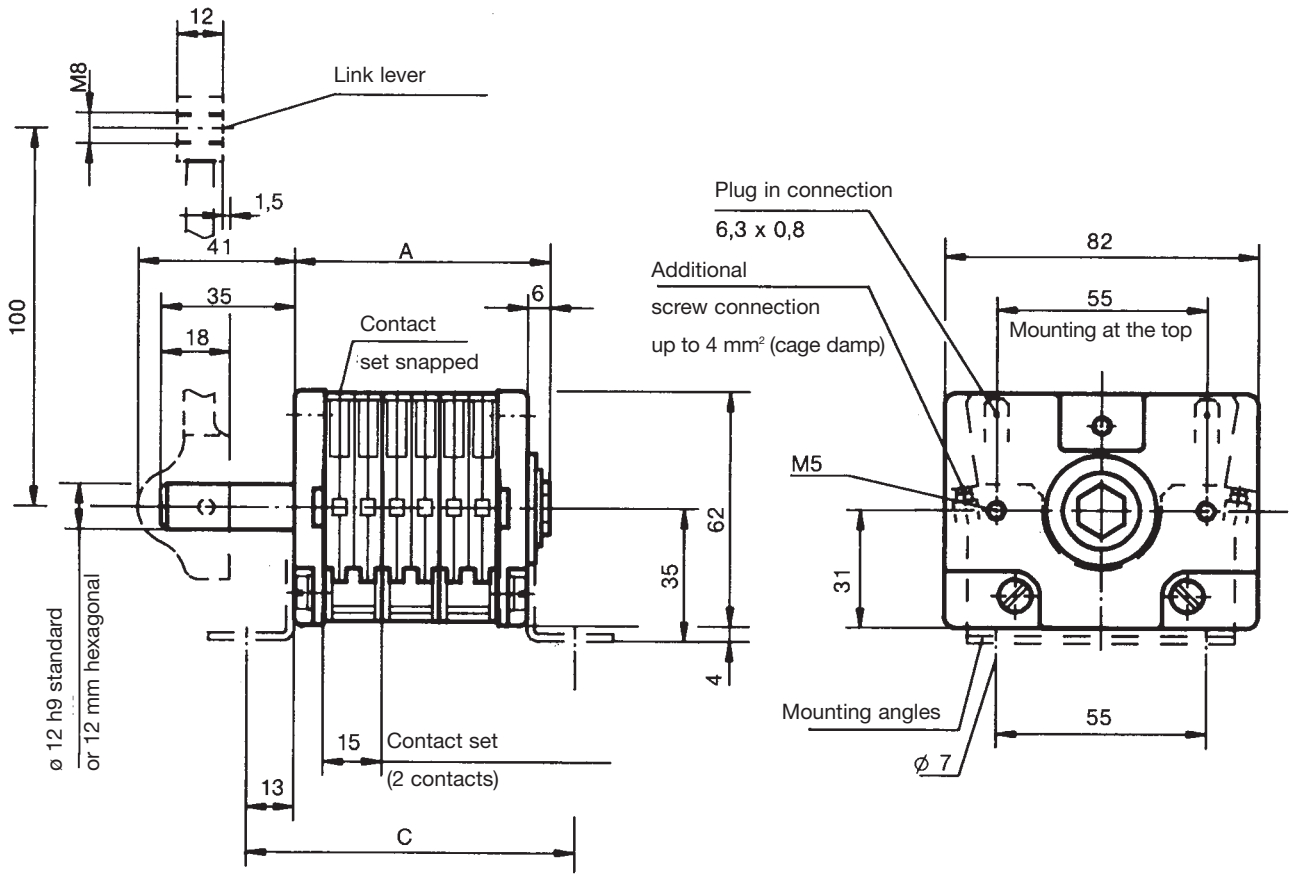
Type NU3-09-...

The cam controller NU 3 is used as a signal and announciation switch in HV systems. This rugged switching device to IEC 947-5-1 EN 60947 DIN VDE 0660-200 and VDE 0670/4 § 20 has cam disk that can be programmed.
The switching rating of the contacts (positively opened and positively closed) is 8 A 250 V AC 15 res. 2,5 A 250 V DC.
Time constant L/R = 20 ms.

Mechanical life	1 million operating cycles
Permissible ambient temperature	Operation -40° C to +60° C Storage -50° C to +80° C
Climate resistance	
Damp heat constant	DIN IEC 68 part 2-3
Damp heat cyclic	DIN IEC 68 part 2-30
Degree of protection (in housing)	IP 54 IEC 529 DIN 40050

Technical data look catalog 5/100

Pos.				Weight gramm	Type	Price EURO
1	Signal-cam controller	No. of contacts 2		450	01	
2	with free shaftend 12 mm ø standard	4		600	02	
3	or 12 mm hexagonal	6		750	03	
4	Contacts with connector lugs	8		900	04	
5	Switching program to your	10		1050	05	
6	contact-arrangement	12		1200	06	
7		14		1350	07	
8		16		1500	08	
9		18		1650	09	
10		20		1800	10	
11		22		1950	11	
12		24		2100	12	
13		26		2250	13	
14		28		2400	14	
15		30		2550	15	
16		32		2700	16	
20	Contacts with additional screw connection each	2				
21	Second free shaftend 12 mm ø standard or 12 mm hexagonal				F	
22	Spring return in 0-position			110	Z	
23	Switching sequence 4-0-4					
24	Mounting angles 2 pieces each signal-cam controller			80	W	
25	Link lever for shaft 12 mm ø standard or 12 mm hexagonal			70	GH	



Type	No. of contacts	Dimension A	Dimension C
01	2	37	57
02	4	52	72
03	6	67	87
04	8	82	102
05	10	97	117
06	12	112	132
07	14	127	147
08	16	142	162
09	18	157	177
10	20	172	192
11	22	187	207
12	24	202	222
13	26	217	237
14	28	232	252
15	30	247	267
16	32	262	282

Example for type-sign **NU 3-04- F W GH- X**

Signal-cam controller

No. of contacts

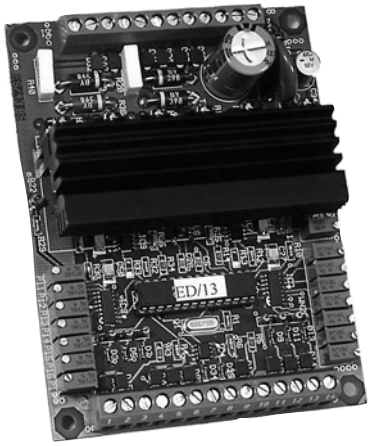
Second free shaftend

Special please describe

Link rod

Mounting angles

Electronic control unit ES/43

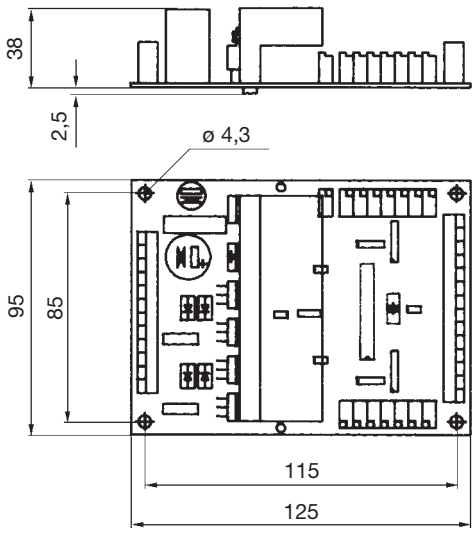


Type ES/43-10-…

The electronic control unit ES / 43 serves for control of proportional valves without position control.

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
- Actuation of 4 proportional valves solenoid connections drawing ES / 43-10
- Actuation of 2 proportional valves solenoid connections drawing ES / 43-11
- LED operating voltage and working display
- Microprocessor technology therefore especially adaptable

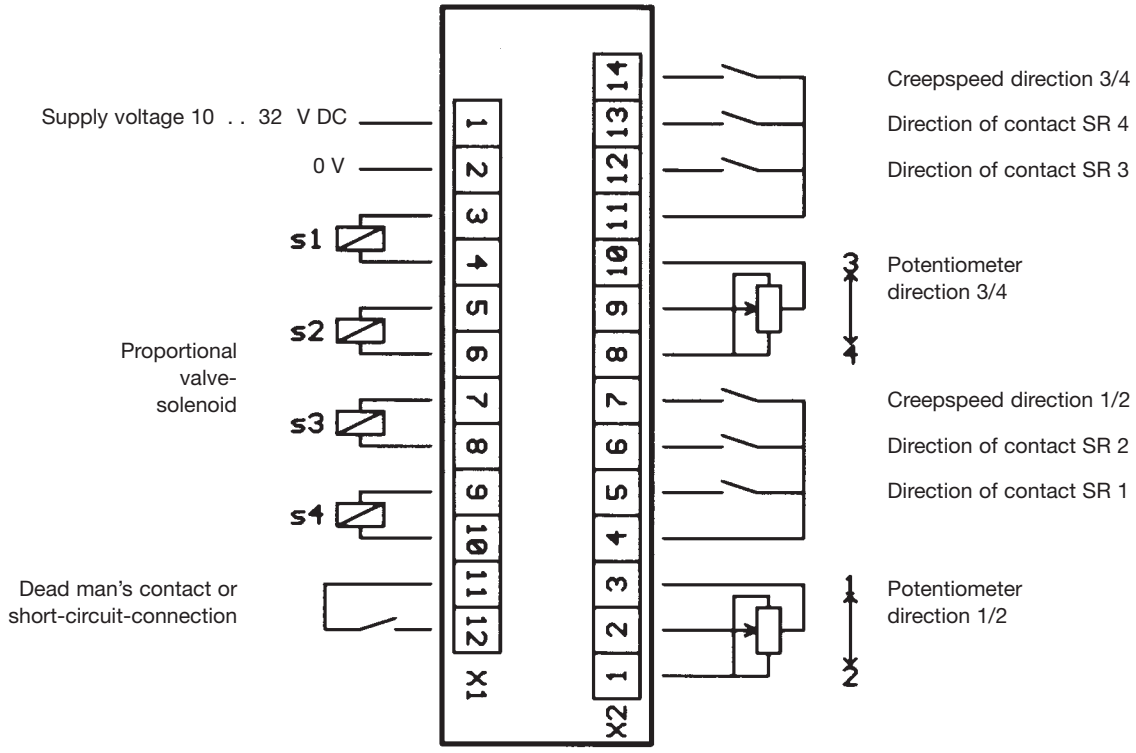


Characteristics:

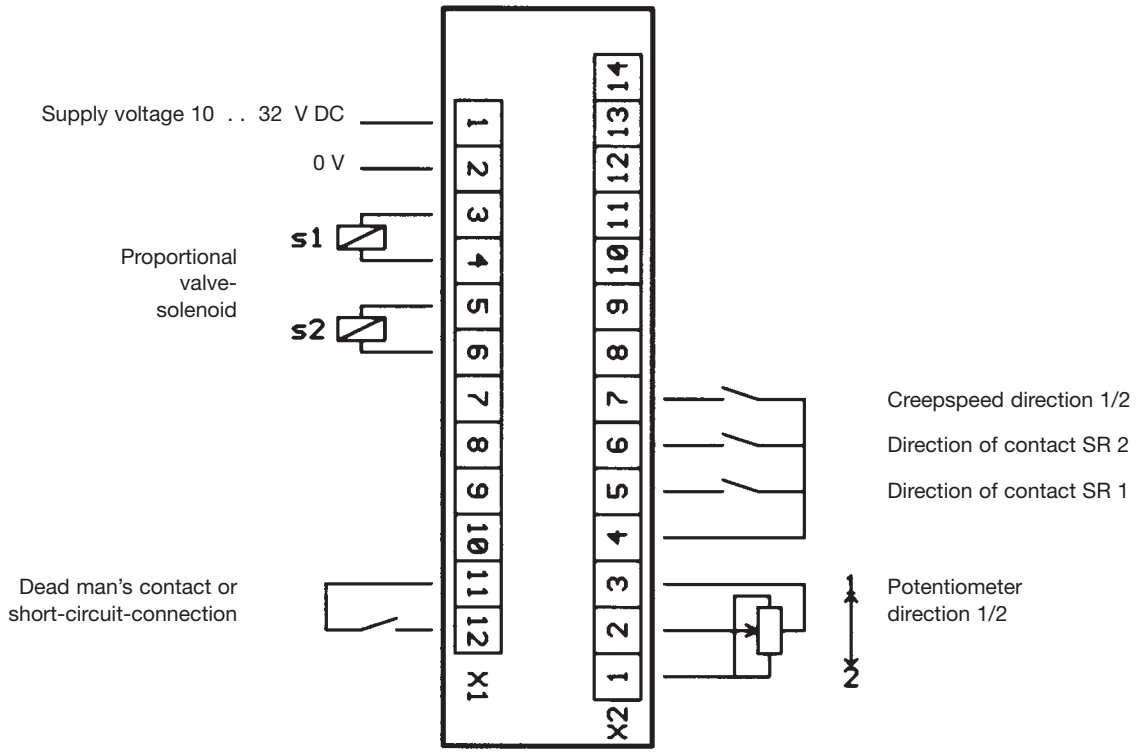
– Supply voltage		10 ...	32 V DC
– Residual ripple		20%	
– Control voltage range	Ue	0 ...	5 V
– Control current	Ie	< 1 mA	
– Dither frequency	f	25 ...	250 Hz
– Proportional valve S 1-4	I min.	0 ...	1 A
Output	I max. = I min ...		2 A at 12 Volt
Output	I max. = I min ...		1 A at 24 Volt
– Ramp time setting	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		

Pos.				Weight gramm	Type	Price EURO
1	Electronic control unit for 4 proportional valves solenoid			250	ES/43-10	
2	Electronic control unit for 2 proportional valves solenoid			200	ES/43-11	
3						

ES / 43-10 4 Proportional valves-solenoid



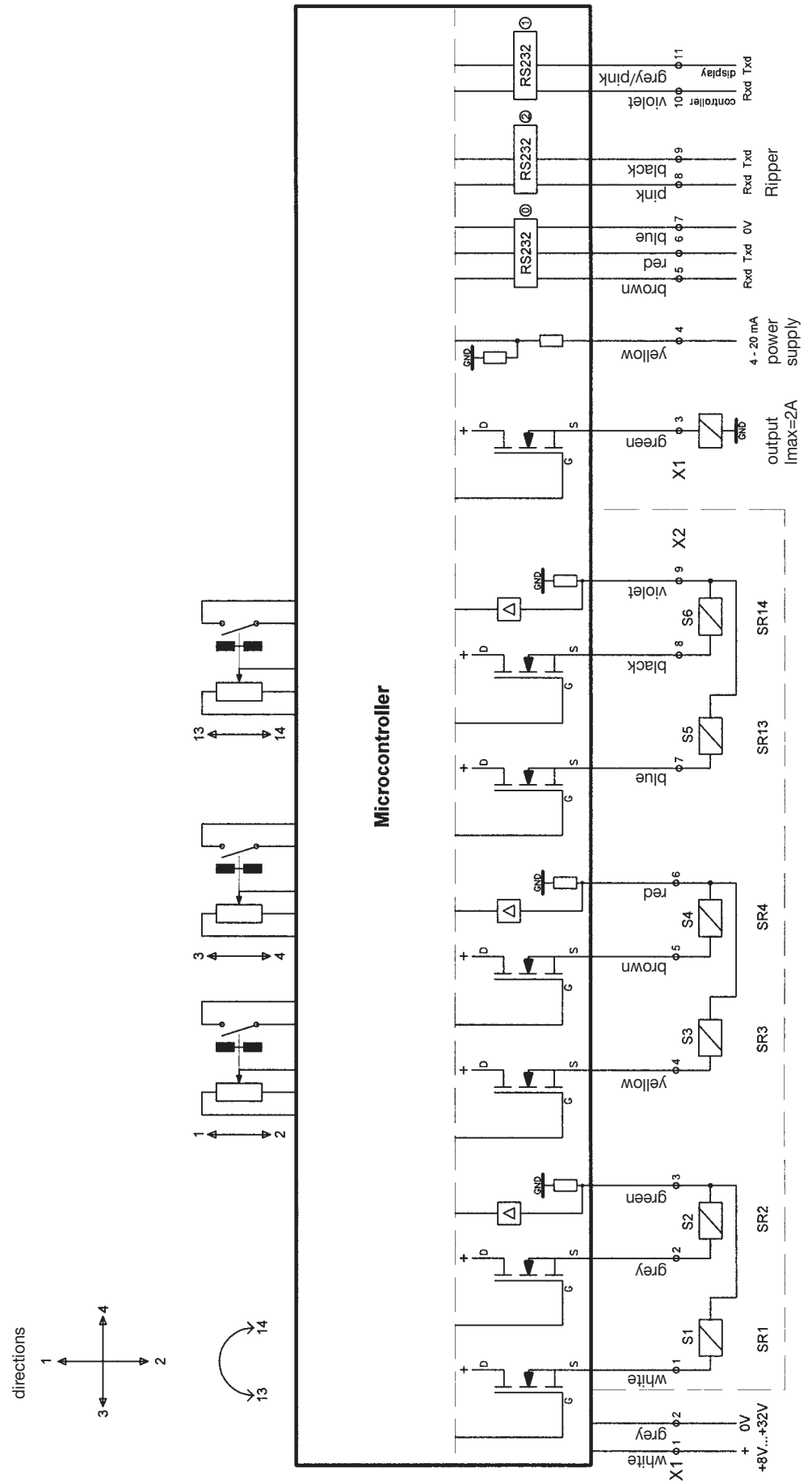
ES / 43-11 2 Proportional valves-solenoid



Electronic (Amplifier)
ES/61
current controlled 0–1 Ampere

Pos.	for mounting on V 8 with potentiometer		Type	Weight gramm	Type	Price EURO
1	Elektronic (Amplifier) Technical data: Power supply 8–32 V DC Current controlled PWM 0–1 A per axis can be a characteristic curve deposited Dither frequency 150 or 200 Hz adjustable Ramp time adjustable or Current input 4–20 mA Current output 2 A RS 232 interface with PC work parameter attitude and diagnosis Error journal for 41 errors with operating time active/inactively recognition Connector DT04-12P / DT06-12S		ES/61	250	EV01	
90	Humidity protection (circuit board moulded) for use with high condensation					

ES/61-10



power supply: +8V ... +32V
PWM-output: max 1A
Frequency: 150/200 Hz ±10 Hz
X1: 12 pol. „DEUTSCH“ Connector type: DT04-12P
X2: 12 pol. „DEUTSCH“ Connector type: DT06-12S

Matching Electronic with digital and analog outputs for potentiometer applications

Pos.	for mounting on: V 10, V 8, VV 8, D 8, P 10, P 11, P 12				Weight gramm	Type	Price EURO
10 11 12							
15 16 17							
30 31 32	Voltage output impressed 0-10 Volt electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output 0-10 Volt (+ 5 mA) Output characteristic linear	ANALOG		EP/84	150	 EU01 EU02	
35 36 37	Voltage output impressed ± 10 Volt electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output ± 10 Volt (± 5 mA) Output characteristic linear	ANALOG		EP/84	150	 EU03 EU04	
40 41 42	Output power impressed 0-20 mA electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output 0-20 mA Output characteristic linear	ANALOG		ER/16		 EI01 EI02	
45 46 47	Output power impressed 4-20 mA electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output 4-20 mA Output characteristic linear	ANALOG		ER/16		 EI03 EI04	
50 51 52	Output power impressed ± 20 mA electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output ± 20 mA Output characteristic linear	ANALOG		ER/44	150	 EI05 EI06	
90	Humidity protection (circuit board moulded) for use with high condensation						

Matching Electronic with digital and analog outputs for redundant Hallsensors

Pos.	for mounting on: V 85, VV 85, V 25				Weight gramm	Type	Price EURO
10 11 12	8bit Gray-code electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output PNP 24 V DC 10 mA) Output characteristic linear	DIGITAL		EP/340	150	 ED11 ED12	
15 16 17	8bit Binär-code electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output PNP 24 V DC 10 mA) Output characteristic linear	DIGITAL		EP/340	150	 ED13 ED14	
30 31 32	Voltage output impressed 0-10 Volt electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output 0-10 Volt (+ 5 mA) Output characteristic linear	ANALOG		EP/318	150	 EU11 EU12	
35 36 37	Voltage output impressed ± 10 Volt electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output ±10 Volt (± 5 mA) Output characteristic linear	ANALOG		EP/318	150	 EU13 EU14	
40 41 42							
45 46 47	Output power impressed 4-20 mA electronic for 1 axis electronic for 2 axis Technical data: Power supply 18-30 V DC Output 4-20 mA Output characteristic linear	ANALOG			150	 El13 El14	
50 51 52							
90	Humidity protection (circuit board moulded) for use with high condensation						

Matching Electronic with Profi-Bus Interface for potentiometer applications

Pos.	for mounting on: V 10, V 8, VV 8, D 8, P 10, P 11, P 12			Weight gramm	Type	Price EURO
1	Electronic Profi-Bus DP Technical data: Power supply 18-30 V DC distinctively poled Profi-Bus Baud rate max. 12 MBit/s Address outside adjustable 0...99 by rotary switch (default 99) potentiometer output value 0 / 128 / 255 or 255 / 0 / 255 Input 3 analog ports for 3 potentiometers (3-axis) 6 digital ports for 3 x 2 direction-contacts 8 digital ports for 8 switches Connection D-SUB 9 socket (female insert) 3 B-line 4 RTS 5 GND 6 +5 V 8 A-line Connector 2-pole 1 24 V 2 0 V Communikation Profi-Bus DP (DIN 192 45 section 3) Ident-No. 068 BH		EB/85		EPB01	
90	Humidity protection (circuit board moulded) for use with high condensation					

Matching Electronic with Profi-Bus Interface for redundant Hallsensors

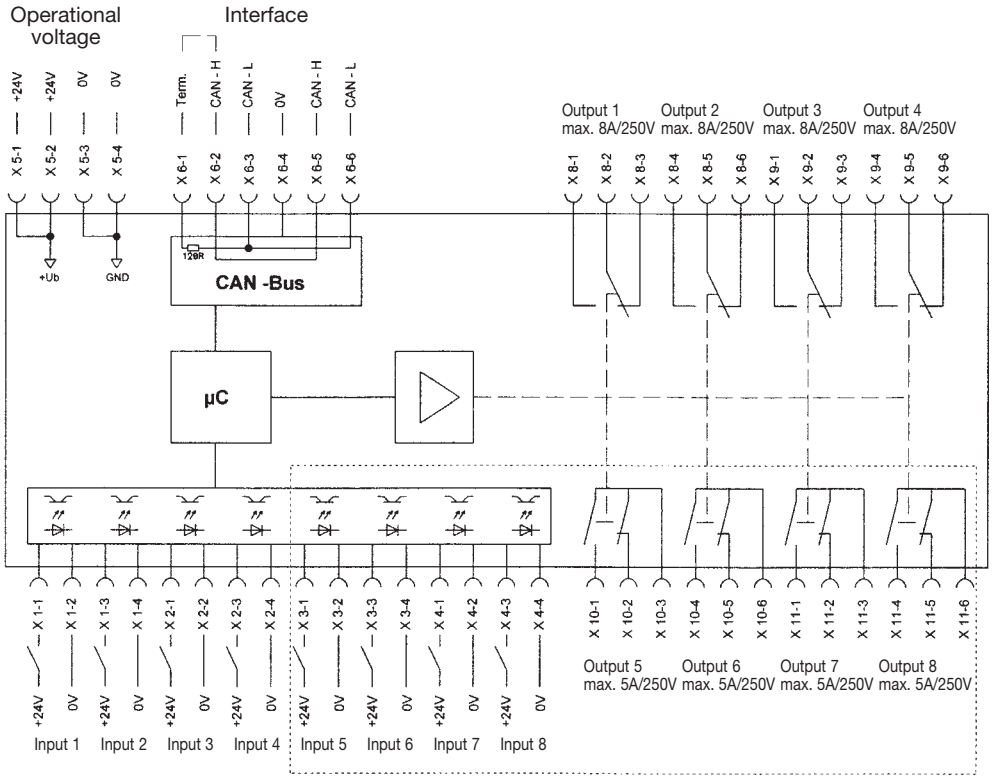
Pos.	for mounting on: V 85, VV 85, V 25			Weight gramm	Type	Price EURO
1	Electronic Profi-Bus DP		EB/85	150	EPB11	
	Technical data: Power supply 18-30 V DC distinctively poled					
	Profi-Bus Baud rate max. 12 MBit/s					
	Address outside adjustable 0...99 by rotary switch (default 99)					
	Hallsensors output value 0 / 128 / 255 or 255 / 0 / 255					
	Input 3 analog ports for 3 potentiometers (3-axis)					
	6 digital ports for 3 x 2 direction-contacts					
	8 digital ports for 8 switches					
	Connection D-SUB 9 socket (female insert)					
	3 B-line					
	4 RTS					
	5 GND					
	6 +5 V					
	8 A-line					
	Connector 2-pole					
	1 24 V					
	2 0 V					
	Communikation Profi-Bus DP (DIN 192 45 section 3)					
	Ident-No. 068 BH					
90	Humidity protection (circuit board moulded) for use with high condensation					

Matching Electronic with CAN-Bus Interface for potentiometer applications

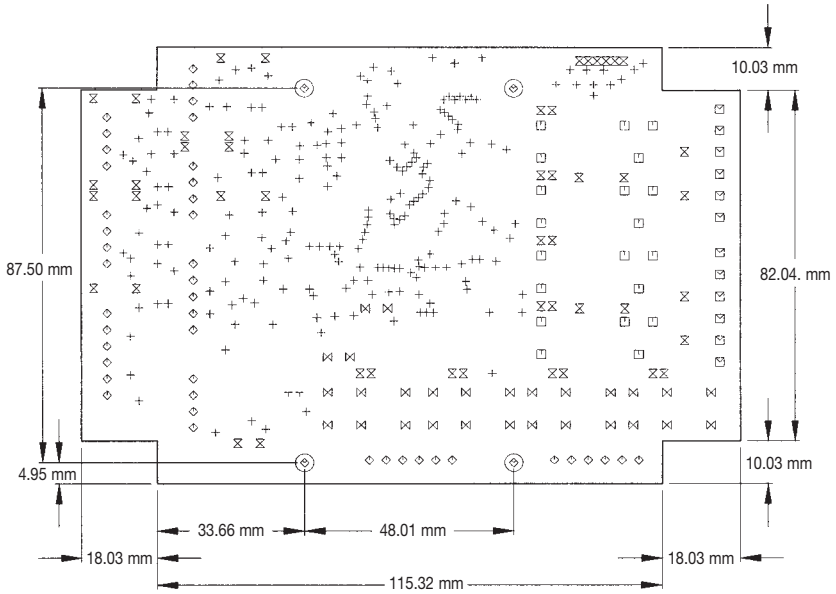
Pos.	for mounting on: V 10, V 8, VV 8, D 8, P 10, P 11, P 12			Weight gramm	Type	Price EURO
1	Electronic CAN-Bus Technical data: Power supply 9-36 V DC distinctively poled CAN-Bus level: physical layer acc. ISO 11898 Baud rate 125 kBit/s...1Mbit/s Bus-exclusion DIP switch hook up Identifier / CAN-open-ID adjustable by DIP switch Input 4 analog ports for 4 potentiometer (4-axis) 8 digital ports for 4 x 2 direction-contacts 8 digital ports for 8 switches Connection D-SUB 9 socket protection IP 65 (male) 2 CAN-L in 3 GND 7 CAN-H in 9 Supply voltage Connection D-SUB 9 socket protection IP 65 (female) 2 CAN-L out 3 GND 7 CAN-H out 9 Supply voltage Protocol CAN-Open according to C/ADS 301 or customer preference Parameters or configurations will be stored in existing EEPROM		T 646 EB/40	150	ECB01	
90	Humidity protection (circuit board moulded) for use with high condensation					

Pos.			Type	Weight gramm	Type	Price EURO
1	Elektronic CAN-Bus I/O card Techncal data: Power supply 9–36 V distinctively poled Baudrate 125 KBit/s Bus-Exclusion DIP switch hook up Identifier / CAN-open-ID adjustable by DIP switch Input: 8 digitale ports Output: 8 digitale ports Connection; Connector pin and socket		EB/49	100	ECB02	

Electrical diagram



Scale drawing



50	Plastic housing (EMV) 120x170x66 with 3 holes for cable entry M20			350	I	
90	Humidity protection (circuit board moulded) for use with high condesation					

Matching Electronic with CAN-Bus Interface for redundant Hallsensors

Pos.	for mounting on: V 85, VV 85, V 25			Weight gramm	Type	Price EURO
1	Electronic CAN-Bus Technical data: Power supply 9-36 V DC distinctively poled CAN-Bus level: physical layer acc. ISO 11898 Baud rate 125 kBit/s...1Mbit/s Bus-exclusion DIP switch hook up Identifier / CAN-open-ID adjustable by DIP switch Input 4 analog ports for 4 potentiometer (4-axis) 8 digital ports for 4 x 2 direction-contacts 8 digital ports for 8 switches Connection D-SUB 9 socket protection IP 65 (male) 2 CAN-L in 3 GND 7 CAN-H in 9 Supply voltage Connection D-SUB 9 socket protection IP 65 (female) 2 CAN-L out 3 GND 7 CAN-H out 9 Supply voltage Protocol CAN-Open according to C/ADS 301 or customer preference Parameters or configurations will be stored in existing EEPROM			150	ECB11	
90	Humidity protection (circuit board moulded) for use with high condensation					

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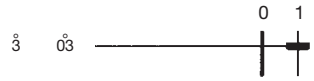
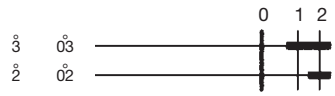
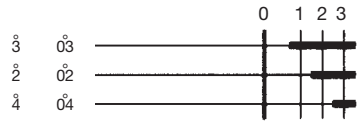
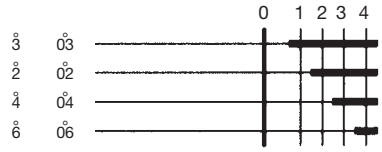
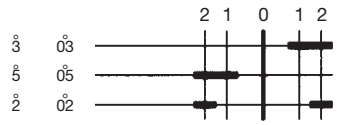
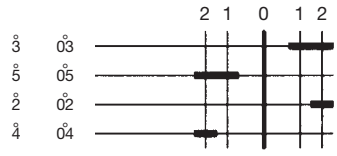
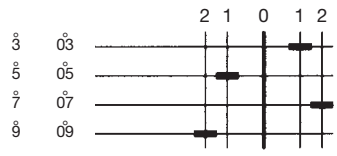
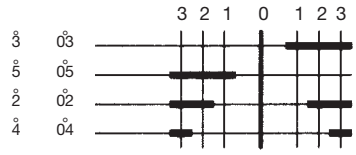
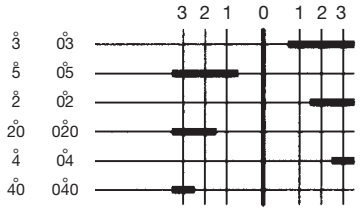
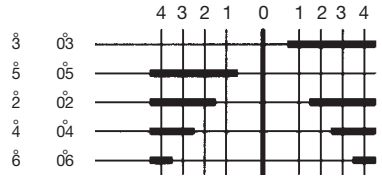
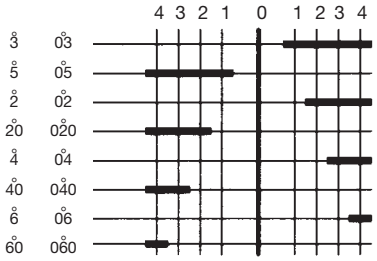
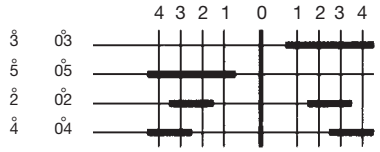
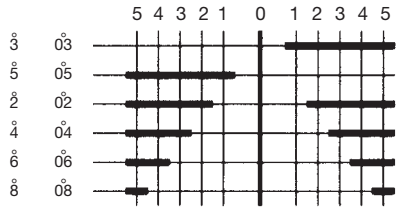
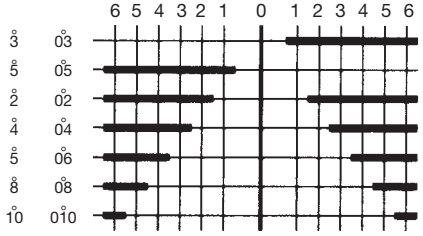
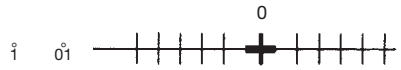
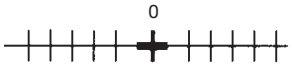
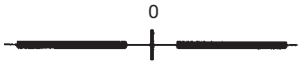
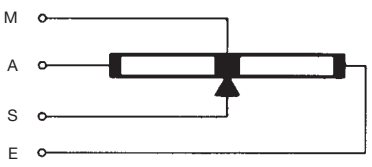
Notice

Notice

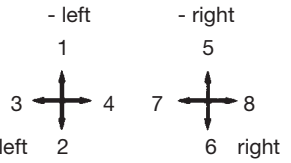
Notice

Standard contact-arrangement for master switch

Pos.	Type	Type
01	MS 11 	A01
02	MS 12 	A02
03	MS 13 	A03
04	MS 14 	A04
05	MS 21 	A05
06	MS 22 	A06
07	MS 212 	A07
08	MS 222 	A08
09	MS 23 	A09
10	MS 213 	A10
11	MS 24 	A11

Pos.	Type	Type
12	MS 214 	A12
13	MS 224 	A13
14	MS 25 	A14
15	MS 26 	A15
16	MS 0 	A98
17	Contact-arrangement special	A99
18	Contact in 0-position normally closed (NC)  **Additional code - 0**	A...0
19	Contact in 0-position normally open (NO)  **Additional code - 1**	A...1
20	Potentiometer MSP 	

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

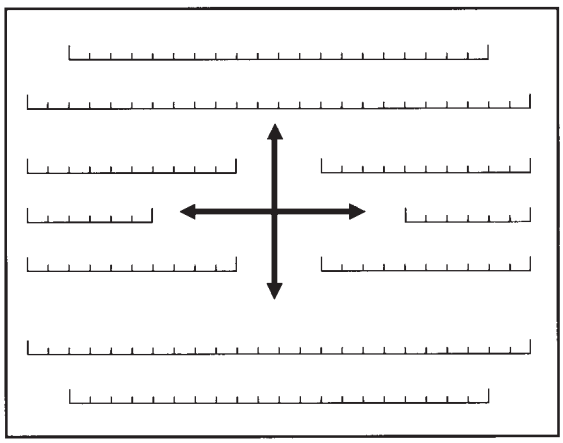


Deflection directions designated to DIN 15025

Ordering information

Customer _____ Order No. _____

Multi-axis controller
Left / right
Indicating label
Black
Engraved white
Lettering height
3,5 mm

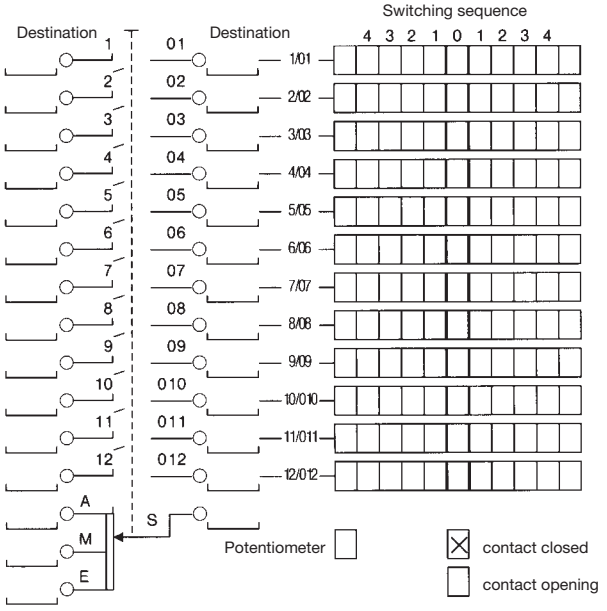


Deflection directions designated to DIN 15025

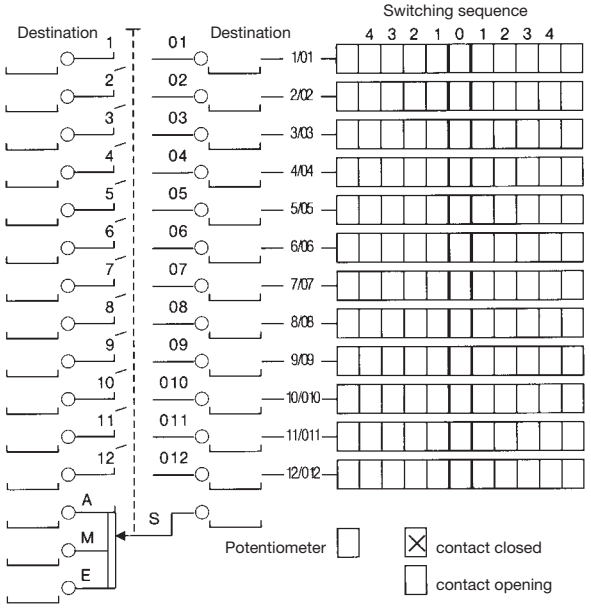
Direction 1-2 / 5-6 _____ Direction 3-4 / 7-8 _____

Switching program _____ Switching program _____

Drive _____ Plant ref. _____ Drive _____ Plant ref. _____



☐ Spring return
☐ Friction brake
☐ Special switching sequence _____



☐ Spring return
☐ Friction brake
☐ Special switching sequence _____

Additional functions in the control-handle _____

☐ Dead man's button T ☐ Signal button H ☐ Push button D

Destination _____ Destination _____ Function _____ Destination _____

Control-handle long or short _____ mm _____

☐ Gate cross-shaped ☐ Gate special-shaped (enclose drawing)

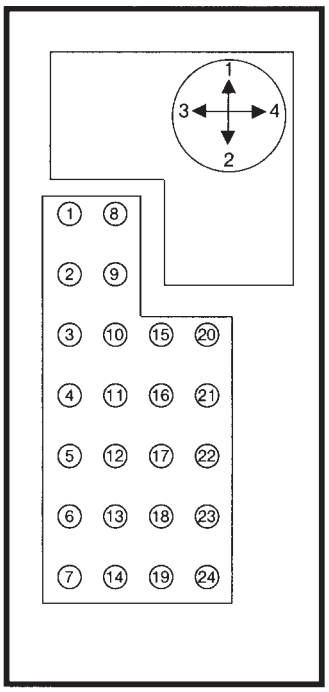
Type key: Type _____

X = _____

Ordering information

Customer _____ Order No. _____

Equipment box left



Maximum installation of command and indicating devices 22 (look 1/360) in our control units and housings if our multi-axis controllers V 62 (look 1/100) are used. Additional command and indicating devices can be installed if multi-axis controllers V 64 or V 11 (look 1/110) are used. (please enquire)

Position No.	Type	Colour	Label text (max. 2 x 12 characters)	Plant ref.	Destination	Notes
1						
2						
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24						

Control unit (look 2/020 ...)

Type		No. of pieces max.
KST 2/3	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 52/54/152/154	1 - 24	24
KST 6	3 - 4, 10 - 11, 15 - 16	6
KST 7	1 - 24	24
KST 75	1 - 19	19

Customer _____ Order No. _____

Position No.	Type	Colour	Label text (max. 2 x 12 characters)	Plant ref.	Destination	Notes
25						
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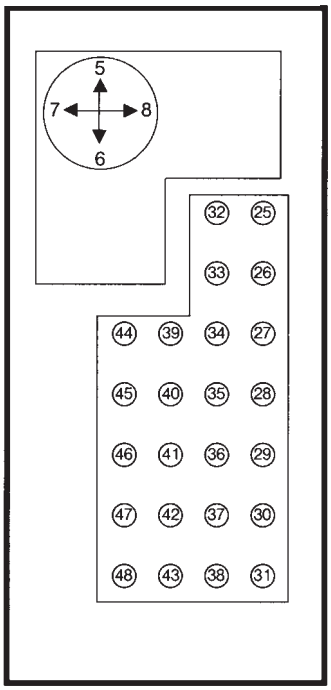
47						
48						

Equipment box right



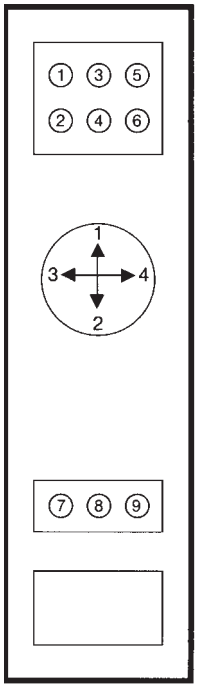
Maximum installation of command and indicating devices 22 (look 1/360) in our control units and housings if our multi-axis controllers V 62 (look 1/100) are used. Additional command and indicating devices can be installed if multi-axis controllers V 64 or V 11 (look 1/110) are used.
(please enquire)

	No. of pieces max.	Control unit (look 2/020 ...) Type
25 - 30, 32 - 37, 39 - 42	16	KST 2/3
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 52/54/152/154
27 - 28, 34 - 35, 39 - 40	6	KST 6
25 - 48	24	KST 7
25 - 43	19	KST 75

Ordering information KST 8, 85

Customer _____ Order No. _____

Equipment box left



Max. 6 pcs. installation of command and indicating devices 22 (look 1/360) or 1 pcs. monitoring device 72 x 72 mm

Multi-axis controller V 64 (look 1/100) or V 11 (look 1/110)

Max. 3 pcs. installation of command and indicating devices 22 (look 1/360)

Place to put on devices

Position No.	Type	Colour	Label text (max. 2 x 12 characters)	Plant ref.	Desti-nation	Notes
1						
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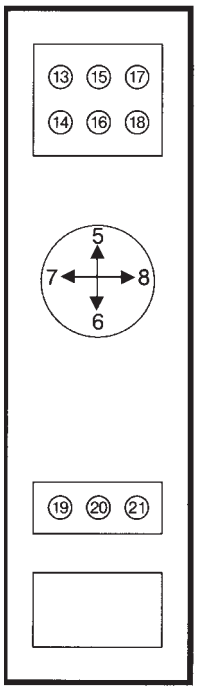
10						
11						
12						

Equipment box right



Max. 6 pcs. installation of command and indicating devices 22 (look 1/360) or 1 pcs. monitoring device 72 x 72 mm

Multi-axis controller V 64 (look 1/100) or V 11 (look 1/110)

Max. 3 pcs. installation of command and indicating devices 22 (look 1/360)

Place to put on devices

Position No.	Type	Colour	Label text (max. 2 x 12 characters)	Plant ref.	Desti-nation	Notes
13						
14						
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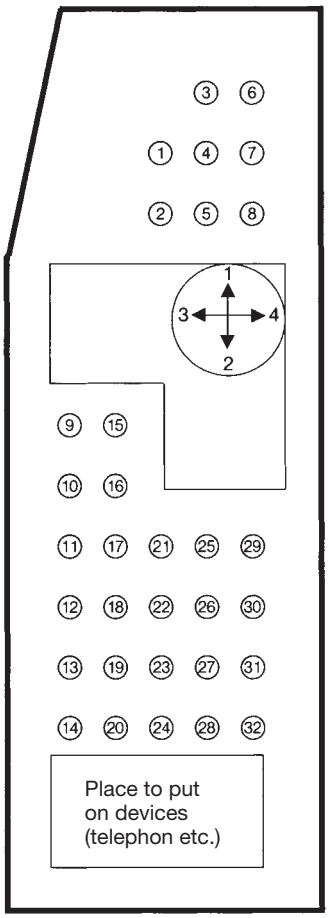
22						
23						
24						

Notice

Ordering information KST 9

Customer _____ Order No. _____

Equipment box left



Maximum installation of command and indicating devices 22 (look 1/360) if our multiaxis controllers V 62 (look 1/100) are used. Additional command and indicating devices can be installed if multi-axis controller V 64 or V 11 (look 1/110) are used. (please enquire)

Pos. 1-8 alternative max. 2 pcs. monitoring devices 72 x 72 mm

Position Nr.	Type	Colour	Label text (max. 2 x 12 characters)	Plant ref.	Destination	Notes
1						
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31						
32						

Ordering information KST 9

Customer _____ Order No. _____

Position Nr.	Type	Colour	Label text (max. 2 x 12 characters)	Plant ref.	Destination	Notes
35						
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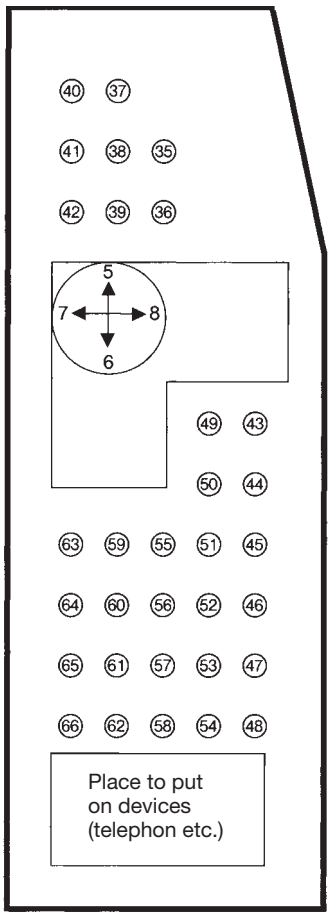
64						
65						
66						

Equipment box right



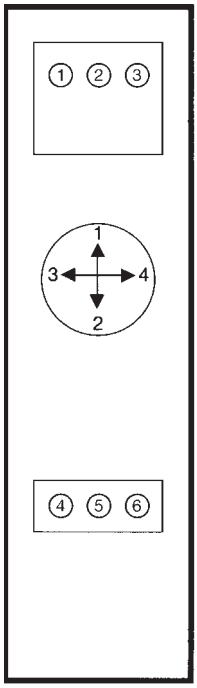
Maximum installation of command and indicating devices 22 (look 1/360) if our multiaxis controllers V 62 (look 1/100) are used. Additional command and indicating devices can be installed if multi-axis controller V 64 or V 11 (look 1/110) are used.
(please enquire)

Pos. 35-42 alternative max. 2 pcs. monitoring devices 72 x 72 mm

Ordering information KST 10

Customer _____ Order No. _____

Equipment box left



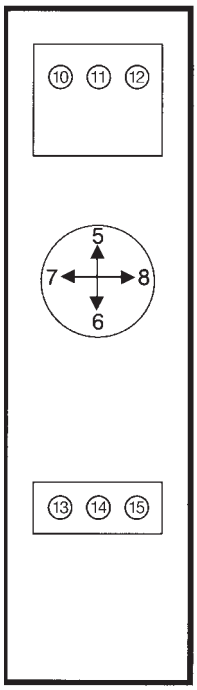
Max. 3 pcs. installation of command and indicating devices 22 (look 1/360)

Multi-axis controller V 11 (look 1/110) or V 8 (look 1/130)

Max. 3 pcs. installation of command and indicating devices 22 (look 1/360)

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

Equipment box right



Max. 3 pcs. installation of command and indicating devices 22 (look 1/360)

Multi-axis controller V 11 (look 1/110) or V 8 (look 1/130)

Max. 3 pcs. installation of command and indicating devices 22 (look 1/360)

Position No.	Type	Colour	Label text (max. 2 x 12 characters)	Plant ref.	Destination	Notes
10						
11						
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17						
18						

Notice

Utilization categories for control switches to IEC 947-5-1 EN 60947 DIN VDE 0660-200.

Type of current	Utilization category	Typical examples of application	Normal conditions of use					
		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	Make			Break		
			$\frac{I}{Ie}$	$\frac{U}{Ue}$	cos φ	$\frac{Ic}{Ie}$	$\frac{Ur}{Ue}$	cos φ
AC	AC 12	Control of resistive loads and solid state loads with isolation by opto couplers	1	1	0,9	1	1	0,9
	AC 15	Control of a.c. electromagnetic loads (> 72 VA)	10	1	0,3	1	1	0,3
			$\frac{I}{Ie}$	$\frac{U}{Ue}$	t 0,95	$\frac{Ic}{Ie}$	$\frac{Ur}{Ue}$	t 0,95
DC	DC 12	Control of resistive loads and solid state loads with isolation by opto couplers	1	1	1 ms	1	1	1 ms
	DC 13	Control of d.c. electromagnets	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	**V 6 S 6 N 61**	**N 6 N 62**	**VV 6 DD 64**	**V 11**	**V 5 S 2-S 23**	**VV 5 SS2-SS21**	**V 8 V 85 D 8**	**VV 8 VV 85 D 3 S 3**	**V 10 V 25 S 1**	**V 14 S 14**	**V 3**	dead man's button signal button push button
Rated isolation voltage Ui in Volt	250		250	250	250	250	110	110	110	250	500	250
Rated operational voltage Ue in Volt	250		250	250	250	250	110	110	110	250	350	250
Rated operational current Ie in Ampere AC 12	6 or 16		6 or 16	6 or 16	10	10	2	2	2	6	16	6
AC 15	2	4	2	4	2	4	2	2	0,5	0,5	0,5	2	4	2
DC 12 24 V	6	8	6	8	6	8	4	4	2	2	2	6	8	4
48 V	2	4	2	4	2	4	2	2	1	1	1	2	4	2
110 V	0,5	1	0,5	1	0,5	1	0,2	0,2	0,1	0,1	0,1	0,5	1	0,2
220 V	0,1	0,5	0,1	0,5	0,1	0,5	0,1	0,1				0,1	0,5	0,1
Contacts gold-coated 24 V	5 mA		5 mA		5 mA		5 mA	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA	5 mA
DC 13 24 V	1		1		1		3	3	1,5	1,5	1,5	1	1	3
48 V	0,5		0,5		0,5		1,5	1,5	0,5	0,5	0,5	0,5	0,5	1,5
110 V	0,2		0,2		0,2		0,1	0,1	0,05	0,05	0,05	0,2	0,2	0,1
220 V	0,05		0,05		0,05		0,05	0,05				0,05	0,05	0,05
Short-circuit-protection in Ampere														
Fuse 9 L	6	16	6	16	6	16	10	10	4	4	4	6	16	6
Circuit-breaker G-characteristic	6	16	6	16	6	16	10	10	4	4	4	6	16	6
Terminal screws	M 3,5		M 3,5		M 3,5		M 3,5	M 3,5	Solder terminal				M 4	M 3,5
Plug-in connection	2,5 mm²		2,5 mm²		2,5 mm²		6,3 x 0,8	6,3 x 0,8			1,5 mm²		6,3 x 0,8	6,3 x 0,8
CAGE CLAMP® connection is a registered trademark of WAGO Kontakttechnik GmbH Germany														
Conductor sizes in mm2 finely stranded with end steeves	1,5		1,5		1,5		1,5	1,5	0,5	0,5	0,5	1	1,5	1,5
Mechanical life in million (operation cycles) max. switching frequency c/h 1000	10		20		10		6	10	8	12	8	6	6	10
Mechanical shock resistance to IEC 68-2-27	Shock-amplitude > 15 Shock duration 20 ms													
Clearances and creepage distances to IEC 947-1; 2.5.46.51	Overvoltage category III pollution grade 3													

Degree of protection to IEC 529 DIN 40050	1. numerial protection of contact and foreign bodies	2. numerial protection of water
	IP 00 No protection	No protection
	IP 54 Protection deposits of dust	Protection splashing of water
	IP 65 Protection complete of dust	Protection hosed of water
	IP 66 Protection complete of dust	Protection hosed strong of water

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