

STANDARD

SP 1

STANDARD EQUIPMENT

- Voltage 230 V AC
- Terminal board connection
- 2 torque switches
- 2 position switches
- Mechanical stop ends
- Mechanical connection - flange ISO 5211
- Mechanical position indicator
- Manual control
- Enclosure protection IP 67



Specification table SP 1

Order code

281. X - X X X X X / X X

Climate Resistance	Ambient Temperature	Corrosivity Category ¹⁰⁾	Enclosure	
Standard	-25°C ... +55°C	C3	IP 67	1
	-25°C ... +55°C	C3	IP 68 ¹¹⁾	5
Tropics and Wet	-25°C ... +55°C	C4	IP 67	2
Cold	-50°C ... +40°C	C3	IP 67	3
Tropical dry and Dry	-25°C ... +55°C	C3	IP 67	6
Sea	-50°C ... +40°C	C4	IP 67	7
Arctic	-60°C ... +40°C	C3	IP 67	8

Electric Connection	Voltage and Frequency		Wiring Diagram	
To terminal board	230 V AC	50 Hz	Z1a + Z11a	0
	220 V AC	50 Hz		L
	3x400 V AC	50 Hz	Z78y + Z12a ²²⁾	9
	3x380 V AC	50 Hz	Z78y + Z12a ²²⁾	M
	24 V AC	50 Hz	Z626f	A
	24 V AC	60 Hz		
	24 V DC	-		
To connector	230 V AC	50 Hz	ZK1a + ZK11a	5
	220 V AC	50 Hz		P
	3x400 V AC	50 Hz	ZK78y + ZK12a ²²⁾	7
	3x380 V AC	50 Hz	ZK78y + ZK12a ²²⁾	R
	24 V AC	50 Hz	ZK626f	C
	24 V AC	60 Hz		
	24 V DC	-		

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Order code

281. X - X X X X X / X X

Switching-off Torque	Max. Load Torque		Electric Motor 230 V, 220 V AC		Electric Motor 3x380, 3x400 V AC		24 V DC	
	ON - OFF Duly ³²⁾	Modulating Duly ³³⁾	Operating Time	[W]	Operating Time ³⁴⁾	AC [W]	DC [W]	
46 Nm	40 Nm	-	10 s/90°	15	10 s/90°	15	32	0
90 Nm	80 Nm	63 Nm	20 s/90°		20 s/90°			1
90 Nm	80 Nm	63 Nm	40 s/90°		40 s/90°			2
72 Nm	63 Nm	50 Nm	80 s/90°	4	-	-	-	3

Operating Angle		
With stop ends	60°	A
	90°	B
	120°	C
	160°	D
Without stop ends	60°	K
	90°	L
	120°	M
	160°	N
	360°	P
	> 0° ≤ 360° ⁴¹⁾	Z

Transmitter		Connection	Output	Wiring Diagram	
Without transmitter		-	-	-	A
Potentiometer	Single	-	1 x 100 Ω	Z5c / ZK5c	B
			1 x 1000 Ω		E
			1 x 2 000 Ω		F
	Double	-	2 x 100 Ω	Z6c / ZK6c	K
			2 x 1000 Ω		N
			2 x 2 000 Ω		P
Electronic position transmitter ⁵¹⁾	Passive	2-wire	4 - 20 mA	Z10g / ZK10g	S
		3-wire	0 - 20 mA	Z257j / ZK257j	T
			4 - 20 mA		V
			0 - 5 mA		Y
	Active ⁵⁹⁾	2-wire	4 - 20 mA	Z269r / ZK269r	Q
		3-wire	0 - 20 mA	Z260h / ZK260h	U
			4 - 20 mA		W
			0 - 5 mA		Z
		3-wire	0 - 10 V	Z260k / ZK260k	D
			0 - 10 V		R
Current CPT ^{51) 52)}	Passive	2-wire	4 - 20 mA	Z10g / ZK10g	I
	Active ⁵⁹⁾	2-wire	4 - 20 mA	Z269r / ZK269r	J
Current ^{51) 52)} DCPT 3M	Passive	2-wire	4 - 20 mA	Z10g / ZK10g	2
	Active ⁵⁹⁾		4 - 20 mA	Z269r / ZK269r	3

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Order code

281. X - X X X X / X X

Mechanical Connection		Coupling Shape		Dimensional Drawing	
		ISO	Dimension		
Flange ISO 5211	F05/F07	D-14	14x14	P-1147 P-2148/A	A
		L-14			B
		D-17	17x17		E
		L-17			F
		D-11	11x11		H
		L-11			Q
		D-16	16x16		R
		L-16			S
		H-8	8x13		N
		H-10	10x16		T
		H-11	11x18		G
		H-12	12x18		3
		H-14	14x22		C
		H-17	17x25		Z
		V-12	Ø12 ⁶²⁾		6
		V-16	Ø16 ⁶²⁾		8
		V-17	Ø17 ⁶²⁾		P
		V-18	Ø18 ⁶²⁾		U
		V-20	Ø20 ⁶²⁾		D
		V-30	Ø30 ⁶³⁾		V
		-	Ø8 ⁶⁴⁾		W
Stand, Output shaft, Key	-	E01	Ø22	P-1162, P-0210 P-2148/A	J
Stand + Lever	-	-	-		K
Siand + Large lever + Pull-rod TV 360	-	-	-		L

Additional Equipment		Wiring Diagrams					
		230 V AC	3x400 V AC	24 V AC	24 V DC		
A	2 additional position switches ²²⁾	Z11a/ZK11a Z633/ZK633	Z12a/ZK12a Z632c/ZK632c	Z626f/ZK626f Z634h/ZK634h		0	0
E	Space heater with thermal switch	Z1a/ZK1a Z633/ZK633	Z78y/ZK78y Z632c/ZK632c	Z626f/ZK626f Z634h/ZK634h		0	2
C	Electric local controls ⁶⁶⁾	Z633/ZK633	Z632c/Z632c	Z634h/ZK634h		0	7
D	Space heater	Z1a/ZK1a Z633/ZK633	Z78y/ZK78y Z632c/ZK632c	Z626f/ZK626f Z634h/ZK634h		1	5
H	Gold coated contacts of microswitches, details after consultation with producer					4	0
Permitted combination code: A+E=04, A+C=08, E+C=10, A+E+C=12, A+D=16, C+D=17, A+C+D=18							

Notes:

10) Climate resistance according to ISO 9223 / EN ISO 12944-2.

11) IP 68-10 m / 48 hours.

22) Version 3x400 V (380 V) with additional position switches and double transmitter in agreement with producer.

32) The actuator can be loaded with this torque under duty cycle S2 - 10 min, or S4 - 25%, 6 - 90 cycles per hour.

33) The actuator can be loaded with this torque under duty cycle S4 - 25 %, 90 - 1 200 cycles per hour.

34) Deviation of operating speed for the DC electric motor is from -50% up to +30% depending on load.

41) Valid for version without transmitter only

51) Not valid for temperatures below -60°C.

52) CPT - capacitive transmitter, DCPT 3M - electronic contactless transmitter.

59) Active position transmitter for version 24 V AC/DC only after agreement with producer.

62) Connection bore directly within output shaft (without replaceable inser).

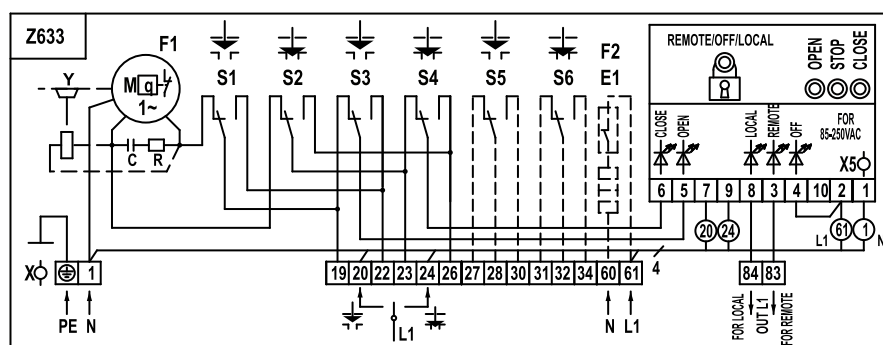
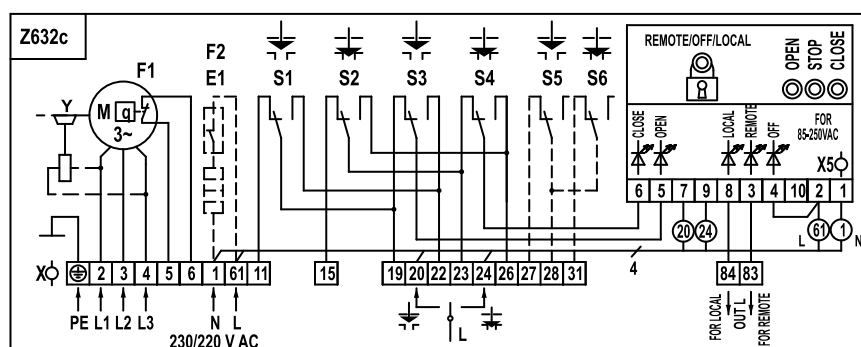
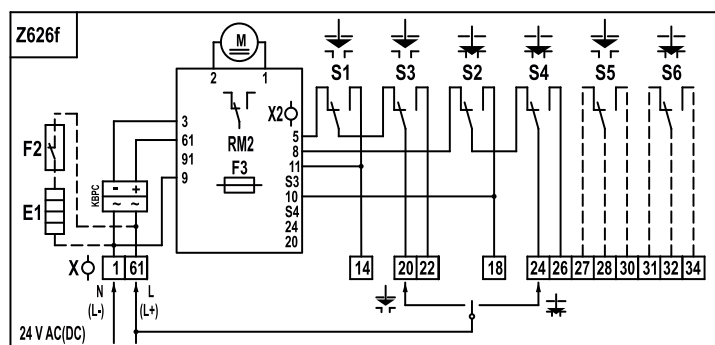
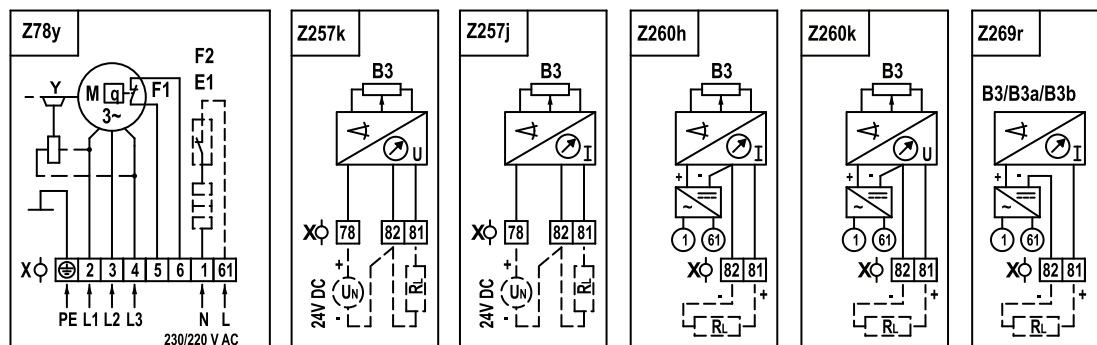
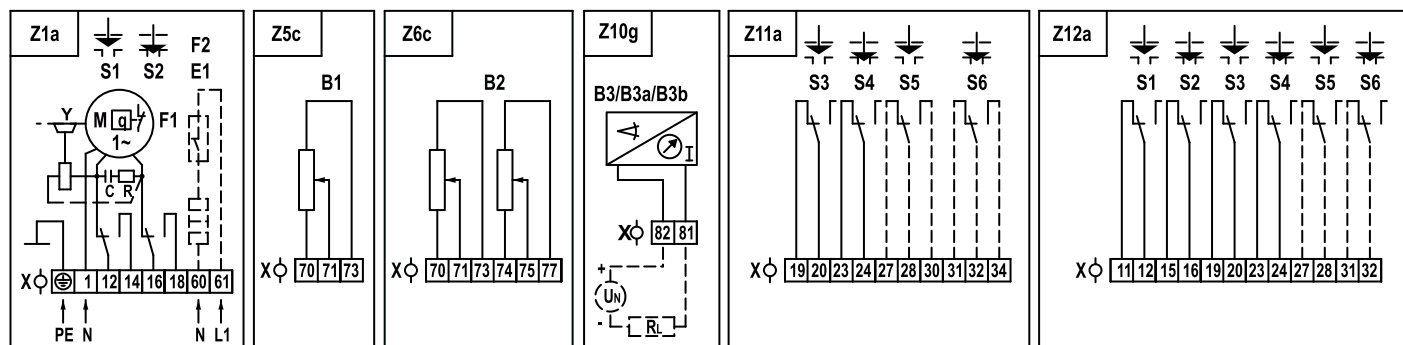
63) Bore for replaceable insert.

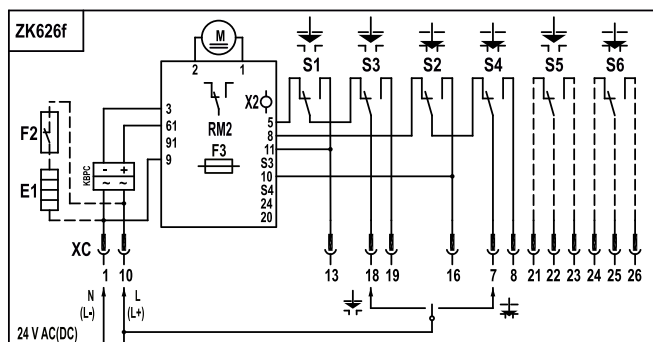
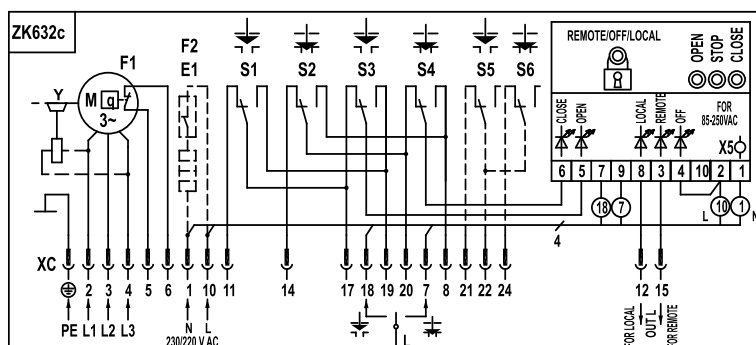
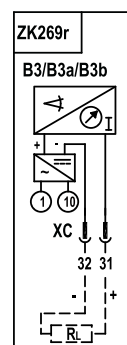
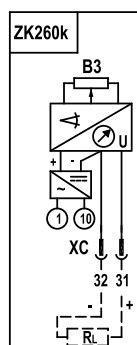
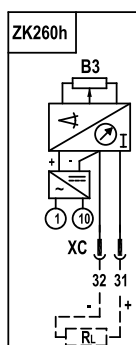
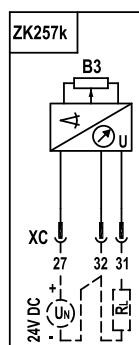
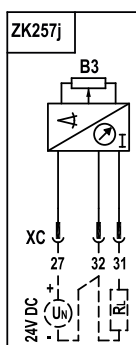
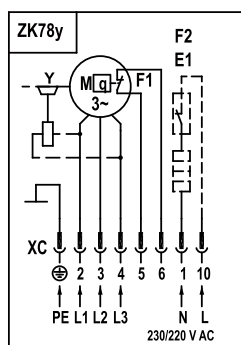
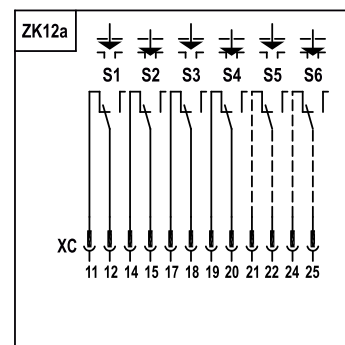
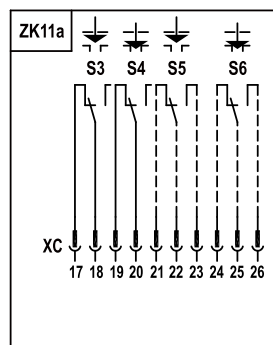
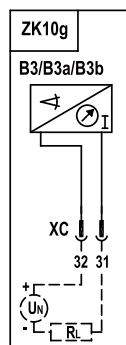
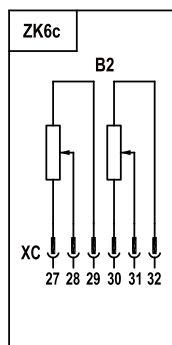
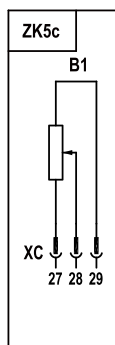
64) Replaceable insert with bore Ø 8.

66) Local control diagram for -60°C on request from the manufacturer.

Wiring diagrams

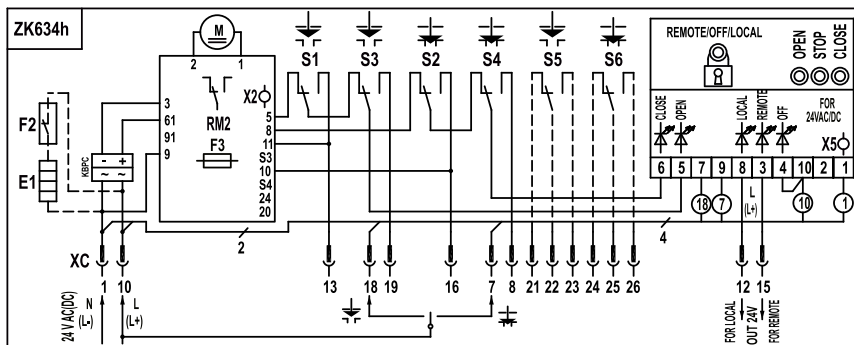
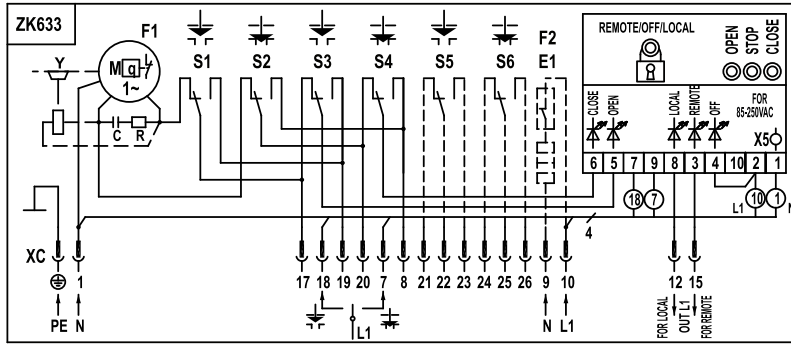
Terminal board connection





Wiring diagrams

Connector connection



Electric connection:

- to terminal board with 24 terminals, wire-cross section 1.5 mm²
- via 3 cable glands: - M20x1,5 for cable diameter 8 to 14,5 mm (1 pc)
- M12x1,5 for cable diameter 3,5 to 5 mm (2 pcS)
- Max. number of terminals per connector: 32
- Min. cross-section of connecting wire: 0.5 mm²

* Cable diameters may vary depending on the temperature resistance of the gland.

Notes:

1. The connection is limited by the number of terminals 24 on the actuator terminal board.
2. The electric motors are equipped with thermal protection as standard.

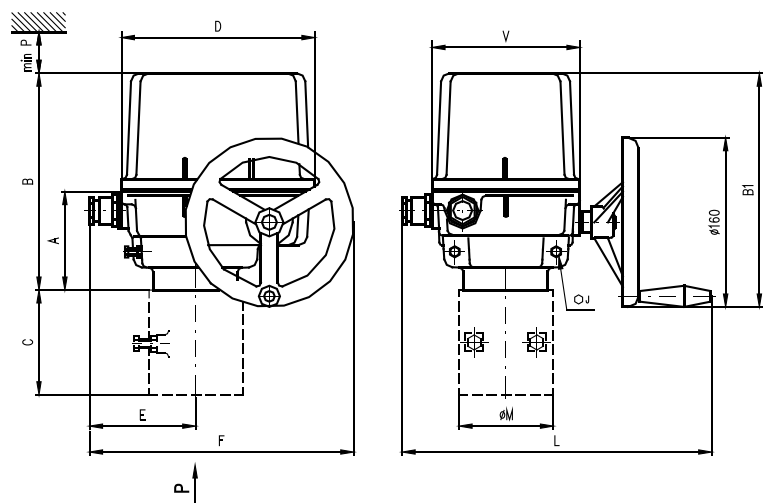
Legenda:

Z1a/ZK1a.....	connection of 1-phase electric motor
Z5c/ZK5c.....	connection of single potentiometer
Z6c/ZK6c.....	connection of double potentiometer
Z10g/ZK10g.....	connection of CPT or electronic position transmitter - 2 - wire, passive
Z11a/ZK11a.....	connection of position switches for 1-phase electric motor
Z12a/ZK12a.....	connection of torque, position, and additional position switches for 3-phase electric motor
Z78y/ZK78y.....	connection of 3-phase electric motor
Z257j/ZK257j.....	connection of electronic position transmitter - 3 - wire, passive
Z257k/ZK257k.....	connection of electronic position transmitter - 3 - wire, passive
Z260k/ZK260k.....	connection of electronic position transmitter - 3 - wire, active
Z260h/ZK260h.....	connection of electronic position transmitter - 3 - wire, active
Z269r/ZK269r.....	connection of CPT or electronic position transmitter - 2 wire - active
Z626f/ZK262f.....	connection of 24 V AC/DC electric motor, torque switches, position switches, and additional position switches
Z632c/ZK632c.....	connection of 3-phase electric motor, torque switches, position switches, additional position switches and local control unit
Z633/ZK633.....	connection of 1-phase electric motor, torque switches, position switches, additional position switches and local control unit
Z634h/ZK634h.....	connection of 24 V DC electric motor, reversing board, torque switches, position switches, additional position switches and local control unit

Legend:

B1.....	single potentiometer
B2.....	double potentiometer
B3.....	CPT or electronic position transmitter
B3a.....	capacitive current transmitter (CPT)
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“
M.....	electric motor
C.....	capacitor
E1.....	space heater
F1.....	motor thermal protection
F2.....	thermal switch of the space heater
F3.....	reversing board fuse
X.....	terminal board
X2.....	reversing board terminal board
X5.....	local control terminal board
R.....	reducing resistor
R _L	loading resistor
I.....	output current signal
RM2.....	24 V reversing board
U _N	transmitter power supply voltage
Y.....	motor brake (not applicable for this type of ES)
OPEN/STOP/CLOSE.....	local control buttons
REMOTE/OFF/LOCAL.....	local control selection button

Dimensional drawing SP 1



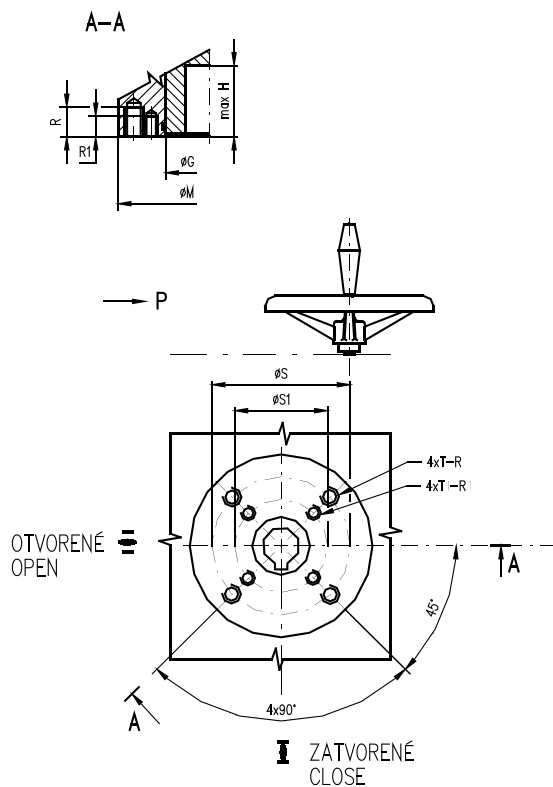
Main dimensions

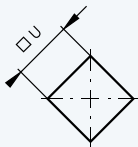
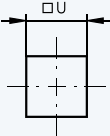
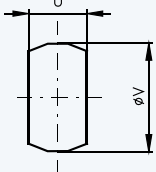
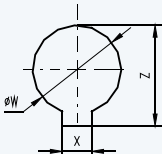
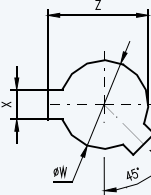
Type	A	B	B1	C	D	E	F	J	L	M	P	V
SP 1	102	221	229	-	183	93	243	17	280 396*	90	160	140

* valid for version with a connector

Flange dimensions

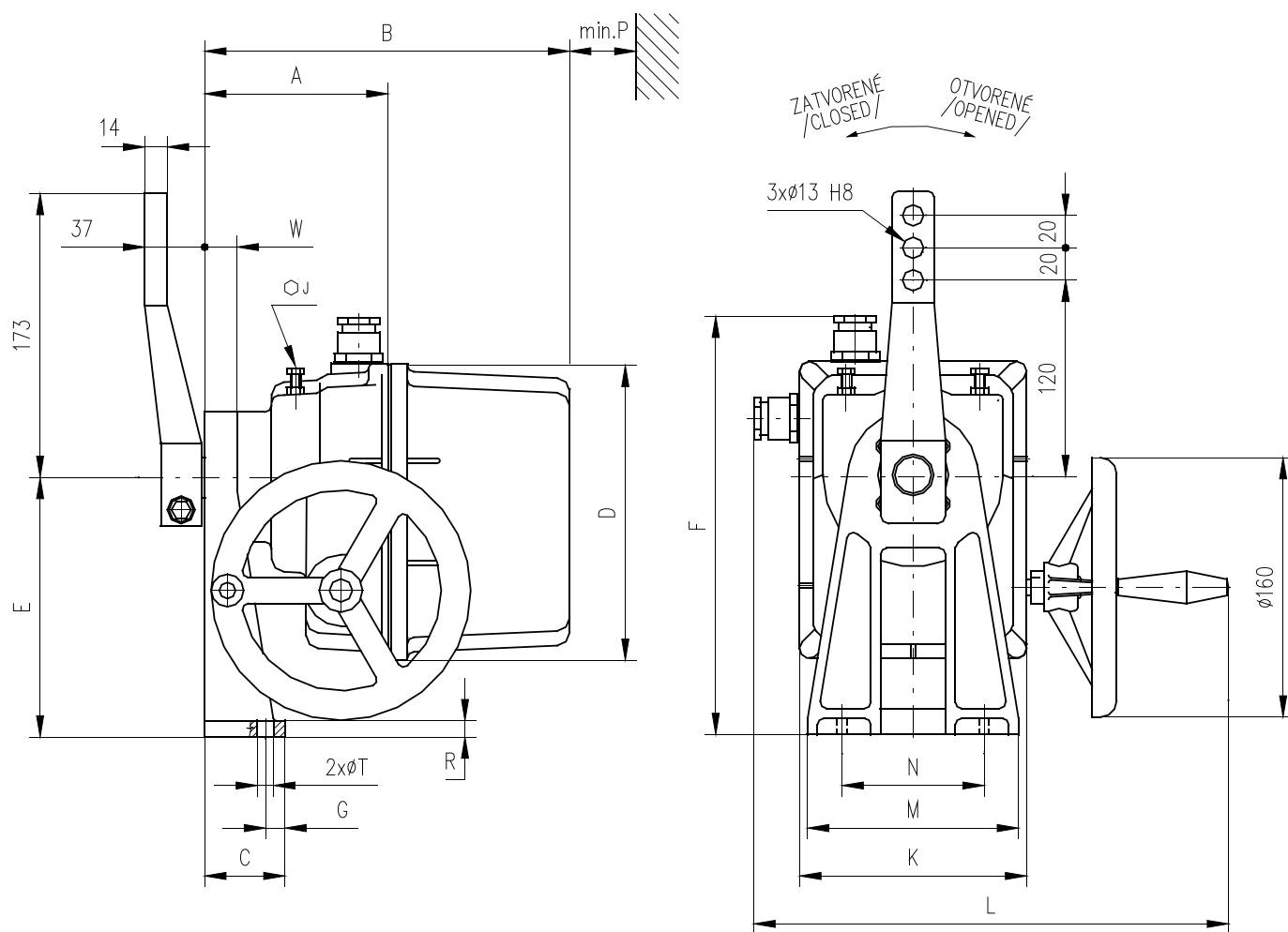
Type	G	H	R	R1	S	S1	T	T1	Flange Size
SP 1	40	37	16	14	70	50	M8	M6	F07/F05



Coupling Shape										
D-xx		L-xx		H-xx			V-xx		V-30, V-45.4	
										
ISO	Dimension	ISO	Dimension	ISO	Dimension		ISO	Dimension		
D-xx	U	L-xx	U	H-xx	U	V	V-xx	W	Z	X
D-11	11	L-11	11	H-8	8	13	V-12	12	13.6	4.0
D-14	14	L-14	14	H-10	10	16	V-14	14	16.1	5.0
D-16	16	L-16	16	H-11	11	18	V-16	16	18.1	5.0
D-17	17	L-17	17	H-12	12	18	V-17	17	19.5	6.0
				H-13	13	19	V-18	18	20.5	6.0
				H-14	14	22	V-20	20	22.5	6.0
				H-16	16	22	V-22	22	24.5	6.0
				H-17	17	25	V-28	28	30.9	8.0
							V-30	30	32.5*	8.0

* The dimension has been adjusted to match the replaced component and may deviate from standard specifications.

Dimensional drawing SP 1



Main dimensions

Type	A	B	C	D	E	F	F2	G	w	J	K	L	M	N	P	R	T
SP 1	122	241	50	183	160	258	273 345*	12	20	13	140	280 396*	130	80	160	10	10.5

* valid for version with a connector

Version SP 1 with stand and free shaft

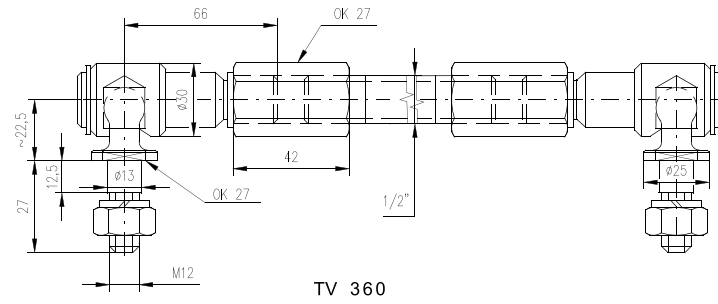
Coupling shape E

Exx		Type	H	S	U	V	Z	Y	Y1	Coupling Shape
		SP 1	24.5	22	6	28	25	2	2	E01

P-1162

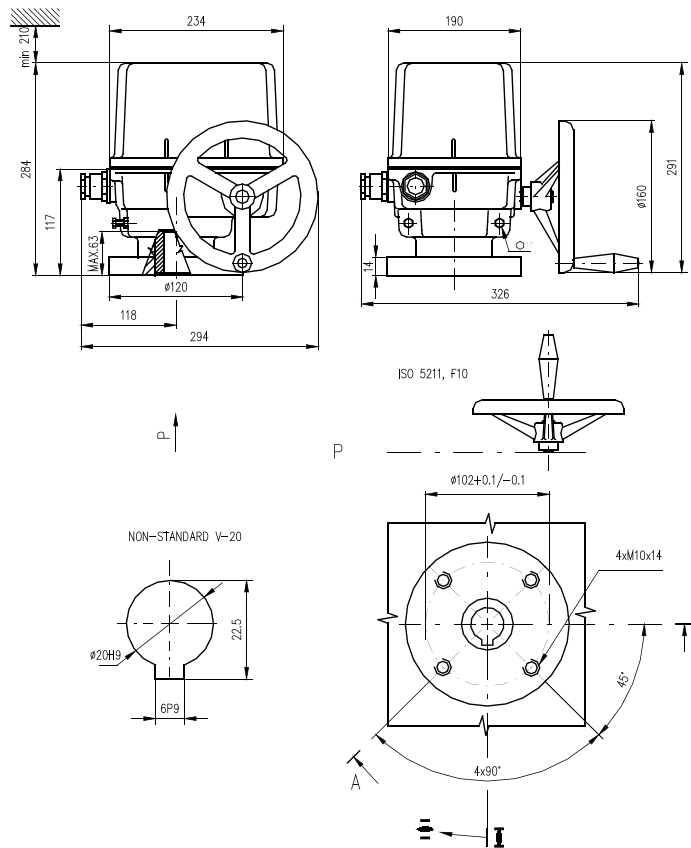
Dimensional drawing SP 1

Pull-rod TV 360



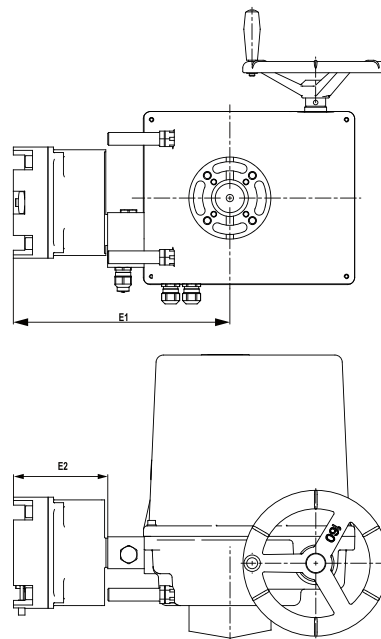
P-0210

Version of SP 1 actuator with F10 flange



P-2068

Version of SP 1 actuators with electric local control



SP 1	P-2148/A	238	103.5
Type	Version	E1	E2

Other dimensions according to basic dimensional drawings

P-2148