



CE

INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS



Electric part-turn actuators MP 52 200

TEST CERTIFICATE

ELECTRIC PART-TURN ACTUATOR MP 52 200	
Type number 52 200	Power supply .....V .....Hz
Serial number	Rated torque .....Nm
Production year	Switching-off torque .....Nm
Wiring diagram	Operation time .....s/90°
	Operation angle°
	Transmitter (potentiometer)
Serial number of electric motor	
Serial number of transmitter	
Serial number of position controller	
Tests made in accordance with TP 74 0787 00	
Tests made by	
Date	Signature and stamp

COMPLETENESS CERTIFICATE

Used valve.....	
Assembled by: Firm.....	
Name	
Warranty period months	
Date	Signature and stamp

INSTALLATION CERTIFICATE

Location	
Installed by: Firm	
Name	
Warranty period..... months	
Date	Signature and stamp

*Please read these instructions carefully before mounting and operating
the actuator.*

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The Mounting, Service and Maintenance Instructions (TI) are designed to inform service staff about the design and operation principles of the part-turn electric actuators, their basic technical specifications, and they serve as a guide during installation and usage.

Because of permanent strength to improve the actuators their design can be changed with changes not included into this version of TI.

1. Description

1.1 Purpose and Operation

The part-turn electric actuators MP 52 200 (of general purpose) are designed for remote and local control of a closing valve built into piping. They can be installed indoor and also in outdoor sheltered places.

EA of MP types for automotive control of regulating bodies in both directions of their movement. They can be equipped with means of measuring and control of technological processes where an unified analogue direct current or voltage signal is an information bearer on their input and/or output. They can be used in heating, energy, gas, air-conditioning and other technological systems, which they are suitable for, regarding their features. They are connected with controlled devices with a lever



It is forbidden to use EA as a lifting mechanism!
Switching of actuator by a semiconductor switches have to be consulted with producer

1.2 Safety instructions

Characteristics of the Product Regarding Its Exposure Rate

EA of the MP type in accordance with the characteristics stated in the chapter "Operation Conditions" and regarding its exposure rate is designated as a device with *high exposure rate (group A)* when it is an electric device of the group A (see Regulation of MPSvR (Ministry of Work and Social Affairs and Family) No.718/2002 – valid for the territory of Slovak Republic) with a possibility of location in areas with specially danger environment regarding accidents caused by electric current. EA are by the standard STN EN 61010-1+A2 designed for the installation category (category of over voltage) II.

Product influence to environment

Electromagnetic compatibility (EMC): the product meets requirements of EC Executive Nr. 89/336/EEC and EN 50 081, Part 2.

Vibrations caused by the product: product influence is negligible

Noise produced by the product: during operation the noise level A at the service area can be at least 80 dB (A).

Requirements for professional qualification of people performing installation, service and maintenance



Electric connection can be performed only by an acquainted person, i.e. an electrical engineer with professional education of electrical engineering at an apprentice school or a technical school (secondary, complete secondary or university education) and whose qualification was verified by an educational facility authorised to verify professional qualification.

Instructions for stuff training

Service can be performed only by workers professionally qualified and trained by the producer or contracted service centre.

Product protection:

Actuator does not have its own protection against a short-circuit therefore feeding voltage supply must include a breaker or a fuse which is also used as a master switch.

1.3 Guaranty Conditions and Guaranty Periods

1.3.1 Guaranty Conditions

Detailed guaranty conditions includes contract.

The guaranty period dependent:

for the territory of Slovak Republic, installation performed by a **electro-technically educated worker** according to § 21, the regulation of MPSvR No.718/2002 and trained by the producer or by a contracted service firm,

for the territory of Czech Republic, installation performed by a **qualified person** according to § 5, the regulations No. 50/1978 of the Coll. trained by the producer or by a contracted service firm.

The supplier is responsible for the completeness of the delivery and warrants the parameters of the products that are stated by the technical conditions (TC) or the parameters agreed in the agreement.

The supplier is not responsible for decline of quality caused by the purchaser while storing, unprofessional installation or incorrect operation.

1.4 Under-Guaranty and After-Guaranty Service

All our products can be serviced by the professional service staff of our firm that provides installation, operation, service, checking and troubleshooting.

The under-guaranty service is provided by the service department of the producer on the basis of a written claim.

While claiming it is advised to present the following:

- basic data from the nameplate (type and serial numbers)
- period in operation, ambient conditions (temperature, humidity,...) operation mode including switching frequency, type of switching (position or thrust), adjusted switching thrust).
- a kind of failure - a description of the claimed failure
- a copy or a transcription of Installation Certificate.

It is advised to perform the **after-guaranty service** by the service department of the producer or by a contracted service firm.

1.5 Operation Conditions

1.5.1 Location of the Products and Operation Position

The EA can be built-in and operated in the sheltered places of industrial objects without any temperature or humidity control and with a protection against direct climate exposure (e.g. direct sunshine)



Warning:

When the EA is installed in open air, **it must be** sheltered lightly to protect is against direct effects of atmosphere.

When installed in the areas with relative humidity more than 80%, in open air under a shelter it is needed to connect the space heater directly – without a thermal switch.

EA can be built-in and operated in any position. Standard position is with vertical axis of the output part and with the control part placed above.

1.5.2 Operation Environment

In accordance with ČSN/STN 33 2000-3, mod. IEC 60 364-3:1993 the EA **MP 52 200** have to resist external effects and operate reliably:

In the conditions of the following types of environment:

- mild to hot dry with temperature in range -25°C to $+55^{\circ}\text{C}$ **AA 7***
- dry up to humid with temperature -25°C up to $+55^{\circ}\text{C}$ (MWDr/WDa)..... **AA 7***

in industrial environment: at temperatures stated above

- with relative humidity 5 to 100 %, with occasional condensation, with max. contain of water 0,028 kg/kg of dry air, with temperatures stated above **AB 7***
- with height above sea level 2 000 m, with barometric pressure range 86 to 108 kPa **AC 1***
- with spraying or jet water from all directions–(protection enclosure IP x5) **AD 5***
- with strong dustiness – with a possibility of influences of inflammable, non-conducted and non-explosive dust; the middle layer of dust; the dust drop more than 35 but not more than 350 mg/m² per day (products with protection enclosure of IP 5x)..... **AE 5***
- with strong dustiness – with a possibility of influences of inflammable, non-conducted and non-explosive dust; the middle layer of dust; the dust drop more than 350 but not more than 1000 mg/m² per day (products with protection enclosure of IP 6x)..... **AE 6***
- with atmospheric occurrence of corrosive and pollution media (with high degree of atmosphere corrosive aggressiveness); important presence of corrosive pollution..... **AF 2***
- with a possibility of influences of mechanical stress:
 - medium sinusoid vibrations with frequency in range 10 up to 150 Hz, with shift amplitude of 0,15 mm for $f < f_p$ and acceleration amplitude 19,6 m/s² for $f > f_p$; (transition frequency f_p is from 57 up to 62 Hz) **AH 2***
 - medium impacts, shocks and vibrations **AG 2***
- with serious danger of plants and moulds growing..... **AK 2***
- with serious danger of animals occurrence (insects, birds, small animals) **AL 2***
- with detrimental influence of radiation:
 - of stray current with intensity of magnetic field (direct and alternating of power supply frequency) to 400 A.m⁻¹ **AM 2***
 - of sun radiation with intensity $> 500 \text{ a } \leq 700 \text{ W/m}^2$ **AN 2***
- with effects of medium seismic activity with acceleration $> 300 \text{ Gal } \leq 600 \text{ Gal}$ **AP 3***
- with indirect danger of storm activity **AQ 2***
- with fast moving of air and strong winds **AR 3 , AS 3***
- with persons frequent touching earth potential (persons often touch conductive parts or they stand on the conductive basement) **BC 3***
- without any danger media with object **BE 1***

* Marking in accordance with IEC 60 364-3:1993 and ČSN/STN 33 2000-3 (mod. IEC 60 364-3:1993).

1.5.3 Power Supply and Operation Modes

Power supply:

Electric motor 230 V AC $\pm 10\%$

Frequency of power supply 50/60* Hz $\pm 2\%$

* At frequency of 60Hz the operating time is 1,2 times reduced.

Duty cycle (according to EN 34-1, 8):

EA MP 52 200 are designed for **remote control**:

- short-time operation S2-10 min
- intermitted operation S4-25%, 6 up to 90 cycles per hour

EA MP 52 200 with controller are designed for **automotive regulation**:

- intermitted operation S4-25%, 90 up to 1200 cycles per hour

1.6 Description of the Actuator

The actuators MP 52 200 (Fig. 1) consist of the following modules:

- Module M1 – an electric motor
- Module M11 – a countershaft box
- Module M3 – a gearbox with a manual control mechanism
- Module M4 – a control box
- Module M6 – a linear adapter

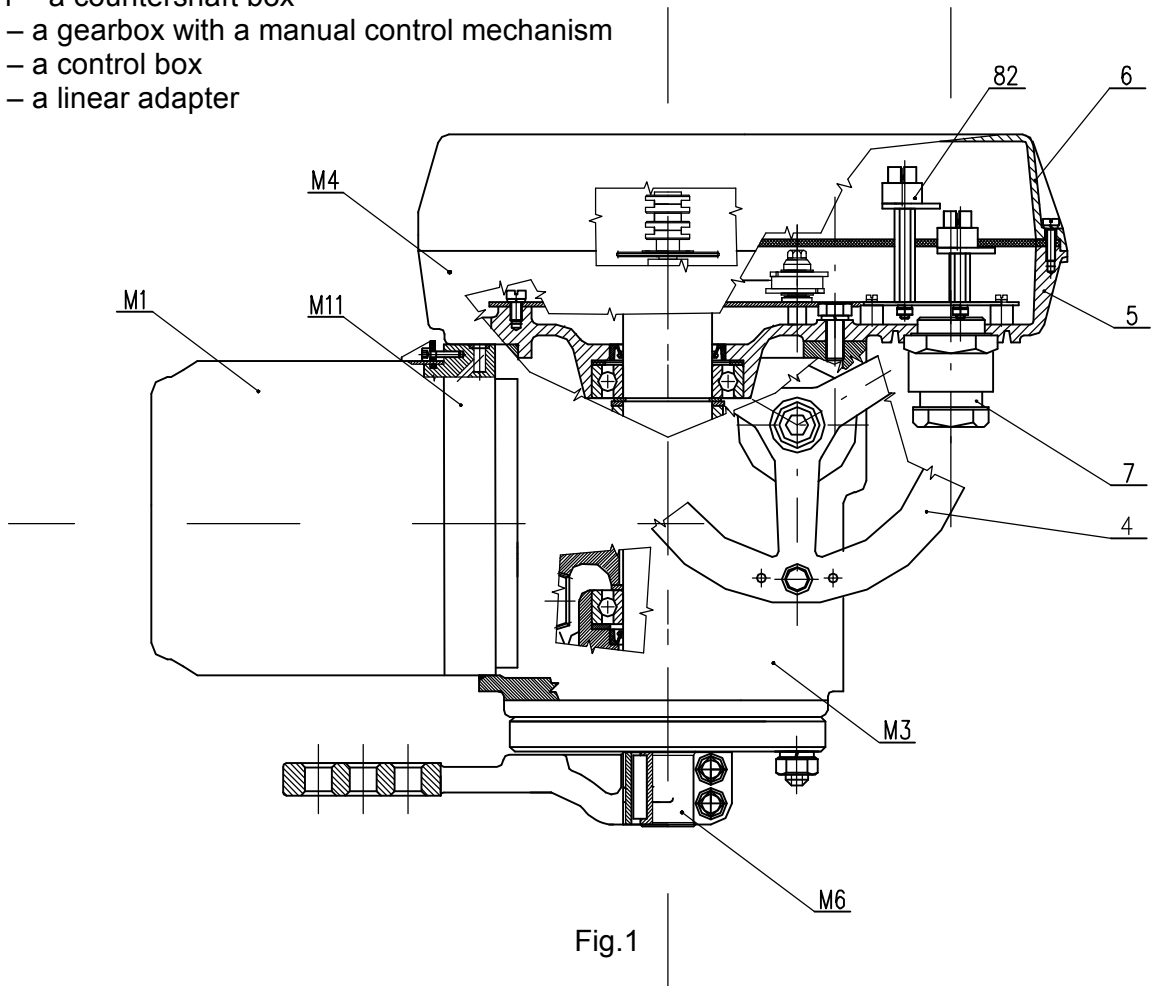


Fig.1

Module M1 – an electric motor

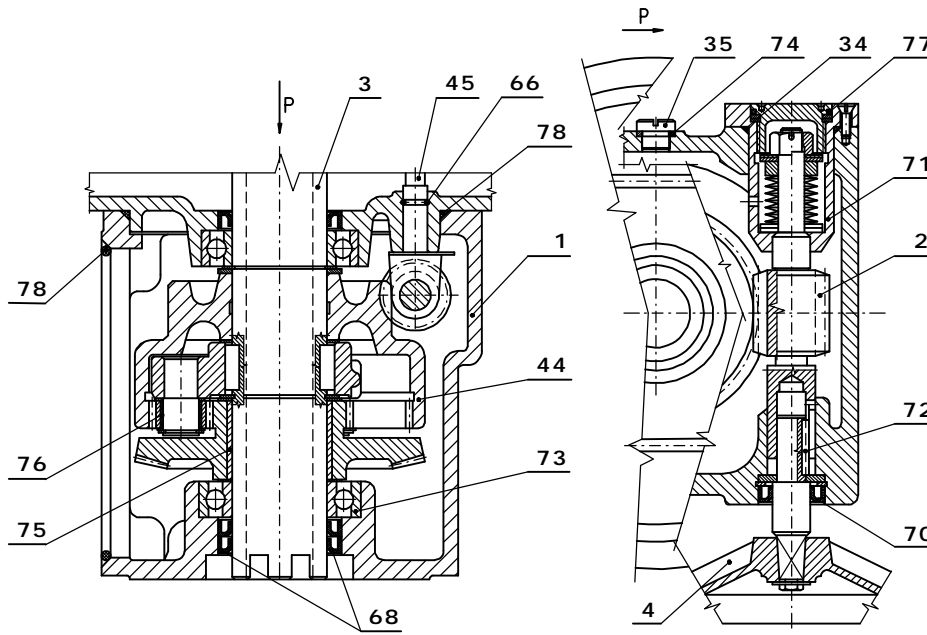
One-phase asynchronous electric motor (Fig. 1)

Module M11 – a countershaft box

It provides reduction of output speed of the electrical motor to a given gear value. The countershaft box consist of six pairs of meshing helical gear wheels and it is ended with a conical pinion meshing a conical wheel of a power gear of the module M3.

Module M3 – a gearbox with a manual control mechanism

The gear train is located in the case (1). The gears are placed on the output shaft (3) and they make up an independent assembly set. The rim (44) with internal teeth provides gearing between the pinion of the electrical motor and the output shaft. The worm (2) designed for torque taking down and manual control is seated in the upper part. The resetting is made with the handwheel (4). The worm is then sprung and the power caused by torque of the output moves the worm shaft axially against spring power. The movement of the worm is taking off by a fork and a pin through shafts (45) leading to the control box. The movement of the worm is measure of the torque. The fork meshes with the groove circumference to allow rotary movement of handwheel it means its rotary movement in every position.



Obr.2

Module M4 – a control box

The following devices are mounted onto the control board place into the control box:

- a transmission unit of the control board
- a position an indication unit
- a torque unit
- a transmitter block
- space heater
- local position indicator
- electric connection means

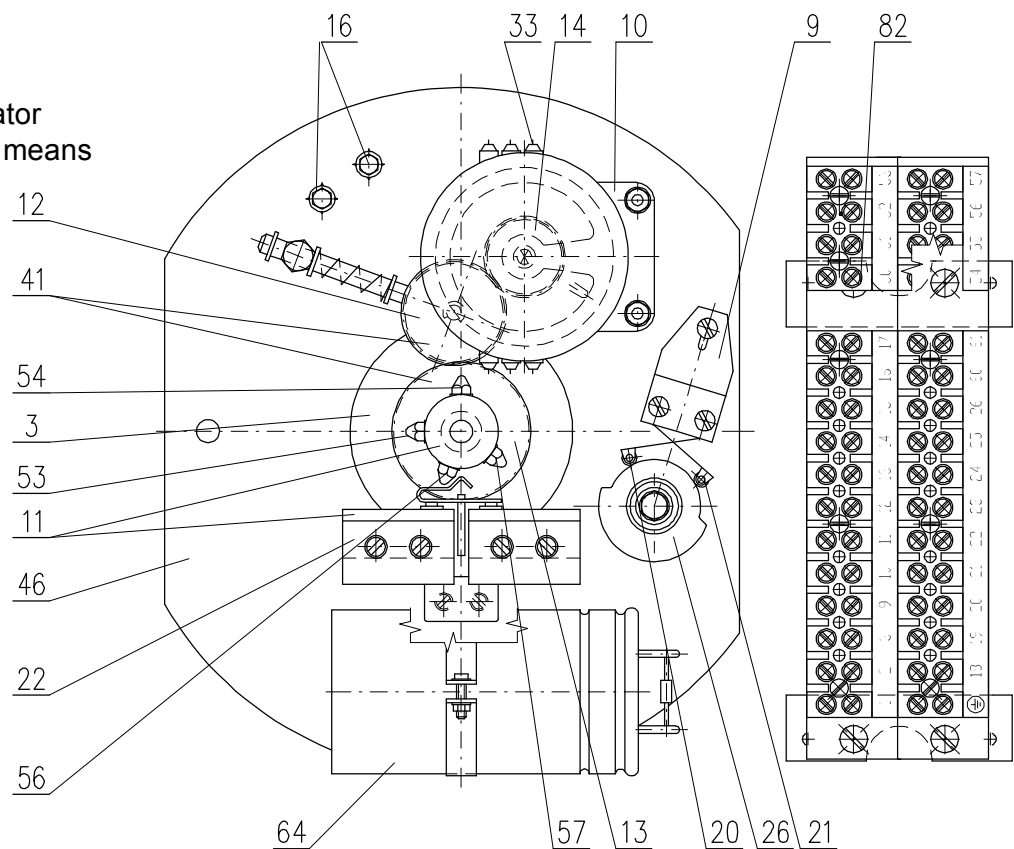


Fig.3

Position unit (11)

After pressing it is integral with the gearwheel (13) and dismantling is not available. The switching-off tips (53),(54),(56),(57) are screwed into the nuts placed in the positional unit groove. After loosening of the switching-off tip in the nut the tip-nut pair can be moved in the groove. The tips are designed to switch off the positional unit microswitches (37),(38),(39),(40) (Fig.4)

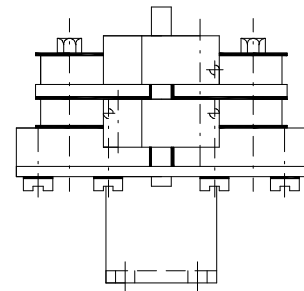


Fig.4

Module M4 – a control box

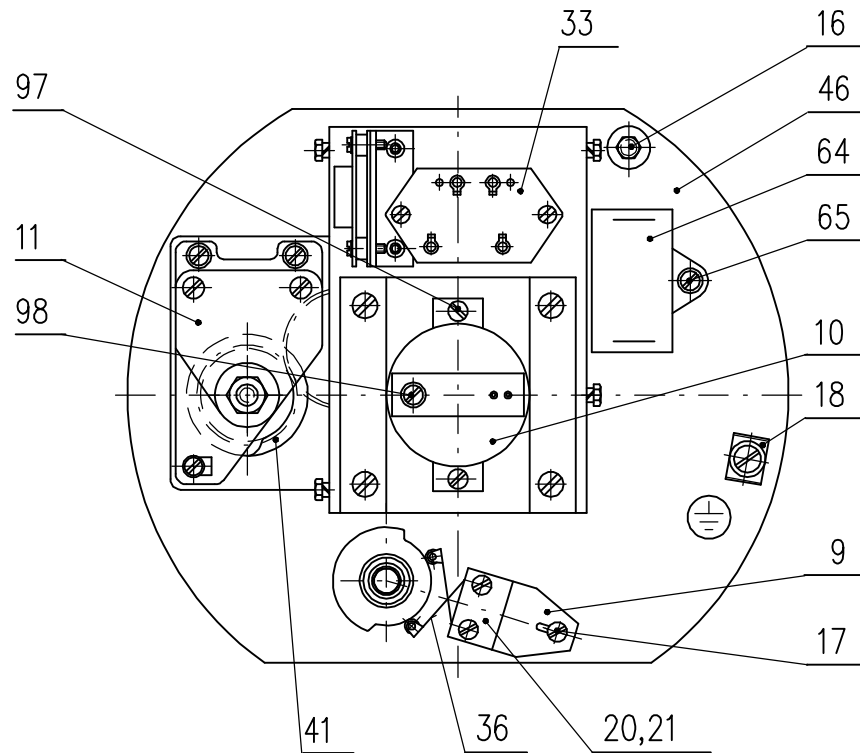


Fig. 5

Position unit (11)

After loosen a nut of the position unit (51) is possible to rotate (53),(54),(56),(57). The construction of position unit is designed so that transforming one of the cams, it does not disturb the others. After adjusting the position unit is needed to tight the nut (51). The switch-off cams are designed to turn-off the positional unit microswitches (37),(38),(39),(40) (Fig.6)

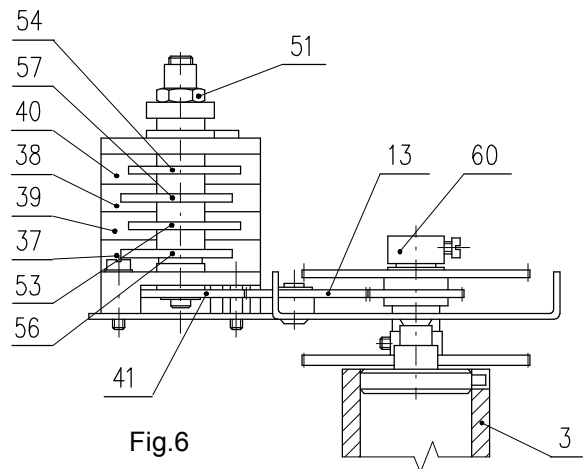


Fig.6

The transmission unit

The unit drive is derived from the gear unit(8). Gear wheels (12),(13),(14) and the transmitter joint make up a module. Rotary movement from the gears (8) to the transmitter(10) is transferred via the clutch after tightening of the screw.

Torque switch unit consists of the following parts:

Switch element (9) (Fig 3) is formed by two micro-switches S1(20) and S2(21). It is put into operation after loosening of the nut (18)(Fig.3).

Cam unit (26)(Fig.3) is formed by two adjustable cams (19) and (22)(Fig.7) placed on the shaft of the torque control element (45)(Fig.2). The cams are turned according to the set switch-off force.

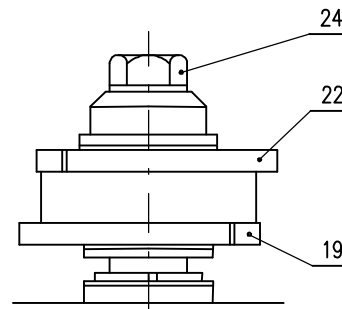


Fig. 7

The space heater

The actuator is equipped with two parallel space heaters(16)(Fig.3,5) With total power output 20W. Connection of the space heater is conditional by operation environment.

Electric connection can be made through the terminal board (82)(Fig.1) or through the connector.

Module M6 – lever mechanism

The lever mechanism is made up with the flange with a groove (27), where a slider with a screw (28) carries the stop ends (29). The flange (27) is screwed onto the actuator box (1) penetrated With a shaft and on its free end the lever is mounted.

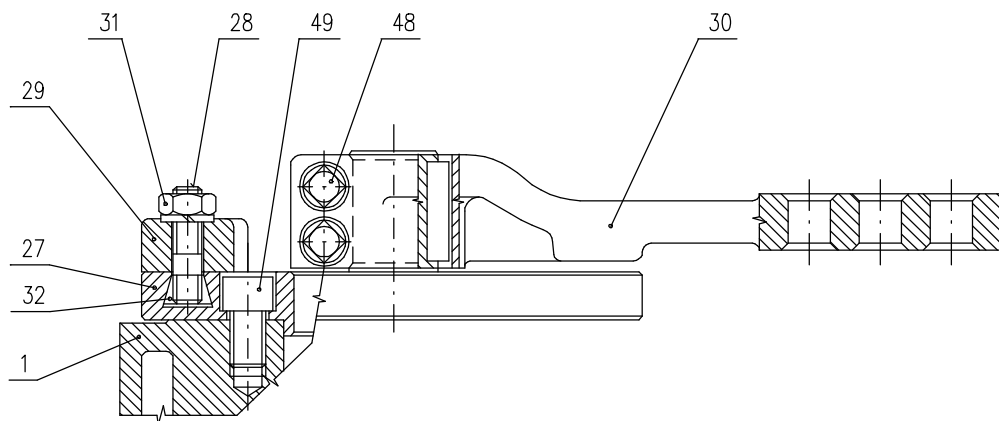


Fig.8

1.7 Specifications

Basic Specifications are given in the table 1.

1.7.1 Basic Specifications

Table 1:

Type/ type number	Operating time $\pm 10\%$ [s/90°]	Operating angle $\pm 1^\circ$ [°]	Switching-off torque ⁵⁾ $\pm 15\%$ [Nm]	Wieżigt [kg]	Electric motor				
					Supply voltage.		Power output	Speed	Current
						[V] $\pm 10\%$	[W]	[1/min]	[A]
1	2	3	6	7	8	9	10	11	12
MP Type No. 52 200	60	60 ÷ 160	63 ÷ 125	cca 25až 27	Single-phase	230	20	1350	0,4
	32						60	2750	0,7
	16								
	8								

⁵⁾ State the switching-off torque in your order by words. If not stated it is adjusted to the maximum rate of the corresponding range. The switching-off torque is not adjusted by customer. The load torque equals minimally the max. switching-off torque of the choosing range multiplied by 1,3.

⁶⁾ The maximum load torque equals the max.switching-off torque multiplied by:

- 0,8 for duty cycle S2-10min, or S4-25%, 6-90 cycles per hour
- 0,6 for duty cycle S4-25%, 90-1200 cycles per hour

Other specifications:

Protection enclosure of EA:IP 55 (STN EN 60 529)

..... IP 65 (required to be confirmed by the producer)

Self-locking: guaranteed within 0% till 100% load torque except load torques

Power supply: **230 V AC** $\pm 10\%$

Power supply frequency 50 Hz or 60 Hz $\pm 2\%$

Note: At frequency of 60 Hz closing time is reduced by 1.2 times.

Switching-off: DB 6 (Cherry)

Switching-off voltage max.250V(AC), 50/60 Hz, 2A or 250V (DC); 0.1A

Space heaters

Heating power: ca 20 W/55°C

Mechanical ruggedness

sinusoid vibrations (V1,STN 18 0002)

Adjustment of the positions switches

The end position of switches operating angle $\pm 1^\circ$

Additional position switches 5° in front of the end position

Adjustment of the torque switches:

If other adjustment not specified the switching torque is set to the maximum value with tolerance of $\pm 15\%$.

Adjustment of the resistive transmitter:

- the position "open" $\geq 93\%$ of rated value

- the position "close" $\leq 5\%$ of rated value

Adjustment of the capacitive transmitter:

- the position "open" 20 mA

- the position "close" (0)4 mA

Weight: 27 up to 29 kg

Lubrication: grease HF 401/0 (GLEITM- μ)

Gearbox oil PP 80

1.7.2 Mechanical Connection

- Lever-joint mechanism

Main and connecting dimensions are given in the dimensional drawings.

1.7.3 Electric connection

to the terminal board(X):max.32 terminals with wire diameter max.2,5mm²

.....2 cables bushings – M25x1,5 with cables diameter 11 up to 17 mm

to the connector:.....max.32 terminals with wire diameter max.0,5mm²

the protection terminal:

- external and internal ones, mutually joined and marked with the protection earthing mark.

Electric connection is provided according to the **wiring diagrams**.

Electronic position controller (N)**Controller software equipment:****A) Function and parameters****programmable functions:**

- .. with functional buttons SW1, SW2 and LED diodes D1, D4 directly placed on controller
- .. with computer or terminal equipped with corresponding programme, using RS 232 interface.

programmable parameters:

- .. control signal
- .. response to SYS-TEST signal
- .. mirroring (ascending/descending characteristics)
- .. insensitiveness

- .. EA limit positions (only with computer and ZP2 programme)
- .. way of regulation

B) Operation states of controller

Error message from error memory: (using LED diodes and RS 232 and personal computer)

- .. control signal missing or faulty
- .. input value of current control signal under 3.5 mA
- .. existence of SYS-TEST signal
- .. activity of switches
- .. failure of feedback position transmitter

Statistic data: (using RS 232 and personal computer)

- .. number of controller operation hours
- .. frequency of relay switching in direction "opening"
- .. frequency of relay switching in direction "closing"

Supply voltage: terminal 61 (L1) -1(N) - 230 V AC $\pm 10\%$

Frequency: 50/60 Hz $\pm 2\%$

Input control signals - analogue: 0 - 20 mA

..... 4 - 20 mA

..... 0 - 10 V

(Actuator opens at rising of control signal.)

Controller linearity: 0.5 %

Controller insensitiveness: 1 - 10% (adjustable)

Feedback (position transmitter): resistive 100 up to 10,000 Ω

..... current 4 up to 20 mA

Power outputs: 2x relay 5A/380V

Digital outputs: 4x LED (supply, error, adjustment, "opening", "closing" - with two-colour LED)

Error status: control switch 24 V, 2W - POR

Reaction at error situation: transmitter error - error message LED

Control signal missing: error message LED

SYS mode: error message LED

Adjusters: communication connector

..... 2x calibrating and adjusting button

Local position indication with position indicator visible through aperture in upper cover

1.8 Packaging, Transport, Storing and Unpacking

The **EA MO** are delivered in solid packages, assuring the resistance according to the requirements of standards ČSN/STN 18 0004, ČSN/STN IEC 60654-1 and ČSN/STN IEC 60654-3.

The package is made by a box. The products in the boxes can be packed on pallets (the pallet is returnable). The following information is given on the outside of the package:

- the producer
- the name and the type of the product
- number of pieces
- other data – inscriptions and labels.

The forwarder is obliged to protect the packed products loaded into transport means against spontaneous motion, in case of an open transport mean they are to be protected against rainfalls and flowing water. Location and fixing of the products in transport means should guarantee their fixed position, avoid possibility of mutual bumps and bumps against the walls of the transport means.

The transport in non-heated and non-pressurized transport means with conditions in range:

- temperature: -25°C to $+70^{\circ}\text{C}$ (special versions -45°C to $+45^{\circ}\text{C}$)
- humidity: 5 to 100% with maximum water content of 0.028 kg/kg of dry air
- barometric pressure: 86 to 108 kPa .

After receiving of the EA check whether during their transport or storing no damage occurred. Compare the data on their nameplates with the accompanying documentation/the purchase agreement (the order). In case of any discrepancy, failure or damage inform about the fact the producer immediately.

If not installed immediately the EA and their equipment should be stored in dry, well-conditioned sheltered areas, protected against impurities, dust and soil humidity (with keeping them on shelves or pallets), chemical and unauthorized impacts, at ambient temperature from -10°C to +50°C and at relative air humidity max. 80 %.



- a) *It is forbidden to store EA outside or in areas not prevented against direct impact of climate.*
- b) *Strains of the surface finishing should be promptly removed if any – it can prevent the product against corrosion damages.*
- c) *While storing more than one year it is necessary to check lubrication filling before the actuator is put into operation.*
- d) *The EA installed but not operated are to be protected the same way as when storing (e.g. with a wrapping).*
- e) *After it is mounted onto a valve in free and wet areas or in areas where temperature is changing it is necessary to connect the space heater – to prevent the actuator against corrosion resulted from water condensed in the control part.*
- f) *Remove odd conservation grease as late as before putting into operation.*

1.9 Liquidation of the Product and the Package

The product is made of recyclable. The single parts of the package and the product should not be thrown away after its lifetime but sorted according to the related regulations and rules about environment protection and delivered for next treatment.

The product itself as well as its package is not a source of spoiling of environment and they do not contain any dangerous waste.

2. Installation and Dismantling of the Actuator



Follow safety regulations!

Note:

Check again whether the EA is place in accordance with the Chapter “Operation Conditions”. If the installation conditions are different than recommended it is needed to consult the situation with the producer.

Before starting the installation onto the valve:

- Check again whether the EA was not damaged while storing.
- Check compliance of the stroke adjusted by the producer and the connecting dimensions of the EA with the parameters of the valve.
- In case of any difference perform the adjustment according to the Chapter “Adjustment”.

2.1.1 Mechanical connection

EA is by the producer adjusted to parameters according to the nameplate, with connecting dimensions according to the corresponding dimensional drawing and put it to a mid-position.

Before installation put the handwheel on.

Mechanical lever-joint connection

- Properly defat contact surfaces of the EA, connecting flange and the valve/gearing.
- Coat the valve/gearing output shaft firmly with a grease not containing any acid.
- Reset the EA to the limit position "closed"; put the valve to the same limit position.
- Put the EA onto the valve to have the output shaft reliably in the valve/gearing coupling.
- Use the handwheel to turn the EA if needed to reach compliance between holes in the EA flange and the valve.

- Check whether the connecting flange clings to the valve/gearing.
- Fix the flange with four screws tightened to allow moving of EA. Then the fixing screws tighten uniformly crosswisely.

2.1.2 Electric connection and checking of function

Follow up with connecting the EA with mains or master system.



1. Follow instructions in the part "Requirements for professional qualification"!
2. While laying electrical line abide by the instructions for heavy current installations.
3. Cables to terminal boards or connectors lead through screw bushings.
4. Before initiation ES into operation internal and external protection terminals are needed to be connected.
5. Feeding cables are to be fixed to the solid construction at most 150 mm from the bushings.

Checking of supply connection

- Connect a supply cable to the actuator and check whether phases are connected properly.
- Press the button SB2 "open" on the control board. The output stem should move counterclockwisely looking to the output shaft from the control chamber.

If the power supply is reversed it is necessary to press the button "stop" and change phases connection. Then perform the check again.

Checking of the torque switches

- Press the button SB2 "open" on the control board. The output shaft should move in the direction "open".
- Press the lever (42) in the direction to the output shaft, what switches contacts (20) MO (S1) and the actuator should stop.
- Press the button SB1 "closed" on the control board. The output shaft should move in the direction "closed".
- Press the lever (42) in the direction from the output shaft, what switches contacts (21) MZ (S2) and the actuator should stop.

Checking of the position switches

- Press the button SB2 "open" on the control board. The output shaft should move in the direction "open".
- Press the spring (36) to switch contacts of the switch (37) PO (S3) and the actuator should stop.
- Press the button SB1 "closed" on the control board. The output shaft should move in the direction "closed".
- Press the spring (36) to switch contacts of the switch (37) PZ (S4) and the actuator should stop.

Checking of the indication switches

The indication switches are ordered as additional equipment. If not agreed else they are adjusted to operate next before positions "open" and "closed".

2.2 Dismantling



**Before dismantling it is required to disconnect the EA from mains!
Do not connect and disconnect live connectors!**

- Disconnect the EA from mains.
- Disconnect the leads from the EA terminal boards and loosen the cables from bushings. Pull out the connectors in case of the connector version.
- Loosen the fixing screws of the EA flange and disconnect the EA from the valve/gearing.
- While sending the EA to be repaired put it into a package solid enough to avoid damages of the EA during transportation.

3. Adjusting of actuator



Abide by safety measures!

- electric switching the electric motor from the manual control status to the electric way of control,
- electric blocking of the electric actuator while other mechanisms or devices operate,
- adjustment of torque rate,
- remote information about valve's stage of opening on the control board with variable resistance of the remote resistance transmitter (potentiometer).

The adjustment can be performed at a mechanically and electrically connected EA. This part describes adjustment of EA to specified parameters in case that any unit of EA is reset. Laying of adjusters of the control board is shown on **Fig.2.**

3.1 EPV – the 2-wire version (Fig. 6)

The position transmitter with the converter PTK1 is in the plant adjusted to have the output current signal on the terminals 81-82 (the wiring diagram Z23) as follows:

- in the position “open” 20 mA
- in the position “closed” 4 mA

If the transmitter requires a new adjustment follow these steps:

- Put the actuator to the position “closed” and switch the power supply off.
- Adjust the resistive transmitter according to the previous chapter. The resistance is to be metered on the terminals X-Y (Fig. 6). The used transmitter resistance is 100 Ω.
- Switch the converter’s power supply on.
- Turn the adjusting trimmer ZERO (Fig. 6) to adjust the output current signal rate measured on the terminals 81-82 to 4mA.
- Set the actuator to the position “open”.
- Turn the adjusting trimmer GAIN (Fig. 6) to adjust the output current signal rate measured on the terminals 81-82 to 20mA.
- Check the output signal of the converter in the both limit positions, and repeat the procedure if needed..

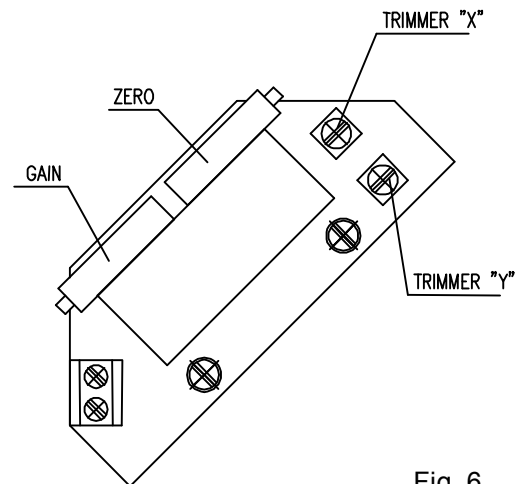


Fig. 6

Note:

The output signal of 4-20mA can be adjusted at the range from 75 up to 100% of the rated stroke stated on the actuator’s nameplate. At values less than 75% the value 20mA is reduced proportionally.

3.2 EPV – 3-wire version (Fig. 7)

The resistive transmitter with the converter is in the plant adjusted to have the output current signal metered on the terminals 81-82 (the wiring diagram Z257 - without power supply) as follows:

- in the position „open“ 20 mA or 5 mA
- in the position „closed“ 0 mA or 4 mA

according to the specified version of the converter.

If the transmitter requires a new adjustment follow these steps:

- Put the actuator to the position „closed“ and switch the power supply off.
- Adjust the resistive transmitter according to the previous chapter. The resistance is to be metered on the terminals X-Y (Fig. 7). The used transmitter resistance is 2000Ω or 100 Ω.
- Switch the converter’s power supply on.

- Turn the adjusting trimmer ZERO (Fig. 7) to adjust the output current signal rate measured on the terminals 81-82 to 0 mA or 4mA.
- Set the actuator to the position „open“.
- Turn the adjusting trimmer GAIN (Fig. 7) to adjust the output current signal rate measured on the terminals 81-82 to 20mA or 5 mA..
- Check the output signal of the converter in the both limit positions, and repeat the procedure if needed.

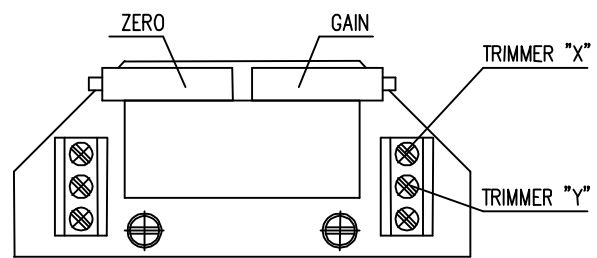


Fig.7

Note:

The output signal of (0-20mA, 4-20mA or 0-5mA - according to the specification) can be adjusted at the range from 85 up to 100% of the rated stroke stated on the actuator's nameplate. At values less than 85% the value of the output signal is reduced proportionally.

Electric local control: - additional equipment

In case of need (during adjusting, function checking etc.), but power supply must be provided, is possible to readjust actuator by electric local control. After switching the mode switch to the mode "LOCAL" it is possible by the direction switch to control motion of the output part to setting direction. Signal lights indicate achievement of limit position at relevant direction.

From terminal 83 of terminal board parent control system must be power-supplied. In opposite case it is not guaranteed disconnection of remote control after switching the mode switch to the mode "LOCAL".

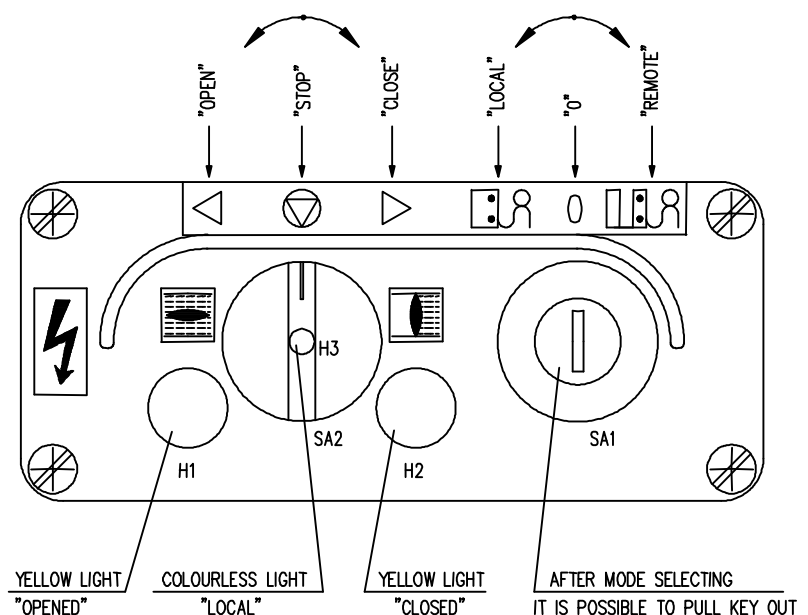


Fig. 10

4. Service, maintenance and troubleshooting

4.1 Service



1. In general it is provided that service of the EA is performed by a qualified worker in accordance with requirement given in Chapter 1!
2. After putting the EA into operation it is needed to verify whether during manipulation any scratch on surface occurred, it is to be removed to prevent actuator against corrosion!

The EA SP/SPR requires just negligible service. Proper putting into operation is a recondition of reliable operation.

The service of the EA leads from the operation conditions and usually resides in information processing for further arranging of required functions.

The stuff has to perform prescribed maintenance to prevent the EA during operation against impacts of environment, which exceed the frame of allowed influences.

4.2 Maintenance - extent and periodicity

During inspections and maintenance it is needed to tighten all screws and nuts which influence tightness and protection enclosure.

Another maintenance resides in greasing. Changing or filling grease up during first years operation is not required. To refill or to replenish the grease is needed during revisions. Intervals between two prevention inspections are four years.

Lubrication: grease HF 401/0 (GLEITM-μ)
Gearbox oil PP 80



Greasing of the valve spindle is independent on maintenance of the EA!

Every six months it is recommended to perform one check move in frame of adjusted operation stroke to verify reliability of functioning with setting back to the original position.

After 6 months and once a year it is recommended to check tightening of fixing screws between the EA and the valve/gearing.

4.3 Troubleshooting

At failure of power supply the EA stops in the position where it was before the failure. If needed the EA can be set only with the manual control (the handwheel). After restoration of power the EA is prepared for operation.

In case of failure of any element of the EA it can be changed by a new one. Entrust the change to a service centre.

In case of an EA failure, which cannot be eliminated directly in operation, follow instructions for under-guaranty and after-guaranty service.

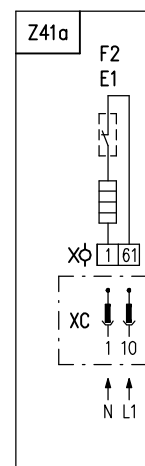
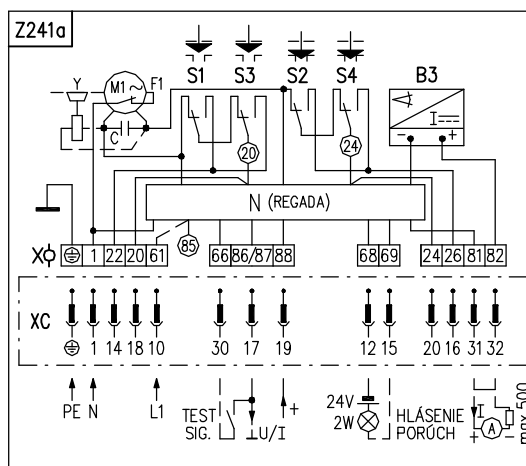
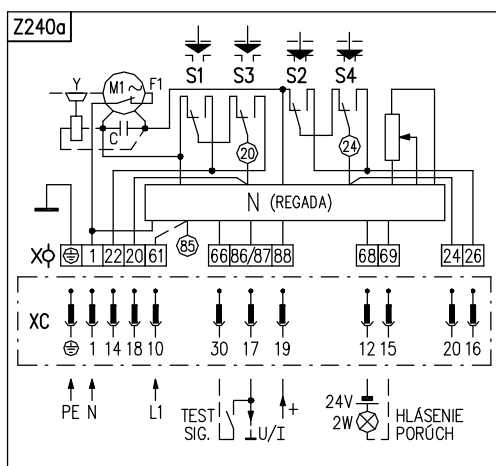
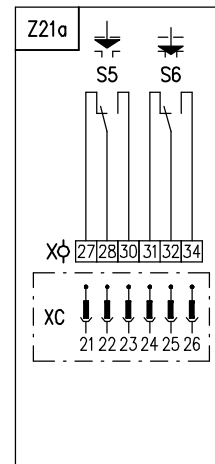
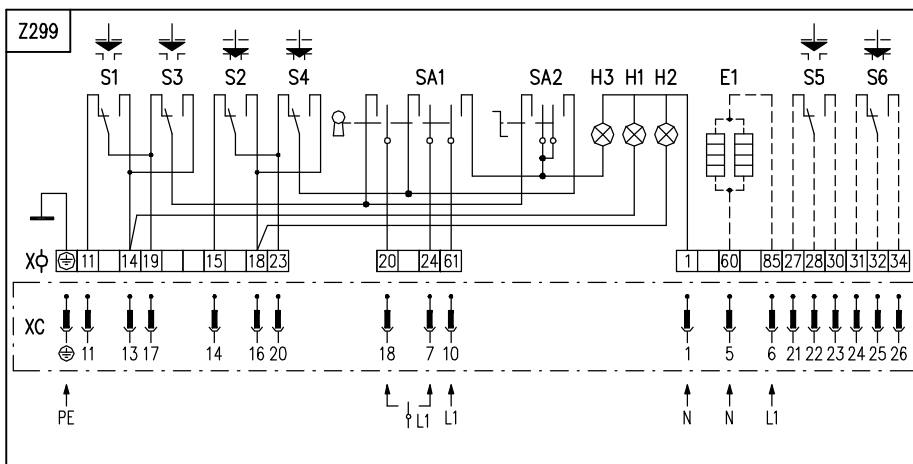
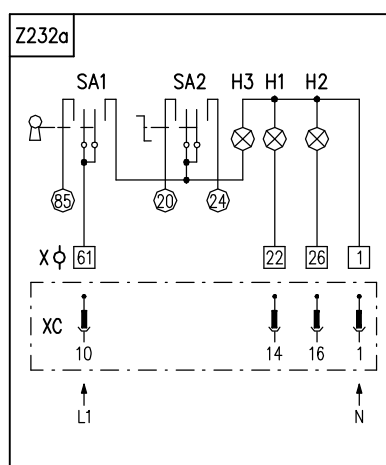
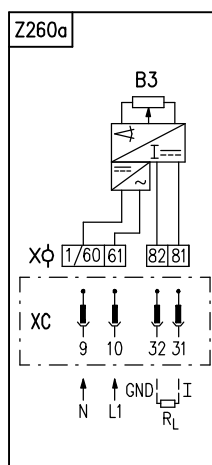
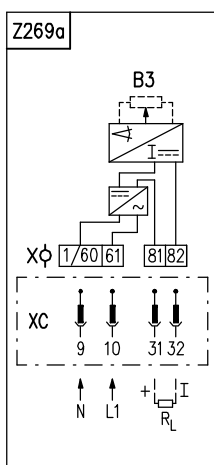
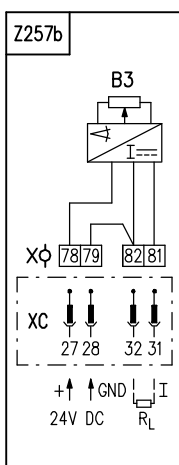
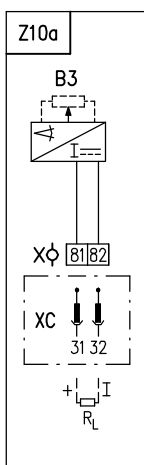
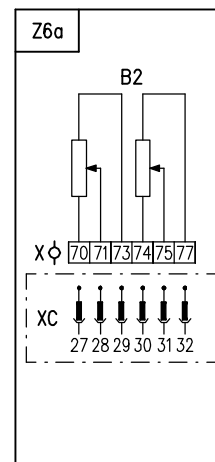
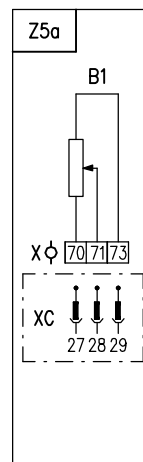
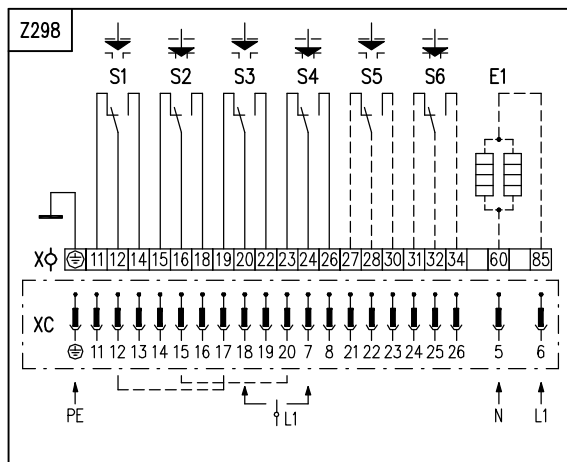
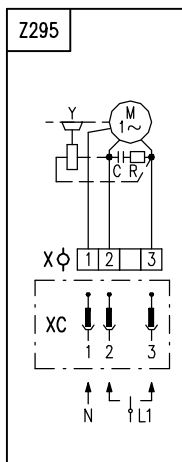
Note:

If the EA requires dismantling follow the chapter "Dismantling".



Taking the EA to pieces for repair purposes is allowed only by professionally qualified persons trained in the production plant or by a contracted service centre!

4.4 Wiring diagrams



Legend:

Z5a	.....connection of single resistive transmitter
Z6a	.....connection of double resistive transmitter
Z10a	.....connection of resistive with current converter or capacitive transmitter – 2-wire without supply
Z21a	.....connection of additional position switches for the EA version with controller
Z41a	.....connection of space heater and space heater's terminal switch for EA with controller
Z232a	....connection of el. local control for the EA version with controller
Z240a	....connection of the EA with controller and resistive feedback
Z241a	....connection of the EA with controller and current feedback
Z257b	....connection of resistive transmitter with current converter– 3-wire without power supply
Z260a	....connection of resistive transmitter with current converter– 3-wire with power supply
Z269a	....connection of resistive transmitter with current converter or capacitive transmitter – 2-wire with power supply
Z295	.....connection of 1-phase electric motor
Z298	.....connection of torque and position switches and space heater
Z299	.....connection of torque and position switches and space heater for the EA version with electric local control
B1	.....resistive transmitter (potentiometer) single
B2	.....resistive transmitter (potentiometer) double
B3	.....capacitive transmitter
S1	.....torque switch „open“
S2	.....torque switch „close“
S3	.....position switch „open“
S4	.....position switch „close“
S5	.....additional position switch „open“
S6	.....additional position switch „close“
M	.....electric motor
C	.....capacitor
Y	.....motor's brake (not valid for this type of the EA)
E1	.....space heater
F1	.....motor's thermal protection (not valid for this type of the EA)
F2	.....space heater's terminal switch
X	.....terminal board
N	.....electric position controller
I/U	.....input (output) current (voltage) signals
H1	.....indication of „open“ limit position
H2	.....indication of „close“ limit position
H3	.....indication of „electric local control“
SA1	.....rotary switch with key „ remote – 0 – electric local“ control
SA2	.....rotary switch „opening - stop - closing“
R	.....reducing resistor
R _L	.....loading resistor

4.5 Dimensional drawings

