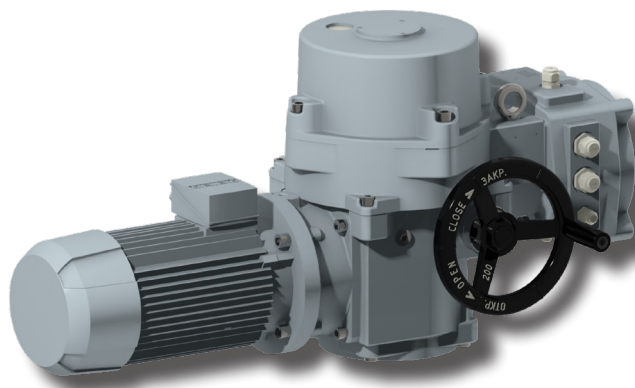


STANDARD

MO 4

STANDARD EQUIPMENT:

- Voltage 3x400 V AC
- Terminal board connection
- Motor's thermal protection PTO ¹⁾
- 2 torque switches
- 2 position switches
- 2 additional position switches
- Space heater with thermal switch
- Mechanical connection - flange
- Mechanical position indicator
- Torque switches blocking in limit position
- Manual control
- Protection code IP 55



Specification table MO 4

Order code

160. X - X X X X X / X X

Climate resistance	Ambient temperature	Corrosivity category ¹⁰⁾	Enclosure	
Standard	-25°C ... +60°C	C3	IP 55	0
			IP 67	1
Tropics and Wet	-25°C ... +60°C	C4	IP 67	2
Cold	-50°C ... +40°C	C3	IP 55	4
			IP 67	3
Tropical dry and Dry	-25°C ... +60°C	C3	IP 55	5
			IP 67	6
Sea	-50°C ... +40°C	C4	IP 67	7
Arctic	-60°C ... +40°C	C3	IP 55	9
			IP 67	8

Electric connection	Electric motor supply voltage and frequency ²⁵⁾		Wiring diagram	
To terminal board	Y/Δ380 V AC	50 Hz	Z279c	0
	Y/Δ400 V AC	50 Hz	Z279c	1
	Y/Δ380 V AC - with reversing unit	50 Hz	Z297b	2
	Y/Δ380 V AC - with reversing unit	50 Hz	Z297b	3
To connector ²¹⁾	Y/Δ380 V AC	50 Hz	ZK279c	5
	Y/Δ400 V AC	50 Hz	ZK279c	6
	Y/Δ380 V AC - with reversing unit	50 Hz	ZK297b	4
	Y/Δ380 V AC - with reversing unit	50 Hz	ZK297b	7

Next page

Order code

160. X - X X X X X / X X

Switching-off torque ³¹⁾	Max. load torque		Operating time	Electric motor 3x400 V, 50Hz ³⁴⁾			
	ON - OFF duty ³²⁾	Modulating duty ³³⁾		Power	Speed	Current	
150 ÷ 250 Nm	150 Nm	100 Nm	16 min ⁻¹	0.75 kW	940 min ⁻¹	2.30 A	C
			25 min ⁻¹	1.1 kW	1 405 min ⁻¹	2.5 A	D
			32 min ⁻¹	1.1 kW	1 405 min ⁻¹	2.5 A	E
			40 min ⁻¹	1.5 kW	1 410 min ⁻¹	3.35 A	F
			50 min ⁻¹	1.5 kW	2 835 min ⁻¹	3.30 A	G
			63 min ⁻¹ ³⁶⁾	1.5 kW	1 410 min ⁻¹	3.35 A	H
			80 min ⁻¹ ³⁶⁾	2.2 kW	2 845 min ⁻¹	4.70 A	J
			125 min ⁻¹ ³⁶⁾	3.0 kW	2 895 min ⁻¹	6.0 A	K
120 ÷ 200 Nm	120 Nm	80 Nm	180 min ⁻¹ ³⁶⁾	3.0 kW	2 895 min ⁻¹	6.0 A	L
300 ÷ 500 Nm	300 Nm	200 Nm	16 min ⁻¹	1.1 kW	925 min ⁻¹	3.15 A	P
			25 min ⁻¹	1.5 kW	1 410 min ⁻¹	3.35 A	Q
			32 min ⁻¹	2.2 kW	1 425 min ⁻¹	4.65 A	R
			40 min ⁻¹	2.2 kW	1 425 min ⁻¹	4.65 A	S
			50 min ⁻¹	2.2 kW	2 845 min ⁻¹	4.70 A	T
250 ÷ 400 Nm	240 Nm	160 Nm	63 min ⁻¹ ³⁶⁾	2.2 kW	1 425 min ⁻¹	4.65 A	U
			80 min ⁻¹ ³⁶⁾	3.0 kW	2 895 min ⁻¹	6.0 A	V
180 ÷ 300 Nm	180 Nm	120 Nm	125 min ⁻¹ ³⁶⁾	3.0 kW	2 895 min ⁻¹	6.0 A	W

Control board version	Switches	Revolutions ⁴⁴⁾		Wiring diagram	
		Without transmitter	With potentiometer		
Electromechanical control board with step counter unit without local controls	S1/S2, S3/S4, S5/S6	1 ÷ 3	1.75; <u>3</u>	Z403a+Z41a	1
		2.5 ÷ 685	5.7; 10.5; 19; <u>34</u> ; 63; 113;206;375;685	ZK403a+ZK41a	2
	S1/S2, S3/S4, with tandem switches S13/S14	1 ÷ 3	1.75; <u>3</u>	Z461f+Z41a	K
		2.5 ÷ 685	5.7; 10.5; 19; <u>34</u> ; 63; 113;206;375;685	ZK461f+ZK41a	L
Electromechanical control board with step counter unit with local controls ⁴⁶⁾	S1/S2, S3/S4, S5/S6	1 ÷ 3	1.75; <u>3</u>	Z635g+Z41a	5
		2.5 ÷ 685	5.7; 10.5; 19; <u>34</u> ; 63; 113;206;375;685	ZK635g+ZK41a	6
	S1/S2, S3/S4, with tandem switches S13/S14	1 ÷ 3	1.75; <u>3</u>	Z636d+Z41a	U
		2.5 ÷ 685	5.7; 10.5; 19; <u>34</u> ; 63; 113;206;375;685	ZK636d+ZK41a	V

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Notes:

- 1) Cut-off temperature 150 °C
 10) Climate resistance according to ISO 9223 / EN ISO 12944-2
 21) The version with connector in -40° C only.
 25) Iné napätia po dohode s výrobcem (3x500 V; 3x480 V; 3x415V).
 31) Specify the switching-off torque in your order by words. If not stated it is adjusted to the maximum rate of the chosen range.
 32) Duty cycle S2-15min, or S4-25%, 6-90 cycles per hour.
 33) Duty cycle S4-25%, 90-1200 cycles per hour.
 34) For 60 Hz, the operating speed increases by a factor of 1.2 and the max. torque decreases by a factor of 0.8.
 36) Do not use for operation mode S4-25%, 90-1200 cycles/hour. It can only be used with an additional gearbox.

- 44) Position switches S3, S4 are being set to specified number of revolutions. If it is not stated in the order, they will be set to 16 operating revolutions. When required settings are out of values listed in table, ohmic value of potentiometer will be reduced accordingly. If less than 75% of revolutions is required, value of output signals from electronic transmitter will be reduced accordingly as well.
 51) Not valid for temperatures of -60°C.
 52) CPT - kapacitný vysielateľ, DCPT 3M - elektronický bezkontaktný vysielateľ.
 61) Up to switch-off torque of 400 Nm

Order code

160. X - X X X X X / X X

Transmitter		Connection	Output	Wiring diagram	
Without transmitter		-	-	-	A
Potentiometer	Single	-	1 x 100 Ω	Z5c/ ZK5c	B
			1 x 2 000 Ω		F
	Double	-	2 x 100 Ω	Z6c/ ZK6c	K
			2 x 2 000 Ω		P
Electronic position transmitter ⁵¹⁾	Passive	2-wire	4 - 20 mA	Z10g / ZK10g	S
			0 - 20 mA		T
		3-wire	4 - 20 mA	Z257b ZK257b	V
			0 - 5 mA		Y
	Active	2-wire	4 - 20 mA	Z269r / ZK269r	Q
			0 - 20 mA		U
		3-wire	4 - 20 mA	Z260h / ZK260h	W
			0 - 5 mA		Z
Electronic position transmitter ⁵¹⁾	Passive	3-wire	0-10 V	Z257m / ZK257m	D
	Active		0-10 V	Z260k / ZK260k	R
Current ^{51) 52)} CPT	Passive	2-wire	4 - 20 mA	Z10g / ZK10g	I
		3-wire	0 - 5 mA	Z257n / ZK257n	5
	Active	2-wire	4 - 20 mA	Z269r / ZK269r	J
		3-wire	0 - 5 mA	Z260m / ZK260m	6
Current ^{51) 52)} DCPT 3M	Passive	2-wire	4 - 20 mA	Z10g / ZK10g	2
	Active		4 - 20 mA	Z269r / ZK269r	3

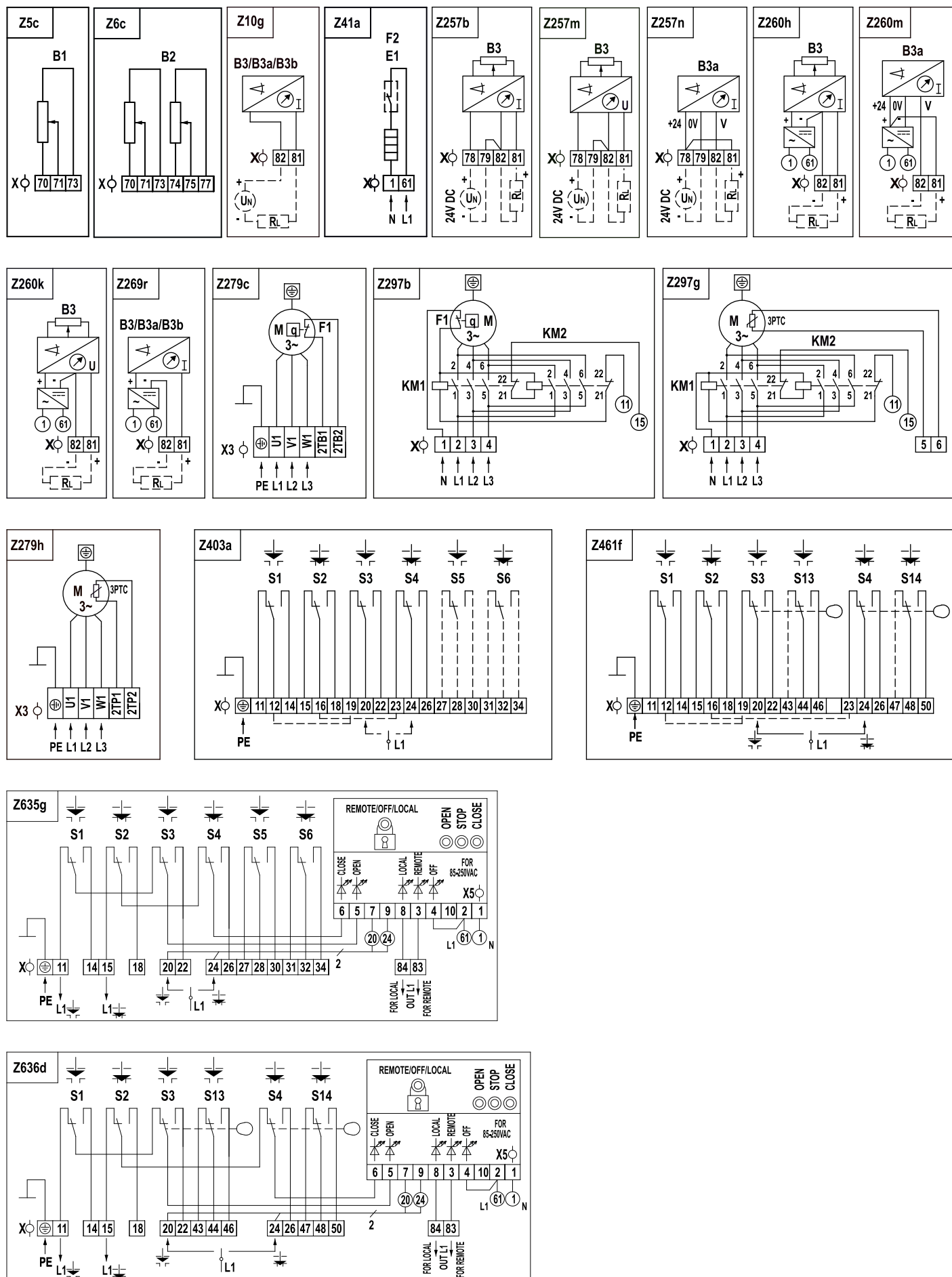
Mechanical connection		Flange	Coupling shape		Dimensional drawing	
Without connect adapter	ISO 5210	F14	B2	Ø60/Ø45	P-2123	2
			B3	Ø60/Ø30	P-2124	B
			B4	Ø60/Ø45	P-2123	4
			C	Ø60/Ø45	P-1435	C
			D	Ø45/Ø30	P-1437	D
	non-standard	F14	4-tooth	Z30°+M60°- Ø60/Ø41.5	P-2121/A	F
With connect adapter	ISO 5210	F14 ⁶¹⁾	A	Max. TR42	P-1471	A
		F14	B1	Ø60/Ø45/18	P-1463	1
	ГОСТ P 55510	Ø135 / 4xØ13 ⁶¹⁾	Б (B)	Ø57/Ø45 5-tooth 35°/37°	P-2125	G

Additional equipment			Wiring diagram		
	No additional equipment. Adjusted to max. switching-off torque of chosen range and stroke to 3 or 34 revolutions		-	-	-
B	Switching-off torque adjustment to the required value		-	0	3
C	Adjustment of revolutions to the required value		-	0	4
F	Electric motor with thermal protection 3PTC, 150 °C.		Z279h / ZK279h Z297g / ZK297g	0	5
H	Gold coated contacts of microswitches, details after consultation with the manufacturer		-	4	0

Allowed combinations and code of version: B+C=06, B+F=07, B+H=41, B+C+H=44, C+H=42, C+F=08, B+C+F=09

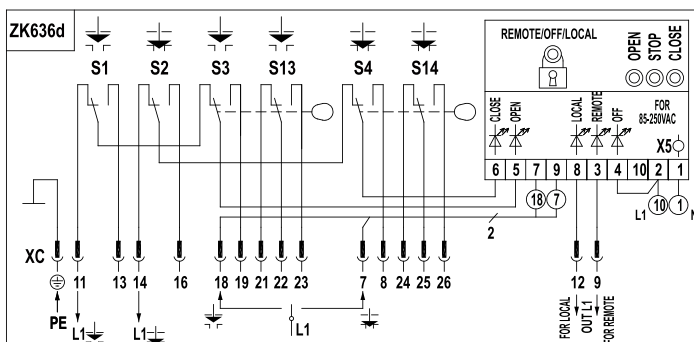
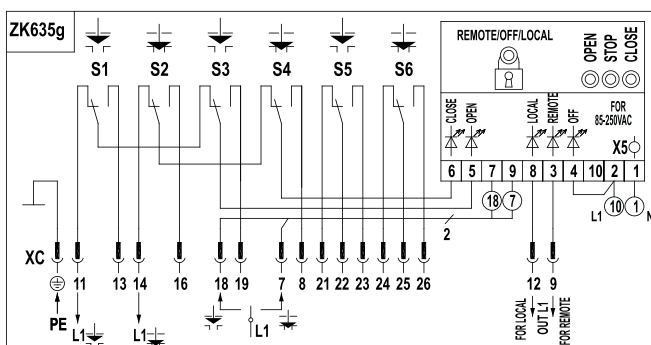
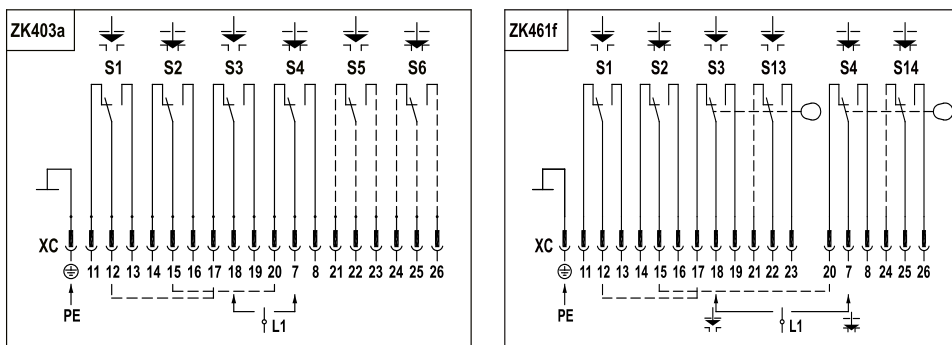
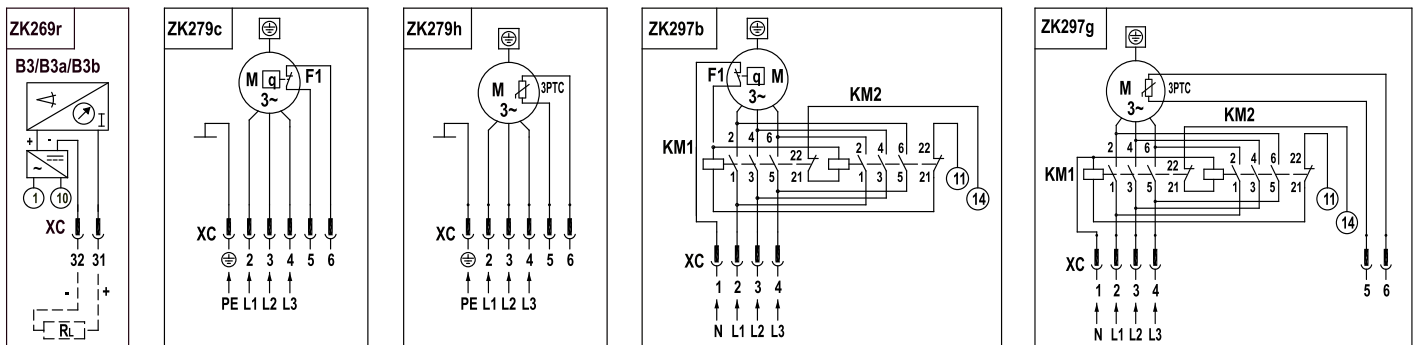
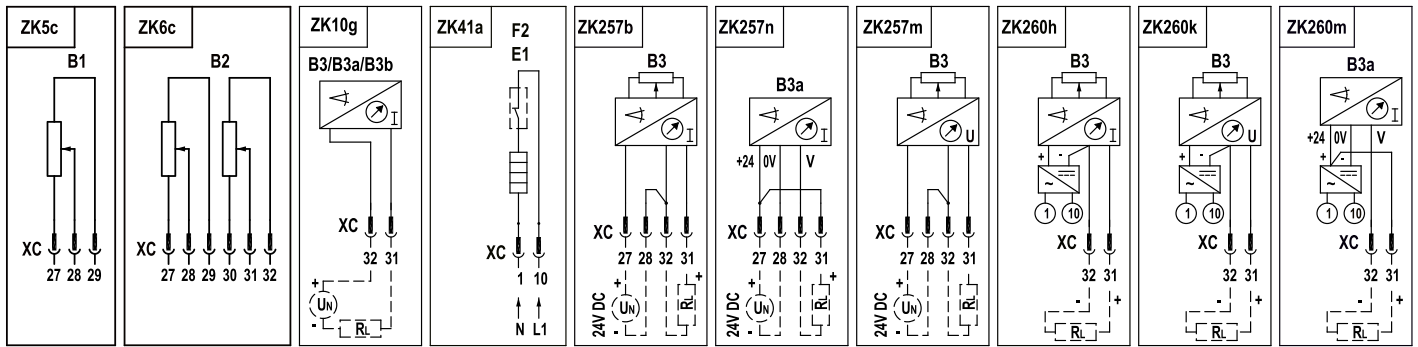
Wiring diagrams

Terminal board connection



Wiring diagrams

Connector connection



Electric connection of actuator to terminal board:

- a) control section to terminal board (X) with max. 32 terminals via:
- 2 cable glands M25x1.5 for cable diameter 12,5 až 19 mm
 - 1 cable gland M16x1,5 for cable diameter 6 to 10.5 mm, max. wire cross-section 2,5 mm²
- b) 3-phase electromotor in version without contactors:
- 1 cable gland M32x1.5 for cable diameter 15 to 21 mm to terminal board of electromotor (X3)

Electric connection of actuator to connector:

The control section and electromotor are connected to common connector (XC) with 32 terminals via:

- 1 cable gland M20x1.5 for cable diameter 8 to 14.5 mm, max. wire cross section 0,5 mm²
- 1 cable gland M25x1,5 for cable diameter 12.5 to 19 mm, max. wire cross-section 1,5 mm²

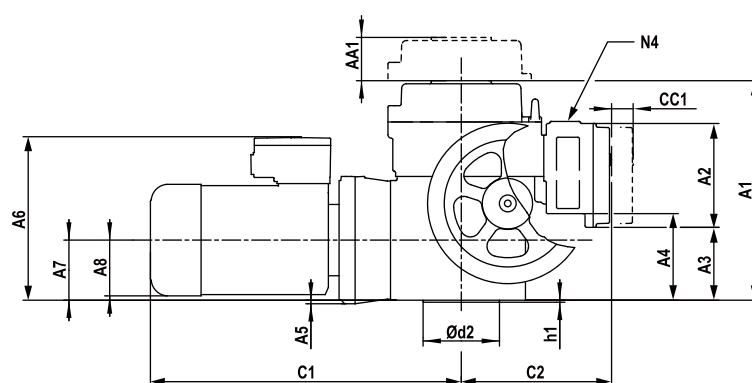
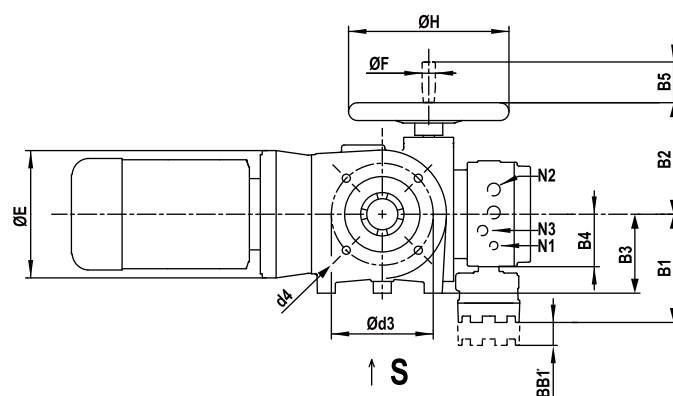
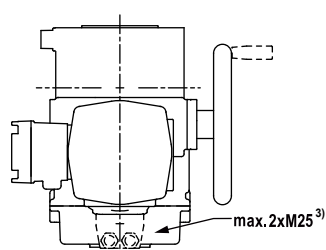
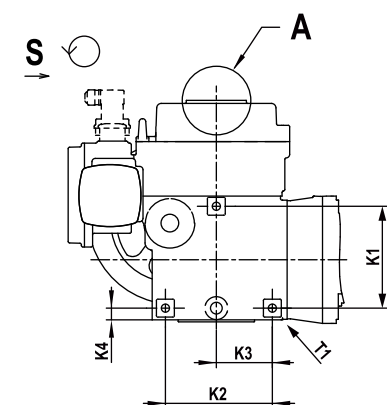
Legend:

Z5c/ZK5c.....	connection of single potentiometer
Z6c/ZK6c.....	connection of double potentiometer
Z10g/ZK10g.....	connection of CPT or electronic position transmitter - 2-wire, passive
Z41a/ZK41a.....	space heater and space heater's thermal switch
Z257b/ZK257b.....	current electronic position transmitter, 3-wire, passive
Z257m/ZK257m.....	electronic position transmitter 0 - 10 V, 3-wire, passive
Z257n/ZK257n.....	position transmitter CPT, 3-wire, passive
Z260h/ZK260h.....	current electronic position transmitter, 3-wire, active
Z260k/ZK260k.....	electronic position transmitter 0 - 10 V, 3-wire, active
Z260m/ZK260m.....	position transmitter CPT, 3-wire, active
Z269r/ZK269r.....	CPT, DCPT 3M or electronic transmitter, 2-wire, active
Z279c/ZK279c.....	3-phase electric motor with thermal protection PTO
Z279h/ZK279h.....	3-phase electric motor with thermal protection PTC
Z297b/ZK297b.....	connection of 3-phase electromotor with reverse contactors and thermal protection PTO
Z297g/ZK297g.....	connection of 3-phase electromotor with reverse contactors and thermal protection PTC
Z403a/ZK403a.....	connection of torque and position switches
Z461f/ZK461f.....	connection of torque and tandem position switches
Z635g/ZK635g.....	connection of torque switches, position switches, additional position switches and local control unit
Z636d/ZK636d.....	connection of torque switches, position switches, tandem position switches and local control unit

Legend:

B1.....	single potentiometer
B2.....	double potentiometer
B3.....	CPT or electronic position transmitter
B3a.....	capacitive current transmitter (CPT)
B3b.....	DCPT current transmitter
S1.....	torque switch „open“
S2.....	torque switch „closed“
S3.....	position switch „open“
S4.....	position switch „closed“
S5.....	additional position switch „open“
S6.....	additional position switch „closed“
S13.....	tandem position switch „open“
S14.....	tandem position switch „closed“
E1.....	space heater
F1.....	motor's thermal protection
F2.....	space heater's thermal switch
I / U.....	current / voltage output signal
KM1, KM2.....	reversing contactors
M.....	electric motor
PTC/PTO.....	thermal protection of electric motor
R _L	loading resistor
X.....	terminal board
X3.....	electric motor's terminal board
XC.....	connector
OPEN/STOP/CLOSE.....	local control buttons
REMOTE/OFF/LOCAL.....	local control selection button

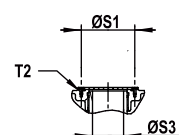
Dimensional drawing MO 4



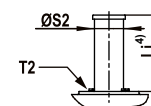
- 1) Access to local control
- 2) Access to terminal board
- 3) Valid for Profibus/Modbus
- 4) L 1 - lenght of tube on request
- 5) Access to control board
- 6) The connection dimensions of flanges (d3, d5, d6, ...) are specified in separate dimensional drawings.
- 7) Connector – not applicable for actuators MO 4-Ex, MO 4PA-Ex.
- 8) Not valid for P-2125

Detail A

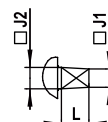
Version for non-rising stem



Protection tube for rising stem



Handwheel shaft

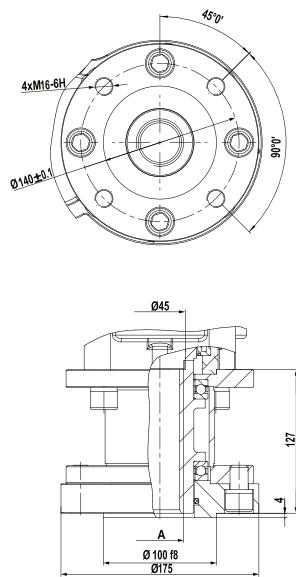


Dimensions		Dimensions	
A1	407	J1	14
AA1 min. ⁸)	600	J2	16
A2	204	K1	140
A3	98	K2	160
A4	125	K3	75
A5 max.	-	K4	47
A6 max.	281	L	18
A7	117	N1	M16x1.5
A8 max.	90	N2	2x M25x1.5
B1	213	N3	M20x1.5
BB1 min. ¹)	600	N4 ³)	4x M16x1.5
B2	173	S1	71
B3 max.	147	S2	57x5
B4	103	S3	45
B5	79	T1	3x M12-24
C1 max.	511	T2	3x M4-8
Cc1 min. ²)	600	d2 ⁶)	100
C2	306	d3 ⁶)	140
ØE max.	200	d4	8x M16
ØF	26	Z	8
ØH	200	h1	4

P-2133b

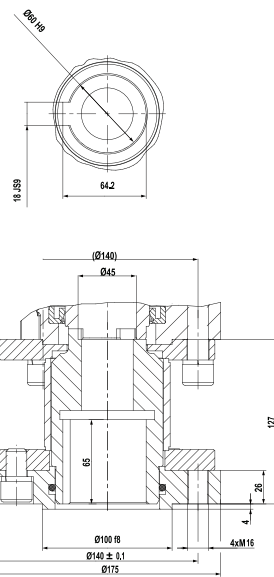
Dimensional drawing MO 4

Shape A



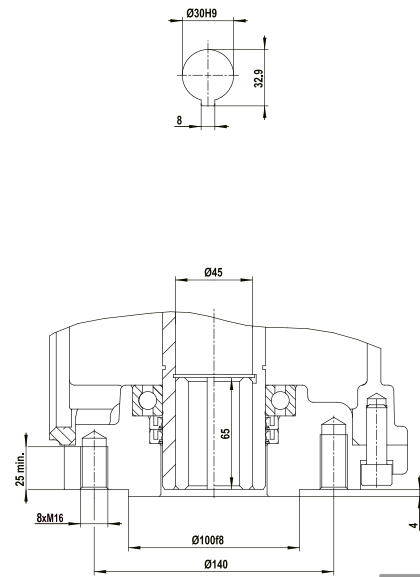
P-1471

Shape B1



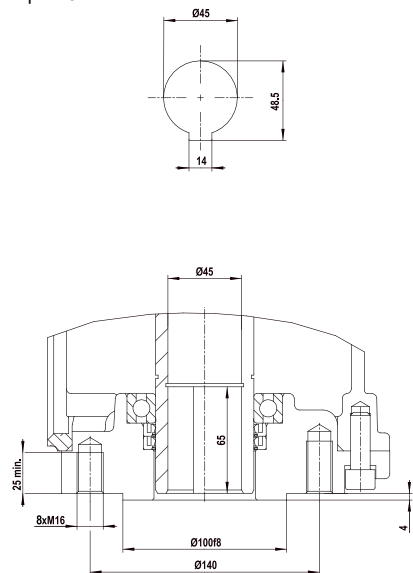
P-1463

Shape B2/B4



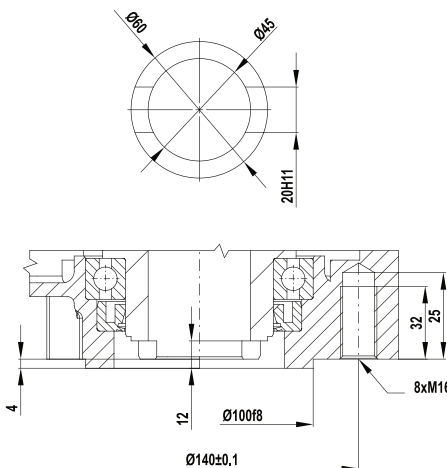
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Shape B3



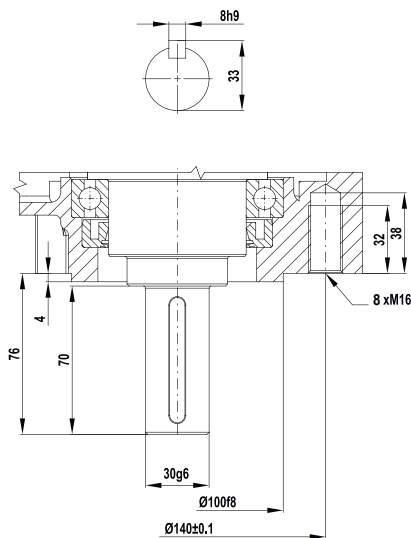
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Shape C



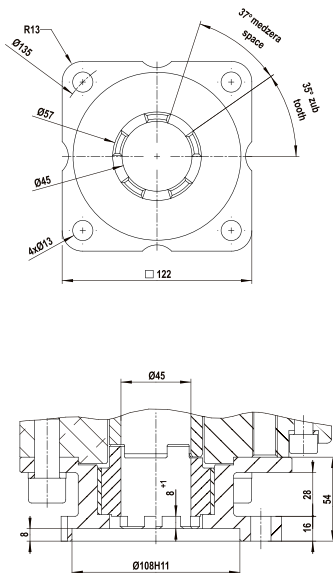
P-1435

Shape D

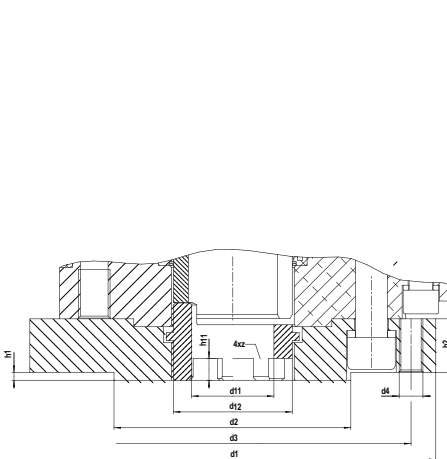


P-1437

Shape B, ROCT P 55510



P-2125



P-2121