ZPA PEČKY, a.s.

Electric actuators

MODACT MON / MOP CONTROL
Type nos. 52 030 – 52 036.xxxxN5

MODACT MTN / MTP CONTROL
Type nos. 52 442 – 52 443.xxxxN5

MODACT MPS CONTROL
Type nos. 52 261 -52 266

TABLE OF CONTENTS

Diagram of electric wiring

Electric actuator	Motor	Actuating	Regulator	Connecting	
				terminal board	connector
MONJ	1 - phase	-	-	**P0913-E**	**P0941-E**
		BMO	-	**P0914-E**	**P0942-E**
MON, MOP		-	-	**P0947**	**P0953**
MTN, MTP	3 - phase	BMO	-	**P0948**	**P0954**
MPS		-	ZP2RE5	**P0949**	**P0955**
52 261 - 52 266		BMO	ZP2RE5	**P0950**	**P0956**

In case of technical data of electric actuators **MODACT MON, MOP, MONJ, MTN, MTP, MPS Control** not given in this Supplement, the provisions of the Installation Instructions of **MODACT MON, MOP, MONJ, MTN, MTP, MPS** apply.

1. GENERAL

As compared with the classical actuators, the electric actuators **MODACT MON, MTN , MPS** in the version Control are fitted with control circuits that need not be installed into switchboards and interconnected externally. Their interconnection is incorporated in the actuator. In this way, a group of actuators can be fed by single three-phase distribution.

The actuator of version Control always includes the element of motor switching (contactors, contact-less) and, optionally, it can also be fitted with the regulator ZP2RE5, electro-dynamic brake, local control block BMO and position transmitter.

These elements are mounted in the terminal box of the actuator. Standard elements of the mechanical board remaining in the control box are torque- and position-limit, and signalling switches, torque blocking, and position transmitter.

Power conductors 3 x 400 V and signal conductors from the superior system are introduced through cable bushings to the actuator terminal board or, optionally, they are connected by the connector Harting.

1.2. ELECTRIC OUTFIT

1.2.1. Switching of electric motor

The actuators in variants Control are fitted with built-in reversing contactor combinations. These are assembled of two contactors and an over-current relay. The combination also includes mechanical blocking that prevents both contactors from being closed at the same time. This could, for instance, happen in case of wrong connection of jumpers on the terminal board. The blocking is not dimensioned for long-term action. The over-current relays protects the electric motor against over-loading and is dimensioned with respect to its output. According to the actuator version, the contactors are controlled by the regulator, change-over switch of local control or external input. Control voltage is 230 V / 50 Hz as a standard; it is supplied via contacts of position and/or moment micro-switches. Thus, these micro-switches need not be led out of the actuator.

1.2.2. Dynamic brake

The brake is an optional accessory to the actuators MON Control. After opening the contactor, it induces dynamic braking moment in the electric motor lasting for several tenths of second. It reduces dramatically the run-down time and regulation is thus more precise. When the actuator is in a standstill no braking moment is exerted.

The actuators without regulator are fitted with autonomous brake **BAM-002.** For its function, it requires auxiliary contacts of the contactors and auxiliary contact of the over-current relay. It is dimensioned for electric motors 3 x 230 / 400 V, output up to 550 W.

The actuators with regulator ZP2RE5 are fitted with simpler controlled brakes **BR2.** They are interconnected with the regulator that provides impulse for action.

According to the electric motor output, corresponding variant is chosen:

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

If outputs higher than 2.2 kW are to be braked, electric motors of special version with an electromagnetic brake should be used.

1.2.4. Feedback position transmitter

Position transmitters are optional accessories of the actuators.

For actuators without regulators, resistance transmitter (2 x 100 ohm), current passive transmitter 4 – 20 mA (CPT1), or current active transmitter 4 – 20 mA (DCPT+DCPZ) can be chosen.

For actuators with regulator ZP2RE5, transmitter 0/4 – 20 mA brought out from a connector of the regulator J3 can be used. The transmitter is galvanic-isolated from other circuits of the regulator and fed from the source DCPZ.

1.2.5. Regulator ZP2.RE5

a) Description

The basic part of the regulator ZP2.RE5 is a microcomputer with control program, programmed in its internal memory. The microcomputer includes A/D converters for processing the control and feedback signals. The regulator provides for automatic setting of the actuator output shaft depending on the value of the current control signal. The

regulator compares the value of the control signal with the value of the feedback signal from the position transmitter. In case a regulating deviation is found, the regulator activates the output signals FO or FZ controlling the actuator run until the output shaft is set into the position corresponding to the control signal value.

Note: *The regulator sets the position; however, it does not influence the rate of resetting. This is given by the type and version of the actuator.*

The regulator also monitors some process states and signalizes detected failures.

The regulator parameters can be set by the push-buttons SW1 and SW2, and/or by the computer with service program. The computer is connected via a communication module to the connector J7. The set parameters are stored in the memory of the EEPROM type, so that switching off the feeding voltage does not damage the memory content.
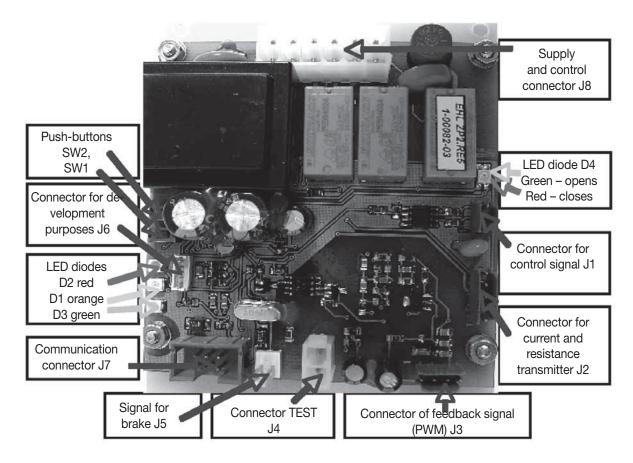

Fig.1 - *ZP2.RE5 overall view*

b) Technical parameters

Feeding voltage:	230 V + 10% -15%, 50 – 60 Hz
Regulator linearity:	0.5 %
Regulator insensitivity:	1 – 10 % (adjustable)

Input signals – double-value (N / 230 V):

U_{DRIVE}	Control phase for outlets FO, FZ, protected by fuse F 1.6 A
TEST1,2	Activation of regime TEST
MO, MZ	States of actuator limit switches
TP	Condition of motor thermal protection

Input signals - analog:

Control signal:	0/4 – 20 mA
Feedback signal:	Current transmitter 4 – 20 mA
	(for instance DICONT CPT1)

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Output signals - double-value:

FO, FZ	Control phase, closing contacts of relay 5A / 230V
Relay OK	Signalization of failure, change-over contact 5A / 230V
BRAKE	Control signal of brake

Output signal - analog:

Signalization of position	Galvanic-isolated passive transmitter 0/4 – 20 mA, external feeding 15 – 30 V, load impedance max 500 ohm.

Signalization:

D1 (yellow)	setting / failure message
D2 (red)	setting / failure message
D3 (green)	feeding
D4 (green)	drive opens
D4 (red)	drive closes

Error messages: Regime TEST
Control signal missing (only when signal 4 – 20 mA is used)
Actuator was switched off by limit switch in other than limit position
Error of position sensor
Thermal protection of motor TP activated
Actuator is under local control

Response to failure:

Regime TEST	Error message + actuator into position according to setting **P2**
Error in control signal	Error message + actuator into position according to setting **P2**
Error in position sensor	Error message + actuator stop
Failure of thermal protection	Error message + actuator stop

Adjustable elements: communication connector (for connection to PC) 2x push-button for setting parameter without computer

Range of working temperatures: -25 °C to +75 °C
Dimensions: 75 x 81 x 25 mm

1.3. CONNECTION OF REGULATOR

In the factory, the actuators **MODACT Control** with the position regulator ZP2.RE5 are wired and tested with the position feedback and, therefore, they are stable. If the actuator is in its balanced position and is deflected from this position by an external action (for instance, by a hand-wheel) the regulator brings it automatically back to this position.

In case the actuator is connected to the sequence of phases opposite to that for which it has been set and tested, its behaviour will become instable. The output shaft is shifted into either of its limit positions and, on reaching it, the actuator is not switched off as, in this case, the limit micro-switch acts on the contactor for motion in the opposite direction. The valve is thus exposed to the maximum torque that the electric motor is able to exert. The load lasts until the motor is switched off by the thermal relay. The acting torque is higher than the set rated torque and the valve or the actuator can be damaged.

After the actuator is connected to feeding voltage, it is always necessary to check whether it is stable and regulates in a required sense, and whether the drive is correctly switched off by pertaining limit micro-switches,

If the actuator is instable it should be immediately stopped, for instance, by changing the local control block BMO "Local"/"0"/"Remote" to the position "O". If the actuator is not fitted with BMO the motor can be stopped by pressing the red push-button O/l on the thermal protection. With certain types of protections, the motor will only stop for the time when the push-button is pressed down. After releasing, it will restart.

ATTENTION! Even after this stopping, the actuator circuits are under voltage. Before any works on the actuator, the feeding voltage must be switched off!!

The change in the phase sequence causing instable behaviour can also happen during repairs and modifications in the distribution of three-phase voltage for feeding actuators!

1.4. REGULATOR SETTING

For an error-free function of the regulator, the limit switches of the actuator must first be set and connected into the control circuit, and the position sensor must be adjusted. If torque-limit switches are used as limit switches make sure that the actuator is able to exert required tripping torque.

Only then, can the regulator be set and Auto-calibration carried out. Auto-calibration of the actuator should be accomplished on a valve installed in the piping already filled with a process medium. After filling the process medium into the piping, properties of the system could change in such a way that Auto-calibration would have to be repeated.

1.4.1. Adjustable parameters

The regulator parameters can be set by the push-buttons and/or with the computer.

In case of the push-button setting, it is possible to set the following parameters (see Fig. 2 Graphical representation):
- Current control signal **(P1)**
- Response to signal TEST and loss of control signal **(P2)**
- Insensitivity of regulator **(P3)**
- Regulation method **(P4)**

Using computer, the following parameters can also be set:
- Response of relay OK
- Output current signal of position (increasing, decreasing).
- Extended selection **P2** (Response to signal TEST ...) by the possibility of moving to the set position.
- Extended selection **P4** (Method of regulation) by the possibility of moving to the set position (Opn, Zpn).

The computer can also be used for monitoring activity of the regulator. The service program is described in paragraph 1.7.
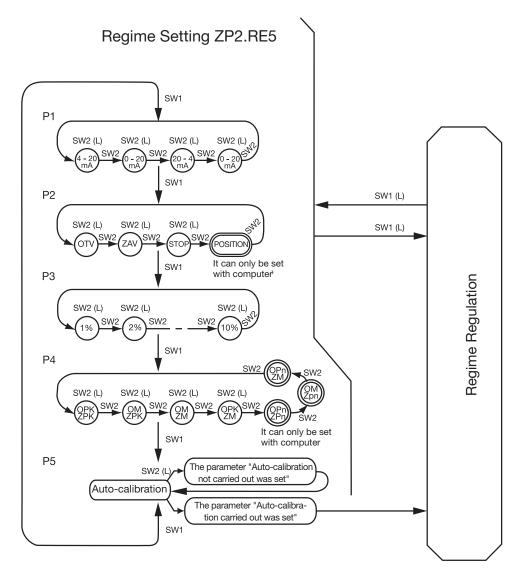

Fig.2 - *Diagram of push-button control.*

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After setting the parameters using the push-buttons or the computer, it is also possible to start the **P5** Auto-calibration. The Auto-calibration is an automatic process during which the regulator scans other necessary parameters and, in case of an error-free operation, will store them in the memory:

- Checking of the position transmitter and sense of rotation of the output shaft;
- Shifting of the shaft to its limit position Open and Closed and recording the values from the position transmitter;
- Measuring of inertia of the shaft for both directions of rotation;
- Finding out and recording of active level of signals TEST and the thermal protection.

Before starting the Auto-calibration, the limit switches (position- and/or torque-) of the actuator must be connected and set, and the position transmitter adjusted. If torque-limit switches are used as the limit switches it must be verified that the actuator is able to exert necessary tripping torque.

The Auto-calibration should always be started after a change in conditions influencing activity of the regulator - for instance, the change in adjusting the limit switches of the actuator or the change in mechanical properties of the valve (tightening of packing, replacement of valve, etc.).

1.4.2. Function of push-buttons SW1 and SW2

With the push-buttons SW1 and SW2, we can carry out all operation settings of the regulator. The push-button SW1 is used for listing through respective parameters and the push-button SW2 for choosing value of a parameter from the options. By long pressing of the push-button SW2, the chosen value of the parameter is stored in the memory. Long pressing of the push-button SW1 changes the regimes Regulation and Setting. The procedure is shown in the Graph; the parameters are described in the table in par. 1.4.3. and 1.4.4.

Abbreviations used:

Short pressing of the push-button:
SW1   Cyclic choice of parameters **P1 – P5**
SW2   Cyclic listing through values of selected parameter

Long pressing of the push-button, until both warning lights D1 and D2 lit up (ca 2 s):
SW1 (L)   Switching-over between the regimes Setting and Regulation.
SW2 (L)   Storing of selected values of the parameters **P1 – P4** into memory.
In **P5**, it has a function of starting the Auto-calibration.

1.4.3. Parameters P1 – P4

Parameter	D1 (yellow)	D2 (red)	Value of parameter	Note.
P1 **Control signal**	1x	1x	4 – 20mA	
		2x	0 – 20mA	
		3x	20 – 4mA	
		4x	20 – 0mA	
P2 **Response to signal TEST and to failure**	2x	1x	opens	**Position** cannot be set by push-buttons but only with computer
		2x	closes	
		3x	drive stop	
		4x	moves to position	
P3 **Regulator insensitivity**	3x	1x	1%	
		2x	2%	
		...	...	
		10x	10%	
P4 **Way of regulation**	4x	1x	OPK, ZPK	Oxx open
		2x	OM, ZPK	Zxx closed
		3x	OM, ZM	----------------
		4x	OPK, ZM	xPK limit position
		5x	**OPn, Zpn**	xM torque
		6x	**OM, Zpn**	xPn set position
		7x	**OPn, ZM**	(can only be set with computer)

Notes to the parameter **P4:**

OPK and **ZPK** - Regulation "to position"; the actuator will stop when the control and feedback signals are equal.

OM and **ZM -** Regulation "to torque"; close to the limit values (for the control signal 4 – 20 mA, these are values lower than 4.2 mA and higher than 19.8 mA), the actuator will not stop when the control and feedback signals are equal, but it goes on moving until the particular limit switch is activated. In this way the valve is tightly closed.

OPn and **Zpn -** Set positions; chosen positions into which the actuator is shifted in case of a requirement for full opening or closing. These positions can only be entered with the computer.

1.4.4. P5 - Auto-calibration

The Auto-calibration begins by shifting the position in the direction Open. In order to prevent an error, it is recommended to preset the actuator into an intermediate position (the actuator is not switched off by either of the limit switches) sufficiently remote from the position Open.

Parameter	D1 (yellow)	D2 (red)	Value of parameter	Note
P5 Auto-calibration	5x	no		Here, the name **limit switch** means the switch which has been set by the Parameter **P4**.
	SW2(L)			
	lit up	lit up	A. proceeds without errors	
	5x	3x	A. start at **limit switch,** failure of **limit switch**	
		4x	error in connection of **limit switch**	
		5x	error in connection or faulty current position sensor CPT	
		7x	wrong direction of rotation, R position sensor connected in opposite way	

If **P5** has been chosen the warning light **D1** is blinking 5x, **D2** is off (see the 1st row of the table). By pressing **SW2(L)** the Auto-calibration can be started (see the 2nd row of the table). During the Auto-calibration, **D1** and **D2** are permanently lit on (see the 3rd row of the table) until the process is terminated. If the Auto-calibration has been unsuccessful **D2** informs about the detected error by the number of blinking (see the remaining rows of the table).

After a successful completion, the values of the measured parameters are stored in the regulator memory. The successful Auto-calibration includes two possible procedures:

- Before starting, the parameter "Auto-calibration not carried out" was set (new actuator from the factory or after entering back-up/default parameters); after termination, the warning light **D1** is blinking 5x and **D2** goes off. The regime Regulation is chosen by pressing **SW1(L)**.

- Before starting, the parameter "Auto-calibration carried out" was set; after termination, the warning lights **D1** and **D2** go off and the regulator changes over into the regime Automatic Regulation

1.5. REGULATION REGIME

The actuator responses to changes in the control signal. In case of an error-free operation **D1** and **D2** are off. The regulator signalizes detected errors by the warning light **D2** (see the table) and by activation of the relay OK.

1.5.1. Operation and error messages

Message	D1 (yellow)	D2 (red)	State or type of failure	Note
Operation	no	no	Error-free operation	
Error	no	1x	Regime TEST	After the error has been repaired, the response to the error will cease (as set in P2) and the actuator changes over into the regime Regulation
		2x	Control current 4 – 20mA < 3mA	
		4x	The limit switch in an intermediate position (10 - 90 %) activated*)	
		5x	Error in position sensor	
		6x	TP activated	
		8 – 10x	Incorrect operation data	

*) *Limit switch – position- and/or torque-limit switch connected in such a way that it stops the actuator moving in the given direction. During the operation, the state of the limit switch assigned to the selected sense of rotation is monitored. If this switch trips the actuator in a position different from the limit one (as determined during the Auto-calibration), the regulator will evaluate it as an error. This error can arise, for instance, in case that the torque-limit switch is connected as a limit switch and the valve seizes or jams in an intermediate position during the operation.*

1.5.2. Relay OK

The relay can work in either of the two regimes:
- Combined error; contacts (terminals 36, 37) will close in case of any error
- Error code; contacts (terminals 36, 37) will close always when D2 (red) is lit on - error code blinking

The regimes can only be interchanged with the computer. The regime "Combined error" is usually set in the factory.

In the error-free state, the coil of the relay OK is connected and the contacts connected to the connector J8.3 - J8.2 (terminals 35, 36) are closed. When the regulator responses to a failure the coil of the relay OK is disconnected or being disconnected, and the contacts connected to the connector J8.3 - J8.4 (terminals 36, 37) are closed or being closed.

1.6. AUXILIARY FUNCTIONS

1.6.1. Function Test

By connecting 24 V - 230 V to the terminals 30 and 31, the actuator will shift into a predefined state given by setting of the parameter P2. The actuator will shift to the state given by the parameter P2 also in case of the lost control signal.

1.6.2. Reset

It is applied in case of a suspicion of a software error and for releasing the regulator in an erroneous course of the Auto-calibration. The function Reset consists in short-time switching off the regulator feeding (ca 20 s, to allow for discharging the filtration capacitors in the supply source) and restarting.

1.6.3. Setting back-up parameters

If the regulator comes into a state to be cancelled (for instance, after a larger number of parameters has been changed) the system can be returned to the basic factory setting:

Switch off the regulator feeding

Press **SW1** and **SW2**

Switch on the regulator feeding and hold the push-buttons pressed down until the warning lights **D1** and **D2** lit up (ca 2 s).
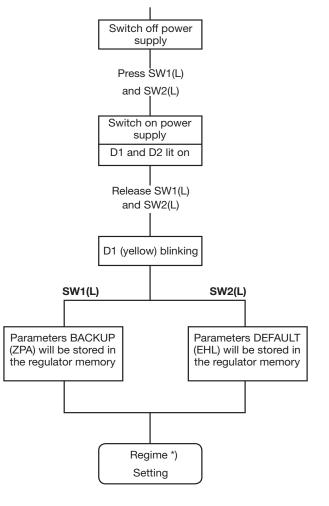
Release the push-buttons and the regulator will transfer to the state when **D1** (yellow) is blinking continuously and **D2** (red) is off.

By pressing the push-button **SW1(L)** until **D1** and **D2** are lit on (ca 2 s) the regulator will change its setting by the stored parameters back-up and, after releasing the push-button, it will transfer into the regime Setting.

By pressing the push-button **SW2(L)** until **D1** and **D2** are lit on (ca 2 s) the regulator will change its setting by the stored parameters DEFAULT, as recommended by the manufacturer of the electronic part and, after releasing the push-button, it will transfer into the regime Setting.

1.6.4. Parameters BACKUP

P1 Control signal	4 – 20 mA	
P2 Response to TEST	stop	
P3 Insensitivity	2 %	
P4 Type of regulation	OPK, ZPK	
Function of relay OK	combined (!! can only be changed with computer!!)	
Level of signal TEST	active 0 (!! can only be changed with computer!!)	
Level of signal TP	active 1 (!! can only be changed with computer!!)	
Signalization of position	increasing	

Note*):

The parameter "Auto-calibration not performed" will be stored in the memory together with the new parameters. This results in the fact that the regime Setting cannot be abandoned before the Auto-calibration is performed (see Fig. 2 Graphical Representation, page 6). It is necessary to select the menu P5 and press SW2(L). After termination of the Auto-calibration, the regime Regulation can be entered by pressing SW1(L).

1.7. SERVICE PROGRAM ZP2RE5

Main window of the program

Monitoring - display of operation data of the drive with regulator

Parameters - display of the regulator parameters, storing of default or back-up parameters and starting ofAuto-calibration

Bottom status line

- state of communication with the regulator and set serial port
- version of the regulator firmware
- serial number of drive and date of the regulator assembly to the drive
- serial number and date of production of the regulator
- service mode of the program

Program menu

File - work with parameters

Open - reading parameters from the file and their display in the window Service

Stor - reading actual parameters from the regulator and their storing in the file

Print - reading actual parameters from the regulator and their print

End - termination of program

Motor - control of the drive motor

Service - overview of the regulator parameters

(their change and record in the service mode)

Importance of parameters is given in the program Help.
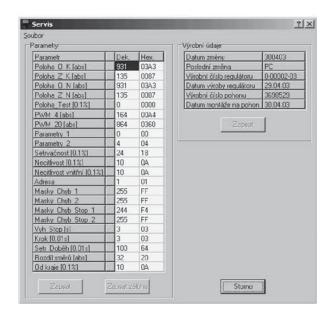
Setting - parameters of the program (language, serial port, regulator address)

Help - calling of context-sensitive help and information on the program.

More detailed information on respective data and control components in the program windows can be obtained by:

- pressing Shift + F1;
- choosing the item "What is it?" in the Help menu;
- pressing the right push-button of the mouse above the selected component;
- pressing the question mark on the upper bar of the windows followed by clicking the left push-button of the mouse with cursor (question mark) on selected data.

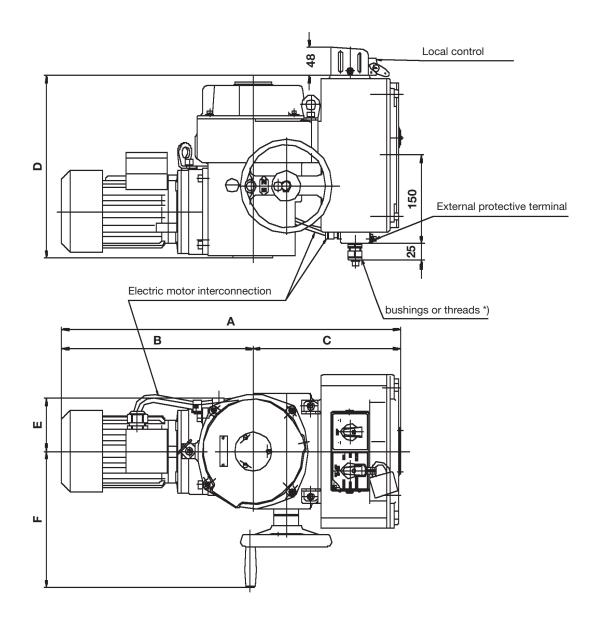# List of signals on connectors of regulator ZP2RE5

J1 - control signal

J1.1	PE	additional 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	not used	

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 outlet "open"
J8.2	OK	contact of relay OK (NO)
J8.3	OK	contact of relay OK (COM)
J8.4	OK	contact of relay OK (NC)
J8.5	MZ	checking input "close"
J8.6	N	not used
J8.7	UCTL	phase 230 V for control outlets FO, FZ
J8.8	FZ	control outlet "close"
J8.9	N	regulator feeding 230 V (neutral)
J8.10	MO	checking input "open"
J8.11	TP	checking input "thermal relay"
J8.12	UREG	regulator feeding 230V (phase)

Differences in versions of contactor combinations

MC1A301AT   and   11MC9

1) Marking of auxiliary tripping contacts.

For the contactors MC1A, they are marked 21, 22 and 31, 32.
For the contactors 11MC9, they are marked 11, 12 and 61, 62.

2) Connection of phase to the auxiliary tripping contact.

For the combination MC1A of the firm GE, internal interconnection F(14) is used – contact (22) and

external interconnection F(4) - F(14).

The combination 11MC9 of the firm Lovato has no internal interconnection and the external connection is F(4) – contact (12).

The differences will only be evident in the variants with the dynamic brake that utilizes these contacts.

Location and dimensions of the terminal box
(MODACT MON Control)

48

Local control

D

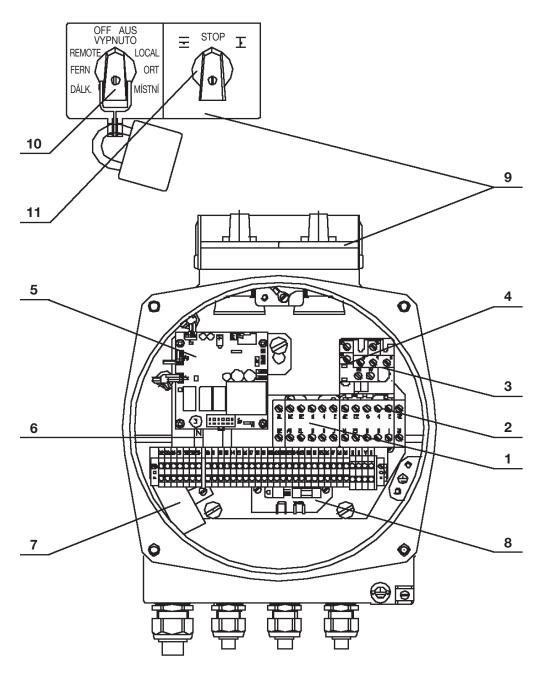150

External protective terminal

25

Electric motor interconnection

bushings or threads *)

A

B

C

E

F

Type 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

The dimensions are in millimetres. The given dimensions are maximal.

Note:

*) - The actuators Control in protective enclosure IP 55 (MODACT MON, MONJ, MTN, MPS)
   are supplied without cable bushings – the bushings are available on request
   (the threads in the therminal board: 3 x M20 x 1,5; 1 x M25 x 1,5).

   - The actuators Control in protective enclosure IP 67 (MODACT MOP, MTP) are always supplied
   with cable bushings (3 x M20 x 1,5; 1 x M25 x 1,5).*

Terminal box
(variant with regulator ZP2.RE5 and brake ZP3-BR)

Note: *Setting out of the terminal box, number and marking of terminals differs according to specific version of the actuator.*

Legend

(1) KO - contactor for direction "open

(2) KZ - contactor for direction "close"

(3) F - thermal relay

(4) I/0 - testing push-button

(5) ZP2.RE5 - electronic position regulator

(6) GS - source of galvanically separated output signal

(7) FT - supply mains filter

(8) BR2 - dynamic brake, controlled

(9) BMO - local control block

(10) M/D - change-over switch "Local/"0"/"Remote"

(11) OTV/ZAV - change-over switch „Open"/"0"/"Close"

Legend to wiring diagrams MODACT Control:

SQ1 (MO)	- torque-limit switch for direction "open"	BMO	- block of local control
SQ2 (MZ)	- torque-limit switch for direction "close"	SA1 (M/D)	- change-over switch Local / 0 / Remote
SQ3 (PO)	- position-limit switch for direction "open"	SA2 (OTV/ZAV)	- change-over switch Open / 0 / Close
SQ4 (PZ)	- position-limit switch for direction "close"	BQ1, BQ2 (V1, V2)	- resistance position transmitter
SQ5 (SO)	- signalling switch for direction "open"	CPT1	- current position transmitter analag-adjustable
SQ6 (SZ)	- signalling switch for direction "close"	DCPT	- current position transmitter digital-adjustable
KO	- contactor for direction "Open"		
KZ	- contactor for direction "Close"	DCPZ	- power-supply source of position transmitterr
F	- thermal relay		
BAM-002	- dynamic brake non-controlled	EH	- anti-condensation heater
BR2	- dynamic brake controlled		

Optional accessories:

Block of local control BMO

Position transmitter   - resistance V1, V2
                              - current passive CPT1
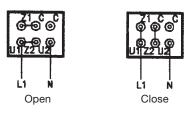   - current active DCPT + DCPZ
                              - without transmitter
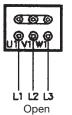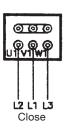
Signalling switches SO, SZ

Electric motors used:

The actuators **MODACT MONJ 52 030 – 52 032 Control** are fitted with single-phase electric motors switched by built-in contactors.

1-phase motor

Open   Close

3-phase motor

The actuators **MODAT MON, MOP 52 030 – 52 036, MTN, MTP 52 442 – 52 443,** and **MPS 52 261 – 52 266** Control are fitted with three-phase electric motors switched by built-in contactors or, in addition, controlled by regulator ZP2RE5..
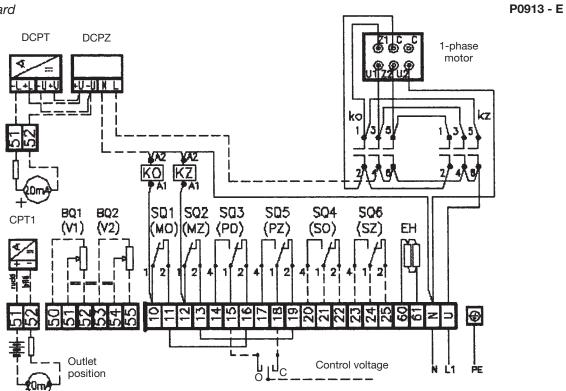

Open   Close

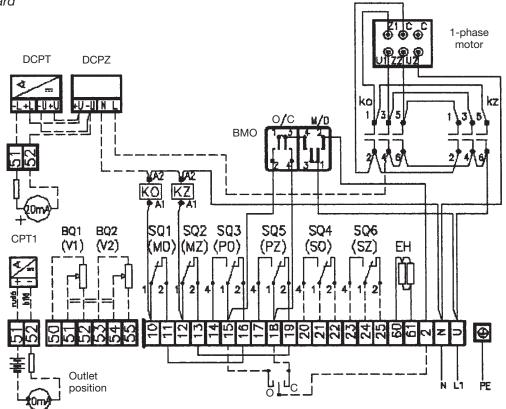# Wiring diagram of **MODACT MONJ Control** electric actuators
- contactors

- terminal board

P0913 - E

DCPT DCPZ

1-phase motor

Z1 C C
U1 Z2 U2

ko   kz
1 3 5   1 3 5
2 4 6   2 4 6

KO KZ
A2 A2
A1 A1

51
52

20mA

CPT1

BQ1 (V1) BQ2 (V2) SQ1 (MO) SQ2 (MZ) SQ3 (PD) SQ5 (PZ) SQ4 (SO) SQ6 (SZ) EH

1 2 1 2 4 1 2 4 1 2 4 1 2 4 1 2 4 1 2

51 52 | 50 51 52 53 54 55 | 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 60 61 N U | PE

20mA

Outlet position

O C   Control voltage

N L1 PE

Wiring diagram of **MODACT MONJ Control** electric actuators
- contactors and block of local control

- terminal board

P0914 - E

DCPT DCPZ

1-phase motor

Z1 C C
U1 Z2 U2

ko   kz
1 3 5   1 3 5
2 4 6   2 4 6

O/C   M/D
BMO
1 3   3
2 4   3 1

KO KZ
A2 A2
A1 A1

51
52

20mA

CPT1

BQ1 (V1) BQ2 (V2) SQ1 (MD) SQ2 (MZ) SQ3 (PD) SQ5 (PZ) SQ4 (SO) SQ6 (SZ) EH

1 2 1 2 4 1 2 4 1 2 4 1 2 4 1 2 4 1 2

51 52 | 50 51 52 53 54 55 | 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 60 61 2 N U | PE

20mA

Outlet position

O C

N L1 PE

15

Wiring diagram of **MODACT MONJ Control** electric actuators
- contactors

- connector

1-phase motor

DCPT DCPZ

CPT1

BQ1 (V1) BQ2 (V2) SQ1 (MO) SQ2 (MZ) SQ3 (PO) SQ4 (PZ) SQ5 (SO) SQ6 (SZ) EH
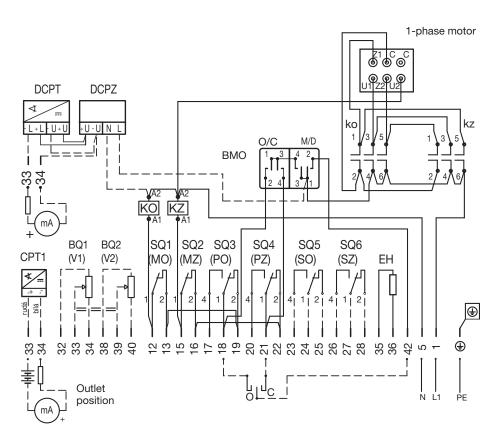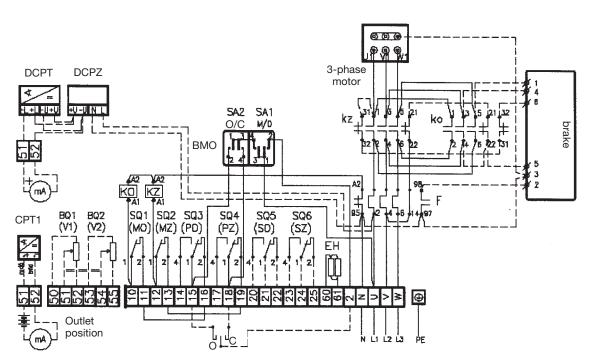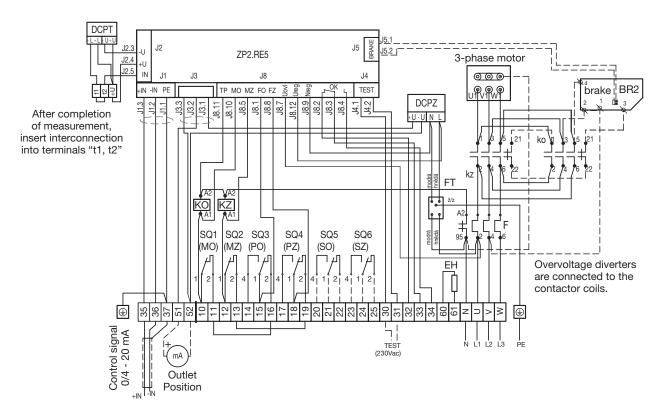
Outlet position

Control voltage

N L1 PE

Wiring diagram of **MODACT MONJ Control** electric actuators
- contactors and block of local control

- connector

P0942 - E

1-phase motor

DCPT DCPZ

BMO O/C M/D

CPT1

BQ1 (V1) BQ2 (V2) SQ1 (MO) SQ2 (MZ) SQ3 (PO) SQ4 (PZ) SQ5 (SO) SQ6 (SZ) EH

Outlet position

N L1 PE

16

Wiring diagram of **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control** electric actuators
- contactors

Wiring diagram of **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control** electric actuators
- contactors and block of local control

Wiring of electric actuators **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control,**
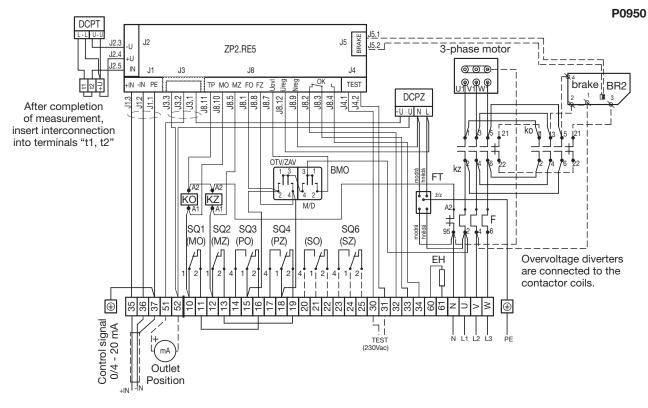### - with contactors and regulator ZP2RE5

- terminal board

P0949

Wiring of electric actuators **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control,**
- with contactors, BMO and regulator ZP2RE5

- terminal board

P0950

18

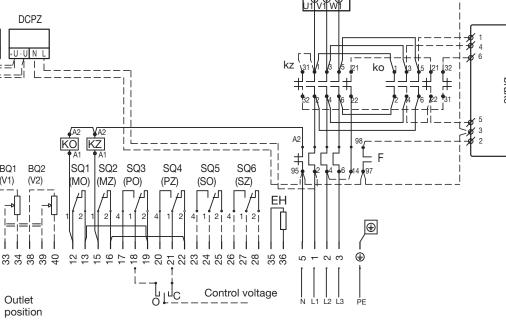Wiring diagram of **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control** electric actuators
- contactors

- connector

3-phase motor

P0953

Control voltage

Outlet position

Wiring diagram of **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control** electric actuators
- contactors and block of local control

- connector

P0954

3-phase motor

Outlet position

Wiring of electric actuators **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control,**
– with contactors, regulator ZP2RE5
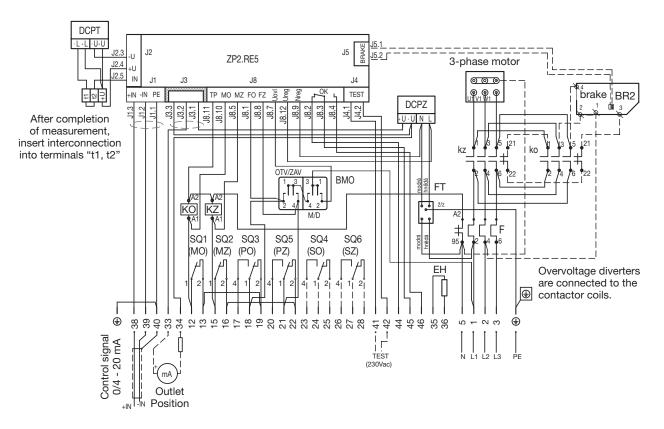
- connector

Wiring of electric actuators **MODACT MON, MOP, MTN, MTP, MPS 52 261-6 Control,**
– with contactors, BMO and regulator ZP2RE5
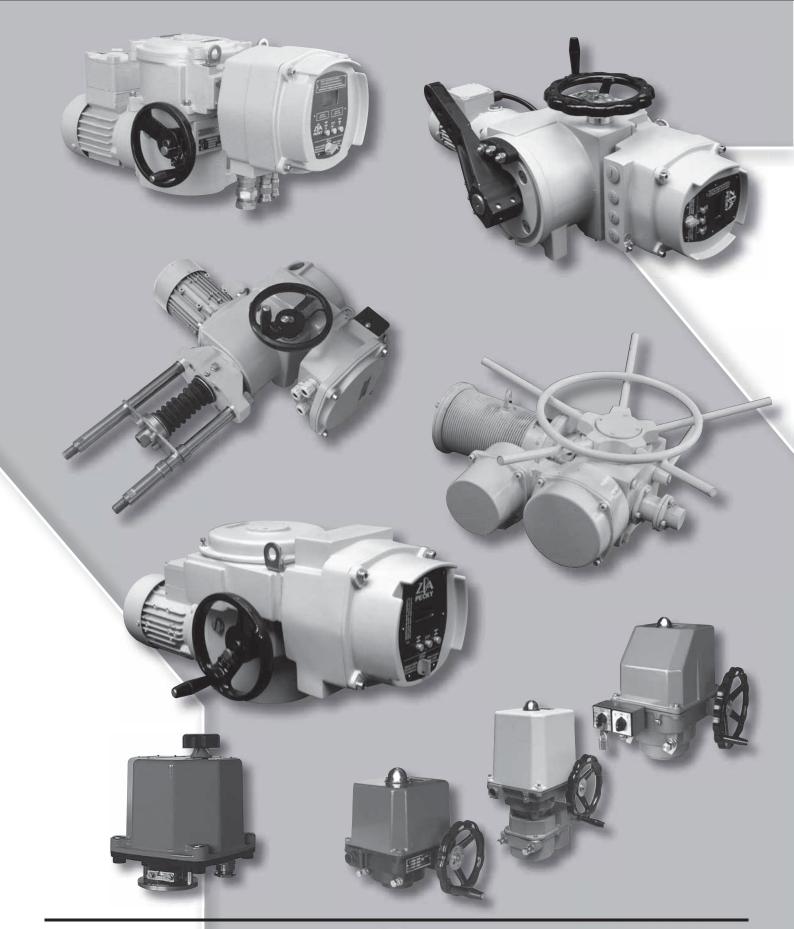
- connector

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Spare parts for **MODACT MON, MOP, MTN, MTP Control** electric actuators

As compared with the actuators MODACT MON, MOP, MTN, MTP the version Control includes the following extra spare parts:

	Name		Type	Storage number
ZPA	Electronic regulator		ZP2.RE5	2339610003
ZPA	Supply mains filter		Filtana TS8111422	2339610076
ZPA	Feeding source GS		ZPT01	2340510394
ZPA	Dynamic brake non-controlled		BAM 002	2334510008
ZPA	Brake		BR2 550	2339610124
ZPA	Brake		BR 2,2	2339610142
ZPA	Resistance		TR342 68R	2337110355
GE	Auxiliary contact of contactors		MACL101AT	2335821062
GE	Thermal relay 0,26 – 0,43A	*)	MT03C	2335821066
GE	Thermal relay 0,43 – 0,65A	*)	MT03D	2335821067
GE	Thermal relay 0,65 – 1A	*)	MT03E	2335821068
GE	Thermal relay 0,85 – 1,3A	*)	MT03F	2335821069
GE	Thermal relay 1,1 – 1,6A	*)	MT03G	2335821070
GE	Thermal relay 1,35 – 2A	*)	MT03H	2335821063
GE	Auxiliary contact of thermal relay		MATV10AT	2335821064
Lovato	Contactor		11MC9.01	2335821006
Lovato	Mechanical blocking of contactors		11G321	2335821080
Lovato	Auxiliary contact of contactors		G320-1	2335821079
Lovato	Thermal relay 0,3 – 0,5A	*)	11RF9.05	2335826182
Lovato	Thermal relay 0,45 – 0,75A	*)	11RF9.075	2335826183
Lovato	Thermal relay 0,6 – 1A	*)	11RF9.1	2335826184
Lovato	Thermal relay 0,9 – 1,5A	*)	11RF9.1V5	2335826185
Lovato	Thermal relay 1,4 – 2,3A	*)	11RF9.2V3	2335826188

*) depending of the electric motor power

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