



**Electric Rotary Multi-turn
Actuators**

**MODACT MON, MOP
MODACT MON, MOP CONTROL**

Type numbers 52 030 - 52 036

MODACT MONJ

Type numbers 52 030 - 52 032



www.zpa-pecky.cz

1 APPLICATION

MODACT MON, MOP, MONJ series actuators are intended for actuating valves or other appliances suitable for control using actuators' rotary reverse movement. Other application than for operating valves must be consulted with manufacturer. Actuators may work in remote-controlled circuits. Actuators fitted with current transmitter may also work in automatic control circuits in S4 – 25 %; 1,200 h⁻¹ operating mode.

Depending on the relevant version, **MODACT MON, MOP, MONJ Control** actuators may be fitted with position regulator, reversing contactors, electric motor current protection, and electronic brake. Control elements, working in regulating circuits, can be set depending on the analogue input signal value of position regulator. They can be also delivered only with reversing contactors, or with reversing contactors and electronic brake.

2 WORKING ENVIRONMENT, OPERATING POSITION

Working environment

MODACT MON, MOP, MONJ (MODACT MON, MOP, MONJ Control) actuators are resistant to operating conditions and external impact classes AC1, AD5, AD7, AE4, AE6, AF2, AG2, AH2, AK2, AL2, AM-2-2, AN2, AP3, BA4 and BC3 pursuant to ČSN 33 2000-5-51 ed. 3.

When located in outdoor areas, we recommend you to provide a light shelter to prevent direct impact of atmospheric conditions. The shelter should overreach the actuator's ground plan by at least 10 cm at the level of 20 to 30 cm.

When actuators are located in a working environment with temperatures below +10 °C, with relative humidity exceeding 80 %, below a shelter, or in tropical areas, it is always necessary to use thermal element that is mounted to all actuators.

Actuators can be applied in premises with inflammable and non-conductive dust unless such environment adversely influences the electric motor's function. In such case, the ČSN 34 3205 standard must be consequently adhered to. Dust should be wiped off when the dust layer thickness reaches about 1 mm.

Notes:

Sheltered areas are considered those where the fall of atmospheric precipitations under the angle up to 60° from vertical axis is prevented.

Electric motor must be located in areas providing free access of cooling air so that warm air blown out is not re-aspired by the electric motor. Minimum distance from wall for fresh air access is 40 mm. The area where the electric motor is located must be sufficiently large, clean and ventilated.

Surrounding temperature

Operating temperature for the **MODACT MON, MON CONTROL** is from -25 °C to +70 °C or from -40 °C to +60 °C.

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

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

Relative humidity from 10 to 100 % with condensation.

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 – water occurrence – shallow dipping, possible sporadic partial or full coverage (*only MOP*)
- 3) AE4 – medium dustiness
AE6 – strong dustiness (*only MOP*)
- 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 requirement.
- 10) AN2 – medium solar radiation with intensities > 500 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.

Operating position

MODACT® MON, MOP, MONJ actuators filled with grease can be operated in any position. Actuators with grease are identified with label stating “Filled with grease”, located on the power box on the hand wheel side.

Working position of actuators with oil filling is limited only by the inclination of electric motor axis – max. 15° below horizontal line. This prevents possible clippings and impurities in oil bath from reducing the service life of electric motor shaft seal.

In case of installation with electric motor above horizontal level, oil bath must be supplemented so as to secure motor pinion’s reliable lubrication.

Actuators with oil bath are not identified by any label.

Lubricants

Actuator serial number	Adjusting speed of output shaft [min ⁻¹]	Ambient temperature [°C]		
		-25 +70	-40 +60	-25 +60
52 030, 52 031, 52 032 52 033, 52 034	up to 40	M	M	M
	above 40	O	O	O
52 035	applies to all speeds	O	O	O
52 036	applies to all speeds	O	O	O

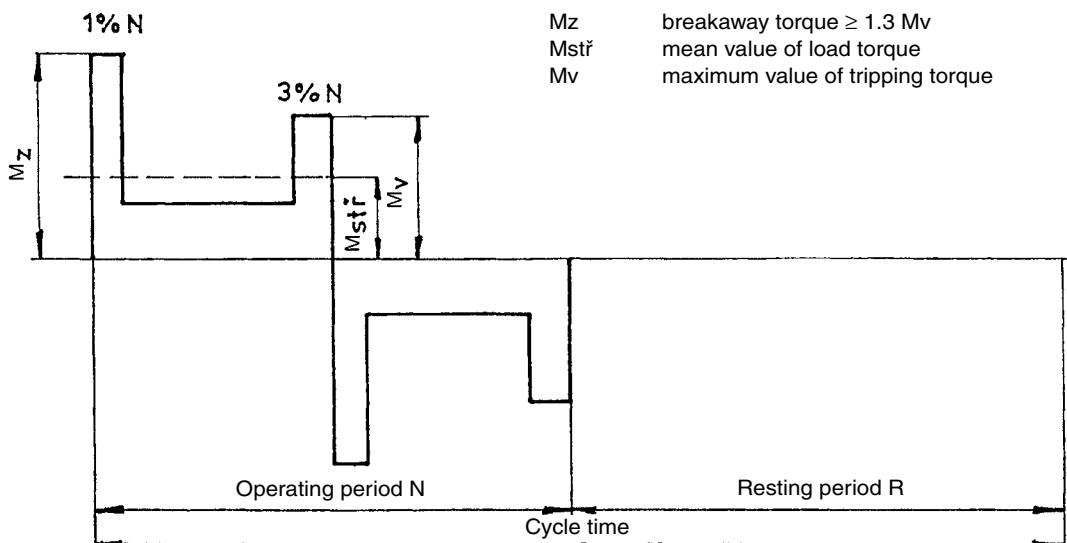
Note: M – grease
O – gear oil

3 OPERATING MODE, ACTUATOR SERVICE LIFE

Operating mode

Actuators can operate with S2 load type as per ČSN EN 60 034-1. Period of operation at +50 °C is 10 minutes and mean load torque value is maximally 60 percent of the maximum tripping torque value Mv.

Actuators may also work in S4 mode (*interrupted operation with run-up*) as per ČSN EN 60 034-1.



Operating cycle course

Load factor N/N+R is max. 25 %; longest operating cycle N+R 10 minutes (*course of load is specified on figure below*). Maximum number of switching operations with automatic regulation is 1,200 switching operations per hour. Mean value of load torque with load factor of 25 % and ambient temperature of +50 °C is maximally 40 percent of the maximum tripping torque value Mv.

Maximum mean value of load torque equals to rated torque of actuator.

Actuators service life

Actuator intended for closing valves must be able to execute at least 10,000 operating cycles (*Close - Open - Close*). Actuator intended for regulation purposes must execute at least 1 million cycles with operating period of (*with input shaft in motion*) at least 250 hours. Service life in operating hours (*h*) depends on load and number of switching operations. High frequency of switching operations may have a negative impact on regulation accuracy. To achieve the longest possible fault-free service life, we recommend you to set switching frequency to the lowest possible number necessary for the relevant process. Reference information on service life, derived from set-up regulation parameters, is specified in the table below.

Actuators service life for 1 million starts

service life [h]	830	1,000	2,000	4,000
number of starts [1/h]	maximum number of starts 1,200	1,000	500	250

4 TECHNICAL SPECIFICATIONS

Feeding voltage

Actuators feeding voltage: **MODACT MON, MOP:** 3 x 230 / 400 V, +10 %, -15 %, 50 Hz, ±2 %
 3 x 220 / 380 V, +10 %, -15 %, 50 Hz +3 % -5 %
MODACT MONJ: 1 x 230 V, +10 %, -15 %, 50 Hz, ±2 %
 1 x 220 V, +10 %, -15 %, 50 Hz +3 % -5 %

Upon agreement with supplier, actuators can be supplied also to comply with another feeding voltage and frequency. More details can be found in Technical Conditions.

Ingress protection

Ingress protection of actuators: **MODACT MON, (MODACT MON Control), MODACT MONJ – IP 55**
MODACT MOP (MODACT MOP Control) – IP 67

Noise

Sound pressure level A max. 85 dB (A)
 Sound power level A max. 95 dB (A)

Tripping torque

Tripping torque is set up by manufacturer as per customer’s requirement pursuant to Version Table 1 or 2. If tripping torque adjustment is not required, maximum value of tripping torque is set up.

Breakaway torque

Breakaway torque is a calculated value, determined by electric motor’s breakaway torque, actuator’s total ratio and effectiveness. Actuator can produce breakaway torque after run reversing operation for 1 to 2 revolutions of the output shaft, while torque tripping is interlocked. This may occur either in end position or in any optional intermediate position.

Self-locking function

Actuator is self-locking provided that load acts against the motion of the actuator’s output shaft. Self-locking function is provided by a roller lock, which immobilizes actuator’s rotor even in case of manual operation.

With respect to safety regulations, it is unacceptable to apply actuators for operating transport lifting equipment with possible transport of persons, or for equipment where persons may be present below the lifted load.

Rotation direction

When looking at the input shaft from the control box, “closing” direction is equal to clockwise rotation direction.

Working stroke

Working stroke is specified in Table 1 or 2.

Raising spindle

Actuators with A and C-shape installation dimensions can be adjusted to install actuator on valve with raising spindle, which overreaches the top end of the actuator output shaft in the valve's end position. Room for raising spindle of valve is obvious from dimensional sketches. When necessary, operator may install a protective cylindrical cover for raising spindle, replacing the cover of openings in the control box. Protective cover for raising spindle is not included in the scope of actuator delivery.

Manual operation

Manual operation is carried out by hand wheel directly (*without clutch*) and can take place also while the electric motor is running (*output shaft motion is determined by the differential gear's function*). When rotating the hand wheel in clockwise direction, the actuator's output shaft also rotates in clockwise direction (*looking at the shaft into the control box*). If the valve nut has a left-hand thread, the actuator will close 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.

5 ACTUATOR FEATURES

Torque switches

Actuators are fitted with two torque switches (*MO, MZ*), each for one direction of actuator output shaft motion. Torque switches may work in any point of the operating stroke except where they are interlocked (*Breakaway torque*).

Tripping torque value can be set up within the range specified in Table 1 or 2. Torque switches are interlocked in the event that once switched off they lose load torque. This provides protection of actuator against so-called "pulsing".

Position switches

Position switches PO, PZ delimit the working stroke of the actuator (*one switch for each limit position*).

Position signalling

Actuator's output shaft position is signalled by two signal switches SO, SZ – each for one output shaft motion direction. Switching point of micro switches can be set up in the entire range of working stroke, except a tight range before micro switch tripping point, which deactivates the electric motor.

Position transmitters

Actuators **MODACT MON, MOP, MONJ** may be delivered without position transmitter or they can be provided with position transmitter:

a) Resistance transmitter 2 x 100 Ω

Technical parameters:

Position sensing	by resistance
Rotation angle	0° – 160°
Linearity	≤ 1 %
Contact resistance	max. 1.4 Ω
Permissible voltage	50 V DC
Maximum current	100 mA

b) Passive current transmitter type CPT 1Az. Current loop feeding is not part of the actuator. Recommended feeding voltage is 18 to 28 V DC, with maximum loop load resistance of 500 Ω. Current loop must be earthed in one point. Feeding voltage does not need to be stabilized, however, it must not exceed 30 V, otherwise the transmitter may be destructed.

Range of CPT 1Az is adjusted using potentiometer on the transmitter's body, and output value is adjusted by rotating the transmitter accordingly.

Technical parameters of CPT 1Az:

Position sensing	by capacity
Working stroke	adjustable 0° – 40° to 0° – 120°
Non-linearity	≤ 1 %
Non-linearity including gears	≤ 2.5 % (<i>for max.stroke 120°</i>).

Hysteresis including gears		≤ 5 % (for max. stroke 120°)
<i>(Non-linearity and hysteresis relate to signal value of 20 mA.)</i>		
Load resistance		0 – 500 Ω
Output signal		4 – 20 mA or 20 – 4 mA
Feeding voltage for	Rz 0 – 100 Ω	10 – 20 V DC
	for Rz 400 – 500 Ω	18 – 28 V DC
Maximum feeding voltage ripple		5 %
Maximum power input of transmitter		560 mW
Insulation resistance		20 MΩ at 50 V DC
Electrical resistance of insulation		50 V DC
Temperature of working environment		-25 °C to +60 °C
Temperature of working environment – extended range		-25 °C to +70 °C (other ranges upon request)
Dimensions		ø 40 x 25 mm

c) Active current transmitter type DCPT. Current loop feeding is part of the actuator. Maximum load resistance of loop is 500 Ω. For **MODACT MON, MOP, MONJ Control** versions with ZP2.RE5 regulator, the current transmitter is used as position sensor.

DCPT is easy to adjust by means of two pushbuttons with LED on the transmitter body.

Technical parameters of DCPT:

Position sensing	contactless, magnetoresistant
Working stroke	adjustable from 60° to 340°
Non-linearity	max. ±1 %
Load resistance	0 – 500 Ω
Output signal	4 – 20 mA, or 20 – 4 mA
Feeding	15 – 28 V DC, < 42 mA
Working temperature	-25 °C to +70 °C
Dimensions	ø 40 x 25 mm

Transmitters CPT 1Az and DCPT are connected by two-wires, i.e. transmitter, power supply and load are connected in series. User must provide connection of two-wire circuit of current transmitter to ground of the adjacent regulator, computer etc. Connection must be provided only in one point in any part of the circuit, outside the electric actuator.

d) Resistance transmitter VISHAY 1 x 100 Ω. Resistance transmitter is used only in combination with regulator ZP2RE6. It is utilized for higher thermal resistance and higher electric strength.

Technical parameters:

Position sensing	by resistance
Scope of resistance	5 Ω to 40 kΩ
Angle of rotation	340° ±2°
Linearity	± 0.5 %
Contact resistance	max. 0.5 Ω
Noise	100 Ω ENR
Minimum voltage	0.5 % max.
Insulation resistance	1,000 MΩ at 50 V DC
Dielectric strength	1,000 V RMS, 60 Hz
Transmitter power input	2 W (reduction to zero from 125 °C)
Working temperature	-55 °C to +125 °C

Position indicator

Actuator can be equipped with local position indicator.

Heating element

Actuators are equipped with a heating element to prevent water vapour condensation. Heating element is to be connected to 230 V power supply.

Local control

Local control serves to operate the actuator from the place of installation. Local control consists of two switches: switch1 has positions: “remote control – off – local control”, switch 2: “opening – stop – closing”. Switch 1 can be integrated as 2-pole or 4-pole switch. Switches are located in terminal box.

Position regulator

Position regulator, integrated in the actuator, enables the position of the actuator output shaft and thus also the actuated fitting to be controlled by an input analogue signal.

The regulator's basic component is a microcomputer, programmed to regulate the actuator, to identify and lever error statuses and to easily set regulation parameters.

In case of power failure, the regulator will not regulate. Parameters and diagnostic data are written in regulator memory, where they are stored. After power up, data will be automatically loaded from regulator memory.

In the regulator's circuits, input signal is compared with feedback signal from the position transmitter of the actuator input shaft. If a discrepancy is found between the input and feedback signal, the regulator switches one of the integrated contactors in the electric motor so that the actuator's shaft is set to a position corresponding to the value of the input signal. If the feedback signal corresponds to the input signal, the actuator will stop.

Regulation parameters are adjusted using function buttons on regulator or by means of a personal computer connected to the regulator through communication module, while adjusting the parameters.

Dynamic brake

Brake is an optional equipment of **MODACT MON, MOP Control** actuators. Upon contactor disconnection, it incites dynamic braking torque in the electric motor for several tenths of second. It significantly reduces rundown time and thus makes regulation more precise. No braking torque is applied when actuator is stopped.

Autonomous brake **BAM-002** is used for actuators without regulator. For its function, the brake needs supplementary auxiliary contacts of contactors as well as an additional over-current relay contact. It is designed for electric motors 3 x 230 / 400 V with output up to 550 W.

For actuators with regulator ZP2.RE5, simpler controlled brakes BR2 are used. They are interconnected with regulator that gives them actuation impulse.

The corresponding version is selected depending on the electric motor version:

BR2 550 up to the output of 550 W,
BR 2.2 up to the output of 2.2 kW.

If outputs higher than 2.2 kW need to be braked, special versions of electric motors with electromagnetic brake must be applied.

Electric motor switching, contactor unit

Control versions of actuators have integrated reversing contactor combinations. These consist of two contactors and an over-current relay. The combination also includes mechanical interlocking, which prevents both contactors from switching at the same time. This could happen for instance as result of wrong connection of jumpers in the terminal box. Interlocking is not designed for long-term function. Over-current relay protects the electric motor from overloading and is designed according to its output.

Depending on the actuator version, contactors are controlled by regulator, local control switch or by external input. Standard control voltage is 230 V/50 Hz and is transferred through contacts of position and/or torque micro switches. Thus, these micro switches do not need to be led out of the actuator.

The applied contactors provide extensive mechanical durability and a great spare switching capacity so that also their electric durability is sufficient for the relevant application. Thermal relay has been selected so as to protect the electric motor from overloading. The alignment and components of actuators allow simple connection to feeding and control circuits.

Feeding circuits can be shared by an entire group of actuators, which provides wiring material savings.

6 ELECTRICAL PARAMETERS

External electrical connection

a) Terminal board

Actuator is fitted with a terminal board providing connection to external circuits. Terminal board is provided with screw terminals for connection of conductors with a maximum section of 4 mm². Terminal board is accessible upon removal of terminal box cover. All electrical control circuits of actuator are led to the terminal board. Terminal box is provided with cable bushings for electric connection of actuator. Electric motor is provided with separate box including terminal board and bushing.

b) Connector

Upon customer's request, actuators **MODACT MON, MOP, MONJ** can be provided with a connector that enables connection of control circuits. Connector is provided with crimp terminals for connection of conductors with a maximum section of 4 mm². ZPA Pečky, a.s. also supplies terminal counterpart for cable. Special crimping scissors are necessary for attaching a cable to this counterpart.

Internal electrical connection of actuators

Internal electrical wiring diagrams of **MODACT MON, MOP, MONJ** actuators including identification of terminals are included in the present Catalogue.

On the actuator, the internal wiring diagram is depicted on the inner side of the terminal box cover. Terminals are identified by numbers on adhesive stickers attached on carrying belt below the terminal board.

Current-carrying capacity and maximum voltage of micro switches

Micro switches maximum voltage is 250 V AC and DC at the following maximum current values:

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

Micro switches can be used only as single-circuit micro switches. Two voltages of varying values or phases must not be connected to the terminals of one micro switches.

Insulation resistance

Insulation resistance of electrical circuits against the ground or against each other at normal conditions must be at least 20 M Ω , after humidity test at least 2 M Ω . Insulation resistance of electric motor must be at least 1.9 M Ω . More details can be found in Technical Conditions.

Electric strength of electrical circuits' insulation

Circuit of position resistance transmitter	500 V, 50 Hz
Circuit of current transmitter	50 V DC
Circuits of micro switches and heat resistor	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 from basic parameters

Tripping torque	± 12 % of maximum value of range
Setting speed	- 10 % of maximum value of range +15 % of rated value (<i>in idle run</i>)
Signal switches setting	± 2.5 % of maximum value of range (<i>ranges are specified in Installation Manual</i>)
Signal switches hysteresis	max. 4 % of maximum value of range
Position switches setting	$\pm 25^\circ$ of output shaft swivel angle (<i>no run-out impact</i>)
Position switches hysteresis	max. 45° of output shaft swivel angle

Protection

Actuators are provided with one internal and one external protective terminal serving as protection from electric shock as per CSN 33 2000-4-41 ed. 2. Also the electric motor is provided with one protective terminal. Protective terminals are identified with a sign complying with ČSN EN 60 417-1 and 2 (013760).

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

7 DESCRIPTION

A) Actuators MODACT MON, MOP, MONJ

Actuators **MODACT MON, MOP, MONJ** are designed for direct installation to the controlled body. They are connected using a flange and coupling pursuant to ČSN DIN 5210 and DIN 3338. Adapters are supplied for possible connection to valves with different installation dimensions.

Asynchronous motor drives the central wheel of the differential gear, through counter gear set. The central wheel is located in the actuator's bearing box (*power transmission*). While operated by motor, the ring gear of the planetary gear differential is held in a constant position by means of a self-locking worm gear. Hand wheel, connected with worm gear, enables alternative manual control even while electric motor is running, without any risk for operating personnel.

Output shaft is firmly connected with planetary gear carrier and passes into control box, where all control elements of actuator are concentrated.

Operation of position switches, signalling switches and position transmitter is derived, through drive mechanisms, from the output shaft's rotary motion. The operation of torque switches is derived from the axial displacement of the "floating worm" of manual control, which is sensed and transferred to the control box by a handle.

Control elements are accessible upon removal of control box cover.

B) Actuators MODACT MON, MOP, MONJ Control with regulator ZP2.RE5

As for application, working environment, technical parameters and description, information already specified in section dedicated to **MODACT MON, MOP, MONJ** applies accordingly. Additionally, actuators **MODACT MON, MOP** and **MONJ Control** include a combination of contactors for reversing the motion of the output shaft. Part of the combination of contactors is also mechanical interlock of simultaneous switching of both contactors and over-current protection of electric motor.

Optionally, actuators can be equipped with electronic position regulator ZP2.RE5, which sets the input shaft according to control signal value from 4 to 20 mA.

To avoid long rundown of actuator, which might worsen the properties of regulation loop, an electro-dynamic brake may be provided too. Brake BAM-002 is used for actuators without regulator and with electric motor with output up to 0.55 kW. Brake BR2 550 and BR 2.2 is used for actuators with ZP2.RE5 regulator and with electric motor with output up to 0.55 kW or 2.2 kW respectively.

Manufactured types of actuators **MODACT MON, MOP** and **MONJ Control** are specified in Tables 1 and 2.

8 REGULATOR ZP2.RE5

The fundamental part of ZP2.RE5 regulator is a microcomputer with a control program loaded in its integrated memory. The microcomputer includes A/D converters for processing control and feedback signal. Regulator enables automatic adjustment of actuator output shaft depending on the value of current control signal. The regulator compares the control signal value with the feedback signal value from position transmitter. If a regulation deviation is identified, the regulator activates output signals FO or FZ, which control the actuator's operation, until the output shaft is set to a position corresponding to the control signal value.

Note:

The regulator adjusts position; however, it cannot influence the setting speed. This is determined by the type and version of actuator.

The regulator also monitors certain operational statuses and indicates failures.

The regulator's parameters can be adjusted using SW1 and SW2 buttons or by means of a computer with a service program. The computer connects to connector J7 through a communication module. Set-up parameters are stored in EEPROM memory, so that the memory content is not affected by power supply interruption.

The following parameters can be adjusted using buttons on regulator

- type of control signal
- feedback to TEST signal and to error identified by regulator
- regulator's insensibility
- type of regulation

Other parameters can be set up using computer. The computer can also be used to retrieve diagnosis data on regulator's operation - for instance period of regular operation.

Once regulation parameters have been set up, the regulator will run a so-called autocalibration to adapt to the actuator and valve, which it is supposed to control. Type of feedback transmitter, end position and actuator output shaft inertia are automatically identified and read in by the regulator as parameters.

Error messages identified by regulator are signalled by LEDs on regulator. The regulator has a change-over OK contact, which can provide an error status signal. During fault-free operation and while regulator is deactivated, this contact is interrupted; in case of an error status, the contact is activated. If a computer is connected to the regulator, the identified error is indicated on the computer.

In case of an error, the actuator responds according to the set up "Response to TEST signal" parameter.

Regulator technical parameters

Feeding voltage:	230 V +10 % -15 %, 50 – 60 Hz
Regulator non-linearity:	0,5 %
Regulator insensibility:	1 – 10 % (<i>adjustable</i>)

Bivalent input signals (N / 230 V):

U _{ACTUATOR}	Control phase for outputs FO, FZ, secured by fuse F1, 6A
TEST1,2	Activation of TEST mode
MO, MZ	Actuator limit switch statuses
TP	Status of motor's thermal protection

Analogue input signals:

Control signal:	0/4 – 20 mA
Feedback signal:	Current transmitter 4 – 20 mA

Bivalent output signals:

FO, FZ	Control phase, switched by relay contacts 5A / 230V
Relay OK	Failure signal, switching contact 5 A / 230 V
BRAKE	Control signal for brake module (2 mA)

Analogue output signal:

Position signalling	Galvanically separated passive transmitter 0/4 – 20 mA, external supply 15 – 30 V, load impedance max. 500 Ω
---------------------	--

Signalling:

D1 (<i>yellow</i>)	set-up/ failure indication
D2 (<i>red</i>)	set-up/ failure indication
D3 (<i>green</i>)	power supply
D4 (<i>green</i>)	actuator opening
D4 (<i>red</i>)	actuator closing

Error messages:

TEST mode
Control signal missing (<i>only when using signal 4 – 20 mA</i>)
Actuator has been switched off by a limit switch in another than limit position
Position sensor fault
Actuator thermal protection TP has been triggered
Actuator is in local control mode

Reaction to fault:

TEST mode	Error message + actuator travels to position as per setting P2
Control signal missing	Error message + actuator travels to position as per setting P2
Position sensor fault	Error message + actuator stops
Thermal protection fault	Error message + actuator stops

Set up elements:

Communication connector (<i>for PC connection</i>)
2x button for setting parameters without computer

Operating temperature range:

-25 °C – +75 °C

Dimensions:

75 x 81 x 25 mm

9 PURCHASE ORDER DETAILS

The following details must be specified in a purchase order:

- piece count
- title of actuator
- serial number as per tables of versions
- special version (*extension working stroke – see Tables 1, 2*)
- supply voltage and frequency (*for electric motor*)
- tripping torque adjustment (*if required by customer*)

Example of purchase order

Electric multi-turn rotary actuator **MODACT MON**, serial No. 52 032 with tripping torque within the range from 160 to 250 Nm, with output shaft setting speed 25 1/min, with connector; C-shape installation dimensions; with local position indicator and local control block; equipped with signalling switches and position transmitter 2 x100 Ω; with required possibility of adjusting another than maximum tripping torque; feeding voltage 3 x 230 / 400 V, 50 Hz, shall be specified in a purchase order as follows:

1 pc. of actuator 52 032.H623N, torque switches setting to 200 Nm, electric motor supply voltage 3 x 230/400 V, 50 Hz.

Table 1 – Electric actuators MODACT MON (IP 55), MOP (IP 67) – basic parameters, supply voltage 3 x 230/400 V, 50 Hz

Basic equipment: 2 selector switches PO, PZ; 2 torque switches MO, MZ; 1 electric motor (brake motor also available on special order); 1 heating element

Type ID	Control	Torque [Nm]		Setting speed [1/min]	Working stroke (rev)	Type of lubricant	Electric motor				Weight [kg]		Serial number	
		Tripping	Break-away				Output [kW]	Revs [1/min]	I _n (400 V) [A]	I _z — I _n	basic	additional		
MON, (MOP) 40/135-7	C		135	7			1xx7070-8AB	0,09	630	0,36	2,2	28	1 2 3 4 5	6 7 8 9 10 11
MON, (MOP) 40/220-9	C		220	9			1xx7070-6AA	0,18	850	0,62	2,3	26		
MON, (MOP) 40/135-15	C		135	15			1xx7070-6AA	0,18	850	0,62	2,3	26		
MON, (MOP) 40/100-25	C	20 – 40	100	25			1xx7070-4AB	0,25	1350	0,76	3,0	24		
MON, (MOP) 40/60-40	C		60	40			1xx7070-4AB	0,25	1350	0,76	3,0	24		
MON, (MOP) 40/95-50	C		95	50		●	1xx7070-2AA	0,37	2740	1,00	3,5	26		
MON, (MOP) 40/60-80	C		60	80		●	1xx7070-2AA	0,37	2740	1,00	3,5	26		
MON, (MOP) 80/135-7	C		135	7			1xx7070-8AB	0,09	630	0,36	2,2	28		
MON, (MOP) 80/220-9	C		220	9			1xx7070-6AA	0,18	850	0,62	2,3	26		
MON, (MOP) 80/135-15	C	40 – 80	135	15			1xx7070-6AA	0,18	850	0,62	2,3	26		
MON, (MOP) 80/100-25	C		100	25			1xx7070-4AB	0,25	1350	0,76	3,0	24		
MON, (MOP) 75/95-40	C	40 – 75	95	40	2 – 250		1xx7073-4AB	0,37	1370	1,03	3,3	26	5 2 0 3 0	
MON, (MOP) 70/95-50	C		95	50		●	1xx7070-2AA	0,37	2740	1,00	3,5	26	installation dimension	
MON, (MOP) 70/90-80	C	40 – 70	90	80		●	1xx7073-2AA	0,55	2800	1,36	4,3	25	F10	
MON, (MOP) 125/200-7	C		200	7			1xx7073-8AB	0,12	645	0,51	2,2	26		
MON, (MOP) 125/220-9	C	80 – 125	220	9			1xx7070-6AA	0,18	850	0,62	2,3	26		
MON, (MOP) 125/200-15	C		200	15			1xx7073-6AA	0,25	860	0,78	2,7	25		
MON, (MOP) 120/155-25	C	80 – 120	155	25			1xx7073-4AB	0,37	1370	1,03	3,3	26		
MON, (MOP) 115/150-50	C	80 – 115	150	50		●	1xx7073-2AA	0,55	2800	1,36	4,3	25		
MON, (MOP) 200/320-9	C	100 – 200	320	9			1xx7073-6AA	0,25	850	0,78	2,7	25		
MON, (MOP) 200/260-15	C	100 – 200	260	15			1xx7073-4AB	0,37	1370	1,03	3,3	26		
MON, (MOP) 200/310-25	C	100 – 200	310	25			1xx9073-4LA	0,60	1340	1,65	3,6	27		
MON, (MOP) 200/260-50	C	100 – 200	260	50		●	1xx9073-2LA	0,94	2735	2,3	4,8	26		
MON, (MOP) 95/125-7	C	63 – 95	125	7			1xx7070-8AB	0,09	630	0,36	2,2	49		
MON, (MOP) 95/210-9	C		210	9			1xx7070-6AA	0,18	850	0,62	2,3	49		
MON, (MOP) 100/185-15	C		185	15			1xx7073-6AA	0,25	860	0,78	2,7	49		
MON, (MOP) 100/150-25	C		150	25			1xx7080-6AA	0,37	920	1,20	3,1	44,5		
MON, (MOP) 100/170-40	C		170	40			1xx7080-4AA	0,55	1395	1,45	3,9	41		
MON, (MOP) 100/150-63	C	63 – 100	150	63		●	1xx7083-4AA	0,75	1395	1,86	4,0	42		
MON, (MOP) 100/200-80	C		200	80		●	1xx7083-2AA	1,1	2845	2,40	6,1	43		
MON, (MOP) 100/130-100	C		130	100		●	1xx7090-4AA	1,1	1415	2,55	4,3	45		
MON, (MOP) 100/150-145	C		150	145		●	1xx7090-2AA	1,5	2860	3,25	5,5	51	5 2 0 3 1	
MON, (MOP) 125/190-7	C	100 – 125	190	7	2 – 250		1xx7073-8AB	0,12	645	0,51	2,2	49	installation dimension	
MON, (MOP) 160/210-9	C		210	9			1xx7070-6AA	0,18	850	0,62	2,3	49	F14	
MON, (MOP) 160/220-16	C		220	16			1xx7080-6AA	0,37	920	1,20	3,1	49		
MON, (MOP) 160/250-25	C		250	25			1xx7083-6AA	0,55	910	1,60	3,4	41		
MON, (MOP) 160/245-40	C	100 – 160	245	40			1xx7083-4AA	0,75	1395	1,86	4,0	42		
MON, (MOP) 160/300-65	C		300	65		●	1xx7096-4AA	1,5	1420	3,40	5,0	54		
MON, (MOP) 160/250-80	C		250	80		●	1xx7090-2AA	1,5	2860	3,25	5,5	46		
MON, (MOP) 160/210-100	C		210	100		●	1xx7096-4AA	1,5	1420	3,40	5,0	54		
MON, (MOP) 160/250-145	C		250	145		●	1xx7096-2AA	2,2	2880	4,55	6,3	54		

MON, (MOP) 245/340-7	C	160 – 245	340	7			1xx7083-8AB	0,25	680	1,03	2,6	52		X X 6 X X X
MON, (MOP) 250/350-9	C		350	9			1xx7080-6AA	0,37	920	1,20	3,1	50		X X 0 X X X
MON, (MOP) 250/360-16	C	160 – 250	360	16			1xx7083-6AA	0,55	910	1,60	3,4	52		X X 1 X X X
MON, (MOP) 250/360-25			360	25			1xx7090-6AA	0,75	915	2,10	3,7	45		X X 2 X X X
MON, (MOP) 240/310-40		160 – 240	310	40			1xx7090-4AA	1,1	1415	2,55	4,3	45		X X 3 X X X
MON, (MOP) 230/300-65		160 – 230	300	65			◆ 1xx7096-4AA	1,5	1420	3,40	5,0	54		X X 4 X X X
MON, (MOP) 250/425-80		160 – 250	425	80			◆ 1xx7096-2AA	2,2	2880	4,55	6,3	49		X X 5 X X X
MON, (MOP) 195/250-145		160 – 195	250	145		2 – 250	◆ 1xx7096-2AA	2,2	2880	4,55	6,3	49		X X 7 X X X
MON, (MOP) 400/640-7	C	230 – 400	640	7			1xx7096-8AB	0,55	675	1,58	3,0	55		X X E X X X
MON, (MOP) 400/530-10	C	230 – 400	530	10			1xx7083-6AA	0,55	910	1,6	3,4	53		X X F X X X
MON, (MOP) 400/515-16		230 – 400	515	16			1xx7090-6AA	0,75	915	2,1	3,7	55		X X H X X X
MON, (MOP) 400/548-25		230 – 400	548	25			1xx7096-6AA	1,1	915	2,9	3,8	48		X X J X X X
MON, (MOP) 400/580-40		230 – 400	580	40			1xx9090-4LA	1,8	1480	3,9	5,1	48		X X K X X X
MON, (MOP) 380/490-75		230 – 380	490	75			◆ 1xx9096-4LA	2,5	1490	5,9	5,1	64		X X L X X X
MON, (MOP) 380/490-140		230 – 380	490	140			◆ 1xx9096-2LA	3,8	2810	7,9	6,5	57		X X M X X X

- 1) Rated torque is equal to 60% of maximum tripping torque for the operation of S2, and 40% of maximum tripping torque for the operation of S4.
- 2) As special version, you can order a modified version with working stroke adjustment range from 2 to 620 rev. for ser. No. 52 030-2; from 2 to 470 rev. for ser. No. 52 033-5; and from 1 to 300 rev. for ser. No. 52036.
This modification must be verbalized in purchase order.
- 3) Weight figures apply to version with connection dimensions C, D, E.
- 4) 6th, 7th and 9th position of serial number will specify the relevant figure or letter as per Table 3.
- 5) Type of electric motors: For actuators MODACT MON, xx symbols will be replaced with letters LA, for actuators MODACT MOP with letters PP.
- 6) Actuators MODACT MON, MOP Control are supplied in versions specified with letter C (column 2).
- 7) Upon agreement with manufacturer, you can order version with doubled position switches (without signalling) – must be verbalized in purchase order.
- 8) C – Control version in full optional version (current position transmission, regulator ZP2.RE5, contactors, brake). Other serial numbers can be supplied in Control version but with incomplete range of optional equipment.
- 9) ◆ – Symbol indicating oil filled actuators. Other actuators are filled with grease.

Table 1a – Electric actuators MODACT MON, MOP – basic parameters
With 1LE1 electric motors – supply voltage 3 x 230/400 V, 50 Hz, IP 55 (MODACT MON), IP 67 (MODACT MOP)

Type ID	Control	Torque [Nm]		Setting speed [1/min]	Working stroke (rev)	Type of lubricant CIATIM 201	Type	Electric motor			Weight [kg]	Serial number												
		Tripping	Break -away					Output [kW]	Revs [1/min]	I _n (400 V) [A]		I _z / I _n	basic	additional										
												1	2	3	4	5	6	7	8	9	10	11		
MON (MOP) 40/...-7	C			7																				
MON (MOP) 40/...-9	C			9																				
MON (MOP) 40/...-15	C			15																				
MON (MOP) 40/...-25	C	20 – 40		25																				
MON (MOP) 40/...-40	C			40																				
MON (MOP) 40/...-50	C			50																				
MON (MOP) 40/...-80	C			80																				
MON (MOP) 80/...-7	C			7																				
MON (MOP) 80/...-9	C			9																				
MON (MOP) 80/...-15	C			15																				
MON (MOP) 80/...-25	C	40 – 80		25																				
MON (MOP) 80/...-40	C			40	2 – 250																			
MON (MOP) 80/...-50	C			50																				
MON (MOP) 80/...-80	C			80																				
MON (MOP) 125/...-7	C			7																				
MON (MOP) 125/...-9	C			9																				
MON (MOP) 125/...-15	C	80 – 125		15																				
MON (MOP) 125/...-25	C			25																				
MON (MOP) 125/...-50	C			50																				
MON (MOP) 200/...-9	C			9																				
MON (MOP) 200/...-15	C	100 – 200		15																				
MON (MOP) 200/...-25	C			25																				
MON (MOP) 200/...-50	C			50																				
MON (MOP) 100/...-7	C			7																				
MON (MOP) 100/...-9	C			9																				
MON (MOP) 100/185-15	C		185	15																				
MON (MOP) 100/165-25	C		165	25																				
MON (MOP) 100/165-40	C	63 – 100		40																				
MON (MOP) 100/140-63	C		140	63																				
MON (MOP) 100/210-80	C		210	80																				
MON (MOP) 100/150-100	C		150	100																				
MON (MOP) 100/165-145	C		165	145																				
MON (MOP) 160/...-7	C			7																				
MON (MOP) 160/...-9	C			9																				
MON (MOP) 160/260-16	C		260	16																				
MON (MOP) 160/290-25	C		290	25																				
MON (MOP) 160/225-40	C	100 – 160		40																				
MON (MOP) 160/350-65	C		350	65																				
MON (MOP) 160/275-80	C		275	80																				
MON (MOP) 160/225-100	C		225	100																				
MON (MOP) 160/245-130	C		245	130																				

Table 2 – Electric actuators MODACT MONJ – basic parameters, supply voltage 1 x 230 V, 50 Hz

Basic equipment: 2 selector switches PO, PZ; 2 torque switches MO, MZ; 1 electric motor (brake motor also available on special order); 1 heating element

Type ID	Control	Torque [Nm]		Setting speed [1/min]	Working stroke [rev]	Lubric. type	Electric motor					Weight [kg]	Serial number	
		Tripping	Break-away				Type with start and run capacitor	Output [kW]	Revs [1/min]	I _n (230 V) [A]	I _z / I _n		basic	
				1	2	3						4	5	6
MONJ 40/75-25	C	20 – 40	75	25	2-250		1LF7070-4	0,25	1400	1,86	3,4	27	52 030	x x 2 x NJ x
MONJ 40/50-40	C		50	40			1LF7070-4	0,25	1400	1,86	3,4	27		x x 3 x NJ x
MONJ 40/60-50	C		60	50		◆	1LF7070-2	0,37	2895	2,85	3,5	27		x x 4 x NJ x
MONJ 40/60-80	C		60	80		◆	1LF7073-2	0,55	2860	4,15	3,7	27		x x 5 x NJ x
MONJ 80/135-25	C	40 – 80	135	25			1LF7073-4	0,37	1400	2,6	3,2	27		x x 8 x NJ x
MONJ 70/90-40	C	40 – 70	90	40			1LF7073-4	0,37	1400	2,6	3,2	28		x x 9 x NJ x
MONJ 75/100-50	C	40 – 75	100	50		◆	1LF7073-2	0,55	2860	4,15	3,7	28		x x A x NJ x
MONJ 110/143-25	C	80 – 110	143	25			1LF7073-4	0,37	1400	2,6	3,2	28		x x E x NJ x
MONJ 100/130-40	C	63 – 100	130	40			1LF7080-4	0,55	1415	3,5	3,6	41	52 031	x x 3 x NJ x
MONJ 95/124-63		63 – 95	124	63		◆	1LF7083-4	0,75	1405	4,8	3,9	42		x x 4 x NJ x
MONJ 100/230-80		63 – 100	130	80		◆	1LF7083-2	1,1	2860	6,7	4,4	43		x x E x NJ x
MONJ 100/130-100			130	100		◆	1LF7096-4	1,5	1430	8,7	4,3	50		x x 5 x NJ x
MONJ 95/124-145		63 – 95	124	145		◆	1LF7090-2	1,5	2845	9,25	4,5	51		x x F x NJ x
MONJ 150/195-40		100 – 150	195	40			1LF7083-4	0,75	1405	4,8	3,9	41		x x 9 x NJ x
MONJ 160/208-65		100 – 160	208	65		◆	1LF7096-4	1,5	1430	8,7	4,3	42		x x A x NJ x
MONJ 160/208-80			80	◆		1LF7090-2	1,5	2845	9,25	4,5	43	x x H x NJ x		
MONJ 130/170-145		100 – 130	170	145	◆	1LF7096-2	2,2	2830	13,3	4,8	51	x x J x NJ x		
MONJ 250/325-40		160 – 250	325	40		1LF7096-4	1,5	1430	8,7	4,3	45	52 032	x x 3 x NJ x	
MONJ 220/286-80		160 – 220	286	80	◆	1LF7096-2	2,2	2830	13,3	4,8	49		x x 5 x NJ x	

Actuators MODACT MONJ use single-phase electric motors Siemens 1LF7 Series, with run and start capacitor. For two pole electric motors (approx. 2,800 rev/min), manufacturer guarantees 60,000 starting cycles, for four pole electric motors (approx. 1,400 rev/min) 100,000 starting cycles. Afterwards, centrifugal disconnecter of start capacitor must be exchanged – can be ordered at ZPA Pečky a.s.

ZPA Pečky a.s. mounts triac disconnecter to electric motors with output up to 0.37 kW. The triac disconnecter extends service life to 350,000 starting cycles.

If the actuator with single-phase electric motor is intended for regulation purposes, this lowered service life must be taken into consideration while setting up the regulation process (frequency of regulation interventions).

Please consult your expected operating mode of MONJ actuators with the Sales Department of ZPA Pečky, a.s.

◆ – Symbol indicating oil filled actuators. Other actuators are filled with grease.

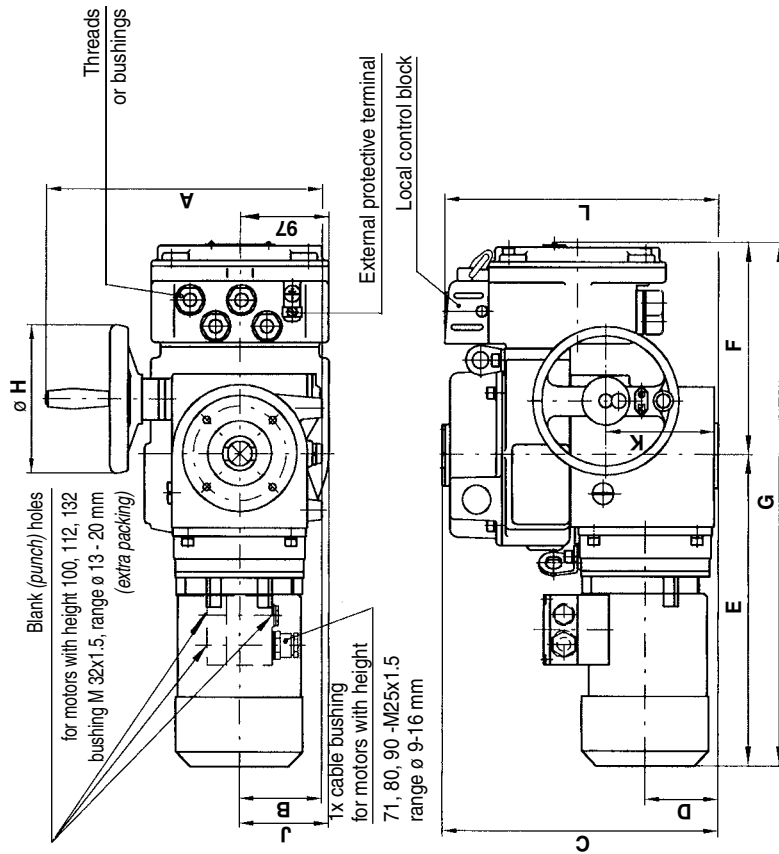
Table 3 – Electric actuators MODACT, MON, MOP, MONJ – installation dimensions, method of electrical connection

Serial number	5 2 0 3 X . X X X X X X									
	↓									
Installation dimensions	Version									
	Outlets	Connector								
Shape A	5	F								
Shape B1	6	G								
Shape C	7	H								
Shape D	8	J								
Shape E	9	K								

Table 3 – continuation

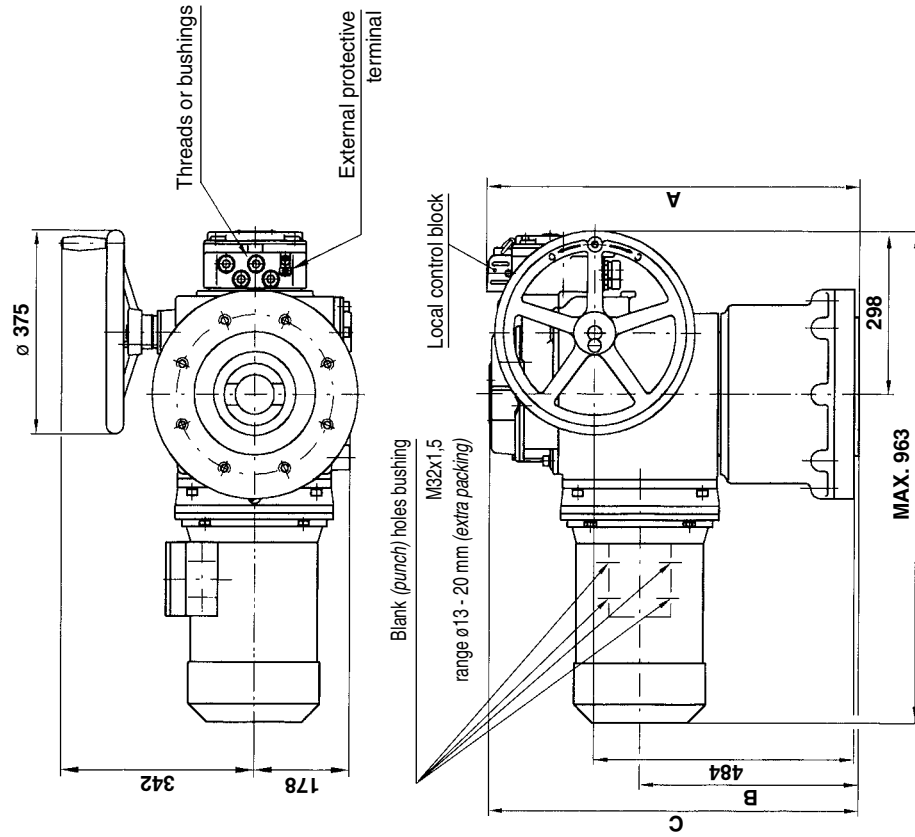
Serial number	5	2	0	3	X	.	X	X	X	X	X	X
↓												
Local control block, position indicator	Design without transmitter	Resistance transmitter	Current transmitter 4–20 mA	Current transmitter 4–20 mA + source								
Without local control block, without position indicator	1	K	B	A								
Local position indicator	2	L	-	-								
Local control block	4	M	E	C								
Local control block and position indicator	6	N	-	-								
Local control block for actuators MODACT MON, MOP, MONJ Control	7	P	H	D								
Local control block and position indicator for actuators MODACT MON, MOP, MONJ Control	8	R	-	-								
↓												
Tripping torque values, setting speeds and other technical parameters are specified in Table 1 or 2 including identification. This position will include figure or letter corresponding to the required parameters.												
↓												
Signalling, position transmitter, flash lamp	MODACT MON, MOP, MONJ	MODACT MON, MOP, MONJ Control										
		Complete equipment¹⁾	Without position regulator	Without position regulator and brake								
W/O signalling, pos. transmitter and flash lamp	0	-	E	M								
Position transmitter	1	A	F	N								
Signalling switches	2	-	G	Q								
Signalling switches and position transmitter	3	B	H	P								
Flash lamp	4	-	I	R								
Position transmitter, flash lamp	5	C	J	S								
Signalling switches and flash lamp	6	-	K	T								
Signalling switches, pos. transmitt. and flash lamp	7	D	L	U								
Note: ¹⁾ Actuators MODACT MON, MOP, MONJ Control with regulator ZP2 RE5 – figure 5 will be specified.												
↓												
Letter N (MODACT MON), P (MODACT MOP), NJ (MODACT MONJ) will be specified universally for all versions.												
↓												
For surrounding temperature from -25 °C to +70 °C										without designation		
For surrounding temperature from -40 °C to +60 °C										F1		

Dimensional sketch of **MODACT MON, MOP** actuators, ser. No. 52 030.xxxxx up to 52 035.xxxxx (version with terminal board)



Type ID	A	B	C	D	E	F	G	ø H	J	K	L
52 030.xxxxx	305	90	300	78	334	228	562	160	99	120	300
52 031.xxxxx 52 032.xxxxx	376	120	328	92	436	228	664	200	-	144	328
52 033.xxxxx 52 034.xxxxx	455	145	382	123	519	258	777	250	-	190	387
52 035.xxxxx	540	178	442	153	598	298	896	375	-	234	445

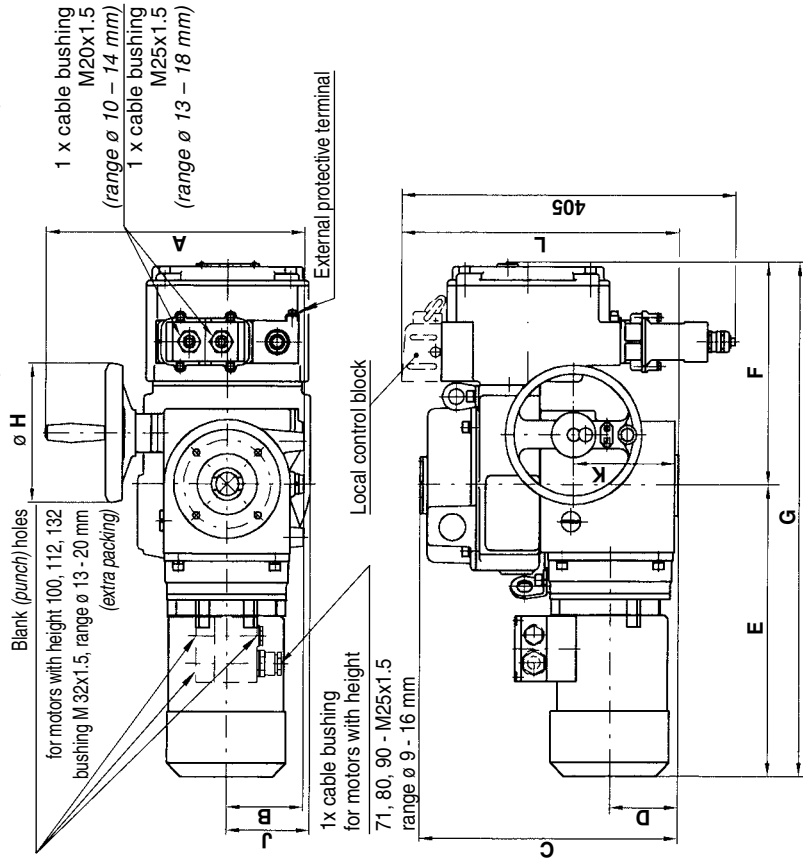
Dimensional sketch of **MODACT MON, MOP** actuators, ser. No. 52 036.xxxxx (version with terminal board)



Type ID	A	B	C
52 036.xxxxx shape A	757	463	750
52 036.xxxxx shape B ₁ , C, D, E	712	418	705

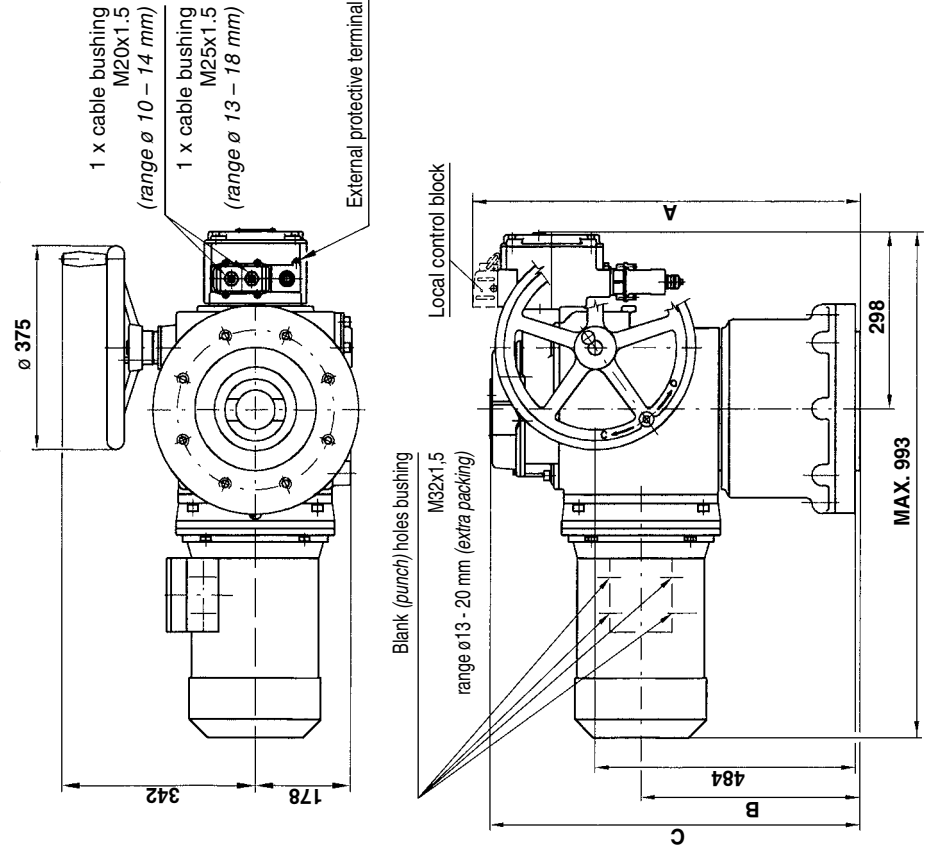
Note: For actuators MODACT MON, MONJ, terminal box provides threads for bushings: 3 x thread M20 x 1.5; 1 x thread M25 x 1.5 (bushings are included in scope of delivery – extra packing). For actuators MODACT MOP, terminal box provides bushings: 1 pc M25 x 1.5 range ø 13 – 18 mm; 2 pc M20 x 1.5 range ø 10 – 14 mm; 1 pc M20 x 1.5 range ø 6 – 12 mm. A cable bushing is always supplied with electric motor (except actuator versions with interconnection of motor and terminal box. Connector is always fitted with cable bushings).

Dimensional sketch of **MODACT MON, MOP** actuators
ser. No. 52 030.xxxxx - 52 035.xxxxx (version with connector)



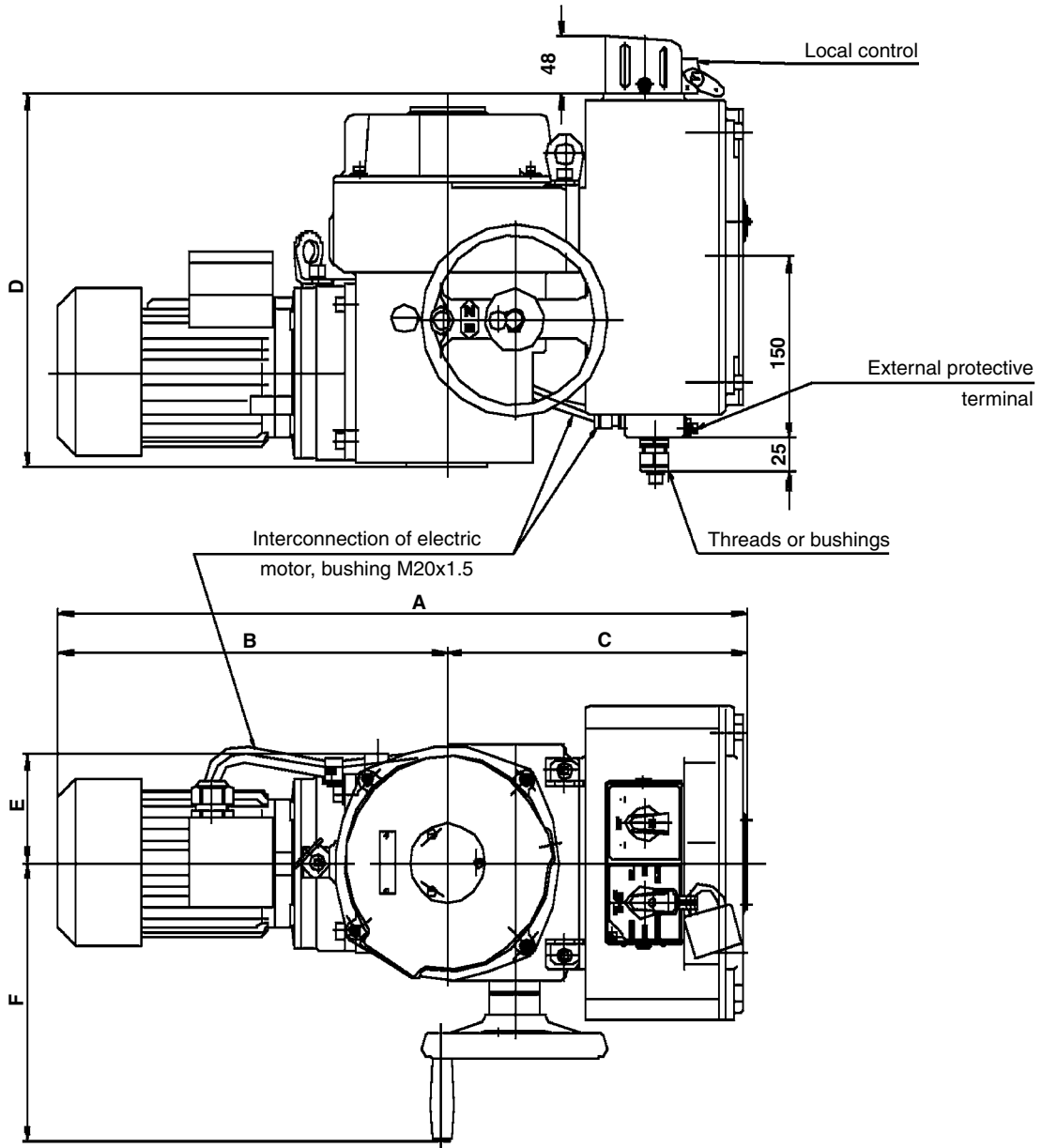
Type ID	A	B	C	D	E	F	G	ϕ H	J	K	L
52 030.xxxxxN	305	90	300	78	334	258	592	160	99	120	325
52 031.xxxxxN 52 032.xxxxxN	376	120	328	92	436	258	694	200	-	144	350
52 033.xxxxxN 52 034.xxxxxN	455	145	382	123	519	288	807	250	-	190	410
52 035.xxxxxN	540	178	442	153	598	328	926	375	-	234	470

Dimensional sketch of **MODACT MON, MOP** actuators
ser. No. 52 036.xxxxx (version with connector)



Type ID	A	B	C
52 036.xxxxxN shape A	785	463	750
52 036.xxxxxN shape B ₁ , C, D, E	740	418	705

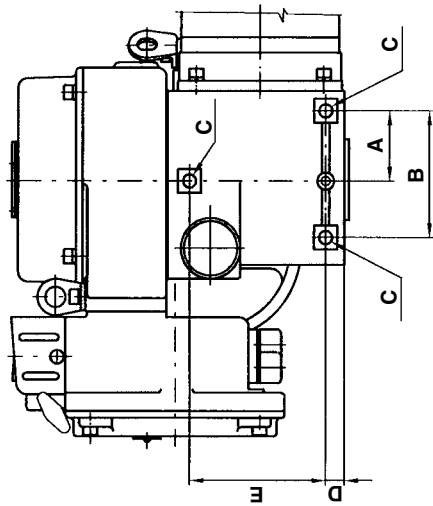
Dimensional sketch of **MODACT MON Control** actuators
 ser. No. 52 030 – 52 033



Serial number	A	B	C	D	E	F
52 030	500	325	255	307	90	200
52 031, 52 032	630	382	255	316	120	355

Note: The dimensions are maximal.

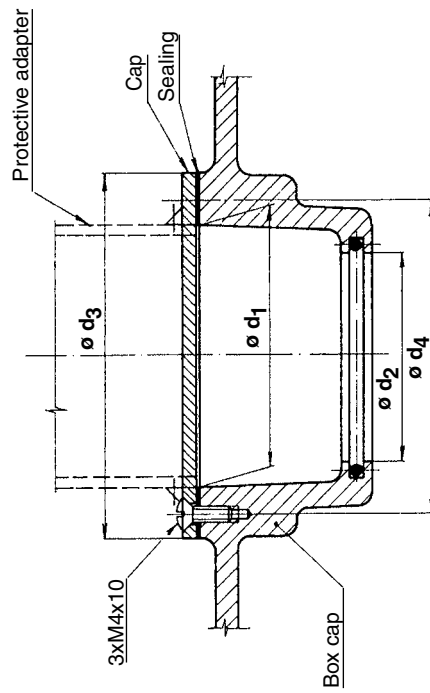
Openings for additional fixation of **MODACT MON, MOP** actuators
 ser. No. 52 030.xxxxN – 52 035.xxxxN,
 ser. No. 52 030.xxxxP – 52 035.xxxxP



Type ID	Dimensions (mm)				
	A	B	C	D	E
52 030.xxxxN	61	110	M10	16	120
52 031.xxxxN 52 032.xxxxN	90	160	M12	21	140
52 033.xxxxN 52 034.xxxxN	110	210	M16	23	200
52 035.xxxxN	120	240	M20	47	220

Note:
 Openings for additional MODACT actuator fixation only serve to hold the actuators' weight and must not be subject to any other additional force.

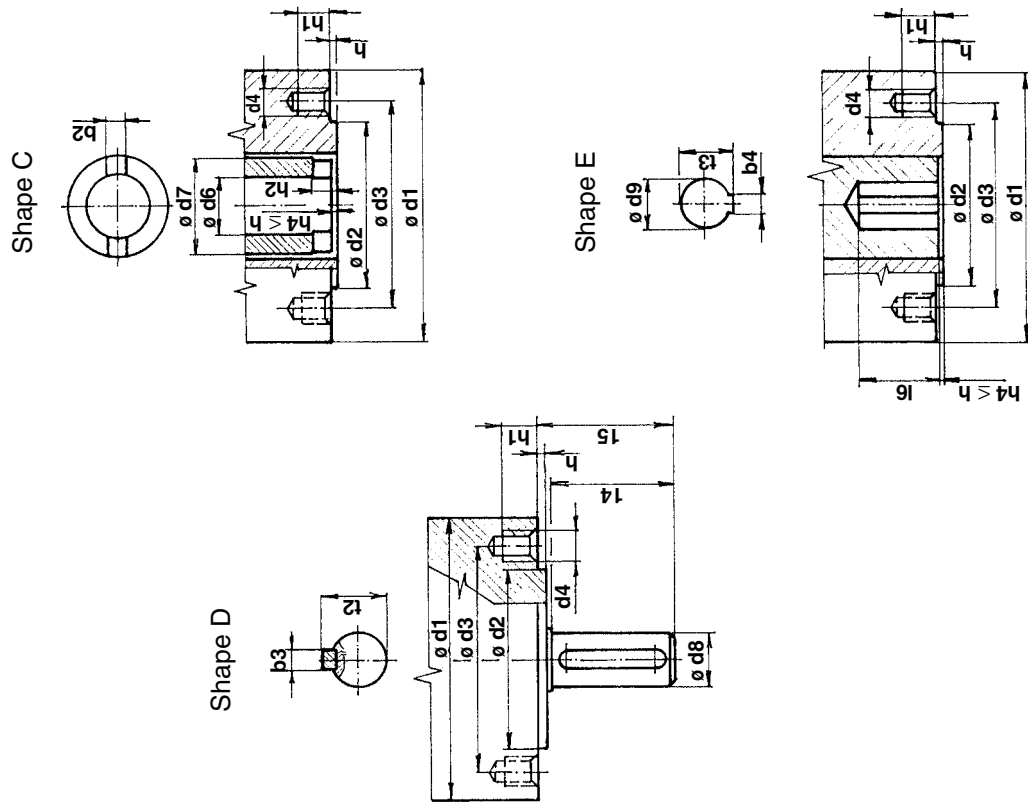
Modification for rising spindle



Dimen- sions [mm]	Serial number			
	52 030	52 031 52 032	52 033 52 034	52 035 52 036
ϕd_1	45	60	80	90
ϕd_2	35,5	50,5	75	80,5
ϕd_3	65	80	110	110
ϕd_4	55	70	100	100

Protective adapter (including opening in cap) to be provided by customer.

Installation dimensions of **MODACT MON, MOP** actuators,
ser. No. 52 030 – 52 036 – basicversion (*without adapter*)

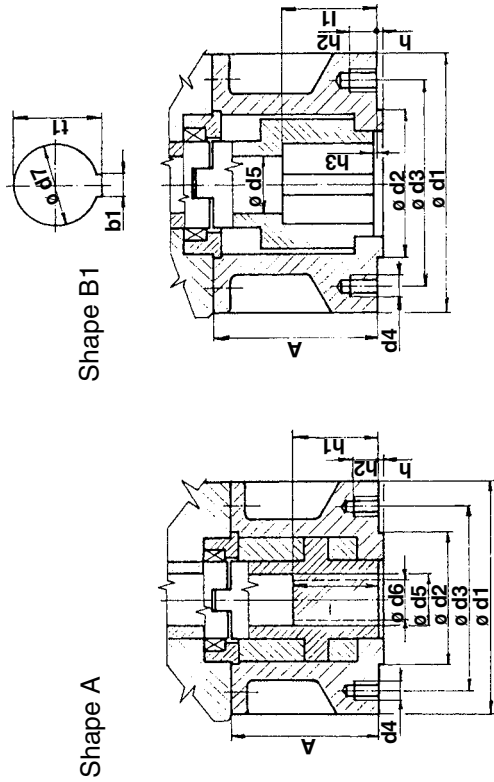


Actuators basic installation dimensions table
MODACT MON, MOP (*without adapter*)

Shape	Dimensions [mm]	Serial No.			
		52 030	52 031 52 032	52 033 52 034	52 035 52 036
C, D, E (equal dimensions)	$\varnothing d1$ approximate value	125	175	210	300
	$\varnothing d2$ f8	70	100	130	200
	$\varnothing d3$	102	140	165	254
	d4	M 10	M 16	M 20	M 16
	number of thread holes	4	4	4	8
	h max	3	4	5	5
	h1 min. 1,25d4	12,5	20	25	20
	$\varnothing d7$	40	60	80	100
	h2	10	12	15	16
	b2 H11	14	20	24	30
D	$\varnothing d6$	30	41,5	53	72
	$\varnothing d8$ g6	20	30	40	50
	l4	50	70	90	110
	t2 max	22,5	33	43	53,5
	b3 h9	6	8	12	14
	l5	55	76	97	117
	$\varnothing d9$ H8	20	30	40	50
	l6 min.	55	76	97	117
	l3	22,8	33,3	43,3	53,8
	b4 Js9	6	8	12	14
E	$\varnothing d6$	30	41,5	53	72
	$\varnothing d8$ g6	20	30	40	50
	l4	50	70	90	110
	t2 max	22,5	33	43	53,5
	b3 h9	6	8	12	14
	l5	55	76	97	117
	$\varnothing d9$ H8	20	30	40	50
	l6 min.	55	76	97	117
	l3	22,8	33,3	43,3	53,8
	b4 Js9	6	8	12	14

Dimensions $\varnothing d6$ and l6 must not be lower than specified in Table.
Dimensions are specified in mm.

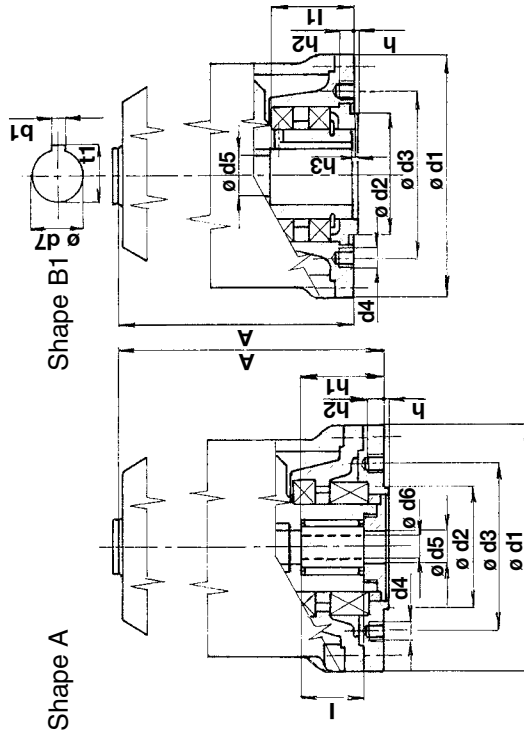
Adapters for **MODACT MON, MOP** actuators
ser. No. 52 030 – 52 035



Allocation of adapters to actuators

Shape	Dimensions [mm]	Serial No.			
		52 030	52 031 52 032	52 033 52 034	52 035
A, B1 (equal dimensions)	$\varnothing d1$	125	175	210	300
	$\varnothing d2$ f8	70	100	130	200
	$\varnothing d3$	102	140	165	254
	d4	M 10	M 16	M 20	M 16
	Number of holes d4	4	4	4	8
A	h	3	4	5	5
	h2 min.	12,5	20	25	20
	A	63,5	110	179	155
	$\varnothing d5$	30	38	53	63
	$\varnothing d6$ max	28	36	44	60
	h1 max	43,5	65	92	110
	l min	45	55	70	90
B1	A	63,5	110	122	155
	$\varnothing d5$	30	40	50	65
	l1 min	45	65	80	110
	h3 max	3	4	5	5
	b1	12	18	22	28
	$\varnothing d7$ H9	42	60	80	100
	t1	45,3	64,4	85,4	106,4

Adapters for **MODACT MON, MOP** actuators
ser. No. 52 036



Shape	Dimensions [mm]	52 036
A, B1 (equal dimensions)	$\varnothing d1$	390
	$\varnothing d2$ f8	230
	$\varnothing d3$	298
	d4	M 20
	Number of holes d4	8
A	h	5
	h2 min.	25
	A	740 1+)
	$\varnothing d5$	72
	$\varnothing d6$ max	70
	h1 max	165
	l min	110
B1	A	695 2+)
	$\varnothing d5$	72
	l1 min	130
	h3 max	5
	b1	32
	$\varnothing d7$ H9	120
	t1	127,4

Notes:
1+) - nut integrated in actuator
2+) - bushing integrated in actuator

Legend to wiring diagrams of actuators

MODACT MON, MOP, MONJ and MODACT MON, MOP Control

Legend to wiring diagrams:

SQ1 (MO)	– torque switch in “opening” direction	BMO	– local control block
SQ2 (MZ)	– torque switch in “closing” direction	CPT 1Az	– analogue adjustable current position transmitter
SQ3 (PO)	– position switch in “opening” direction	DCPT	– digitally adjustable current position transmitter
SQ5 (PZ)	– position switch in “closing” direction	DCPZ	– power supply of position transmitter
SQ4 (SO)	– signalling switch in “opening” direction	ZP2.RE5	– electronic position regulator
SQ6 (SZ)	– signalling switch in “closing” direction	BAM-002	– electronic brake
SA1 (M/D)	– selector Local/0/ Remote	BR2	– electronic brake
SA2 (OPEN/CLOSE)	– selector Open/0/ Close	EH	– heating resistor
KO	– contactor for opening dir.	M1~	– single phase electric motor
KZ	– contactor for closing dir.	M3~	– three phase electric motor
BQ1, BQ2 (V1, V2)	– resistance position transmitter		

Selectors positions: M – local control; D – remote control; Z, CLOSE – closed; O, OPEN – open

Optional accessories:

Local control block BMO

Position transmitter

- resistance V1, V2
- passive current transmitter CPT 1Az
- active current transmitter DCPT + DCPZ
- without transmitter

Signalling switches SO, SZ

Flash lamp B

Applied electric motors:

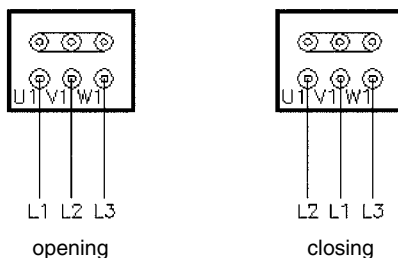
MON, MOP actuators use three phase electric motors with terminal boards.

For versions with terminal strip, electric motors are connected separately; for versions with connectors, electric motors are also connected through this connector.

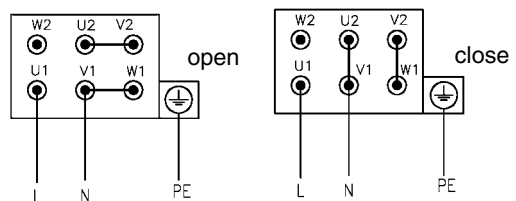
MONJ actuators use single phase electric motors with terminal boards.

For versions with terminal strip, electric motors are connected separately; for versions with connectors, electric motors are also connected through this connector.

3-ph motor



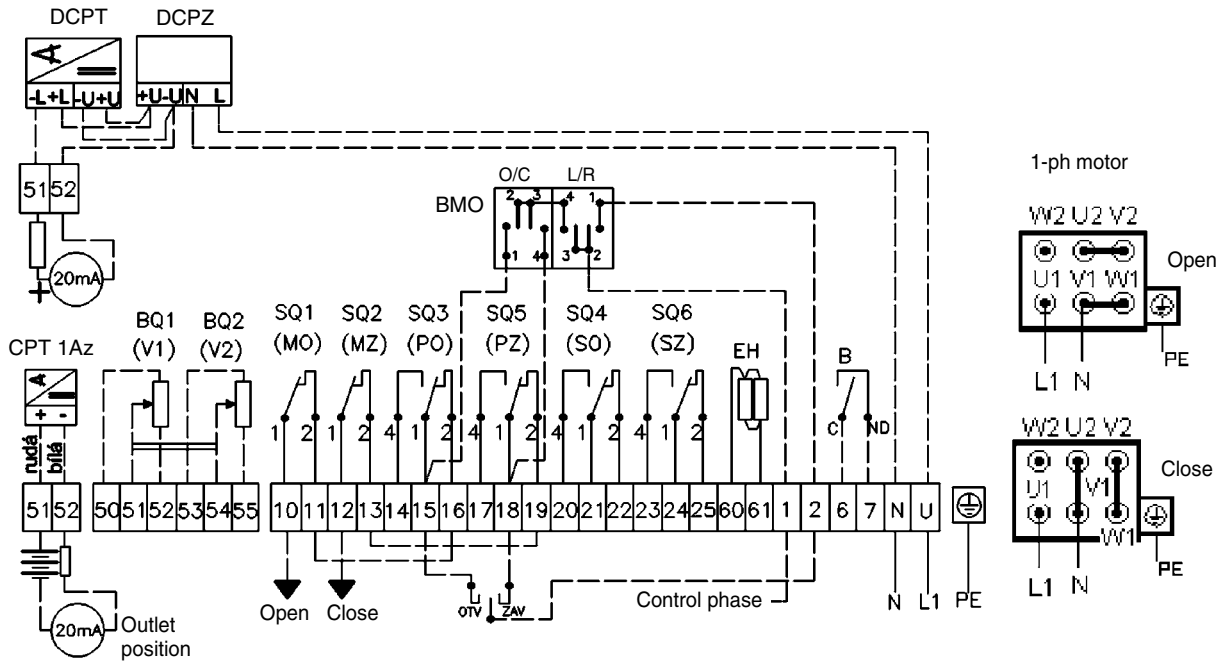
1-ph motor



Connection of electric motors of MODACT MONJ actuators

– with terminal board

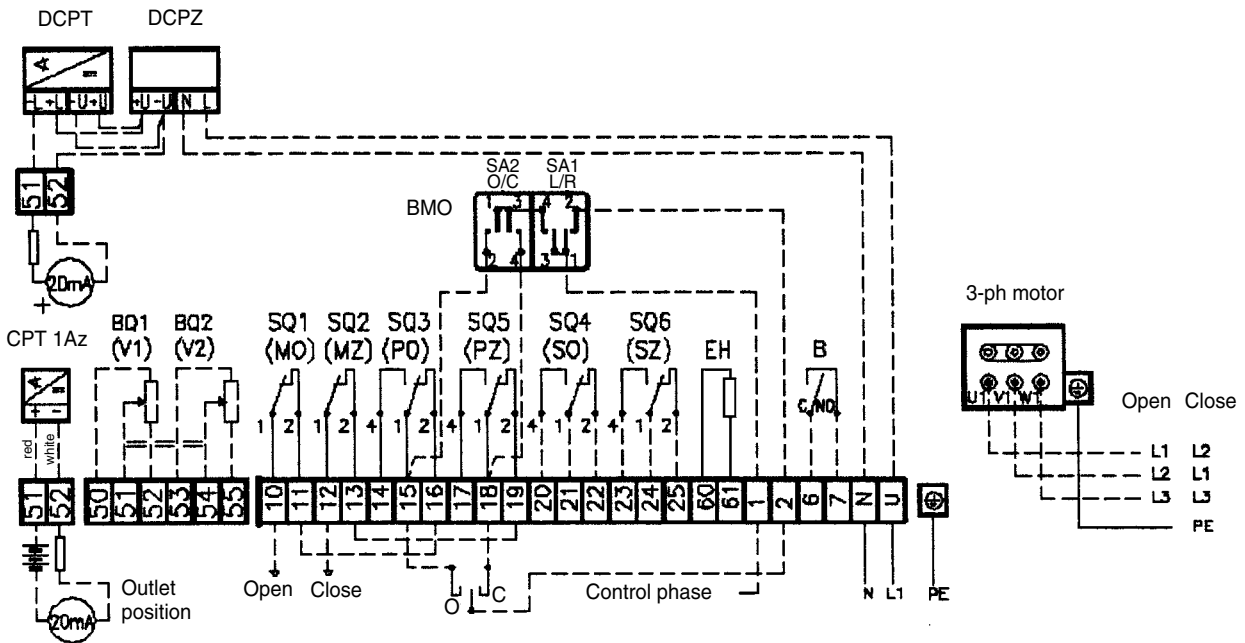
PM0937-E



Connection of electric motors of MODACT MON, MOP actuators

– with terminal board

P0938-E

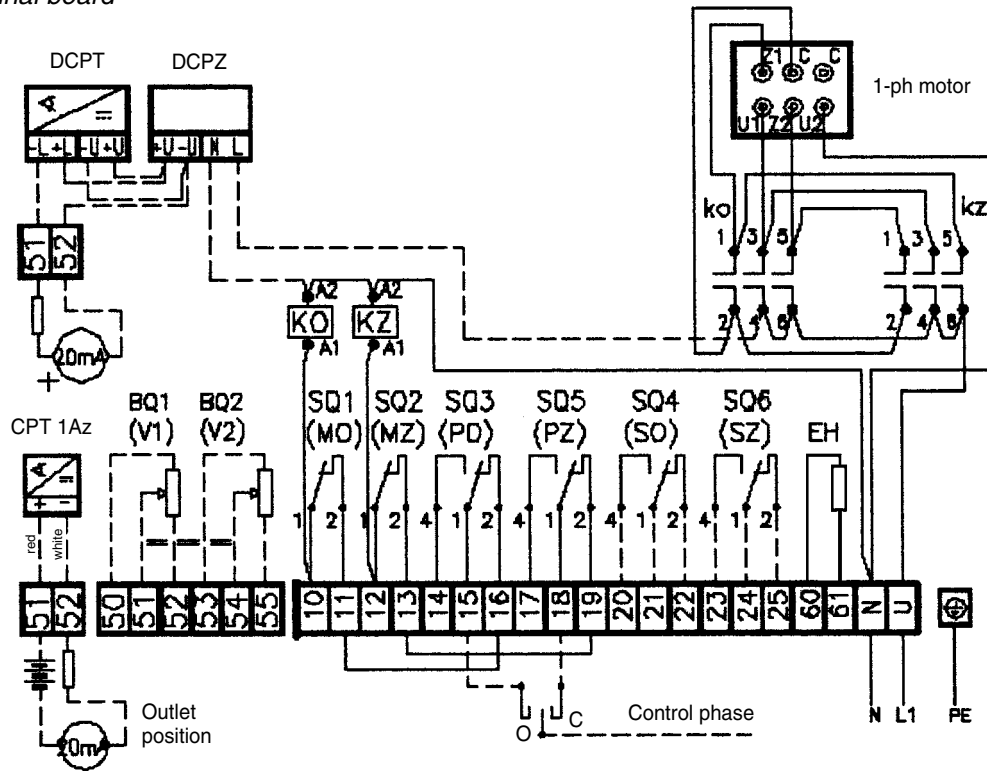


Connection of electric motors of **MODACT MONJ Control** actuators

– with contactors

– with terminal board

P0913-E

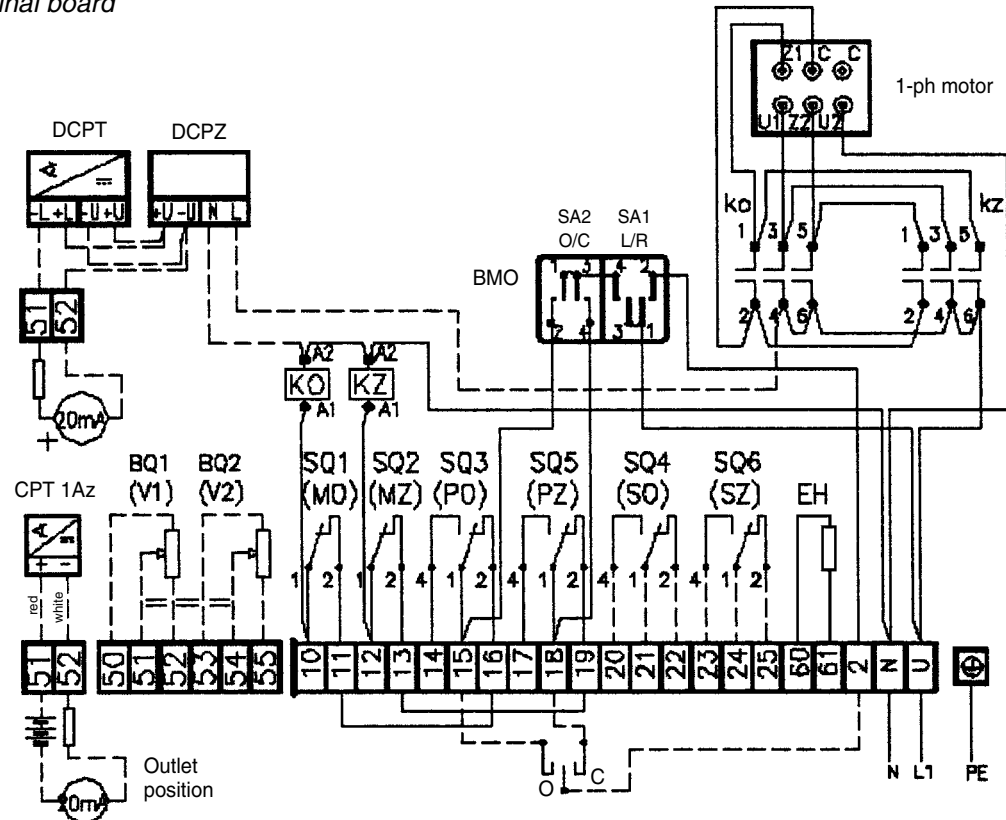


Connection of electric motors of **MODACT MONJ Control** actuators

– with contactors and BMO

– with terminal board

P0914-E

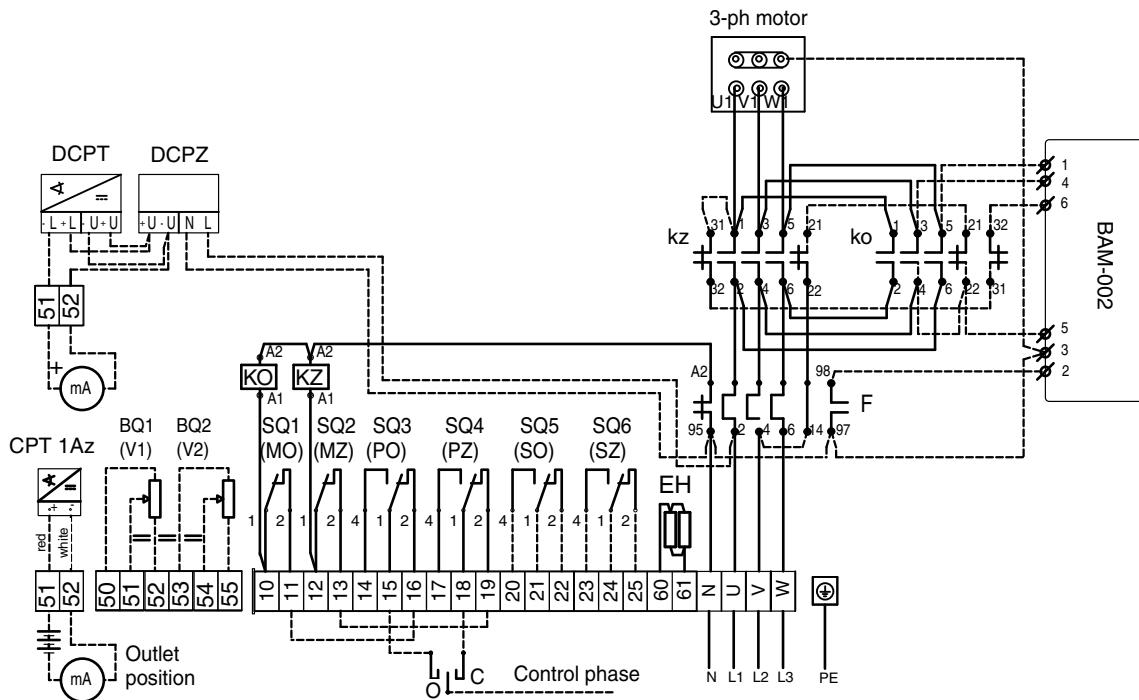


Connection of electric motors of MODACT MON, MOP Control actuators

– with contactors

– with terminal board

P0947

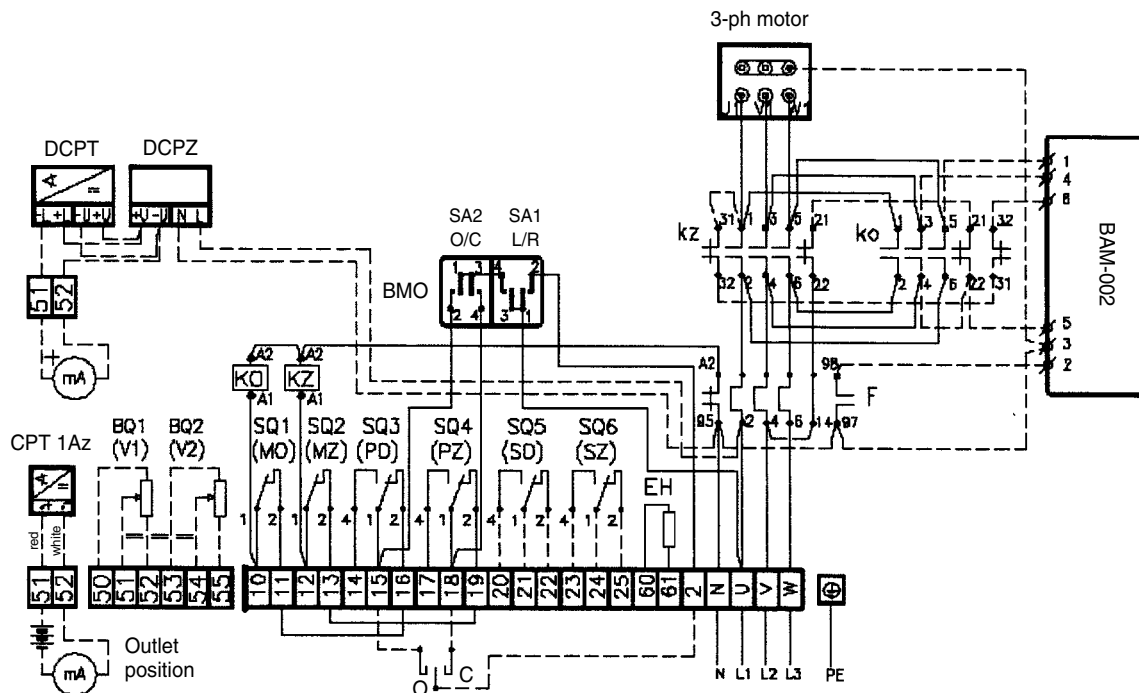


Connection of electric motors of MODACT MON, MOP Control actuators

– with contactors and BMO

– with terminal board

P0948

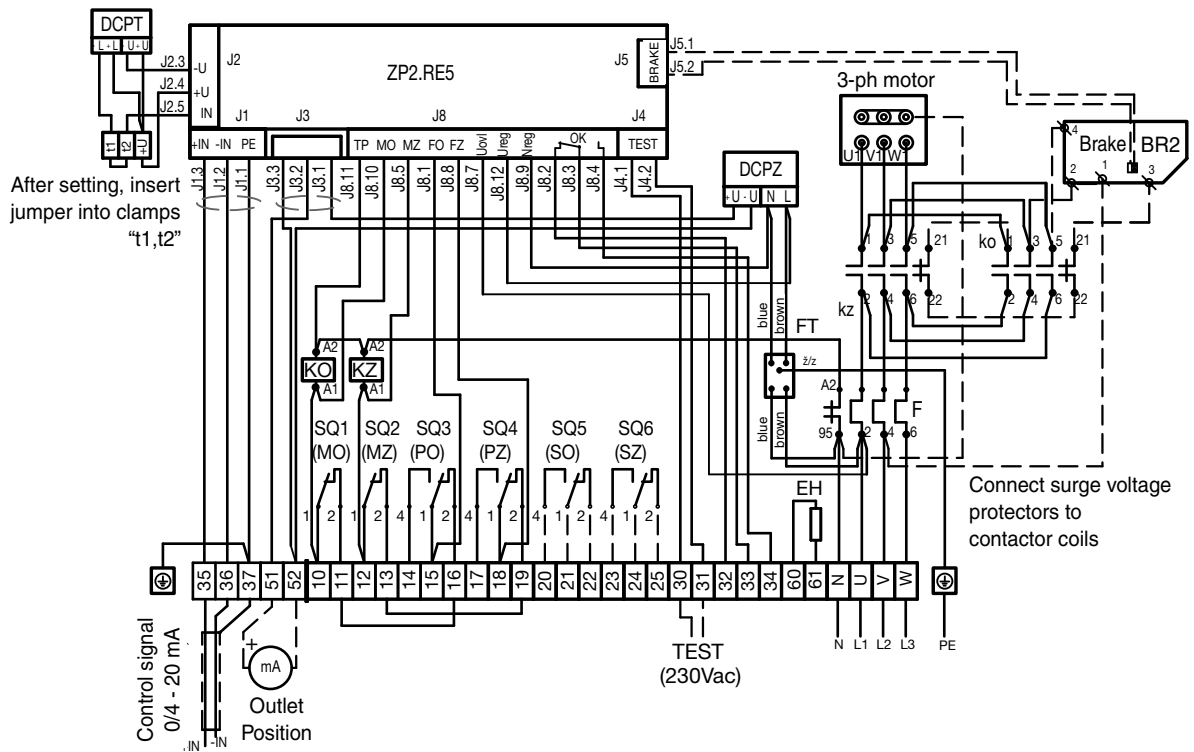


Connection of MODACT MON, MOP Control actuators

– with contactor and ZP2.RE5 regulator

– with terminal board

P0949

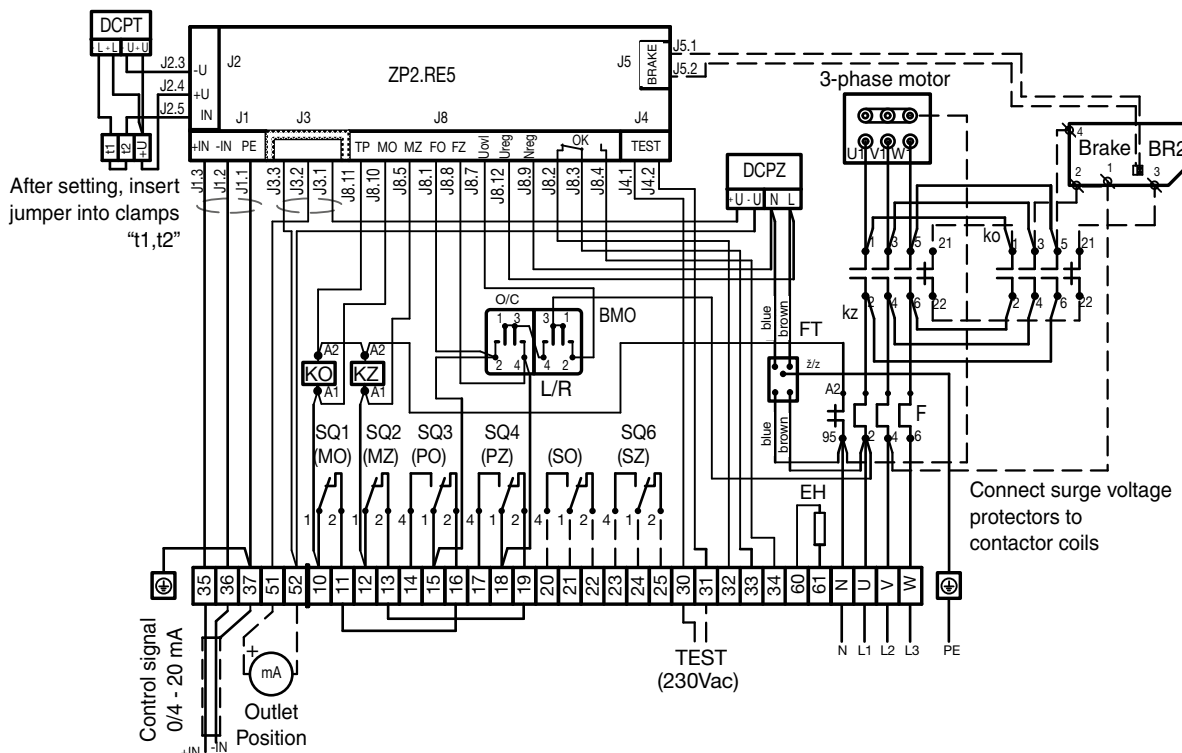


Connection of MODACT MON, MOP Control actuators

– with contactor, ZP2.RE5 regulator and BMO

– with terminal board

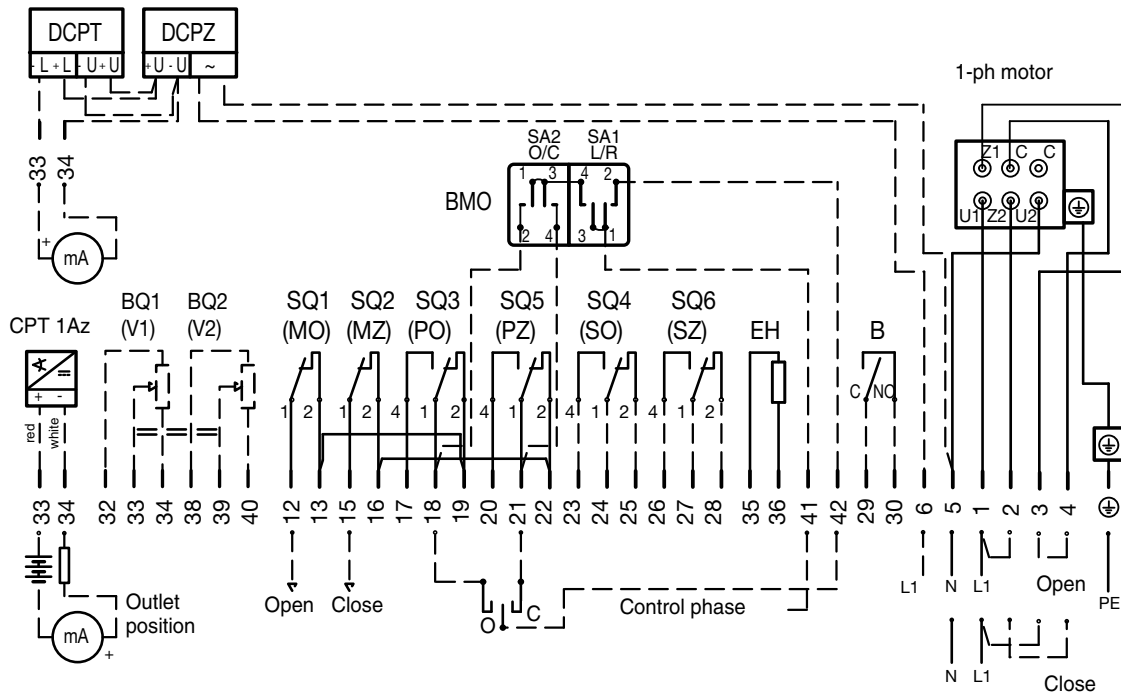
P0950



Connection of electric motors of **MODACT MONJ** actuators

– with connector

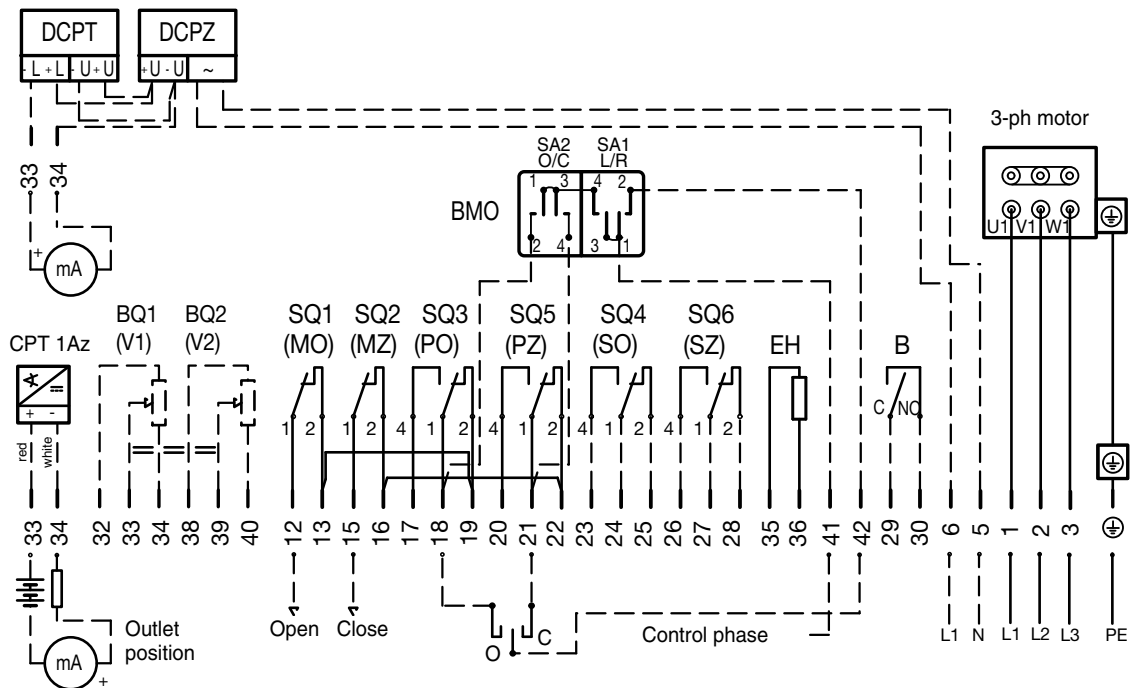
P0939-E



Connection of electric motors of **MODACT MON, MOP** actuators

– with connector

P0940-E

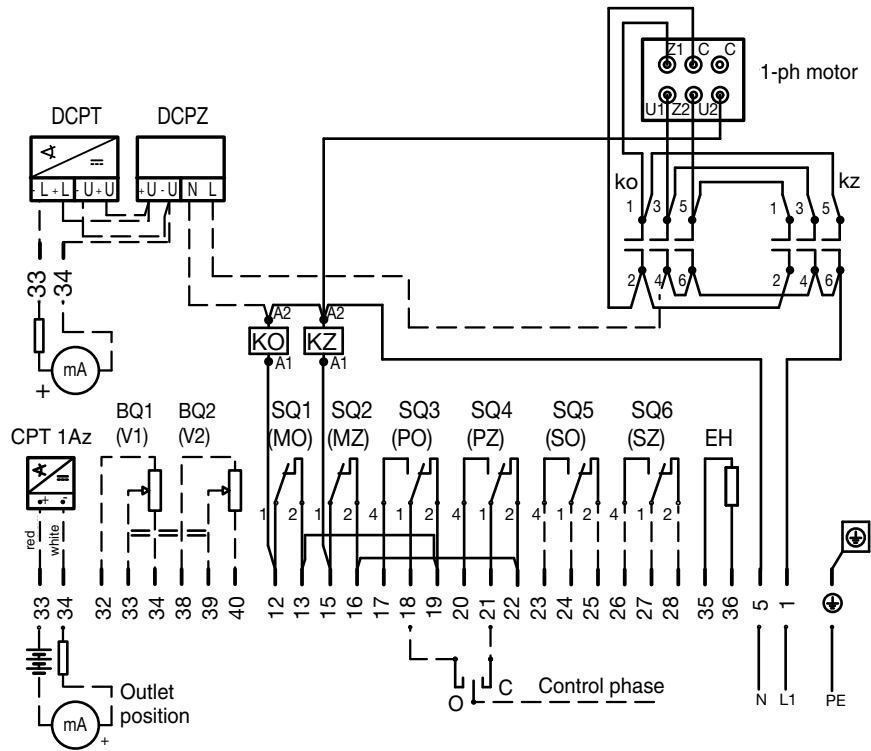


Connection of electric motors of MODACT MONJ Control actuators

– with contactors

– with connector

P0941-E

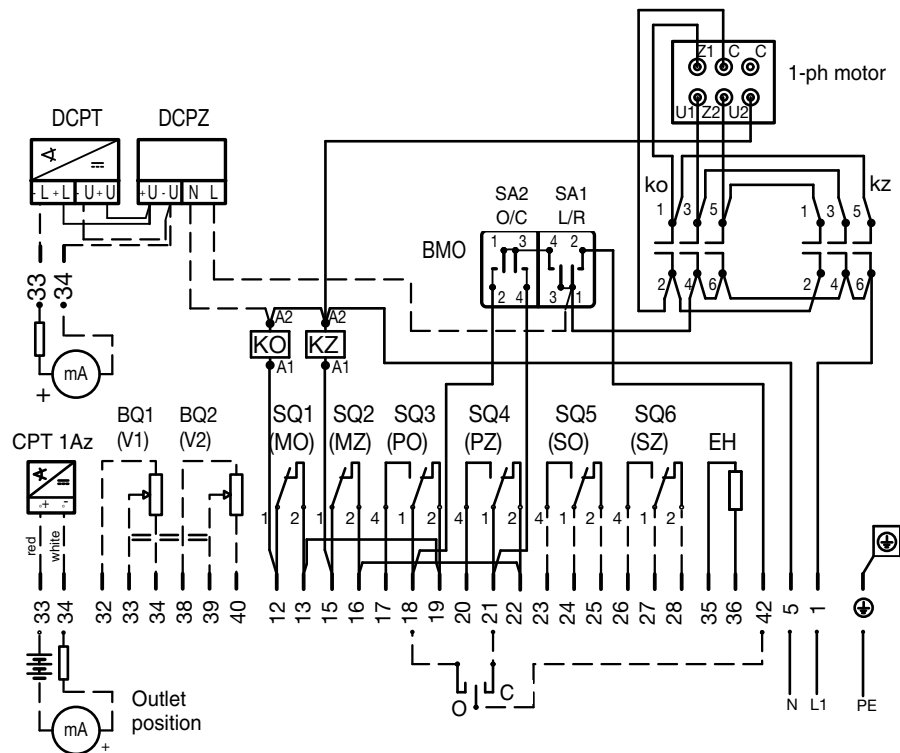


Connection of electric motors of MODACT MONJ Control actuators

– with contactors and BMO

– with connector

P0942-E

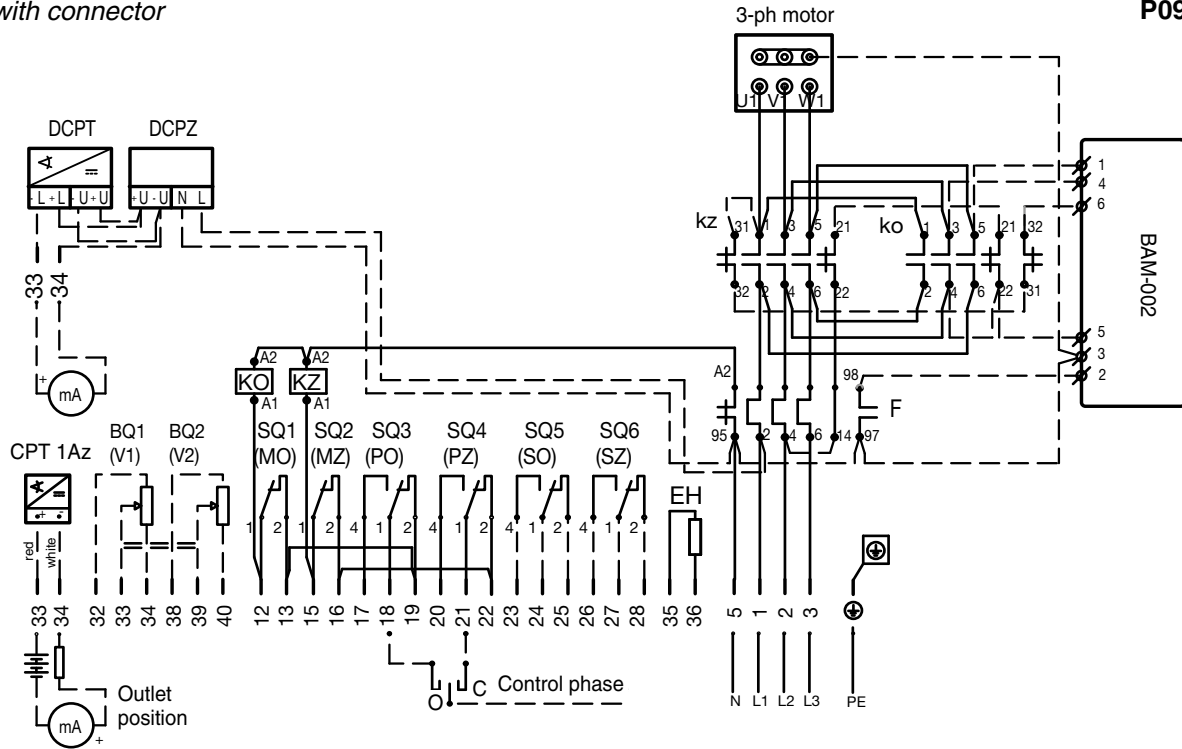


Connection of electric motors of MODACT MON, MOP Control actuators

– with contactors

– with connector

P0953

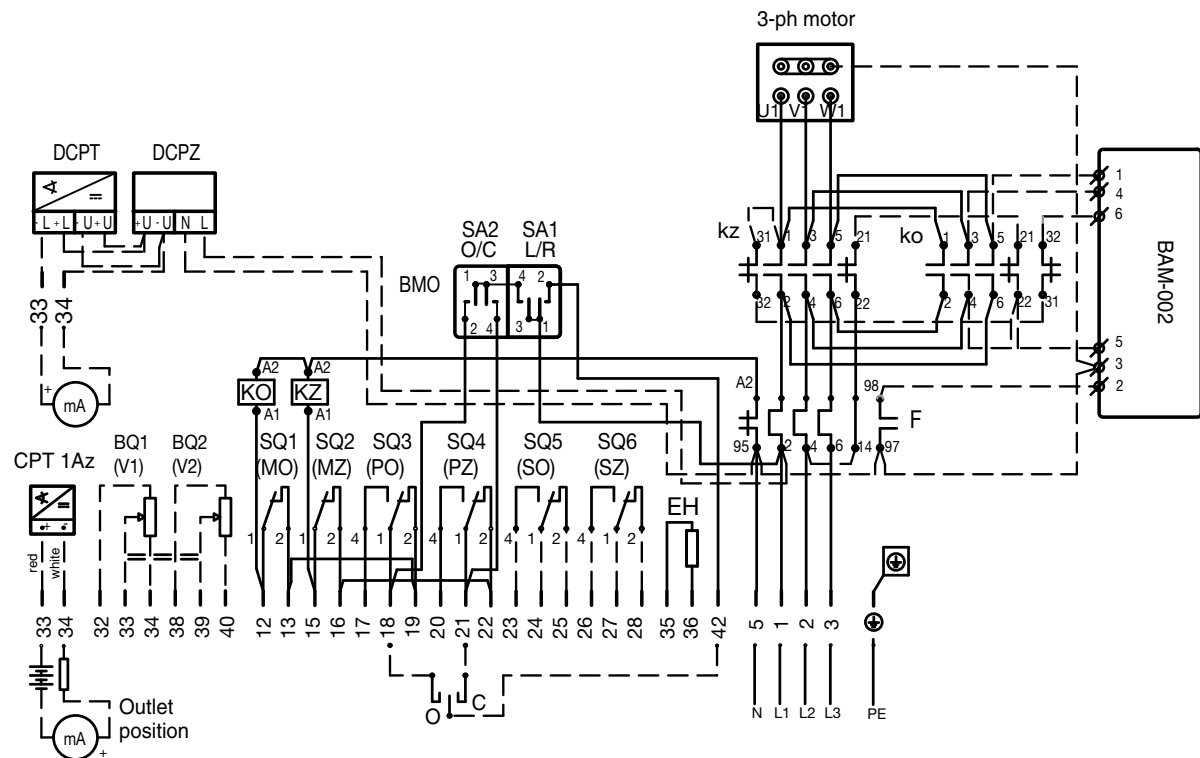


Connection of electric motors of MODACT MON, MOP Control actuators

– with contactors and BMO

– with connector

P0954

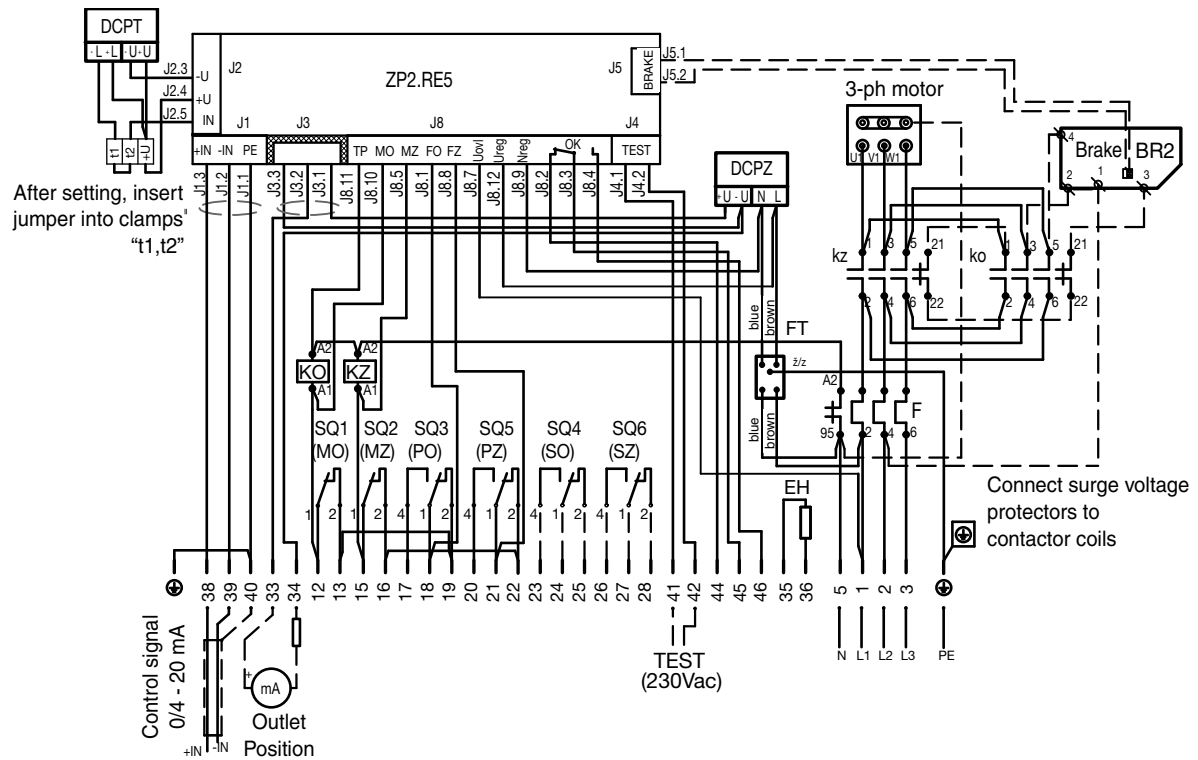


Connection of electric motors of **MODACT MON, MOP Control** actuators

– with contactor and ZP2.RE5 regulator

– with connector

P0955

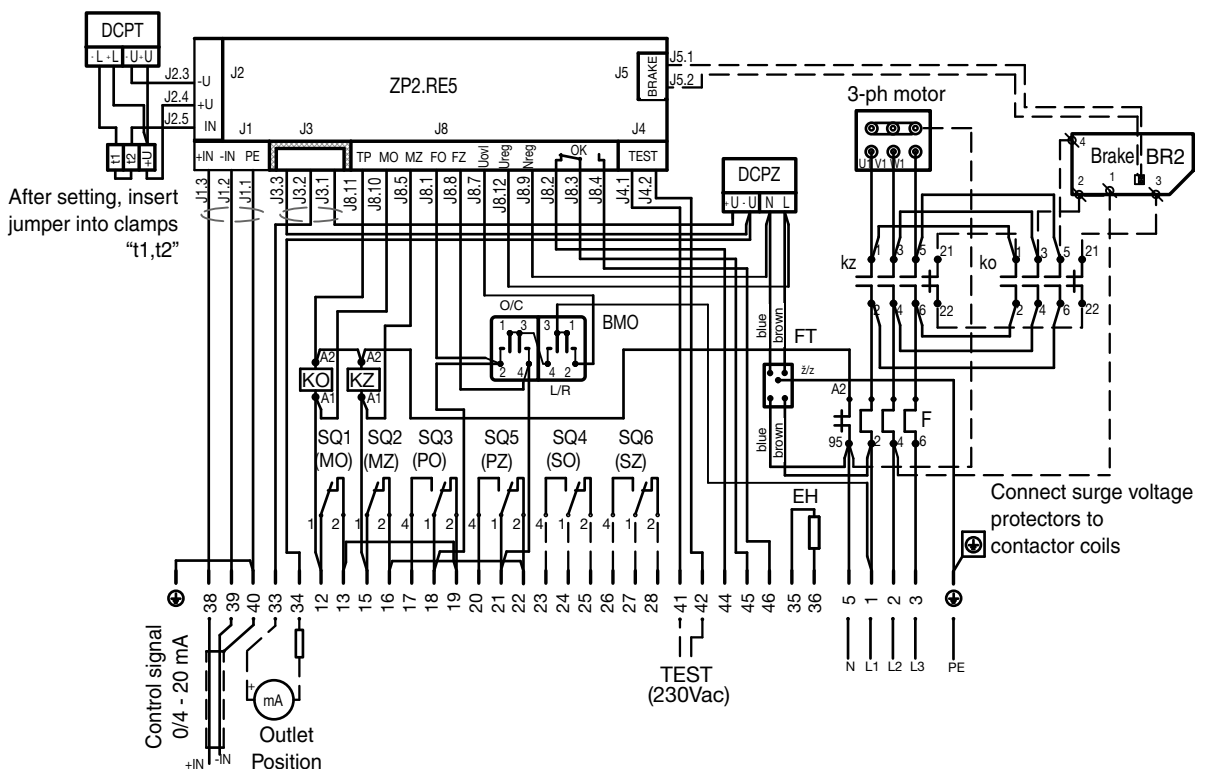


Connection of electric motors of **MODACT MON, MOP Control** actuators

– with contactor, ZP2.RE5 regulator and BMO

– with connector

P0956



List of signals on connectors of ZP2.RE5 regulator

J1 – control signal

J1.1	PE	earthing
J1.2	-IN	control signal -
J1.3	+IN	control signal +

J2 – position sensor

J2.1	+UR	resistance
J2.2	RIN	resistance
J2.3	-UR	resistance
J2.4	+24 V	current
J2.5	IIN	current

J3 – position transmitter

J3.1	+U
J3.2	Iout
J3.3	- U
J3.4	spare

J4 – input TEST (24 V - 230 V)

J4.1	TEST1
J4.2	TEST2

J5 – output of brake

J5.1	brake 1
J5.2	brake 2

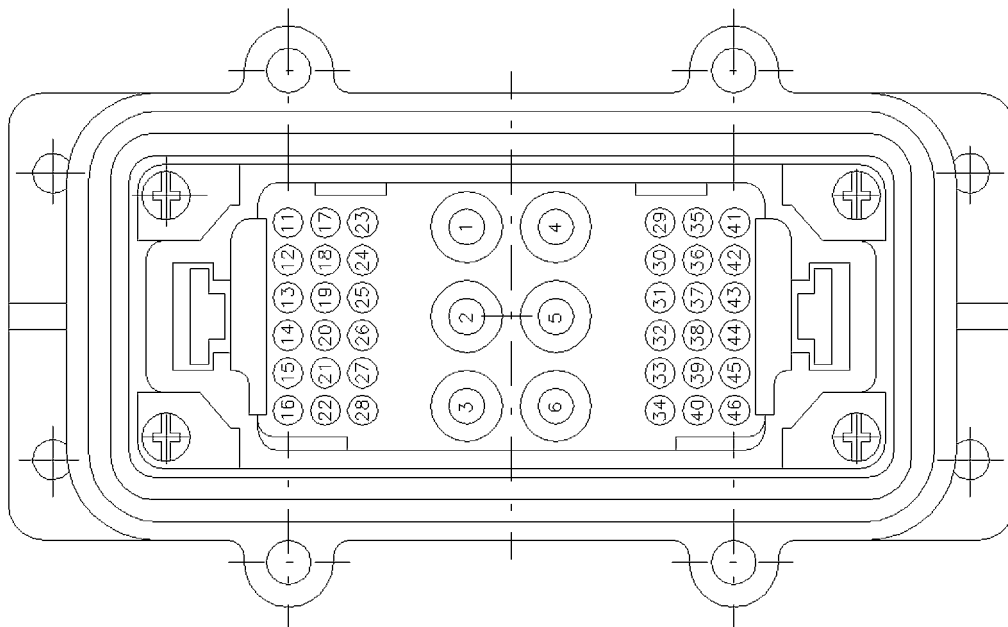
J6 – development

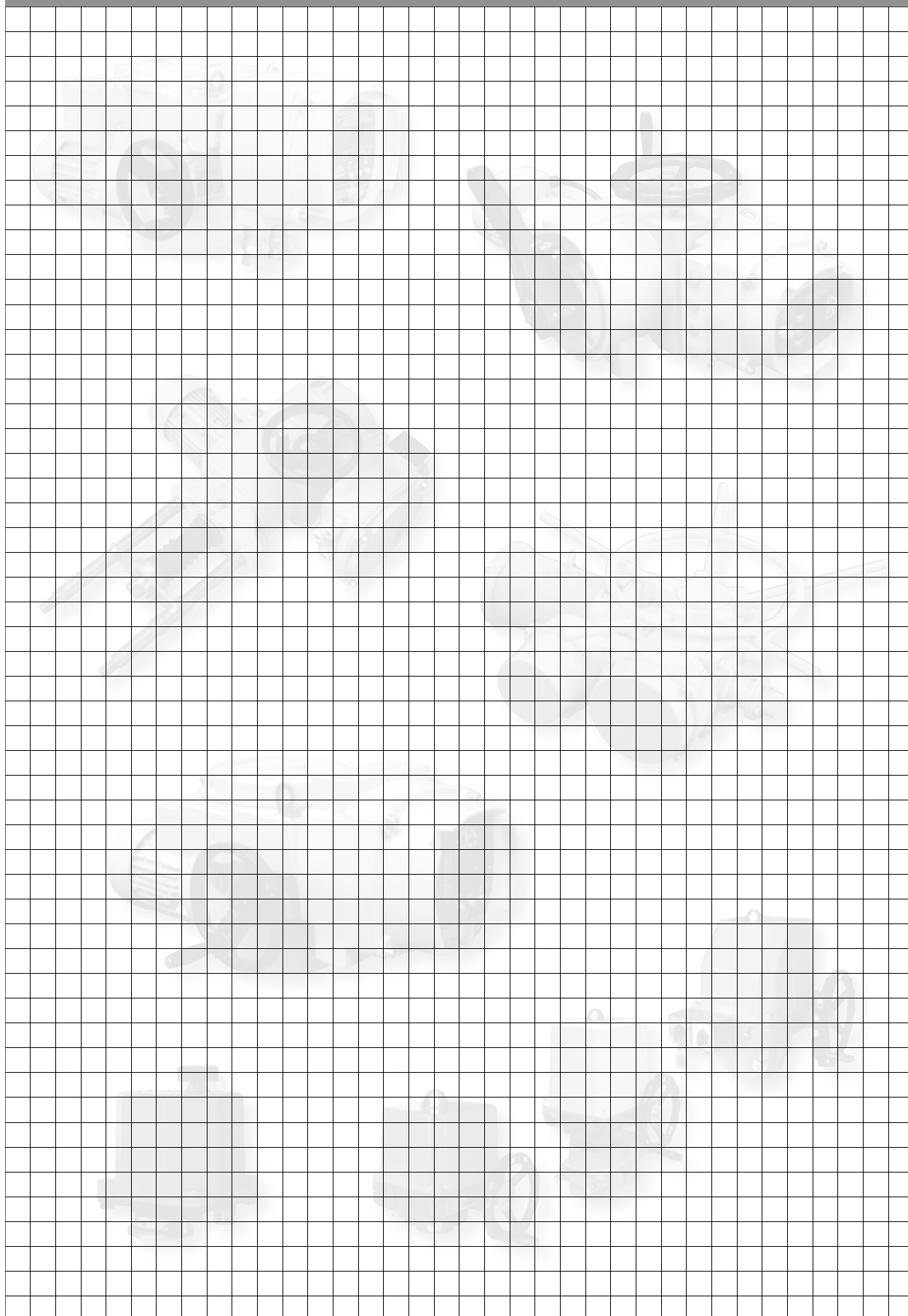
J7 – communication

J8 – power connector

J8.1	FO	control output “opening”
J8.2	OK	contact relay OK (<i>NO</i>)
J8.3	OK	contact relay OK (<i>COM</i>)
J8.4	OK	contact relay OK (<i>NC</i>)
J8.5	MZ	control input “closing”
J8.6	N	spare
J8.7	UOVL	phase 230 V for control outputs FO, FZ
J8.8	FZ	control output “closing”
J8.9	N	supply of reg. 230 V (<i>N</i>)
J8.10	MO	control input “opening”
J8.11	TP	control input “thermal relay”
J8.12	UREG	supply of reg. 230 V (<i>L1</i>)

Connector







Development, production and services of electric actuators and switchboards.
Top-quality sheet-metal processing (TRUMPF equipment), powder paint shop.

SURVEY OF PRODUCED ACTUATORS

KP MINI, KP MIDI

Electric rotary (90°) actuators (up to 30 Nm)

MODACT MOK, MOKED, MOKP Ex, MOKPED Ex

Electric rotary (90°) actuators for ball valves and flaps

MODACT MOKA

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 KONSTANT, MPSED

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

MODACT MTN, MTP, MTNED, MTPED

Electric linear thrust actuators with a constant output speed

Deliveries of assembled actuator + valve (or MASTERGEAR gearbox) combinations



ZPA Pečky, a.s.
tř. 5. května 166
289 11 PEČKY, Czech Republic
www.zpa-pecky.cz

tel.: +420 321 785 141-9
fax: +420 321 785 165
+420 321 785 167
e-mail: zpa@zpa-pecky.cz