

**Electric rotary (90°) actuators
for ball and flap valves**

**MODACT MOK
MODACT MOK CONTROL**

Type numbers 52 325 - 52 329



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ZPA Pečky, a.s. is certified company in accordance with ISO 9001 as amended.

APPLICATION

The actuators **MODACT MOK** are designed for shifting control elements by a reversible rotary motion with the turning angle of the output part 90°, including cases when tight closure in end positions is required. Typical example of using is control of ball and flap valves in similar installations in the regime of remote control as well as automatic regulation. The electric actuators **MODACT MOK** are mounted directly on the controlled element.

OPERATING CONDITIONS, OPERATING POSITION

Operating conditions

The actuators **MODACT MOK (MODACT MOK Control)** are resistant against effect of operating conditions and external effects of classes AC1, AD5, AD7, AE5, AE6, AF2, AG2, AH2, AK2, AL2, AM-2-2, AN2, AP3, BA4 and BC3 according to ČSN 33 2000-5-51 ed. 3.

When the actuator is installed on a free area it is recommended to fit it with a light shelter against direct impact of atmospheric effects. The shelter should overlap the actuator contour by at least 10 cm at the height of 20 – 30 cm.

When actuators are to be installed in the working environment with temperature below +10 °C and in the environment with relative humidity above 80 %, it is always necessary to use an anti-condensation heater fitted to the actuator.

The electric actuators can be installed in areas with non-flammable and non-conductive dust, provided that this does not adversely influence their function. Here, it is necessary to strictly observe ČSN 34 3205. It is recommended to remove dust as soon as its layer is about 1 mm thick.

Notes:

The area under a shelter means the one where falling of atmospheric precipitations under and angle up to 60° from the vertical is prevented.

The electric actuator must be installed in a place where cooling air has a free access. Minimum distance from a wall for access of air is 40 mm. Therefore, the area where the electric actuator is installed must be sufficiently large, clean and ventilated.

Surrounding temperature

Operating temperature for the **MODACT MOK** is from -25 °C to +70 °C or from -60 °C to +60 °C.

Classes of external effects – excerpt from ČSN 33 2000-5-51 ed. 3.

Class:

- 1) AC1 – elevation above sea level ≤ 2000 m
- 2) AD5 – spouting water; water can spout in any direction
AD7 – shallow occurrence – shallow dipping
- 3) AE5 – medium dustiness
AE6 – strong dustiness
- 4) AF2 – occurrence of corrosive or polluting substances from atmosphere. Presence of corrosive polluting substances is significant.
- 5) AG2 – medium mechanical stress by impacts – common industrial processes
- 6) AH2 – medium mechanical stress by vibrations – common industrial processes
- 7) AK2 – serious risk of growth of vegetation and moulds
- 8) AL2 – serious danger of the occurrence of animals (*insects, birds, small animals*)
- 9) AM-2-2 – normal level of the signal voltage. No additional requirements
- 10) AN2 – medium solar radiation with intensities > 500 W/m² and ≤ 700 W/m²
- 11) AP3 – medium seismic effects; acceleration > 300 Gal ≤ 600 Gal
- 12) BA4 – personal abilities. Instructed people.
- 13) BC3 – frequent contact with the earth potential. Persons coming frequently into contact with "live" parts or standing on a conducting base.

Corrosion protection

Actuators are standardly delivered with surface treatment corresponding to category of corrosion aggressiveness C1, C2 and C3 according to ČSN EN ISO 12944-2.

On customer's request is possible to do surface treatment corresponding to category of corrosion aggressiveness C4, C5-I and C5-M.

In following table is provided an overview of environment for each categories of corrosion aggressiveness according to ČSN EN ISO 12944-2.

Corrosion aggressiveness level	Example of typical environment	
	Outdoor	Indoor
C1 (very low)		Heated buildings with clean atmosphere e.g. offices, shops, schools, hotels.
C2 (low)	Atmosphere with low level of pollution. Mostly outdoor areas.	Unheated buildings, in which may occur condensation, e.g. stocks, sports halls.
C3 (middle)	Urban industrial atmospheres, mild pollution of sulfur dioxide. Seaside areas with middle salinity.	Production areas with high humidity and low air pollution, e.g. food industry, processing factories, breweries.
C4 (high)	Industrial areas and seaside areas with middle salinity.	Chemical plants, swimming pools, seaside shipyard.
C5-I (very high – industrial)	Industrial areas with high humidity and aggressive atmosphere.	Buildings or areas with predominantly continuous condensation and high air pollution.
C5-M (very high – seaside)	Seaside areas with high salinity.	Buildings or areas with predominantly continuous condensation and high air pollution.

Operating position

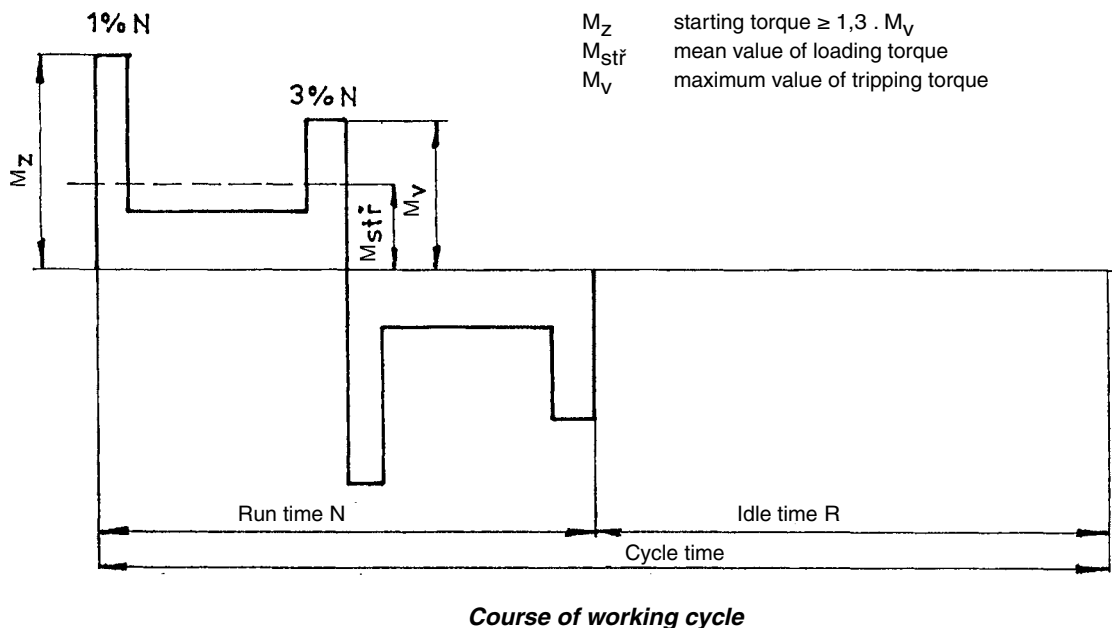
The actuators can be used in any operating position.

OPERATION MODE, SERVICE LIFE OF ACTUATORS

Operation mode

The actuators can be operated with the type of loading S2 according to ČSN EN 60 034-1. The run period at temperature +50 °C is 10 minutes; the mean value of loading torque should not exceed 60 % of the value of maximum tripping torque M_V . The actuators can also work in the regime S4 (*interrupted run with start-up*) according to ČSN EN 60 034-1. Load factor $N/N+R$ is max. 25 %; the longest working cycle ($N+R$) is 10 minutes (*course of working cycle is shown in the figure*). The highest number of closing operations in automatic regulation is 1200 cycles per hour. Mean value of loading torque with load factor 25 % and surrounding temperature +50 °C is not higher than 40 % of maximum tripping torque M_V .

The highest mean value of loading torque is equal to rated torque of the actuator.



Service life of actuators

The actuator intended for shut-off valves must be able to perform at least 10,000 operating cycles (*C - O - C*).

The actuator intended for regulating purposes must be able to perform at least 1 million cycles with operation time (*during which the output shaft is moving*) at least 250 hours. Service life in operating hours (*h*) depends on load and number of switching. Not always, high frequency of switching influences positively accuracy of regulation. For attaining the longest possible faultless period and service life, frequency of switching is recommended to be set to the lowest number of switching necessary for the given process. Orientation data of service life derived from the set regulation parameters are shown in the following table.

Service life of actuators for 1 million starts

Service life [h]	830	1 000	2 000	4 000
Number of starts [1/h]	Max. number of starts 1200	1 000	500	250

TECHNICAL DATA

Supply voltage

Supply voltages of the actuators are shown in Table 1.

1 x 230 V, +10 %, -15 %, 50 Hz \pm 2 %

3 x 230/400 V, +10 %, -15 %, 50 Hz \pm 2 %

(*or as shown on the motor rating plate*)

Other supply voltage for electric actuators should be discussed with the manufacturer.

Protective enclosure

Protective enclosure of actuators **MODACT MOK** IP 67 according to ČSN EN 60529.

Noise

Level of acoustic pressure A max. 85 dB (A)

Level of acoustic output A max. 95 dB (A)

Tripping torque

At the factory, the tripping torque has been adjusted as shown in Table 1, according to the customer's requirements. If no tripping torque adjustment has been specified by the customer the maximum tripping torque is adjusted.

Self-locking

The actuators are self-locking. Self-locking facility of the actuators is provided by a mechanical or electromagnetic brake of the electric motor.

Sense of rotation

When looking at the output shaft in the direction towards the control box, the CLOSE direction of rotation is identical with the clockwise sense.

Working stroke

The rated working travel of the actuator is 90°.

Manual control

Manual control is performed directly by a handwheel (*without clutch*). It can be used even when the electric motor is running (*the resulting motion of the output shaft is determined by the function of the differential gear*). When the handwheel is rotated clockwise the output shaft of the actuator also rotates clockwise (*when looking at the shaft towards the control box*). On condition that the valve nut is provided with left-hand thread, the actuator closes the valve.

Torque-limit switches in the actuator are set and work when the actuator is under voltage.

When using the manual control, ie. actuator is controlled mechanically, the torque-limit switches doesn't work and the valve can be damaged.

ACTUATOR OUTFIT

Torque-limit switches

The actuator is fitted with two torque-limit switches (*MO – OPEN, MZ – CLOSE*) each of which acts only in one direction of motion of the actuator output shaft.

The tripping torque can be adjusted within the range shown in Table 1.

Position-limit switches

The *PO – OPEN* and *PZ – CLOSE* position-limit switches limit the actuator working stroke, each being adjusted to operate in either end position.

Position signalling

For signalling position of the actuator output shaft, two signalling switches, i.e. the *SO – OPEN* signalling switch and the *SZ – CLOSE* signalling switch, are used. Each of these switches acts only in one direction of output shaft rotation. The operating point of the microswitches can be set within the whole working stroke range except the narrow band before the operating point of the microswitch used to switch off the electric motor.

Position transmitters

The **MODACT MOK** electric actuators can be supplied without position transmitter or can be fitted with position transmitter:

a) Resistance transmitter 1 x 100 Ω.

Technical parameters:

Position scanning	resistance
Turning angle	0° – 320°
Non-linearity	≤ 1 %
Transition resistance	max. 1.4 Ω
Permitted voltage	50 V DC
Maximum current	100 mA

b) Type CPT 1Az passive current transmitter. Power supply to the current loop is not a part of the actuator. Recommended feeding voltage is 18 – 28 V DC, at maximum loading resistance of the loop 500 Ω. The current loop should be earthed in one point. Feeding voltage need not be stabilized; however, it must not exceed 30 V or else the transmitter could be damaged.

Range of CPT 1Az is set by a resistance transmitter on the transmitter body and its starting value by corresponding partial turning of the transmitter.

Technical parameters of CPT 1Az:

Scanning of position	capacity
Working stroke	adjustable 0° – 40° to 0° – 120°
Non-linearity	≤ 1 %
Non-linearity, including gears	≤ 2.5 % (for a maximum stroke of 120°)
Hysteresis, including gears	≤ 5 % (for a maximum stroke of 120°)
<i>(The non-linearity and hysteresis are related to a signal value of 20 mA).</i>	
Loading resistance	0 – 500 Ω
Output signal	4 – 20 mA or 20 – 4 mA
Supply voltage	for $R_{load} = 0 – 100 \Omega$ 10 to 20 V DC
	for $R_{load} = 400 – 500 \Omega$ 18 to 28 V DC
Maximum supply voltage ripple	5 %
Maximum transmitter power demand	560 mW
Insulation resistance	20 MΩ at 50 V DC
Insulation strength	50 V DC
Operational environment temperature – extended range	-25 °C to +70 °C (additional on demand)
Dimensions	∅ 40 x 25 mm

c) **Type DCPT3 active current transmitter.** Power supply to the current loop is not a part of the actuator. Maximum loading resistance of the loop is 500 Ω. For variants **MODACT MOK Control** with the regulator ZP2RE4, it is used as a position sensor.

DCPT3 can be easily set by two push-buttons with LED diode on the transmitter body.

Technical parameters of DCPT3:

Scanning of position	contact-less magneto-resistant
Working stroke	adjustable 60° – 340°
Non-linearity	max. ±1 %
Loading resistance	0 – 500 Ω
Output signal	4 – 20 mA or 20 – 4 mA
Power supply	15 – 28 V DC, < 42 mA
Working temperature	-25 °C to +70 °C
Dimensions	ø 40 x 25 mm

For the transmitters CPT 1Az as well as DCPT3, a two-wire connection is used, i.e., the transmitter, the power supply and the load are connected in series. The user should secure that the two-wire circuit of the current transmitter is connected to the electric earth of the associated regulator, computer, etc. This connection should only be made at a single point in any section of the circuit, outside the actuator.

Position indicator

The actuator is fitted with a local position indicator.

Anti-condensation heater

The actuators are fitted with an anti-condensation heater preventing condensation of water vapour. It is connected to the AC mains of voltage 230 V.

Local control

Local control serves for controlling the actuator from the site of its installation. It includes two change-over switches: one with positions “*Remote control – Off – Local control*”, the other “*Open – Stop – Close*”. Switch 1 can be integrated as 2-pole or 4-pole switch.

ELECTRIC PARAMETERS

External electric connection

The terminal board of the actuator is fitted with terminals allowing one conductor with a maximum cross-section of 2.5 mm² or two conductors with the same cross-sectional area up to 1 mm² to be connected.

Connecting of actuators with connector – on special request.

Actuator internal wiring

The internal wiring diagrams of the **MODACT MOK** actuators with terminal designation are shown in this Catalogue.

Each actuator is provided with its internal wiring diagram on the inner side of the actuator cover. The terminals are marked on a self-adhesive label attached to a carrying strip under the terminal block.

Overheating protection of electric motor

All electric motors have thermal fuses in their winding. They serve as an additional protection; they do not substitute the overcurrent protection or circuit breaking.

The fuses of single-phase electric motors are internally interconnected with the winding and, in case of overheating, they cut out the electric motor; after cooling down, they cut it in automatically.

The fuses of three-phase electric motors are separately led out and they can be connected into control or signalling circuits. They are connected to the actuator terminal board as a standard for **MOK 63** (*type no. 52 325*) only.

Load-bearing capacity is 250 V AC / 2.5 A.

Current rating and maximum voltage of microswitches

Maximum voltage of mikroswitches is 250 V AC as well as DC, at these maximum levels of currents.

MO, MZ	250 V AC / 2 A; 250 V DC / 0.2 A
SO, SZ	250 V AC / 2 A; 250 V DC / 0.2 A
PO, PZ	250 V AC / 2 A; 250 V DC / 0.2 A

The microswitches can only be used as single-circuit devices. Two voltages of different values and phases cannot be connected to the terminals of the same microswitch.

Isolation resistance

Isolation resistance of electric control circuits against the frame and against each other is min. 20 M Ω . After a dump test, isolation resistance of control circuits is min. 2 M Ω . Isolation resistance should be at least 1,9 M Ω . See Technical specifications for more details.

Electric strength of electric circuits isolation

Circuit of resistance transmitter	500 V, 50 Hz	
Circuit of current transmitter	50 V DC	
Circuits of microswitches and anti-condensation heater	1 500 V, 50 Hz	
Electric motor	Un = 1 x 230 V Un = 3 x 230/400 V	1 500 V, 50 Hz 1 800 V, 50 Hz

Deviations of basic parameters

Tripping torque	± 15 % of the maximum tripping torque
Operating time of the output part	- 10 % + 15 % of the rated value (<i>in no-load operation</i>)
Hysteresis of position limit and signalling switches	$\leq 4^\circ$
Adjustment of working travel	$\pm 1^\circ$
Clearance of the output part	
actuators, Type Nos 52 325, 52 326, 52 328	1.5° max.
actuators, Type Nos 52 327, 52 329	2.5° max.

Protection

The electric actuators are fitted with external and internal protecting terminal for securing protection against dangerous shock voltage.

The protecting terminals are marked according to ČSN IEC 417 (34 5550).

If actuator is not provided with over-current protection when purchased, such protection must be provided externally.

POSITION REGULATOR

A built-in position regulator allows automatic positioning of the actuator output shaft to be performed, depending on the analog input signal. At the regulator input, the input control signal is compared with the feedback signal of the position transmitter. The resulting control deviation, if any, is used for actuator run control, the actuator output shaft being brought into the position corresponding to the input control signal value.

Regulator software

1) The regulator can be programmed to perform the required functions in the following two ways:

- By a PC after the RS 232 interface.
- By means of the functional keys and LEDs on the regulator.

The following parameters can be programmed:

- Control signal
- Regulator response to the TEST signal and the error state (*depending on the programmed requirements*)
- Mirroring (*ascending or descending characteristic of the control signal*)
- Regulator insensitivity
- Way of Regulations (*narrow to a moment, narrow to a position, wide to a moment, wide to a position*)

2) All operating states of the regulator can be monitored by a PC after the RS 232 interface. In this case, the regulator issues error messages by means of LEDs or PC.

- Presence of the TEST signal
- Control signal is missing
- Limit switches (*faulty connection*)
- Failure of position sensor
- Failure of thermal protection

TECHNICAL PARAMETERS OF THE REGULATOR

Alternative supply voltages:	A. 230 V	+10 %, -15 %;	50 – 60 Hz
	B. 120 V	+10 %, -15 %;	50 – 60 Hz
	C. 24 V	+10 %, -15 %;	50 – 60 Hz
Control signal	0 to 20 mA, 4 to 20 mA, 0 to 10 V		
Position sensor	Current transmitter of 4 to 20 mA		
Regulator linearity	0.5 %		
Regulator insensitivity	1 to 10 % (<i>adjustable</i>)		
Operating temperature range	-25 °C to +75 °C		
LED error messages	– TEST mode – Control signal is missing – Reversed position switches – Failure of position sensor – Failure of thermal protection		
Response to failure:	Failure of sensor	– Actuator in the TEST position, LED error message	
	Control signal is missing	– Actuator in the TEST position, LED error message	
	TEST mode	– Actuator in the TEST position, LED error message	
Output signal:	Power outputs	– 2x relay of 5 A, 230 V	
	Central failure	– Switching contact of 24 V, 2 W	
	5x LED (<i>power supply, failure, adjustment, opens, closes</i>)		
	Brake – Control signal of 2 mA (<i>signal for additional module</i>)		
	Actuator position – I2C bus (<i>signal for additional module</i>)		
Adjusting devices:	– 2x calibrating and parameter adjusting push-button – Communication connector		
Dimensions:	– 75 x 75 x 25 mm		

ORDERING INFORMATION

When ordering, please specify the following:

- Number of actuators required
- Actuator designation
- Complete Type Number, according to Table No. 1 (*9-digits*)
- Adjustment of tripping torque (*If no tripping torque adjustment has been specified the maximum tripping torque will be adjusted by the manufacturer*).

Table 1 – MODACT MOK (Control) electric actuators
– basic technical parameters

Type	Type number		Adjusting time [s/90°]	Tripping torque [Nm]	Electric motor					Weight [kg]
	basic 1 2 3 4 5	complem. 6 7 8 9			Type	Output [W]	Speed [1.min ⁻¹]	Voltage [V]	Current [A]	
MOK 63	52 325	x x 1 x	10	16 – 32	FCJ2B52VA	15	2780	1 x 230	0.37	7.4
		x x 2 x	20	25 – 80*)		15	2780	1 x 230	0.37	7.4
		x x 3 x	40			15	2780	1 x 230	0.37	7.4
		x x 4 x	80	25 – 45	FCT2B54MA	4	1270	1 x 230	0.25	7.4
		x x 5 x	10	16 – 32	FT2B52C	15	2680	3 x 400	0.10	7.4
		x x 6 x	20	25 – 80		15	2680	3 x 400	0.10	7.4
		x x 7 x	40			15	2680	3 x 400	0.10	7.4
		x x C x	40	55 – 110	FCJ2B52VA	15	2780	1x230	0.37	7.4
MOK 125	52 326	x x 1 x	10	63 – 125	FCJ4C52N	60	2770	1 x 230	0.53	12.7
		x x 2 x	20			60	2770	1 x 230	0.53	12.7
		x x A x	20			80 – 160	60	2770	1x230	0.53
		x x 3 x	40	63 – 125	FCT4C54N	20	1350	1 x 230	0.4	12.3
		x x 4 x	80			20	1350	1 x 230	0.4	12.3
		x x 5 x	10		FT4C52NA	90	2770	3 x 400	0.34	12.7
		x x 6 x	20			90	2770	3 x 400	0.34	12.7
		x x 7 x	40		EAMR56N04A	20	1440	3 x 400	0.20	12.7
		x x 8 x	80			20	1440	3 x 400	0.20	12.7
		MOK 250	52 327	x x 2 x	20	125 – 250	FCJ4C52N	60	2770	1 x 230
x x 3 x	40			60	2770	1 x 230		0.53	21	
x x A x	40			160 – 320	60	2770	1 x 230	0.53	21	
x x 4 x	80			125 – 250	FCT4C54N	20	1350	1 x 230	0.4	20.5
x x 5 x	160					20	1350	1 x 230	0.4	20.5
x x 6 x	20				FT4C52NA	90	2770	3 x 400	0.34	21
x x 7 x	40					90	2770	3 x 400	0.34	21
x x 8 x	80				EAMR56N04A	20	1440	3 x 400	0.20	21
x x 9 x	160					20	1440	3 x 400	0.20	21
MOK 500	52 328			x x 2 x	20	250 – 500	1 PK 7060-4AB	120	1350	3 x 400
		x x 3 x	40	120	1350			3 x 400	0.42	26
		x x 4 x	80	120	1350			3 x 400	0.42	26.3
		x x C x	40	EAMRB63L02	90		2780	1 x 230	0.90	27
MOK 1000	52 329	x x 3 x	40	500 – 1000	1 PK 7060-4AB	120	1350	3 x 400	0.42	45
		x x 4 x	80			120	1350	3 x 400	0.42	43
		x x 5 x	160			120	1350	3 x 400	0.42	43.3
		x x C x	80		EAMRB63L02	90	2780	1 x 230	0.90	45

*) Design variants with a greater tripping torque up to 80 Nm can be used at an ambient temperature of -20 °C to +55 °C.

In the type number, the following numeric symbol should be inserted:

6th position determine the possibility of using the position transmitter and electrical connection

	terminal	connector
design with resistance transmitter	6 x x x	A x x x
design with current transmitter 4 -20 mA without built-in power supply	7 x x x	B x x x
design without position transmitter	8 x x x	C x x x
design with current transmitter 4 -20 mA with built-in power supply	9 x x x	D x x x

7th position: 0 – design without built-in position controller and without BMO (*block of local control*)

1 – design with built-in position controller without BMO – **MODACT MOK Control**

2 – design without built-in position controller with BMO

3 – design with position controller and BMO – **MODACT MOK Control**

8th position: Insert a number or letter, according to Table 1.

9th position: Insert a number or letter, according to Table 2.

Table 2 – MODACT MOK (Control)

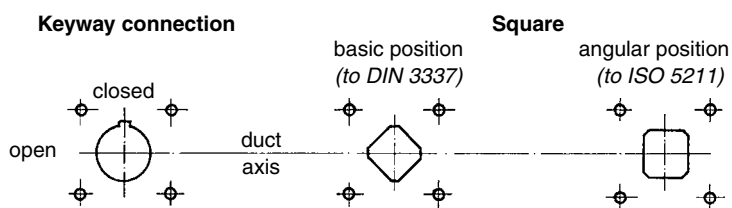
– way of mechanical connection (specification of 9th place of type number)

Flange size	Connection	Square size s [mm]	Square position	Marking on the 9 th place of type number
Type Number 52 325				
F05	keyway	∅ 22		0
F05	square	14	basic	1
F04	keyway	∅ 18		2
F04	square	11	basic	3
F05		14	positioned at a 45°	4
F04		11	positioned at a 45°	5
F04		12	basic	6
F04		12	positioned at a 45°	7
F05		16	basic	8
F05		16	positioned at a 45°	9
Type Number 52 326				
F07	keyway	∅ 28		0
F07	square	17	basic	1
F05	keyway	∅ 22		2
F05	square	14	basic	3
F07		17	positioned at a 45°	4
F05		14	positioned at a 45°	5
F05		16	basic	6
F05		16	positioned at a 45°	7
F07		19	basic	8
F07		19	positioned at a 45°	9
Type Number 52 327				
F10	keyway	∅ 42		0
F10	square	22	basic	1
F07	keyway	∅ 28		2
F07	square	17	basic	3
F10		22	positioned at a 45°	4
F07		17	positioned at a 45°	5
F07		19	basic	6
F07		19	positioned at a 45°	7
F10		24	basic	8
F10		24	positioned at a 45°	9
F10		27	basic	A
F10		27	positioned at a 45°	B
Type Number 52 328				
F12	keyway	∅ 50		0
F12	square	27	basic	1
F10	keyway	∅ 42		2
F10	square	22	basic	3
F12		27	positioned at a 45°	4
F10		22	positioned at a 45°	5
F10		24	basic	6
F10		24	positioned at a 45°	7
F10		27	basic	8
F10		27	positioned at a 45°	9
F12		32	basic	A
F12		32	positioned at a 45°	B
Type Number 52 329				
F12	keyway	∅ 50		0
F12	square	27	basic	1
F12		27	positioned at a 45°	4
F12		32	basic	5
F12		32	positioned at a 45°	6

Actuator output shaft position

(when viewing towards the local position indicator).

The handwheel tallies with the CLOSED position



Other connection of the actuator upon special request.

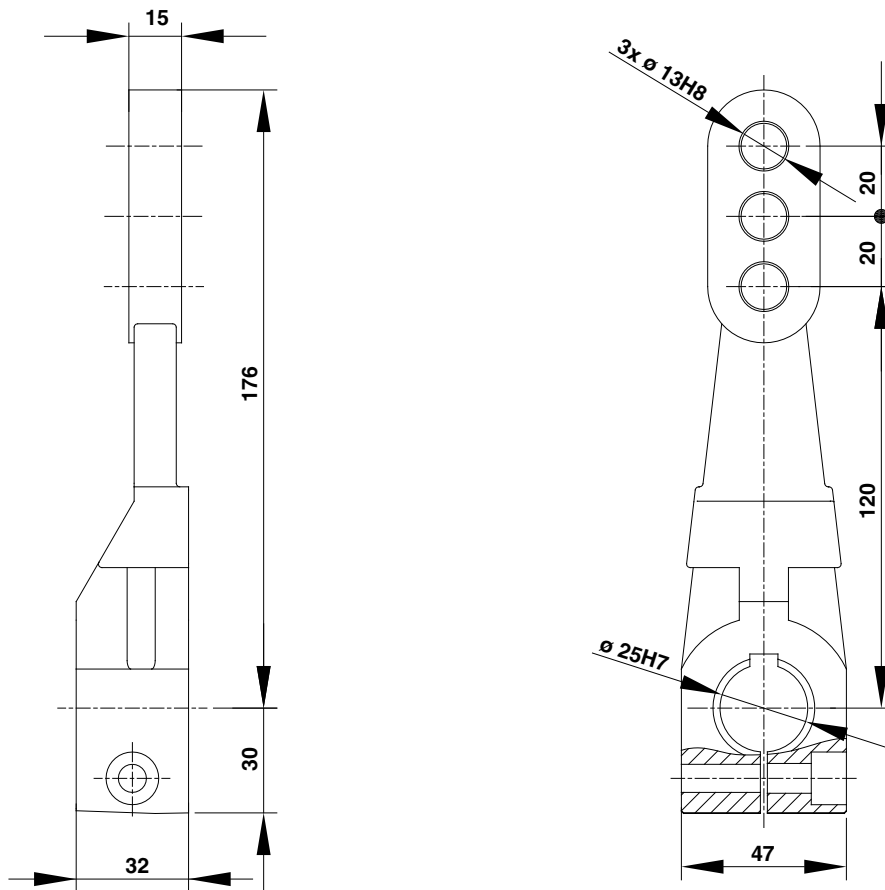
Addition to table 2 – MODACT MOK electric actuators with lever adapter

– mechanical connection (designation of the 9th place of the type number)

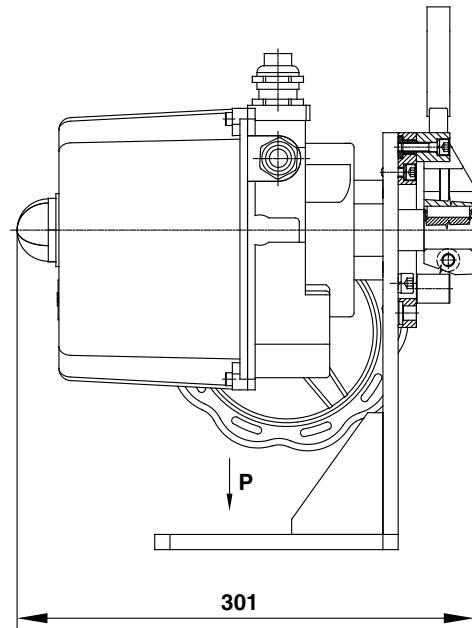
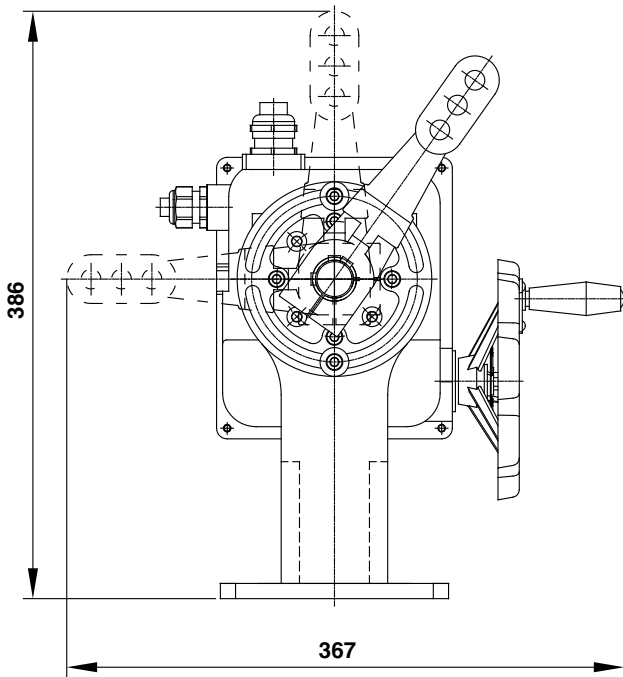
Flange size	Connection	Square size s [mm]	Square position	Marking of the 9th position in the type number	Structural design of output
Type number 52 325					
F05	keyway	∅ 22		0	collar
F05	square	14	basic	1	exchangeable inserts
F04	keyway	∅ 18		2	
F04	square	11	basic	3	
F05		14	positioned at a 45°	4	
F04		11	positioned at a 45°	5	
F04		12	basic	6	
F04		12	ppositioned at a 45°	7	
F05		16	basic	8	
F05		16	positioned at a 45°	9	
Actuator with lever adapter				W	
Type number 52 326					
F07	keyway	∅ 28		0	not available
F07	square	17	basic	1	exchangeable inserts
F05	keyway	∅ 22		2	
F05	square	14	basic	3	
F07		17	positioned at a 45°	4	
F05		14	positioned at a 45°	5	
F05		16	basic	6	
F05		16	positioned at a 45°	7	
F07		19	basic	8	
F07		19	positioned at a 45°	9	
Actuator with lever adapter				W	

Dimensional sketch of MODACT MOK electric actuator with lever adapter

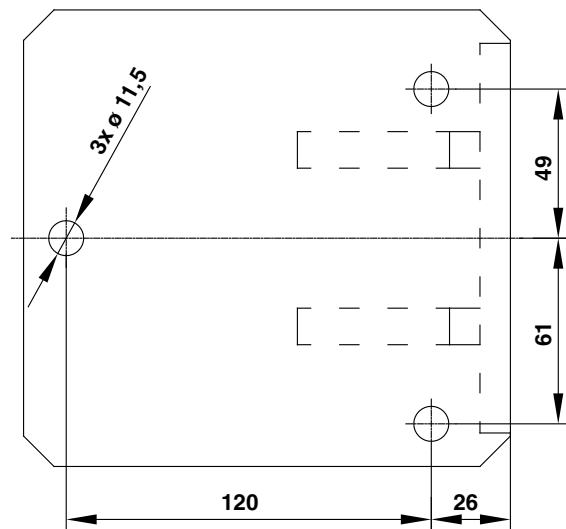
Lever



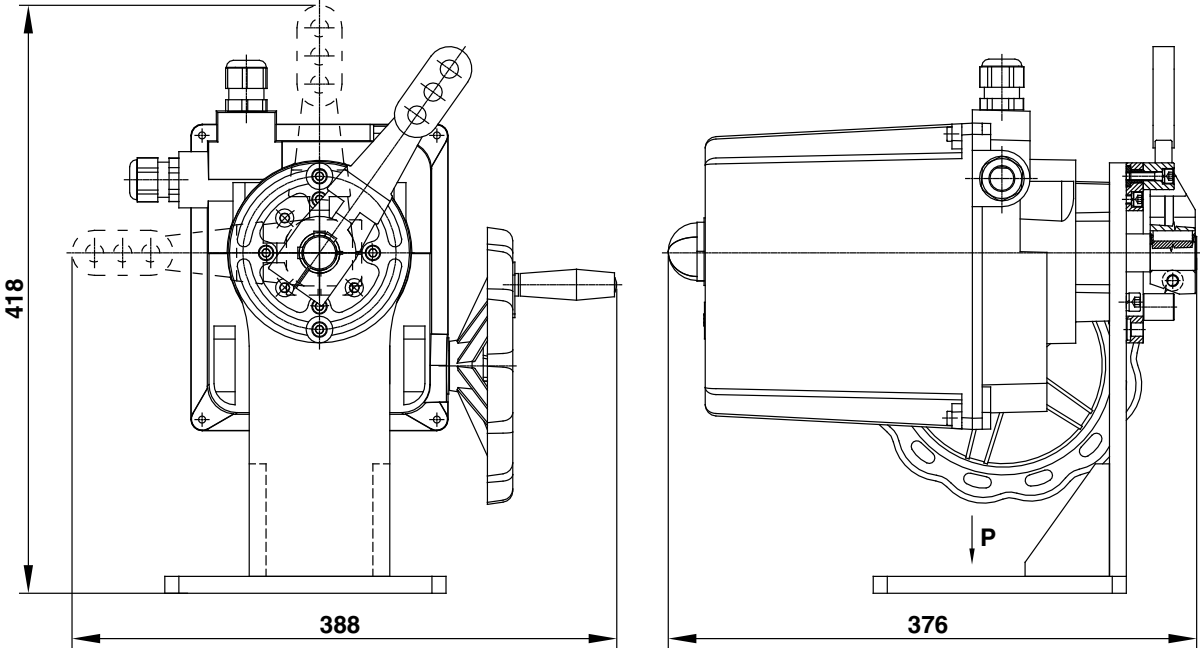
Lever adapter with Type No. 52325 actuator



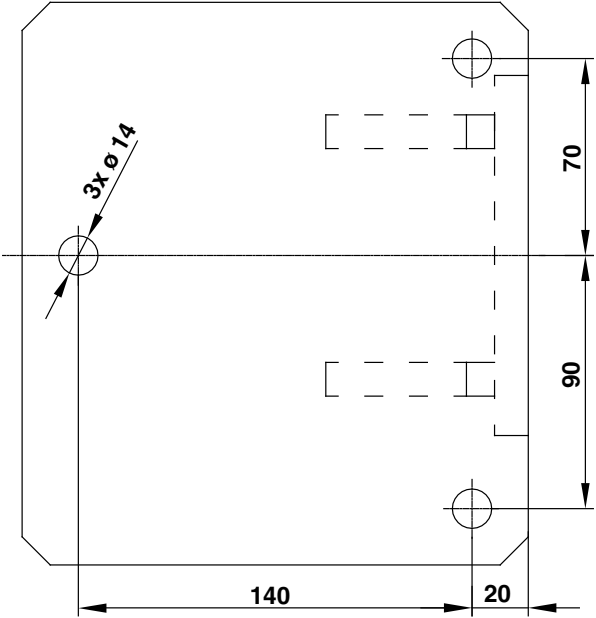
→ P
M2:1
(view of the base plate)



Lever adapter with **Type No. 52326** actuator

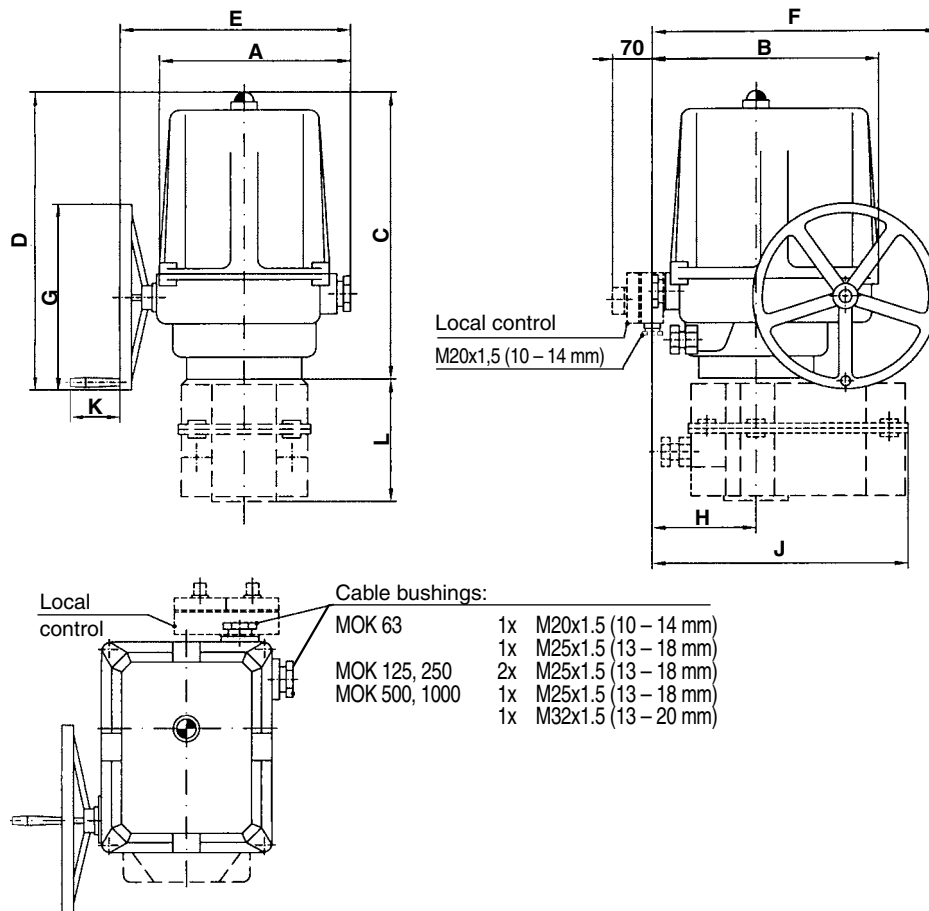


→ P
 M2:1
 (view of the base plate)



Note: Other dimensions are listed in the dimension table.

Dimensional sketch of MODACT MOK electric actuators



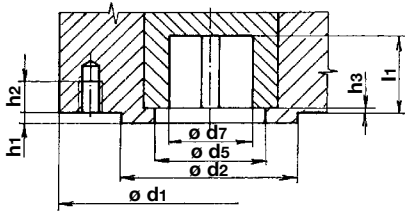
Type	A	B	C	D	E	F	G	H	J	K	L	Flange
MOK 63	173	203	247	244	213	245	160	98	-	73	-	F 05, F 04, F 07*
MOK 125	204	237	325	347	252	290	200	111	-	73	-	F 07, F 05, F 10*
MOK 250	204	237	325	347	252	290	200	111	263	73	128	F 10, F 07
MOK 500	250	290	386	398	325	362	250	128	-	73	-	F 12, F 10
MOK 1000	250	290	386	398	325	362	250	128	323	73	155	F 12

*) on request

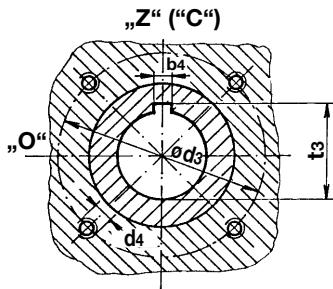
Note: Connecting of actuators with connector – on special request.

Connection dimensions of MODACT MOK actuators

– for valves and control devices with spindles that are provided with a tight-fit keyway



Position of the keyway, according to ISO 5211 and DIN 3337
(The groove is in the CLOSE position whereas the OPEN position is on the left side when viewing the local position indicator)



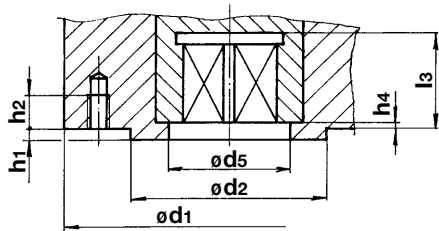
Flange	$\varnothing d_1$	$\varnothing d_2$ f8	$\varnothing d_3$	d_4	$\varnothing d_7$ H9	h_3 max	h_2 min	h_1 max	l_1 min	b_4 Js9	t_3 ^{+0,4} _{+0,2}	$\varnothing d_5$
F04	65	30	42	M6	18	3	12	3	26	6	20,5	25
F05	65	35	50	M6	22	3	12	3	30	6	24,5	28
F07	90	55	70	M8	28	3	13	3	35	8	30,9	40
F10	125	70	102	M10	42	3	16	3	45	12	45,1	50
F12	150	85	125	M12	50	3	20	3	53	14	53,5	70

Note: The CLOSE position "Z" ("C") of the keyway is identical to the "Z" "C" position on the local position indicator.
Dimension d_1 is determined by a larger flange used by the actuator.

– for valves and control devices with spindles that are provided with a square hole

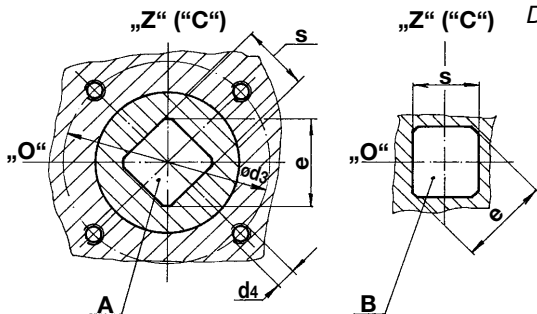
Position of the square hole in the end position of the actuator. The OPEN position is on the left of the CLOSE position, when viewing the local position indicator.

The square hole corresponds to DIN 79. The connecting dimensions comply with DIN 3337 or ISO 5211



Flange	$\varnothing d_1$	$\varnothing d_2$ f8	$\varnothing d_3$	d_4	h_4		h_2 min	h_1 max	l_3 min	s H11	e min	$\varnothing d_5$
					max	min						
F04	55	30	42	M6	1,5	0,5	12	3	15,1 16,1	11 12	14,1 16,1	25
F05	65	35	50	M6	3	0,5	12	3	19,1 22,1	14 16	18,1 21,2	28
F07	90	55	70	M8	3	0,5	13	3	23,1 26,1	17 19	22,2 25,2	40
F10	125	70	102	M10	3	1	16	3	30,1 33,1 37,1	22 24 27	28,2 32,2 36,2	50
F12	150	85	125	M12	3	1	20	3	37,1 44,1	27 32	36,2 42,2	70

Note: The CLOSE position "Z" ("C") of the square hole for the spindle is identical to the "Z" "C" position on the local position indicator.
Dimension d_1 is determined by a larger flange used by the actuator.



A – Square-end joint in the basic position

B – Square-end joint positioned at an angle of 45°

Wiring diagrams of **MODACT MOK** electric actuators

Legend:

- SQ1 (MO) – OPEN torque-limit switch
- SQ2 (MZ) – CLOSE torque-limit switch
- SQ3 (PO) – OPEN position-limit switch
- SQ4 (PZ) – CLOSE position-limit switch
- SQ5 (SO) – OPEN signalling switch
- SQ6 (SZ) – CLOSE signalling switch
- EH – Anti-condensation heater
(MOK 63 12 kΩ, other 6.8 kΩ)
- SA1 – LOCAL/REMOTE switch
- SA2 – OPEN/CLOSE switch
- C – Motor capacitor
- M1~ – One-phase motor

- M3~ – Three-phase motor
- YB – Electromagnetic brake
- BQ1 – Resistance transmitter 1x 100 Ω
- CPT 1 – Current position transmitter CPT 1Az
- DCPT3 – Current position transmitter DCPT3
- DCPZ – Power supply of current transmitter DCPT3
- ZP2.RE – Microcomputer position regulator
- KO – Directional relay for the OPEN direction
- KZ – Directional relay for the CLOSE position
- F(∅) – Thermal safety
- F – Thermal relay
- R1, R2 – 2x resistance protection 10 Ω
for single-phase motors

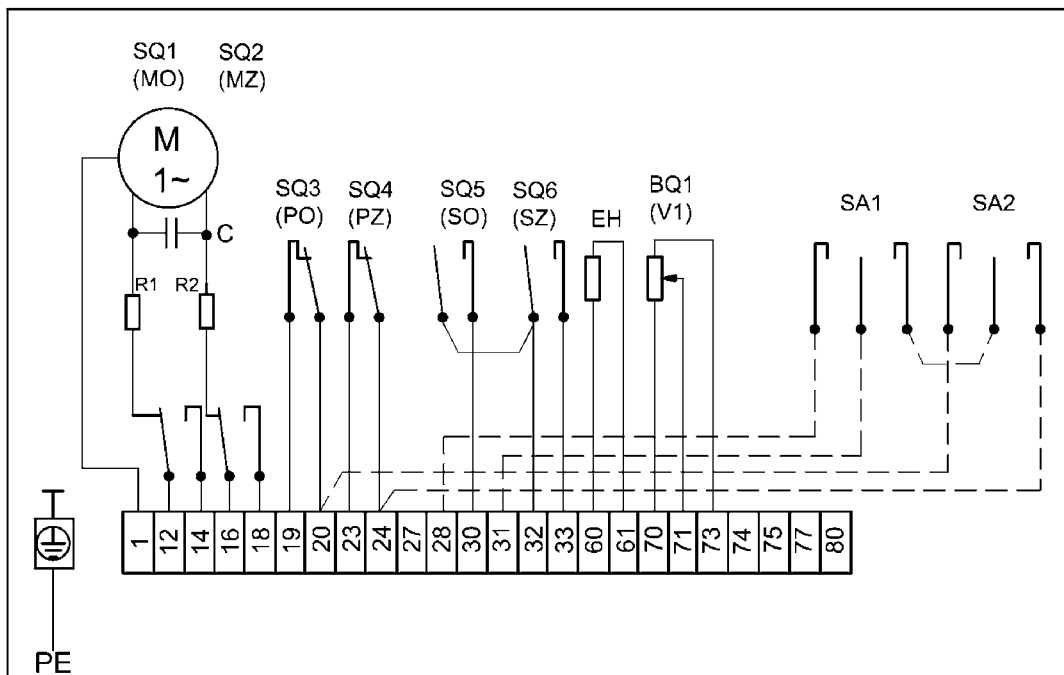
Positions of the switches: M – Local; D – Remote; O, OTV – Open; Z, ZAV – Close

Warning:

In the actuators with a single-phase electric motor, the control phase must not be connected to both outlets of the capacitor at the same time, not even for a moment; otherwise, there is a danger of the end-limit micro-switches being damaged.

Wiring diagrams of **MODACT MOK 63** electric actuators – with the resistance transmitter

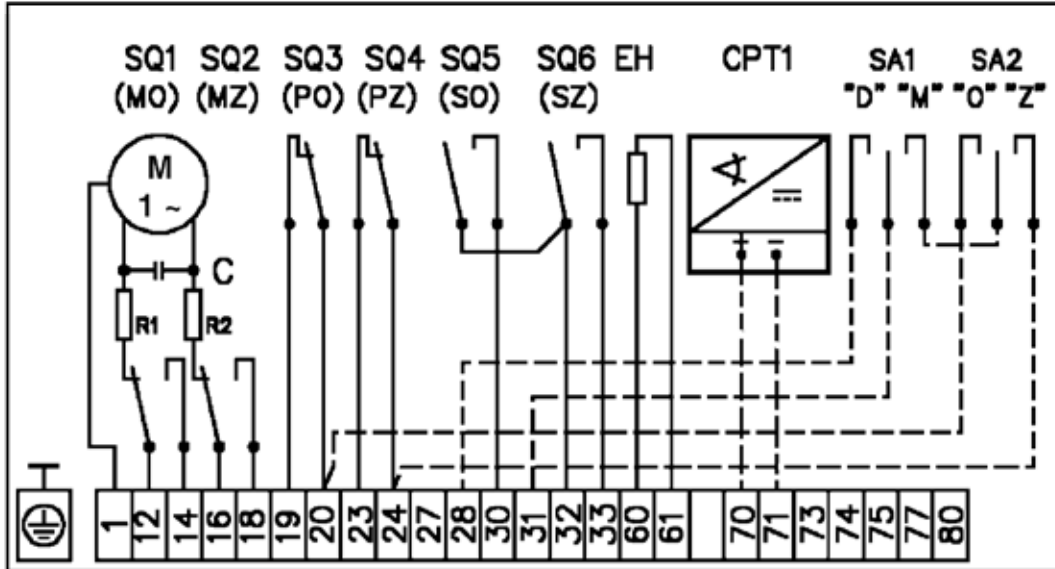
– with a one-phase motor, without local control or with local control



P1022

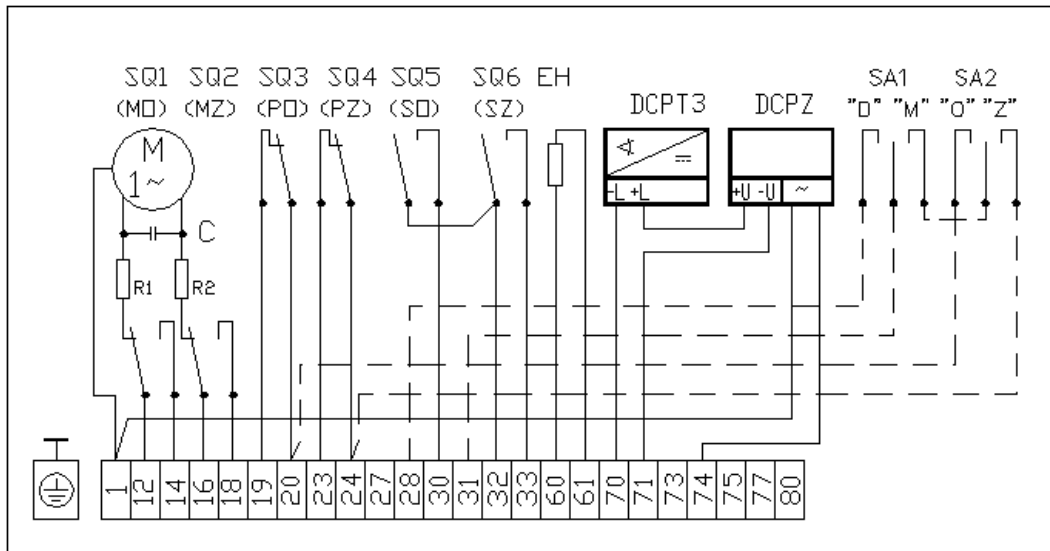
Wiring diagram of **MODACT MOK 63** electric actuators
 – with a one-phase motor

– with the current transmitter without built-in power supply or without transmitter,
 with local control or without local control



P1023

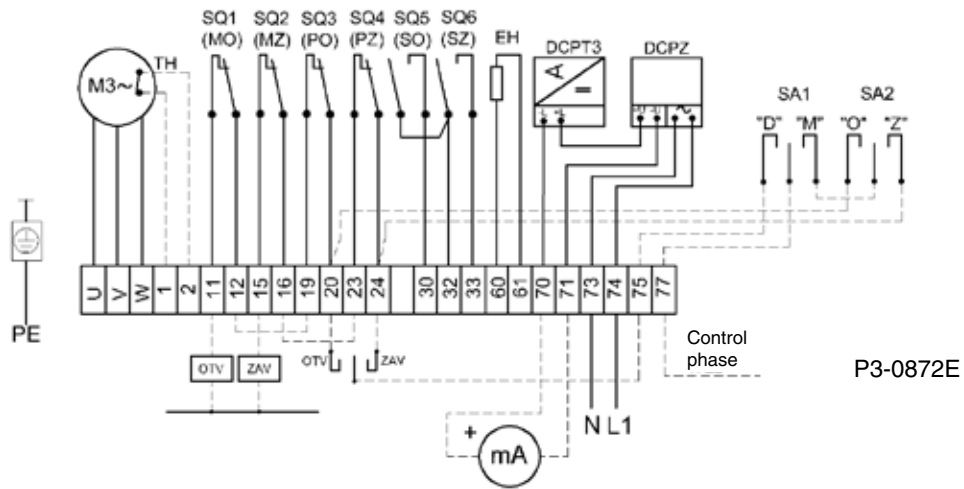
– with the current transmitter with built-in power supply,
 with local control or without local control



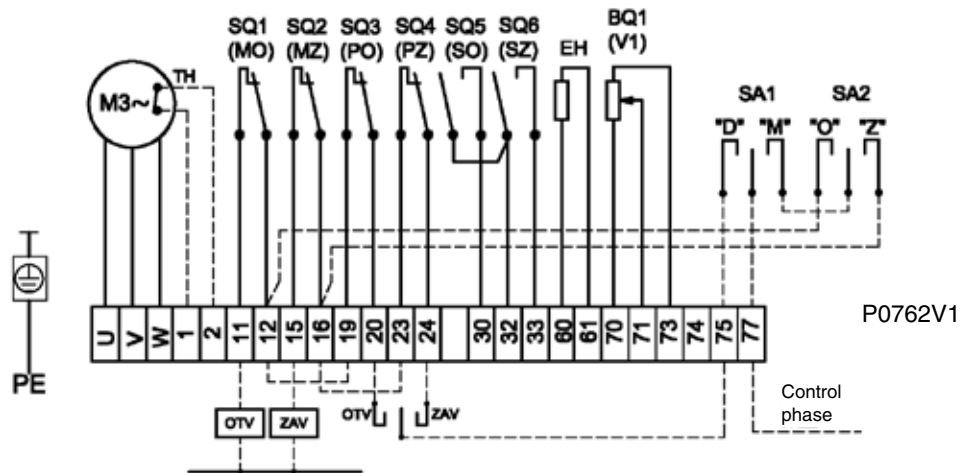
P3-1024

Wiring diagram of **MODACT MOK 63** electric actuators – with three-phase electric motor

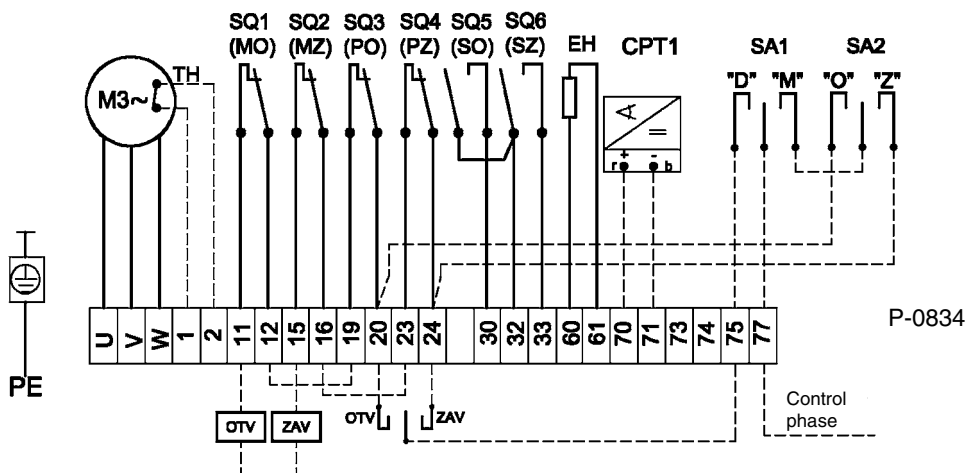
– with current transmitter and built-in power supply, with local control or without local control



– with the resistance transmitter, without local control or with local control

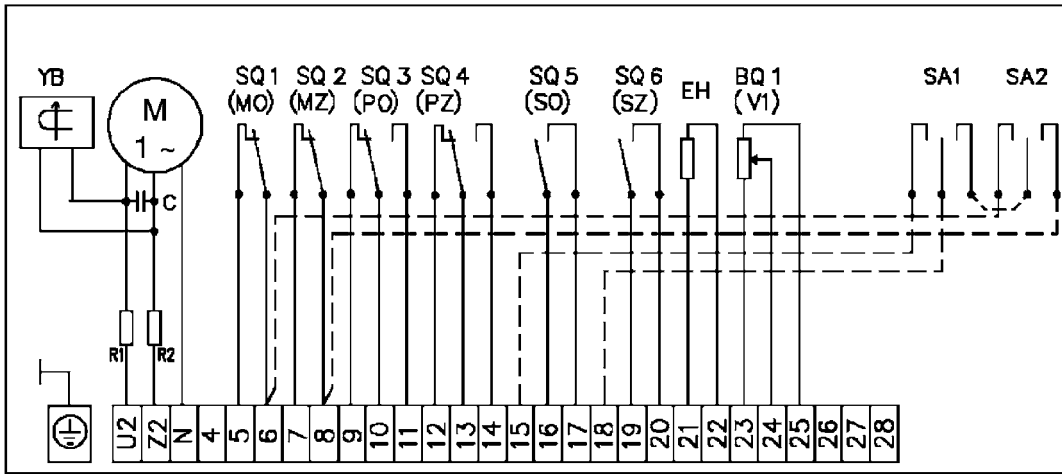


– with current transmitter without built-in power supply or without transmitter,
with local control or without local control



Wiring diagrams of **MODACT MOK 125 – 1000** electric actuators
 – with a one-phase motor

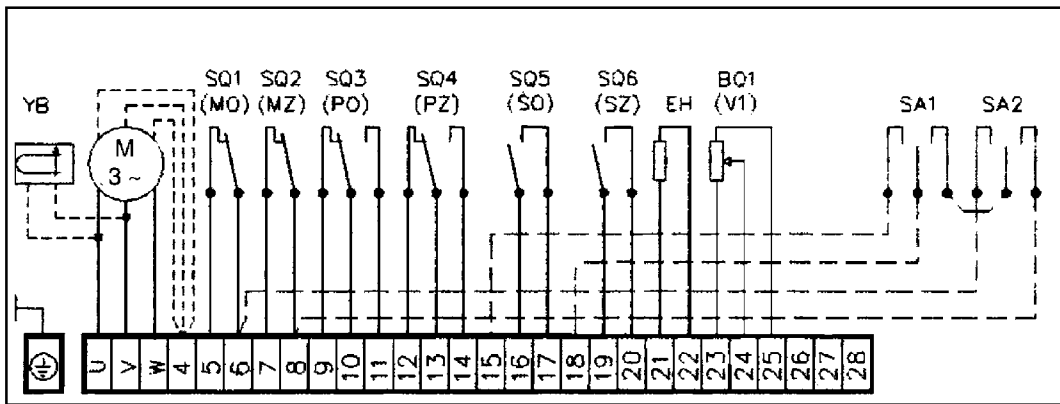
– with the resistance transmitter and local control or without local control



P1025

– with a three-phase motor

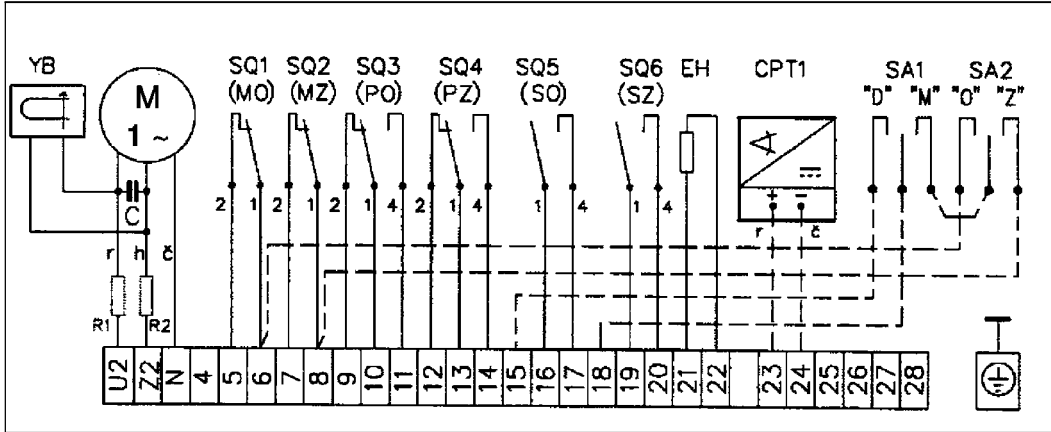
– with the resistance transmitter and local control or without local control



P1026

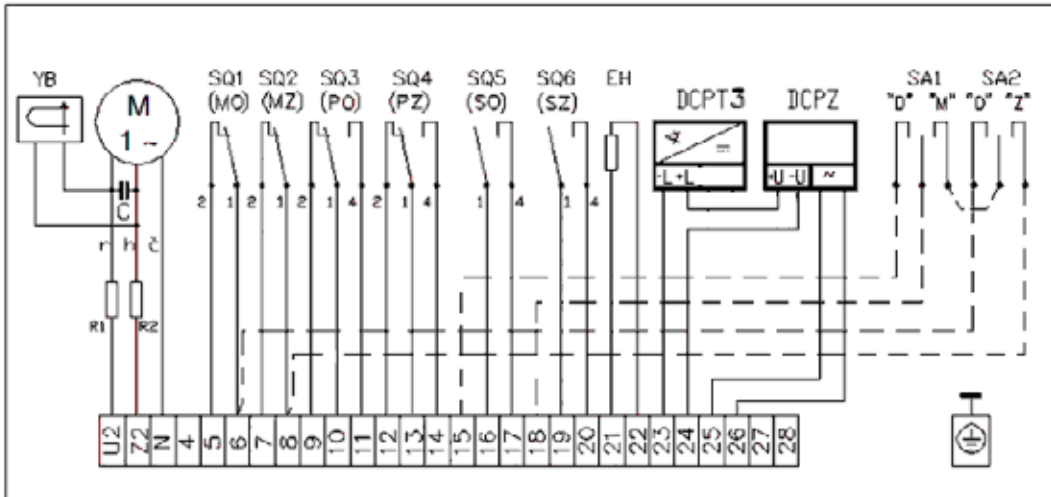
Wiring diagrams of **MODACT MOK 125 – 1000** electric actuators
 – with a one-phase motor

– with the current transmitter without built-in power supply or without transmitter,
 with local control or without local control



P1027

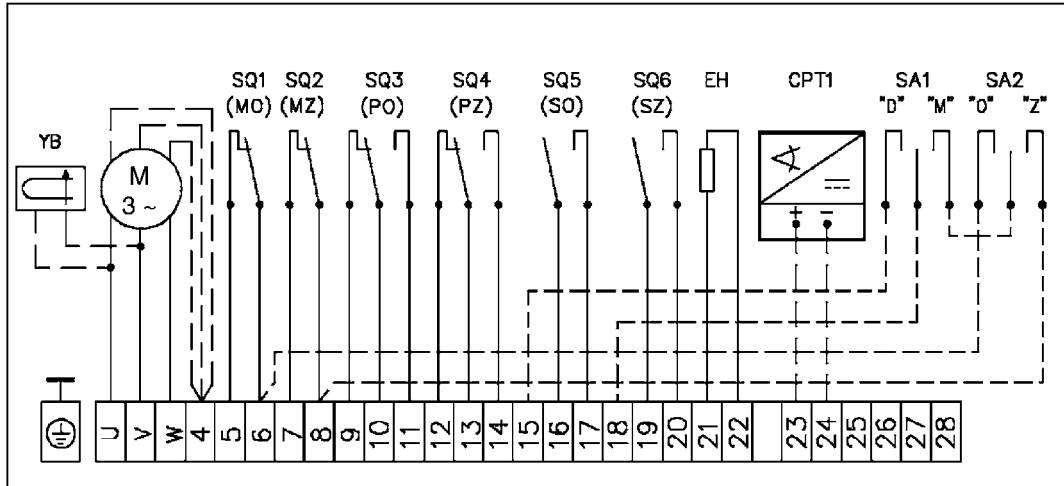
– with the current transmitter with built-in power supply,
 with local control or without local control



P3-1028

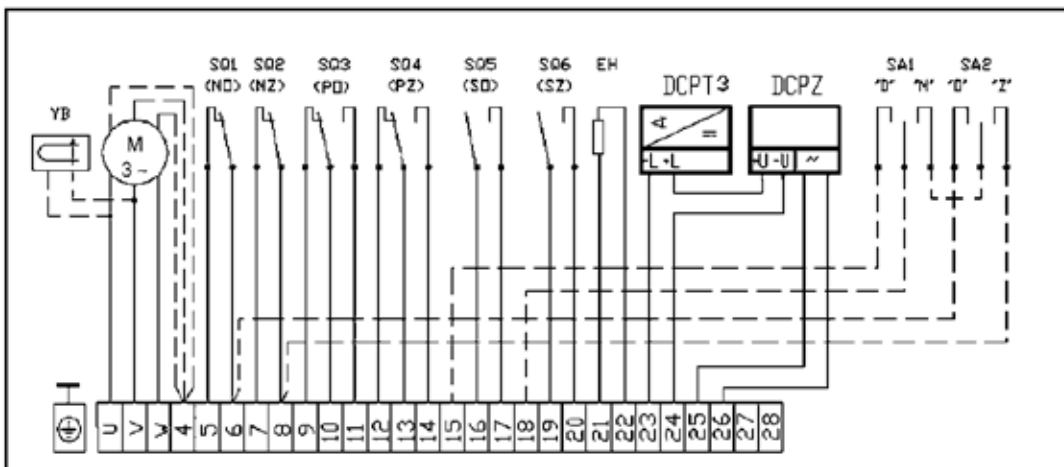
Wiring diagrams of **MODACT MOK 125 – 1000** electric actuators
 – with three-phase electric motor

– with the current transmitter without built-in power supply or without transmitter,
 with local control or without local control



P1029

– with the current transmitter with built-in power supply,
 with local control or without local control

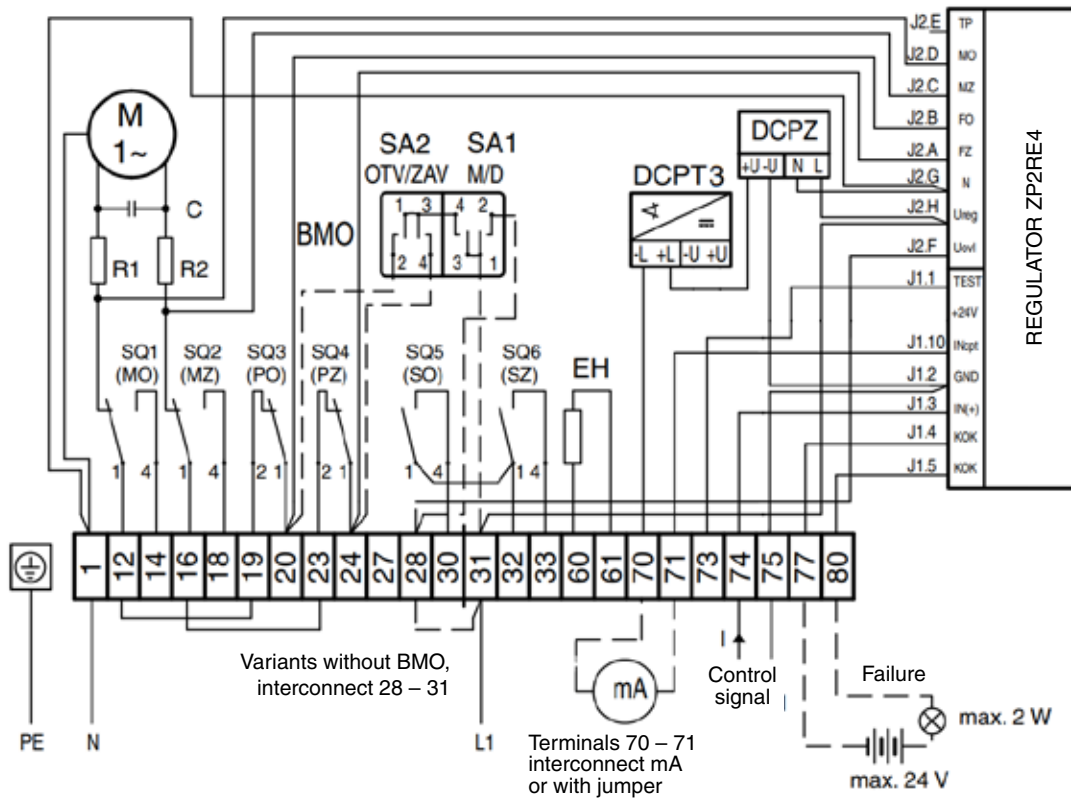


P3-1030

Wiring diagram of MODACT MOK 63 Control electric actuators

– with the one-phase motor and position regulator

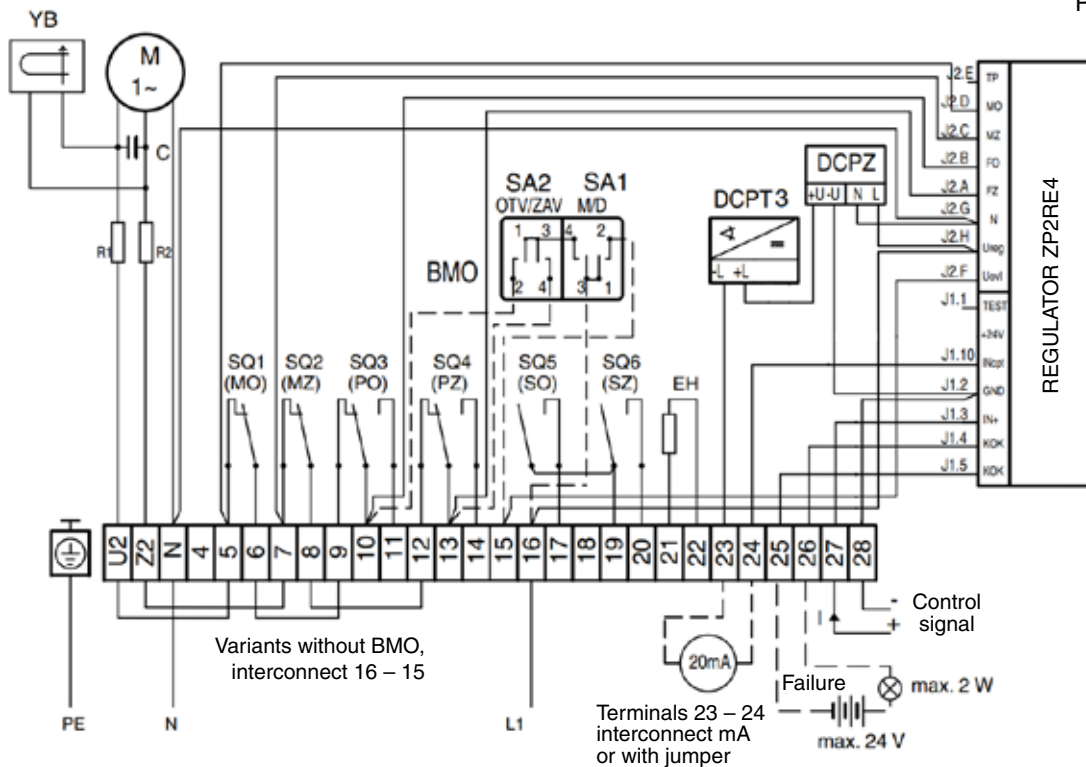
P3-0785EZ



Wiring diagram of MODACT MOK 125 – 1000 Control electric actuators

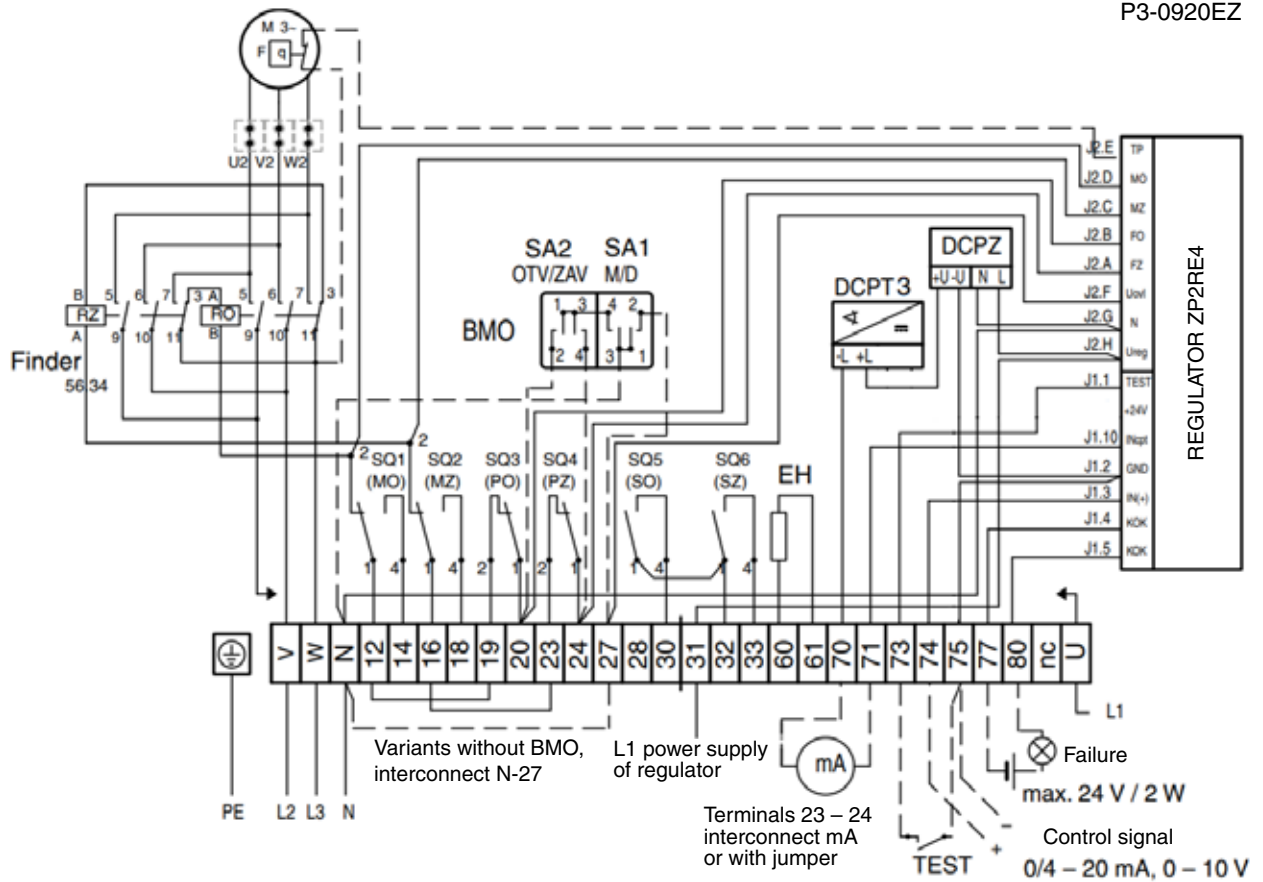
– with the one-phase motor and position regulator

P3-0780EZ



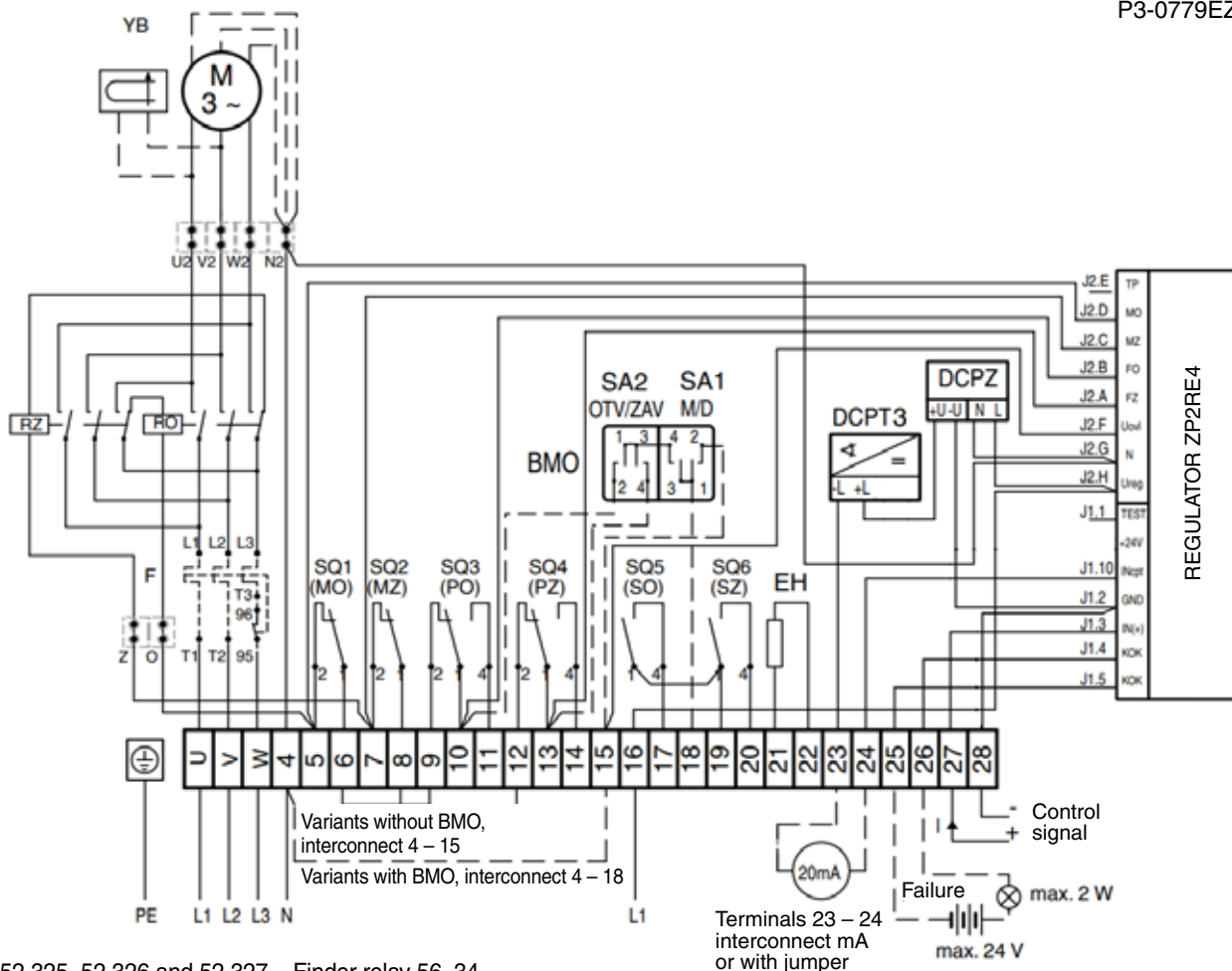
Wiring diagram of **MODACT MOK 63 Control** electric actuators
 – with the three-phase motor and position regulator

P3-0920EZ



Wiring diagram of **MODACT MOK 125 – 1000 Control** electric actuators
 – with the three-phase motor and position regulator

P3-0779EZ



52 325, 52 326 and 52 327 – Finder relay 56, 34
 52 328 and 52 329 – Schrack RM735730 relay + thermal relay Lovato

Notes:

The feedback signal can be brought out provided that its galvanic separation from the input signal has been ensured.

The TEST signal can be activated by an external make contact. This signal need not be connected.

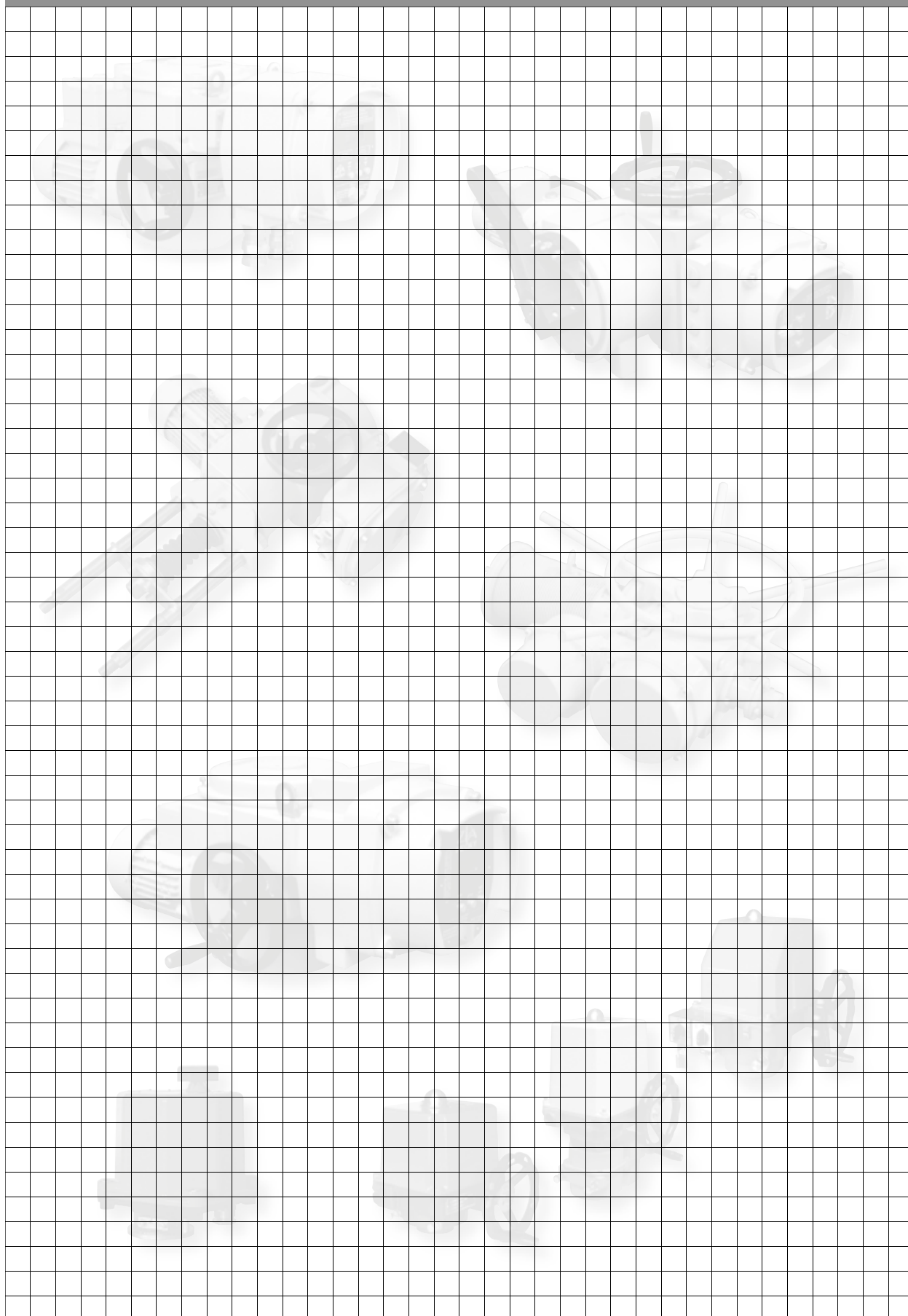
From the terminals 25 and 26 (for **MODACT MOK 125, 250, 500 and 1000**) or 77 and 80 (for **MODACT MOK 63**), a failure signal can be brought out. This signal is galvanically separated from the regulator circuits.

The maximum voltage which can be applied to these terminals, is 24 V.

In the design variant with the current transmitter, the user should provide for connection of the two-wire circuit of the current transmitter to the electric earth of the associated regulator, computer, etc. The connection should only be made at a single point in any section of the circuit outside the electric actuator. The voltage between electronics and the current transmitter case should not exceed 50 VDC.

Warning! In the ZP2.RE regulator, all circuits of the current transmitter are connected to the input signal circuits and the circuits connected to the regulator TEST terminal. The electric earth connection of these circuits should be made only at a single point of one of the three circuits, while other circuits should not be connected to the earth.

Analog signals should be transmitted via a screened conductor. At the signal source the screening should be connected to the common conductor.





Development, production and services of electric actuators and switchboards.
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Electric rotary (90°) actuators for ball valves and flaps

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Electric rotary (90°) actuators for nuclear power stations application outside containment

MODACT MON, MOP, MONJ, MONED, MOPED, MONEDJ

Electric rotary multi-turn actuators

MODACT MO EEX, MOED EEX

Explosion proof electric multi-turn actuators

MODACT MOA

Electric multi-turn actuators for nuclear power stations application outside containment

MODACT MOA OC

Electric multi-turn actuators for nuclear power stations application inside containment

MODACT MPR VARIANT

Electric rotary (160°) lever actuators with a variable output speed

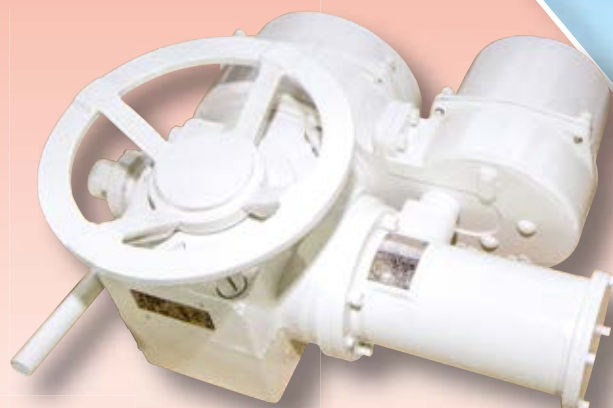
MODACT MPS, MPSP, MPSED, MPSPED

Electric rotary (160°) lever actuators with a constant output speed

MODACT MTN, MTP, MTNED, MTPED

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ZPA Pečky, a.s.
tř. 5. května 166
289 11 PEČKY, Czech Republic
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tel.: +420 321 785 141-9
fax: +420 321 785 165
+420 321 785 167
e-mail: zpa@zpa-pecky.cz