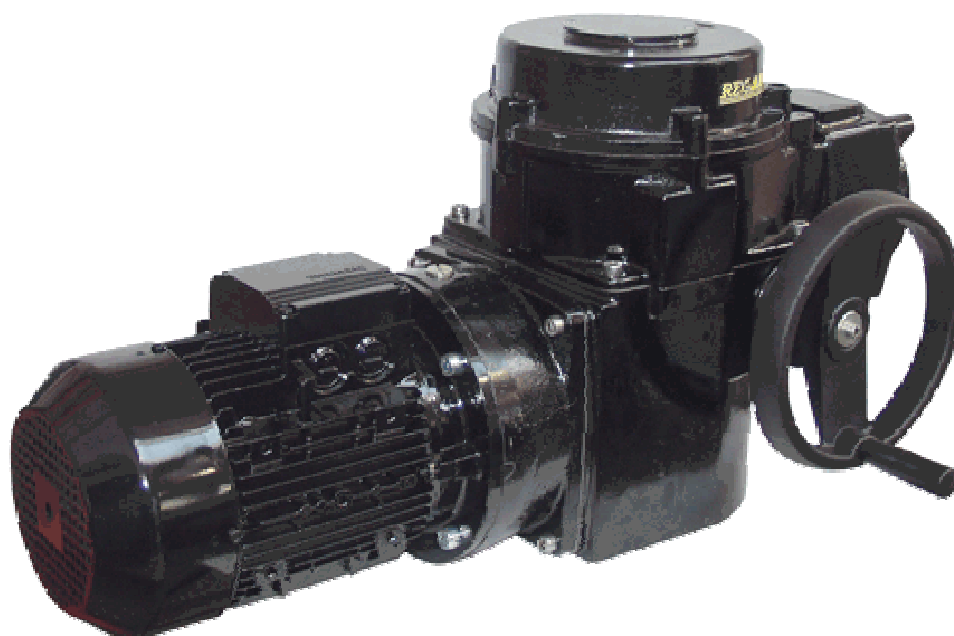




# ***INSTALLATION, SERVICE AND MAINTENANCE INSTRUCTIONS***



***Electric multi-turn actuators  
MO 5P***

## TEST CERTIFICATE

ELECTRIC PART-TURN ACTUATOR MO 5P	
Type number 158. ....	Power supply..... V .....Hz
Serial number .....	Rated torque ..... Nm
Production year .....	Switching-off torque ..... Nm
Wiring diagram .....	Operation speed..... min <sup>-1</sup>
.....	Adjusted number of operating speed.....
Warranty period .....months	Transmitter (potentiometer) .....
Serial number of electric motor .....	
Serial number of module DX 3004 .....	
Tests made in accordance with TP 74 0934 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!*

*Preventive and safety-measures applied on the actuator can not offer required safety level till the actuator and its safety systems are not applied by required and described way and if installation and maintenance is not applied according to applicable instructions and rules!*

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The Installation, Service and Maintenance Instructions are drawn up according to requirements of EC Executive Nr. 2006/42/EC "Uniform requirements for machines and devices from the point of view of safety and health care", to save life and health of users and to avoid material damages and exposure environment to danger

## 1. Generally

### 1.1 Purpose and application of the product

Electric multispeed actuators (hereafter referred to as **EA**), types **MO 5P** are high performance electro-mechanical products, designed for direct as-sembly on controlled devices (regulating bodies - valves, etc.). EA MO 5P is applicable for control of armatures, which require more than one turn adjustable motions, like knife shifters, etc. EA are designed for remote control of armatures by reversing rotary motion in both directions of their movement. They are equipped by measuring and technological processes controlling means; the information carrier on their input and/or output is unified analogue direct current, or voltage signal. They can be used in heating, energy, gas, air-conditioning and other technological equipments, for which are suitable due to their manufacturing qualities. They are assembled by means of flange and connecting component in accordance with ISO 5210 respectively STN 18 6314, DIN 3338, or in accordance with OST 26-07-763.



1. *It is prohibited to use EA as lifting device!*
2. *The option of switching EA via semi-conductive trigger switches must be consulted with the actuator manufacturer.*

### 1.2 Safety instructions

#### Product characteristics from risk point of view

ES type MO 5P is based on characteristics stated in part „Operating conditions“ and from the risk point of view the reserved technical device *with high risk (group A)*, while it is electric device of A group (see Regulation of MPSvR SR no. 718/2002 Statute, §2 and Attachment no. I, III. part, section. 1 – valid for territory of SR).

*Remark: Classification between electric equipment of group A results from the possibility to place the actuator in the extra dangerous locations from an electrical accident point of view – wet environment – possibility of influence by sprinkled water and in the locations with potential risk of explosion of flammable gases and vapours.*

Electric actuators are according to directive LVD 2006/95/EC and standard IEC 61010-1 within valid edition assigned for installation category II (overvoltage category).

#### Product influence to the environment

**Electromagnetic compatibility (EMC):** the product complies with the requirements of the Directive 2004/108/EC of the European Parliament and of the Council on the approximation of the laws the Member States relating to the electromagnetic compatibility and with the requirements of standards as well EN/IEC 61000-6-2, EN/IEC 61000-6-4, EN/IEC 61000-3-2+A1 and EN/IEC 61000-3-3 within valid edition.

**Vibrations originated by the product:** influence of the product is negligible.

**Noise originated by the product:** noise level A at the operators place max. 90 dB (A).

**Environmental risk:** the product contains the cartridge of mineral oil, which is harmful for the water organisms and can cause long-term deteriorating effects to the water environment. During manipulation and operation of the product is necessary to prevent oil leakage to the environment. The increased attention must be put to the operation in close vicinity of water resources.

#### 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 authorized to verify professional qualification. Operation can be performed by skilled personnel only trained by production plant, resp. by contracting service center!*

## Warning for safety use

### Product protection

EA MO 5P does not have own short-circuit protection, therefore there must be included suitable protective device into the supply power (circuit breaker, or fuse), which serves at the same time as main switch.

Supply voltage impressed via selector to terminal A2 respectively D2 and supply voltage of electronic module impressed to terminal 61 must have common circuit breaker.

**Type of equipment from a connection point of view:** The equipment is designed for permanent connection.

## 1.3 Warranty conditions

The supplier is responsible for completeness of the delivery and guarantees these specifications of the product which are stated in the Contract.

The supplier is not responsible for any deterioration of parameters caused by the customer during storage, unauthorized installation or improper operation.

## 1.4 Guarantee and after guarantee service

For all our products is provided specialized company service for placement, operation, service, revisions and the help during fault removal.

**Guarantee service** is performed by service center of production plant, respectively by one of contractual service centers based on written claim.

For claim must be presented:

- Basic data from type label (type marking and serial number)
- Period of operation, ambient conditions (temperature, humidity,...), operating mode including contacting frequency, type of turn-off (position, or thrust), preset turn-off thrust
- Type of the fault – description of claimed fault
- Copy, respectively depiction of assembly and installation certificate

After performing of claim removal works will service employee prepare the service record, which is sent to production company.

We recommend that after **guarantee service** is performed by service centre of manufacturing plant, respectively by one of contractual service centers.

## 1.5 Operating conditions

### 1.5.1 Product placement and working position

The assembly and operation of electric actuators in standard make can be on covered places of industrial objects without the regulation of temperature, humidity and with protection against direct exposure of climate influence (e.g. direct sun shine, precipitations, etc.).

#### **Warning:**



*For placement in free area must be EA provided by light roofing against direct weather influence.  
For placement in areas with relative humidity above 80%, in outdoor environment under shelter is necessary to connect permanent heating resistor directly – without thermal switch.*

Installation and operation of actuators is possible in either position, while motor axis is in horizontal position. Common position is the one with vertical position of exit part axis and control box above. During assembly must be taken care for space for disassembly of cover of control box and terminal box.

### 1.5.2 Working environments

Electric actuators **MO 5P** must resist to ambient influences and must operate reliably:

#### in outdoor environmental conditions classified as:

- mild up to hot dry with temperatures from -25°C up to +55°C ..... AA7\*
- dry and wet tropics with temperatures -25°C up to +55°C (MWDr/WDa) – an option ..... AA7\*
- mild with temperature from -40°C up to +40°C + as an option; ..... AA7\*
- cold up to marine tropic with temperature from -40°C up to +40°C + as an option; ..... AA7\*

#### in industrial environment :

- with relative humidity 5 – 100%, with accidental condensation, with max. water content 0,028 kg/kg of dry air, at above stated temperature ..... AB7\*
- for altitude up to 2 000 m, and barometric pressure range 86 - 108 kPa ..... AC1\*
- with influence of sprinkled water from all directions – (IP x5) ..... AD5\*
- with mild dustiness – with potential influence of fireproof, non-conducting and explosion-proof dust; mean dust layer; dust fall above 35, but not more than 350 mg/m<sup>2</sup> per day (IP 5x) ..... AE5\*
- with mild dustiness – with potential influence of fireproof, non-conducting and explosion-proof dust; mean dust layer; dust fall above 350, but not more than 1 000 mg/m<sup>2</sup> per day (product coverage IP 6x – after agreement with manufacturer) – as an option ..... AE6\*
- with atmospheric presence of corrosive and polluting matters (with very strong degree of atmospheric corrosion aggressivity); presence of corrosive polluting matters is significant ..... AF2\*
- with possibility of medium mechanical stress influence:
  - medium sinusoidal vibrations with frequency within range of 10 up to 150 Hz, with shift amplitude of 0,15 mm for  $f < f_p$  and with acceleration amplitude 19,6 m/s<sup>2</sup> for  $f > f_p$  (transition frequency  $f_p$  is 57 up to 62 Hz) ..... AH2\*
  - medium strokes, shakes and tremblings ..... AG2\*
- with serious danger of flowers and moulds growing ..... AK2\*
- with serious danger of animals occurrence (insects, birds, small animals) ..... AL2\*
- with harmful radiation effects of:
  - escaping stray currents intensity of magnetic field (direct current and alternating line frequency) up to 400A.m<sup>-1</sup> ..... AM2\*
  - medium solar radiation with intensity > 500 and ≤ 700 W/m<sup>2</sup> ..... AN2\*
- with medium seismic effects with acceleration > 300 Gal ≤ 600 Gal ..... AP3\*
- with indirect threat by storm activity ..... AQ2\*
- with fast air motion and high winds ..... AR3 , AS3\*
- with the ability of expert persons :
  - electrotechnicians according to §21, decree MPSvR SR no. 718/2002 (valid for SR) .... BA4,BA5\*
  - resp. expert persons according to §5, decree no. 50/1978 Statute (valid for CR) ..... BA4\*, BA5\*
- with frequent contacts of persons with ground potencial (persons frequently touching conductive parts, or staying on conductive base) ..... BC3\*
- with the explosion risk of flammable gasses and vapours ..... BE1\*

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

### 1.5.3 Power supply and operating mode

#### Supply voltage:

Electric-motor .....Y/Δ; 400 / 230V AC respectively Y/Δ; 380 / 220V AC ±10% (other - after agreement with manufacturer)

Control ..... 230 V AC ±10%

Supply voltage frequency ..... 50/60\* Hz ±2%

**Operating regime** (according to ČSN/STN IEC 60034-1, 8):

- **EA MO 5P** are designed for **remote control**:  
with short-time run S2-10 min.  
with interrupted run S4-25%, 6 up to 90 cycles / hr.
- **EA MO 5P with controllers are designed for automatic regulation**:  
with interrupted run S4-25%, 90 up to 1200 cycles per hour

*Remark: 1. Operating mode consists of load type, load factor and frequency of switching.*

*2. ES MO 5P can be, after connection with external regulator, used as regulating electric actuator under conditions that max. load torque is 0,4 multiple of max. disconnecting torque for ES MO 5P with remote control.*

### 1.6 Packaging, transportation, storage and unpacking

**EA MO 5P** are supplied in packages, warranting resistance according to requirements of standards ČSN/STN 18 0004, ČSN/STN IEC 60654-1 and ČSN/STN IEC 60654-3.

Package is a box. Products in boxes is possible to load on the pallets (pallet is returnable). On the outer side of the package is stated:

- manufacturer label,
- name and type of product,
- number of pieces,
- other data – notices and stickers.

The forwarder is obliged to secure packed products, loaded on transportation means, against self-motion; if open transportation means are used, to secure their protection against atmospheric precipitations and splashing water. Displacement and securing of products in transportation means must provide their stable position, exclude the possibility of their inter-collision and their collision with the vehicle walls.

Transportation can be executed by heatless and non hermetic spaces of transportation vehicles with influences within the range:

- temperature: -25° C up to +70° C (a strange version –45 ° C up to +45 ° C
- humidity: 5 up to 100 %, with max. water content 0.028 kg/kg of dry air
- barometric pressure 86 up to 108 kPa

***Upon receiving of EA examine, if during transportation, resp. storing did not come to its damage. At the same time verify, if the data on the labels corresponds to accompanying documentation and purchase-sale contract / order. Eventual discrepancies, faults and damages should be reported without any delay to supplier.***

Electric actuators and their accessories must be stored in dry, well ventilated covered spaces, protected against impurities, dust, soil humidity (by placement to racks, or on pa-lettes), chemicals and foreign interventions, at ambient temperature from -10°C up to +50°C and at relative air humidity max. 80 %.

**Attention!**

1. It is not acceptable to store EA outdoors, or in areas not protected against direct climate influence!
2. Eventual damages to surface finish remove without delay – thus preventing damage by corrosion.
3. If storing takes longer than 1 year, it is necessary to inspect lubrication fillings before putting EA into operation.
4. Assembled EA, but not put into operation is necessary to protect by the equivalent method as during storage (for example suitable protective cover).
5. After assembly to the armature in free and wet areas, or in areas with temperature changes, connect without delay heating resistor – thus preventing damages caused by corrosion from liquefied water in the control area.
6. Excessive preserving grease remove just before putting EA into operation.

**1.7 Liquidation of the product and package**

The product was made from recycled materials - metal (steel, aluminium, brass, bronze, copper, and cast iron), plastics (PP, PA, POM, PC, PVC) and products from the rubber.

The package and product is necessary after the end of their lifespan to disassembly, to sort their parts by the type of used material and deliver them to recycling, eventually disposing places.

Neither the product itself nor its packing represents a contamination source for the environment and involves hazardous waste. The product, however, contains a mineral oil fill dangerous for the environment. Please avoid oil leak into the environment at its disposal.



## 2. Description, function and technical parameters

### 2.1 Description and function

EA **MO 5P** are of compact construction with several connected modules. They are composed of two functionally different main parts consisting of following modules (**Fig.1**):

Power part -	Module M1 – electromotor Module M11 – countershaft transmission with rotating bief
Control part -	Module M3 – power transmission with manual control Module M4 – control box

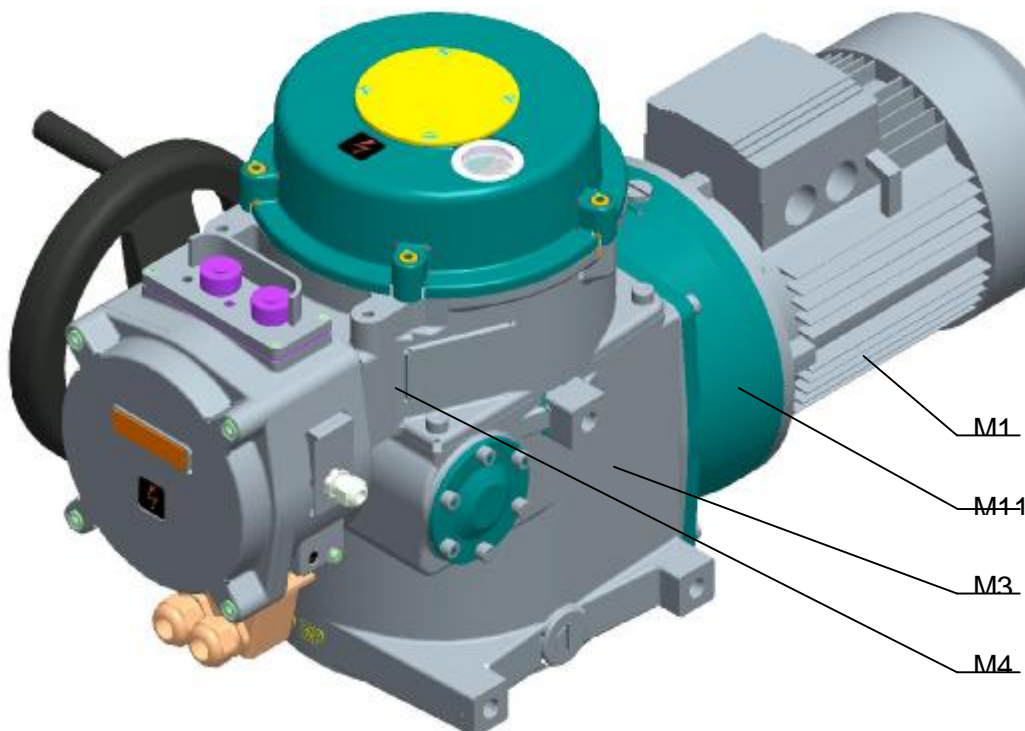


Fig.1

#### Power part

##### Module M1 – electric-motor

- **Three-phase** asynchronous electric-motor

##### Module M11 – countershaft transmission with rotating bief

Countershaft transmission performs reduction of electromotor revolutions to specified transmission value. Countershaft transmission consists of one up to two pairs of spur gears and is terminated by bevel pinion, which is meshed into transmission bevel wheel from module M3.

Rotating bief replaces motor mechanic brake and allows manual control of EA.

##### Module M3 – power transmission with manual control (Fig.2)

The set is stored in a box (22). Gears are centrally mounted on output shaft (24) and compose individual assembly unit. The pinion of electromotor transfers torque moment on bevel wheel (34), which together with planet gears (35) and firm crown wheel – rim (32) with inner gearing, forms planetary gearbox. The catch cam of planetary gearbox provides transfer of torque moment on output shaft (24). In its upper part is mounted the spiral worm (23) for moment sensing and manual control, which is used for adjustment of controlled device during electric power dropout. The adjustment is executed by hand wheel (25). The spiral worm is suspended and a force created by torque of output shaft moves the spiral worm axially against the spring tension. Movement of the spiral worm is collected by a fork with a pivot through shaft (29), joined to control box. The movement of spiral worm is

proportioned to torque load. The fork fits into perimeter slot and thus is allowed rotary motion of hand wheel, therefore manual control in every operating status. On the rear part of the box (22), (across to hand wheel) are three bosses with threaded openings, which allow fastening of electric actuator on the wall, or auxiliary construction (**Fig.1**).

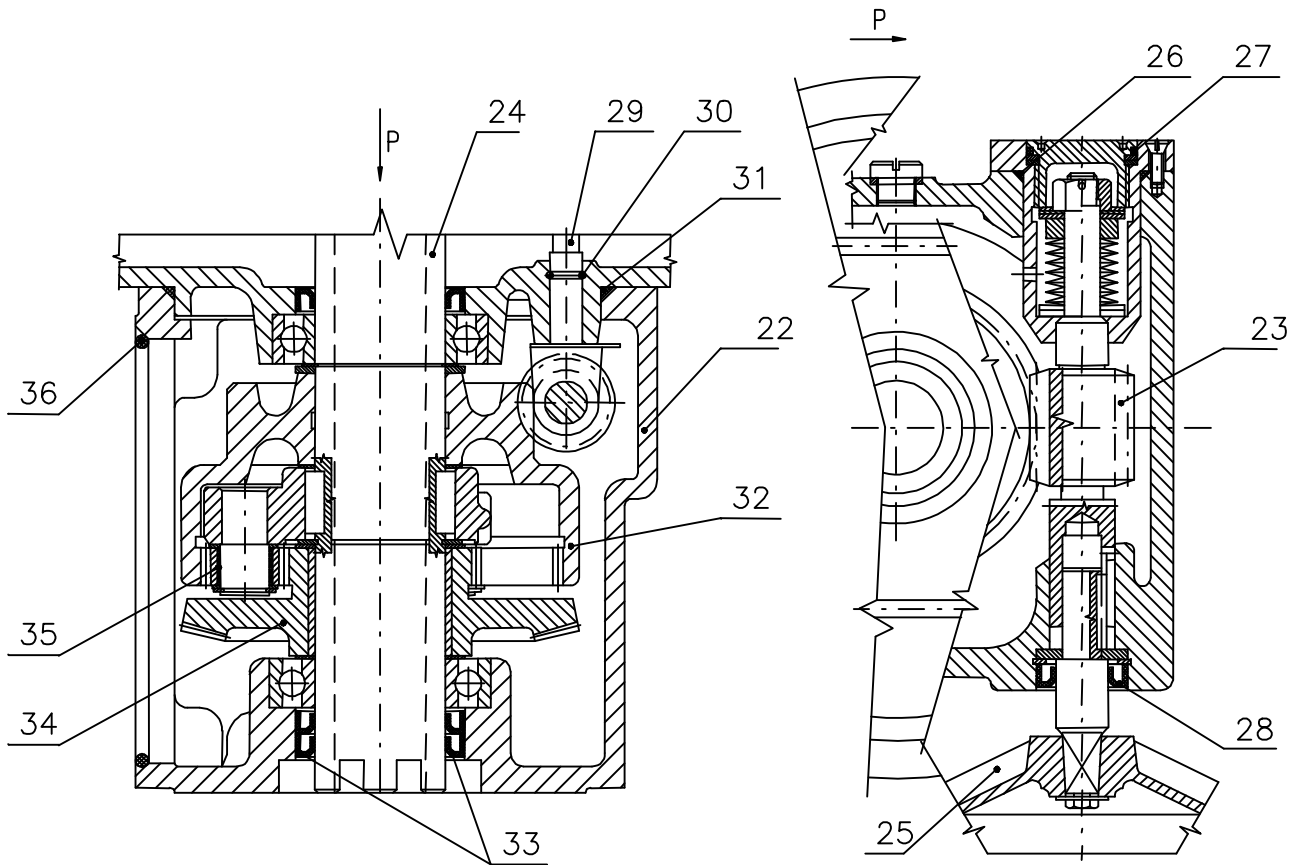


Fig. 2

### Control part

**Module M4 – control box** (fig. 1), is in upper part of electric actuator and forms individual functional unit. The upper part is created by a cover. The bottom part of control box closes the box of force transmission and forms carrying part of control plate fig.3. (9), which contains:

- Torque unit (12) – controlled by axial shift of spiral worm
- impulse sensor of position (electronic module DX3004) (13) with power source (14)
- suppression module (11)
- control disk
- heating resistor (16) with thermo switch (15)
- electric connection via **terminals** (58), located in the space of control box, and cable bushings **respectively connector** with cable bushings
- contactors (10) for make with 3~ electromotor
- local control (fig. 9)

Terminal positions of EA are measured by the number of magnetic impulses, which are generated by moving magnetic poles of permanent magnets (by control disk) in front of reed sensors. The information about direction of movement and frequency of magnetic field is stored in microprocessor of impulse position sensor, and even during absence of supply voltage. The output of device is delimitation of EA terminal positions in both directions. Besides to it are transmitted continuous data in a form of unified signal about position of actuating device.

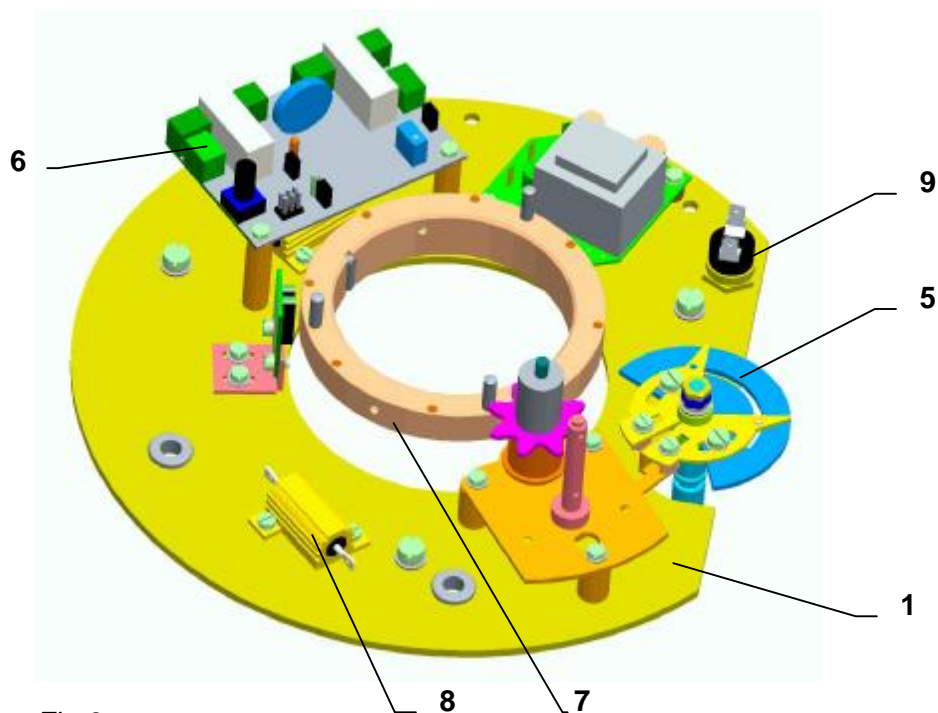


Fig.3

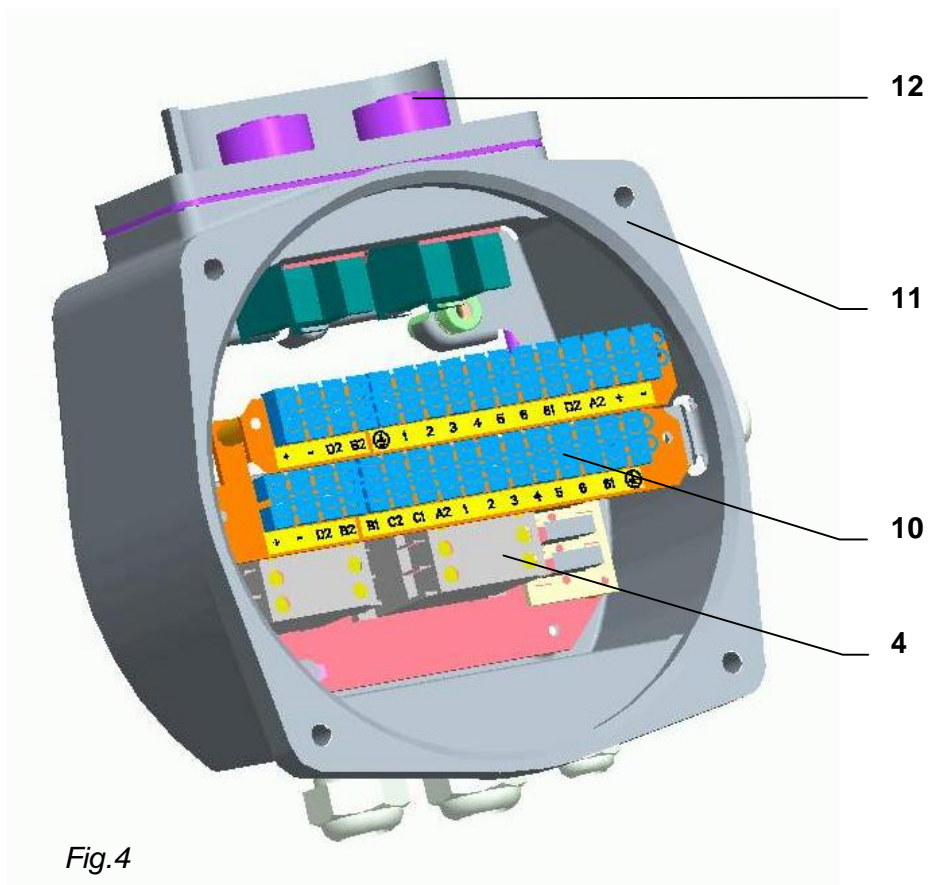


Fig.4

## 2.2 Technical data

Basic technical data of ES are presented in table no.1

**Table no. 1: Basic technical data**

Type Number	Operating speed $\pm 10\%$ [min <sup>-1</sup> ]	Work. Stroke [revolutions]	Maximum load torque		Switching thrust $\pm 10\%$ [Nm]	Weight [kg]	Electric motor				
			S2	S4-25%			Supply voltage [V]	Nominal			
								output [kW]	revolutions [1/min]	current [A]	
1	2	3	5		6	7	8	9	10	11	12
MO 5P / typové číslo 158	15	5 až 500	600	400	500 - 1000	93,5 až 103	Three-phase	Y / Δ; 380 / 220; 50 Hz Y / Δ; 400 / 230; 50 Hz	1,5	705	3,9
			375	250	320 - 630						
			300	200	250 - 500						
	20		600	400	500 - 1000						
			375	250	320 - 630						
			300	200	250 - 500						
	40		600	400	500 - 1000						
			375	250	320 - 630						
			300	200	250 - 500						
	60		600	400	500 - 1000						
			375	250	320 - 630						
			300	200	250 - 500						
100	600	400	500 - 1000								
	375	250	320 - 630								
	300	200	250 - 500								

### Other technical data:

The cover of electric actuator: ..... **IP 55 (IP 65 respectively IP 56)**(STN EN 60 529)

**Braking of ES:** ..... by roller bief

### **Mechanical ruggedness:**

Sinusoidal vibrations with frequency within 10 up to 150 Hz with shift amplitude 0, 15 mm for  $f < f_p$

..... With acceleration amplitude 19, 6 m/s<sup>2</sup> for  $f > f_p$

..... (Transient frequency  $f_p$  must be within range 57 up to 62 Hz))

Resistibility against drops ..... 300 drops with acceleration 5 m.s<sup>-2</sup>

seismic resistibility ..... according to art. 1.5.2

**Auto buckling:** ..... guaranteed throughout full range of torque moment (provided by rotary roller bief)

**Self-buckling:** ..... guaranteed within range from 0 % up to 100 % of turn-off torque

**Clearance of output part:** ..... < 5 ° at the load by 5% value of turn-off torque

Switching off

Switching off torque is set up to maximum value with tolerance  $\pm 10\%$ , unless agreed otherwise.

Working travel (working revolutions) is set up by manufacturer, according to specified value.

Hysteresis of positioning and signaling relay ..... max. 45°

### **Impulse position sensor:**

Maximum number of revolutions in each direction ..... 5 - 500 rpm

Accuracy of revolutions set up .....  $\pm 45^\circ$

Nominal value of output unified signal ..... see position transmitter

Max. input power of electronic module ..... 2,2 W

Permissible load of contacts of positioning and signaling relay .....	6 A, 30 V DC
.....	6 A, 250 V AC at resistive load
.....	6 A, 250 V AC at resistive load respectively 100 W, 250 V AC at reactive load
Maximum sequence output.....	1500 VA
Minimum sequence loading .....	10 mA 5V DC

**Note:** The contacts of the indication relay are bridged by the capacitors with capacity.....4n7Y  
**If you are switching the coils of contactors or similar devices by positioning, respectively signaling relays, it is necessary to suppress this coil by suitable R-C protection!**

**Position indicator:** local electronic position indicator can be seen through visor on control box. It is functional after set up of electronic module DX3004 only.

### Position indicator

Electric current, respectively voltage output signal from electronic plate. Selection of signal value is performed by jumpers on electronic plate.

Electric current signal .....	0 ÷ 20 mA (DC)
Electric current signal.....	4 ÷ 20 mA (DC)
Voltage signal .....	0 ÷ 10 V (DC)
Voltage signal .....	2 ÷ 10 V (DC)
Maximum load resistor at electric current output signal .....	500 Ω
Maximum load resistor at voltage output signal.....	250 kΩ
The values of output signal in terminal positions: "O" .....	20 mA resp. 10 V (terminals +; -)
"Z".....	0 (4) mA resp. 0 (2) V (terminals +; -)
Tolerance of values of transmitter output signal in terminal positions .....	"Z" +0,2 mA resp. +0,1 V
.....	For 0 ranges 4 ÷ 20 mA resp. 2 ÷ 10 V .... "Z" ±0,2 mA resp. ±0,1 V
.....	"O" ±0,2 mA resp. ±0,2 V
Output signal has jump changes with the size of jump .....	$0,125 \cdot R/N$ [mA resp. V] <sup>1)</sup>
Tolerance of values of transmitter output signal in mid-position.....	$\pm [0,125 \cdot R/N + 0,2]$ mA <sup>1)</sup>
.....	resp. $\pm [0,125 \cdot R/N + 0,1]$ V <sup>1)</sup>
Linearity deviation of electronic position transmitter .....	$\pm [12,5/N + 20/R]$ [%] <sup>1)</sup> <sup>2)</sup>
Hysteresis of electronic position transmitter .....	max. $2 \cdot [12,5/N + 20/R]$ [%] <sup>1)</sup> <sup>2)</sup>

Linearity deviation of electronic position transmitter .....

Hysteresis of position transmitter .....

Linearity of unified signal output.....

1. N is the number of preset working revolutions and R is the range of output signal

(for range 0-20 mA → R=20, 4-20 mA → R=16, 0-10 V → R=10, 2-10 V → R=8)

2. Related to output values from nominal transmitter value

### Heating element (E1)

Heating resistor – supply voltage: .....

max. 250 V AC;

Heating output: ..... about 1x25 W/55°C

### Thermo-switch of heating element (F2)

Supply voltage: ..... 230 V AC, 5 A

Temperature of conduction: +20°C ± 3 K

Temperature of disconnection: +30°C ± 3 K

### Manual control:

By hand wheel after releasing of arresting bolt even during electromotor run. By turning hand wheel clockwise is output shaft of electric actuator moving towards „Z“.

### Electric control:

- remote control (movement of EA output member is controlled by supply voltage)

### Set up of terminal positions:

Terminal position relays are set up with accuracy ..... working angle ± 45°

Additional position relays (if specified) ..... about 1 revolution in front of terminal positions.

### Adjustment of torque switches

Turn-off torque, unless other adjustment is specified, is set up to maximum turn-off torque of selected range with tolerance ±10 %, for repeated torque turn-off.

### Lubrication:

- Gearbox oil for temperatures: -25°C up to +70°C Madit PP-80 (Slovnaft)  
-45°C up to +45°C GYROL 75W (Paramo)

### 2.2.1 Mechanical connection

- By flange F16 (ISO 5210, STN 18 6314, DIN 3338)
- By flange φ220 (OST 26-07-763)

Main and connecting dimensions are presented in **dimensional drawings**.

### 2.2.2 Electric connection

**to terminal box type (X) :**

- max. 32 terminal connectors
- crosscut of connecting wire max. 2,5 mm<sup>2</sup>
- 2 cable bushings from control box – cable diameter 11 to 17 mm
- 1 cable bushing from control box – cable diameter 5 to 10 mm
- 1 cable bushing from electromotor – cable diameter 11 to 17 mm

**to connector (XC):**

- (max. 32 poles - the crosscut of connecting wire 0, 5 mm<sup>2</sup>):
- 2x cable bushings - P 21/18 - cable diameter from 11 up 17 mm

### Protective terminal

Outer and inner, they are mutually interconnected and marked by a sign of protective grounding. Electric connection is performed according to **connection drawings**.

***Warning: If by positioning, respectively signaling relays are connected the coils of contactors, or similar devices, it is necessary to suppress this coil by suitable R-C protection! Otherwise can electronic module be interfered and incorrect switching offs of EA in terminal positions can occur.***

### 3. Installation and Dismantling of the Actuator



Adhere to safety rules!

#### Notes:

Repeatedly verify whether placing of EA corresponds to part "Operating conditions". If actual conditions differ from recommended, it is necessary to consult it with manufacturer.

Before commencing of EA assembly to the armature :

- Repeatedly verify, if EA was not damaged during storing.
- According to data label verify conformity between working stroke set up by manufacturer and EA connecting dimensions with parameters of armature.
- In case of discrepancy perform set up according to part "Set up".

#### 3.1 Installation

EA is by the producer adjusted to parameters according to the nameplate.

Before installation put the handwheel on.

##### 3.1.1 Mechanical connection to the armature

In case that required shape of mechanical connection is designed by A-shape adapter (with flange F16), at first is necessary to fix this adapter to connecting flange of EA by the screws.

##### Mechanical connection – shape of connecting element B, C, D and gear clutch :

- Bearing surfaces of EA connecting flange must be carefully de-greased.
- Slightly grease the shaft of armature/gearbox by acid-free grease;
- Shift EA to its terminal position „CLOSED“; shift armature into identical terminal position.
- Put EA on armature, so as output shaft reliably fits into clutch of armature.

##### Warning!

**Do not use force when you put EA on armature, otherwise the gear can be damaged!**

- Should there is the necessity to synchronize the openings in the EA flange and armature, turn the EA by hand wheel;
- Verify, whether connecting flange fits tightly to the armature / gearbox.
- Attach the flange by four bolts (with mechanical hardness min. 8G), which steadily tighten crosswise.
- At the end of mechanical connection perform **the check of proper connection with the armature**, by turning hand wheel.

##### Mechanical connection – rising spindle (for shape A resp. C, eventually B1):

- If the rising spindle of armature is in one of its terminal positions longer than dimension of mounting flange up to the control box cover, disassembly cover of output shaft (Fig.1) on control box and replace it by covering pipe (not part of delivery) after assembly of electric actuator on armature.
- Seating surfaces of EA connecting flange and armature carefully de-grease.
- Slightly grease the output shaft of armature.
- Shift EA to terminal position „CLOSED“; shift armature into identical terminal position.
- Slide electric actuator by output shaft / nut on the spindle / nut of armature and turn by hand wheel counterclockwise until connecting flange of electric actuator fits to connecting flange of armature. Further procedure is identical to previous part of mechanical connection for shapes B, C, D.
- At the end of mechanical connection perform the check of proper connection of EA with the armature by turning the hand control wheel.

### 3.1.2 Electric connection to the network, respectively control system

Consequently perform electric connection to the network, respectively to joining system.



1. Adhere to instructions stated in chapter 1.2 Safety instructions – Requirements for professional skills....
2. During deposition of electric line is necessary to adhere to regulations for installations of heavy-current equipment.
3. Line wires to terminal boards, respectively to connector lead by screw cable bushings.
4. Before putting the electric actuator into operation is necessary to connect inner and outer grounding terminal.
5. Leading-in cables must be attached to firm construction maximum 150 mm from bushings!
6. The bushing blinds are for transportation and storing purposes only. Should one of cable bushings is not used, this bushing must be secured by the blinder.

**Warning: If by positioning, respectively signaling relays are connected the coils of contactors, or similar devices, it is necessary to suppress this coil by suitable R-C protection! Otherwise can electronic module be interfered and incorrect switching offs of EA in terminal positions can occur.**

#### Electric connection of terminal board:

Remove cover of terminal box before electric connection and verify whether type of current, supply voltage and frequency correspond with data on electromotor type plate.

Before electric connection remove cover of electric actuator control box and check whether the type of electric current, supply voltage and frequency corresponds with data on electromotor type label.

Electric connection:

- perform electric connection according to connection drawing, which is inserted into terminal box.
- electric connection is performed through two cable bushing with cable diameter 11 to 17 mm and through 1 cable bushing with cable diameter 5 to 10 mm. Description of connection of individual terminals:
- connect grounding wire to grounding terminal (identically to outer protective terminal )
- to terminal no.1 connect neutral wire for supply of reversing connectors coils, supply of source of electronic module and heating resistor, for signal lights of local control
- to terminals no. 2,3,4 connect phases for supply of 3~electromotor
- connect wires for switching off of contactor's coil, or other electromotor switching components (for a make without built-in reversing contactors) to terminals no.11 and 15.
- to terminals + and – is connected electric current, respectively voltage output signal 0/4-20mA resp. 0/2-10V
- to terminal D2 connect phase wire for control of EA towards „open“
- to terminal A2 connect phase wire for control of EA towards „close“
- to terminals B1-B2 is connected signaling relay for position „closed“
- to terminals C1-C2 is connected signaling relay for position „open“
- Put on the cover and fasten it evenly crosswise by bolts. Cable bushings fasten firmly, only thus is the coverage guaranteed.

#### Electric connection to connector

- Check, whether the type of electric current, supply voltage and frequency comply with data on electric motor type label
- Release bodies of the connectors
- Strip the ends of wires
- Attach relevant connector tubes to the wire ends by means of pliers.
- Slide the tubes into relevant contacts of connector according to connection drawings.
- Fasten and tighten connectors.
- Firmly tighten cable bushings to secure coverage.



Remarks:

1. Stuffing bushings are delivered with EA, which in case of tight mounting on supply line secure coverage up to IP 68. For required coverage is necessary to use ringlets according to actual cable diameter and required thermal resistibility.
2. During attachment of a cable is necessary to watch acceptable bending radius to prevent damage, respectively not acceptable deformation of sealing element of cable bushing. Supply cables must be attached to firm construction maximum 150 mm from bushings.
3. For connection of remote transmitters is recommended to use shielded wires.
4. Sealing surfaces of control part cover must be cleaned before repeated fastening.
5. EA reversal is secured, if time interval between switching OFF and ON of supply voltage for reverse direction of output part motion is minimum 50 ms.
6. Delay after turn-off, i.e. time from reaction of the switches until the motor is without voltage, can be max. 20 ms.



*Adhere to instructions of armature manufacturers, whether turn-off in terminal positions must be executed via position, or force switches!*

After electric connection perform **functional check**:

- After electric connection is for proper function of torque switches S1 and S2 necessary to check and adjust if needed the connection of individual phase conductors sequence for supply of 3-phase electromotor.
- Manually move the armature to the middle-position.
- Lead supply voltage to terminal D2 for supply of EA to direction „open“ and watch the sense of disk rotation (7) fig.3, in controlling part of EA at electronic module. If is EA properly connected, the disk must from upper view to control box rotate counterclockwise (the output shaft moves towards „open“. If it is not so, it is necessary to mutually exchange input of phases L1 and L3 on terminals no.2 and 4. After the exchange check the sense of EA rotation by connection of supply voltage to terminal D2 towards „open“ resp. to terminal A2 towards „close“.

### 3.2 Disassembly



**Attention!**

**Before disassembly is necessary to disconnect electric supply of electric actuator! Connection and disconnection of connectors must not be performed under the voltage! Secure by prescribed way protection against connection of EA to the network and thus potential electrical accident!**

- Turn off EA from power supply.
- Disconnect connecting wires from terminal board of EA and release the cable from bushing.
- Release fixing flange bolts and EA coupling bolts and separate EA from the armature.
- If you will send EA to the service, pack it to sufficiently firm package, to prevent its damage during transportation.

### 4. Set up



Adhere to safety regulations! By prescribed method secure protection against electric current injuries risk!

After mechanical connection, electric connection and verification of connection and functionality start adjusting and set up of the equipment. The set up is performed on mechanically and electrically connected EA. In this chapter is described set up of EA to specified parameters in case that any of EA elements has been adjusted. The placement of control plate adjusting elements is in fig. 3. Should manual control is required, it is necessary to release locking screw (**Fig.13**). After finishing of manual control fasten locking screw back.

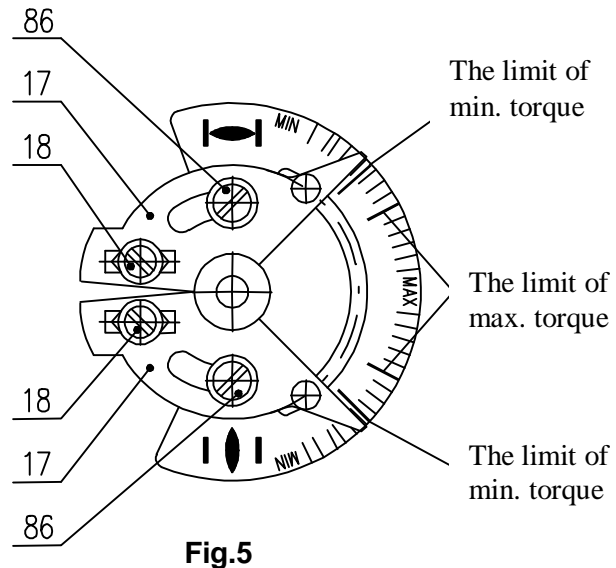
#### 4.1 Set up of torque unit

Disconnecting moments are in production plant adjusted to required values for direction „open" (torque switch S1), as well as for direction "close" (torque switch S2), with the accuracy  $\pm 10\%$ . Unless agreed otherwise, they are set up to maximum value.

**Torque unit** is composed of three functional sub-units:

- Torque disk (**Fig. 5**)
- Torque unit with locking mechanism (82) (**see fig. 6**)

*Torque disk (Fig. 5)* is assembled on torque shaft discharged from power transmission (**Fig.2**). Steer angle of torque disk is proportional to torque moment of output shaft of electric actuator. Its magnitude can be adjusted by segments (17) and by shifting of backstops (18) (**Fig. 5**). Achieved torque moment value is from torque disk transferred on torque unit by means of torque lever (42) (**Fig. 6**).



**Fig.5**

#### Remark:

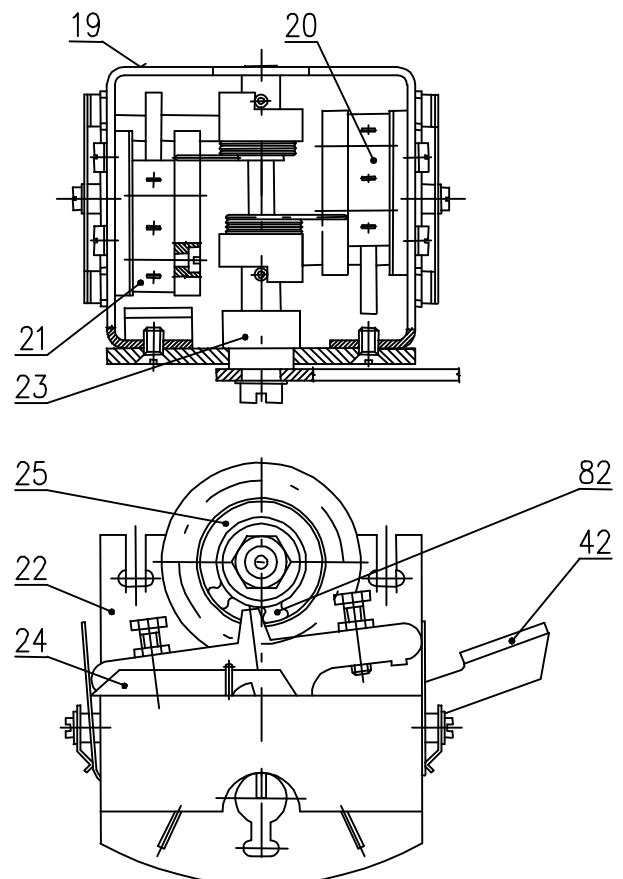
*The gauge marks on the scales do not indicate direct value of disconnecting moment; they are used only for more detailed orientation during adjusting its magnitude within marked MIN. and MAX. disconnecting value for given make without testing device for torque measurement.*

*Torque unit (obr.6)* consists of a carrier, on which are displaced switches S1 (20) and S2 (21). On the shaft (23) are mounted disconnecting levers (24), keeping switches pressed by spring tensions until a moment when the shaft is turned out of the mesh of torque disconnection.

*Locking mechanism (82) (Fig.6)* provides locking of torque disconnection usually to 1 or 2 turns after reversing of electric actuator. After elapsing of adjusted revolution will torque unit acquire its original function.

Disconnecting torque can be adjusted only in connection with a device for torque measurement and only within relevant range, according to specification table, by rough regulation (17) and soft regulation (18), (**Fig.5**).

**Adjustment of disconnecting torque** by means of segments (17), (**Fig.5**), can be performed only within highlighted interval MIN – MAX on torque disk within relevant power range of electric actuator.



**Fig.6**

To change torque range, springs in torque drive must be replaced, what can be executed only in production plant, respectively service center due to its assembly requirements.

### Set up of locking:

If there is one pin on control dick, the locking adjustment can be performed (7) (Fig. 3):

- 1 – 2 turns – cams on pinion (25), (Fig.6), are turned by 90°
- 3 – 4 turns – cams on pinion (25) are turned by 180°
- 5 – 6 turns – cams on pinion (25) are turned by 270°
- 7 – 8 turns – cams on pinion (25) are turned by 360°

Locking for multispeed electric actuators is by manufacturer adjusted to 1 or 2 turns of output shaft.

## 4.2 Local electric control:

### - Additional accessories

In case of necessity (set up, functional check, etc.) but at provided supply is possible to adjust the EA by local electric control. After switch over of mode selector to the mode „LOCAL“ is possible to control the movement of output member in desired direction by direction change over switch. The signal lamps go out with reaching the end position of the appropriate direction.

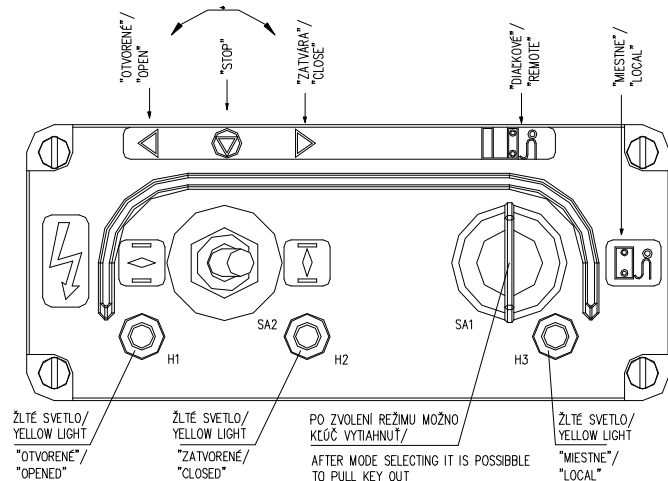


Fig. 7

## 4.3 Position indicator

EA is equipped by electronic position indicator (Fig.8). The position indicator is active after module of electro-nics DX3004 set up. **During a supply voltage failure of the electronic module, the position display is inactive.**

The output signal of position indicator is output signal from electronic module. **According to set up value of output signal is necessary on indicator circuit board (pic.9) to change position of jumpers according to table no. 3.** The output voltage signal is measured by a voltmeter to be connected to the + and – terminals. At output current signal measuring, the jumper is to be disconnected from the IN and + terminals, and the ampermeter is to be connected to these terminals subsequently. The position display doesn't operate until the ampermeter isn't connected to the IN and + terminals with jumper disconnected.

If the customer doesn't specify the output signal, this one is factory set on a value of the range from 2 to 10 V (with the jumper connected between the IN and + terminals).



**Note:** With the setup of output signal for value 2-10V or 4-20 mA, the first two LED diodes are not light.



Fig.8

Table no.3				
Range of output signal values	JP1	JP3	JP4	JP5
0 – 10 V	on 1-2	off	on	on
2 – 10 V			off	off
0 – 20 mA	on 2-3	on	on	on
4 – 20 mA			off	off

Legend:  
 off- without jumper  
 on- with jumper

By jumper JP2 can be selected illustration of LED indicator – point illustration JP2=off, column illustration JP2=on.

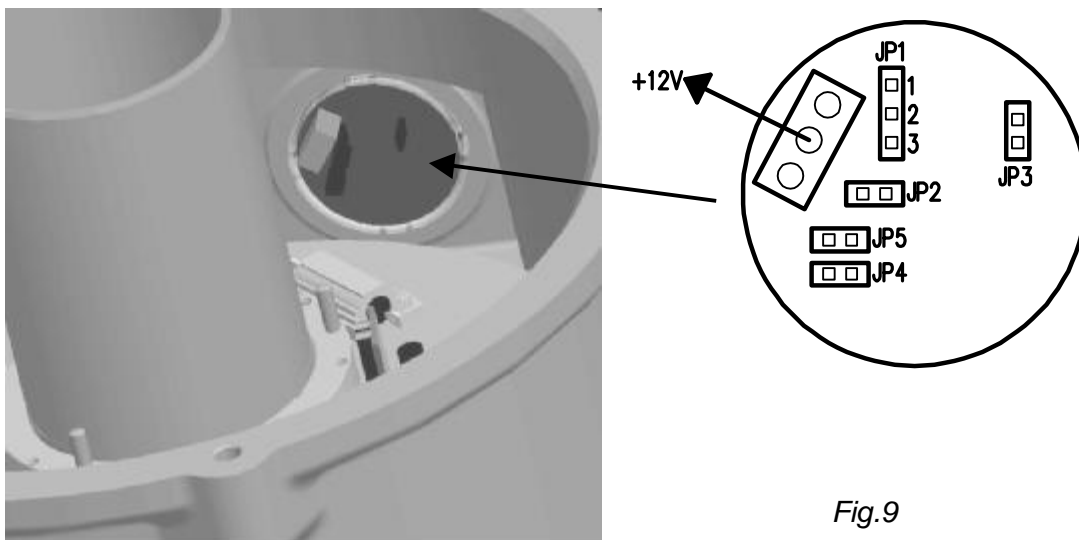


Fig.9

#### 4.4 Set up of module of electronics DX 3004

By set up of module of electronics DX3004 is possible to:

- Set up terminal positions
- Set up maximum value of output unified signal

New set up must be performed in cases of:

- a) Loss of set up (position) – the loss of position is indicated by LED D1 flashing (red)
- b) Necessity to change to working travel

The adjustment is performed by rotation of adjustable pushbutton **T1 (Fig.11)** for period about 2 sec.

Procedure of module of electronics DX3004 set up (fig. 11)		
Point	With switching off in terminal position by the torque	With switching off in terminal position by the position
1	Disconnect EA from supply voltage and check, respectively set up jumpers for range selection of output signal (selection is performed via jumpers X1 and X2 according to tab. no. 2 and fig. no. 11)	
2	Connect EA according to connection drawing and connect supply voltage to relevant terminals	
3	Connect voltage to terminal A2, respectively D2 and check the sense of rotation	
4	Cancel original set up by pressing pushbutton <b>T1</b> (according to 5,6,7,8) <b>for cca 2 sec. – light up LED D1 red</b>	
5	Set EA to terminal position „closed – by connection of supply voltage to terminal A2 respectively D2. When the terminal position „closed“ is reached, disconnect supply voltage connected to terminal A2 respectively D2	
6	Press adjusting pushbutton <b>T1</b> for about 2s – <b>LED D2 glows red</b>	
7	Press adjusting pushbutton <b>T1</b> for about 2s - <b>LED D2 glows green</b>	
8	Press adjusting pushbutton <b>T1</b> for about 2s - <b>LED D2 goes off</b> and after releasing of pushbutton will go off also <b>LED D1</b> . By this step is EA ready for new set up	
9	For disconnection by the torque in position „closed“ connect torque switch S2 by pressing jingle bell and connect supply voltage to terminal A2	-
10	Press adjusting pushbutton <b>T1</b> for about 2s – <b>LED D1 glows red</b> (from this moment will glow permanently until finish of set up procedure) and terminal position „closed“ is stored into memory	
11	Disconnect supply voltage connected to terminal A2 and release jingle bell of torque switch S2	-
12	<b>Adjust EA towards „open“ by connection of supply voltage on terminal D2 to position in which you want to adjust the size of range for closure of signaling relay „closed“ (conducted state of relay contacts B2-B1).</b>  When required position is achieved, turn off supply voltage to terminal D2 Press adjusting pushbutton <b>T1</b> for period about 2s - <b>LED D2 glows red</b>	
13	Set EA towards „open“ by connection of supply voltage to terminal D2 into terminal position „open“. After reaching of terminal position „open“ disconnect supply voltage to terminal D2	
14	For disconnection by torque in position „open“ connect torque switch S1 by pressing jingle bell and connect supply voltage to terminal D2	-
15	Press adjusting pushbutton <b>T1</b> for about 2s - <b>LED D2 glows green</b> and terminal position „open“ is stored into memory	
16	Disconnect supply voltage connected to terminal D2 and release jingle bell of torque switch S1	-

17	Adjust EA towards „close“ by connection of supply voltage to terminal A2 to position in which you want to adjust the size of range for closure of signaling relay „open“ (conducted state of relay contacts C2-C1) When required position is achieved, turn off supply voltage to terminal A2. Press adjusting pushbutton <b>T1</b> for period about 2s - <b>LED D2 turns off</b> . When adjusting pushbutton is released, <b>LED D1 will also be turned off</b> . The process of adjustment of EA terminal positions and adjustment of signaling relays is finished
<b>Procedure of maximum value of output signal set up (fig. 7)</b>	
Set up of output signal maximum value is performed after set up of EA terminal positions.	
1	Set up EA to position „open“ by connection of supply voltage to terminal A2
2	Set up maximum value of output signal measured on terminals + an – according to selected range (20mA resp. 10 V) by trimmer R26

At properly set up sensor must not glow, or flash red LED D1 and LED D2 glows green permanently during movement of EA towards „close“. After reaching of EA terminal position will ES LED D2 go off. In the case of losing the information about position, (deletion of terminal positions during longtime power loss, or during short circuit) will be this situation indicated by flashing of red LED D1. In this case is necessary again set up terminal positions of EA according to item „ set up of electronics module “.

Remark 1: The plate of electronics is equipped by electronic locking module, which reacts on disconnection of EA by overload (torque). After exceeding of set up torque will be EA disconnected in relevant direction in any mid-position except of set up locking range of torque switches ( locking set up according to item „ set up of electronics module “). After such a disconnection can be EA controlled only towards opposite direction. Towards direction of disconnection can not be EA controlled even after reducing the load. In this case is necessary to reverse EA in opposite direction and after this reversing is possible to continue in controlling of EA towards original direction.

Remark 2: During permanent connection of EA to power supply is the set up stored by EA. After supply voltage dropout will EA retain set up for period min. three years. Even more, all changes of EA output member movements are registered (even without power supply. The durability of battery is about 10 years.

Remark3: During set up of electronics module keep the sequence of individual directions of movement. Should the directions are not kept, the EA will not be set up, or respectively set up will be wrong.

Remark 4: (Fig.10) illustrating sequential pressing of adjusting pushbutton T1 from first pressing up to 4th pressing together with status of the contacts in locking range respectively in signaling range.

Remark 5: The jumper X3 according to (fig.11) is not meant for the use of customer - must be permanently inserted.

Remark 6: When the problem appears with adjusting, shut down the supply voltage of electronic module and turn it on again after 10 seconds. If the problem with adjusting continues, reset the electronic board by short-circuiting of the pins 4 and 5 in the connector J4 for the period approximately 2 seconds (Fig. 12).

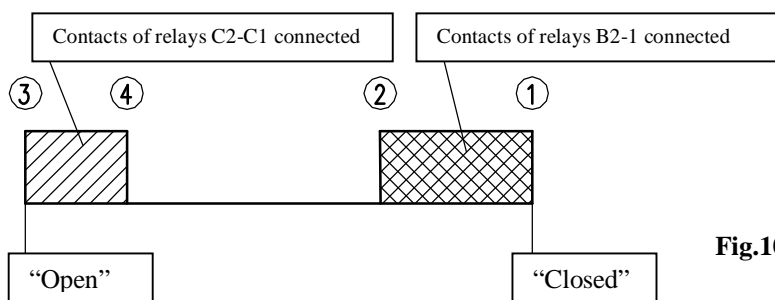


Fig.10

Table no.2		
JUMPER		The range of output signal values
X1	X2	
0	0	0 – 20 mA
0	1	0 – 10 V
1	0	4 – 20 mA
1	1	2 – 10 V

Legend:  
 0- without jumper  
 1- with jumper

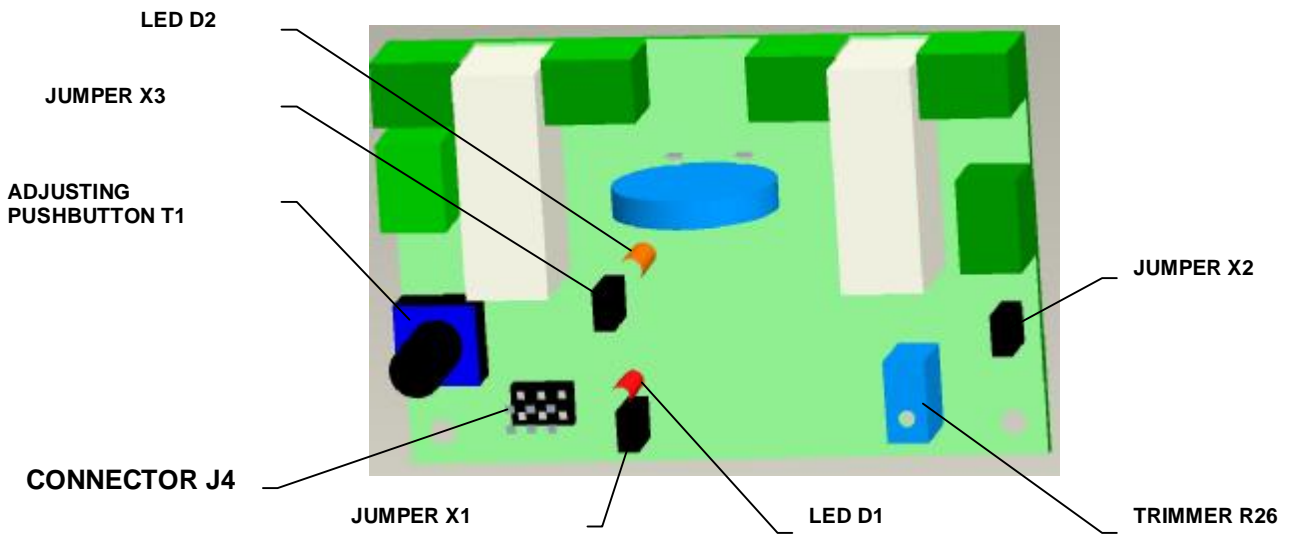


Fig.11

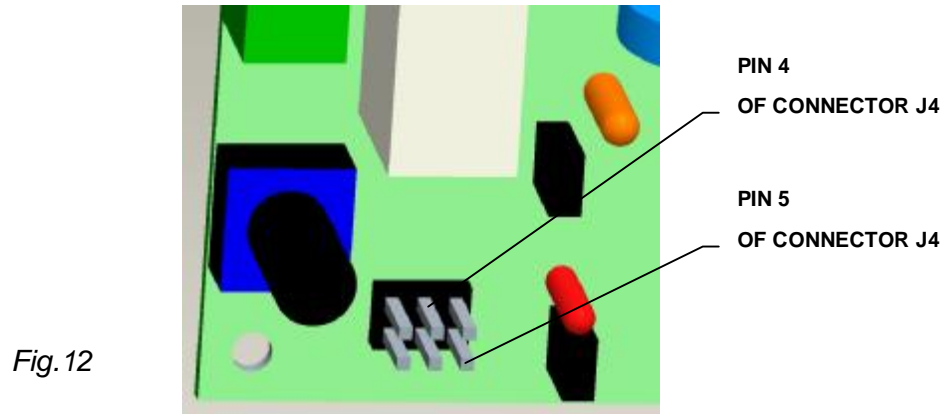


Fig.12



## 5. Service, maintenance and troubleshooting

### 5.1 Operation



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!

- Electric actuator requires only inconsiderable operation. The assumption for reliable operation is proper putting into operation.
- The operation of these EA comes out of operating conditions and usually consists of information processing for consequential securing of required function. EA can be controlled either remotely by electricians, or manually on their assembly position. Manual control is executed via hand wheel.
- The operators must take care for performing of prescribed maintenance and for protection of EA during operation against harmful ambient effects and atmospheric exposure, which exceeds the scope of acceptable effects described in part „Working conditions“.
- It is necessary to prevent excessive heating of the surface of EA, exceeding of type label values and excessive vibration of EA.

#### Manual control:

- In case of necessity (set up, functional check, dropout, etc.) can the operator perform adjustment of controlled body by means of hand wheel. When the hand wheel is turned clockwise, the output member turns towards "CLOSE".
- Before manual control must be realized locking screw (**Fig.13**). Fasten locking screw after finishing of manual control.

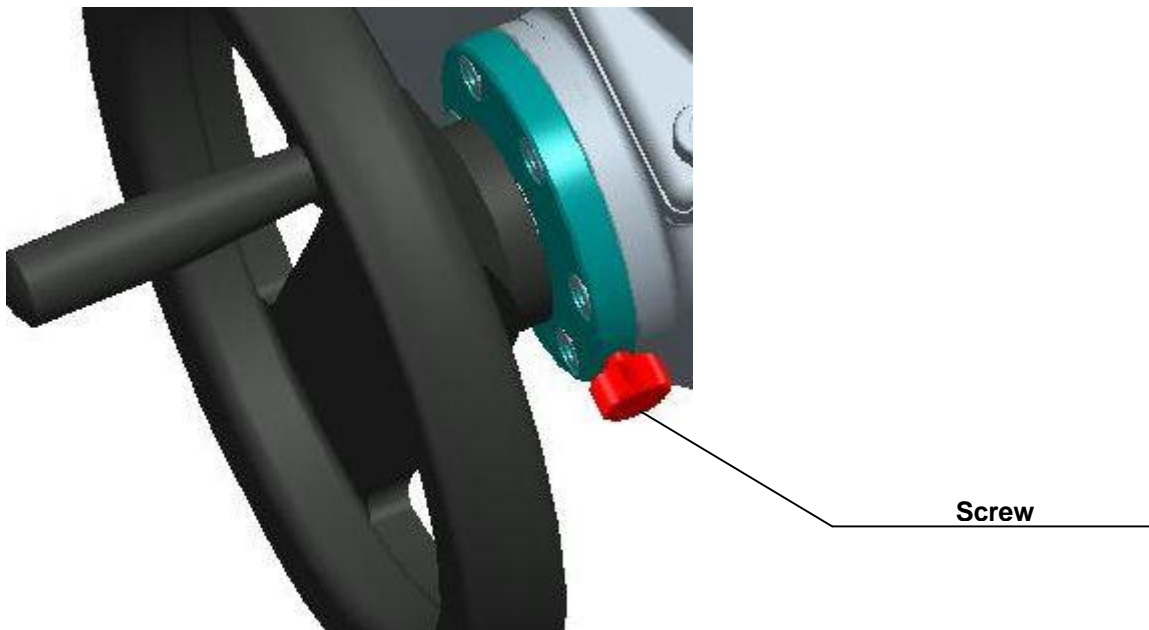


Fig.13

### 5.2 Maintenance – scope and regularity

All screw and nuts which can influence tightness and coverage must be fastened during inspections and maintenance.

Further maintenance consists of lubrication. Replacement, respectively replenishment of lubrication is not required in the first years of operation. Replacement, respectively replenishment of lubrication is necessary during revision works.

After every potential flooding of the product check, whether there is no water inside. After eventual water penetration, dry the product before repeated putting into operation and replace damaged sealings, resp. other parts of EA. identically check also tightness of cable bushings and replace them, if they are damaged.

**Lubrication:**

- the gearbox:  $-25^{\circ}\text{C}$  till  $+55^{\circ}\text{C}$  - Madit PP-80 (Slovnaft)  
 $-40^{\circ}\text{C}$  till  $+40^{\circ}\text{C}$  - GYROL 75W (Paramo)
- the drive mechanism on the control board:
  - grease Gleit- $\mu$ HF 401/0
  - grease ISOFLEX TOPAS AK 50. - in versions with temperatures  $-50^{\circ}\text{C}$  till  $+40^{\circ}\text{C}$
- grease Gleit- $\mu$ HP 520 M - nut and spindle of valve.



**Lubrication of armature spindle is performed regardless on EA service!**

- It is recommended to perform inspection run every 6 months within set up working stroke to verify proper function, with reverse set up of original position.
- Unless otherwise stated in revision rules, perform inspection of EA once a four years, whereby check tightening of all connecting and grounding bolts, to prevent heat-up.
- 6 months after putting EA into operation and then once a year is recommended to check tightness of fastening bolts between EA and armature (bolts should be tightened by cross method).

**Check a voltage of the back up battery minimum 3 years after the date of servo-unit's production written on type label or from date of last change the back up battery. If the voltage is less than 2 V, change the back up battery for a new one.**



- During electric connection and disconnection of EA check sealing rings of bushings – damaged and obsolete sealings replace by original ones!
- Maintain EA clean and take care for removal of impurities and dust. Cleaning should be performed regularly, according to operating options and requirements.

### 5.3 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.

Failure	Failure manifestation	Reason of a failure	Troubleshooting
Servo-unit does not stop in the limit positions	Lost of servo-unit's position. The red LED D1 of DX 3004 module is blinking	1. The voltage of a back up battery dropped down under 2 V;	Check the voltage of a back up battery. If the voltage is under 2 V, replace a battery. Make the adjusting in accordance with the chapter 4.3 of the manual
	The red LED D1 of DX 3004 module is blinking or module is not active at all.	2. Failure of the sensor module	Make the program reset – see Note 6 in the chapter 4.3 of manual ...
			If it is not possible to remove a failure, contact the producer's service center.

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!**

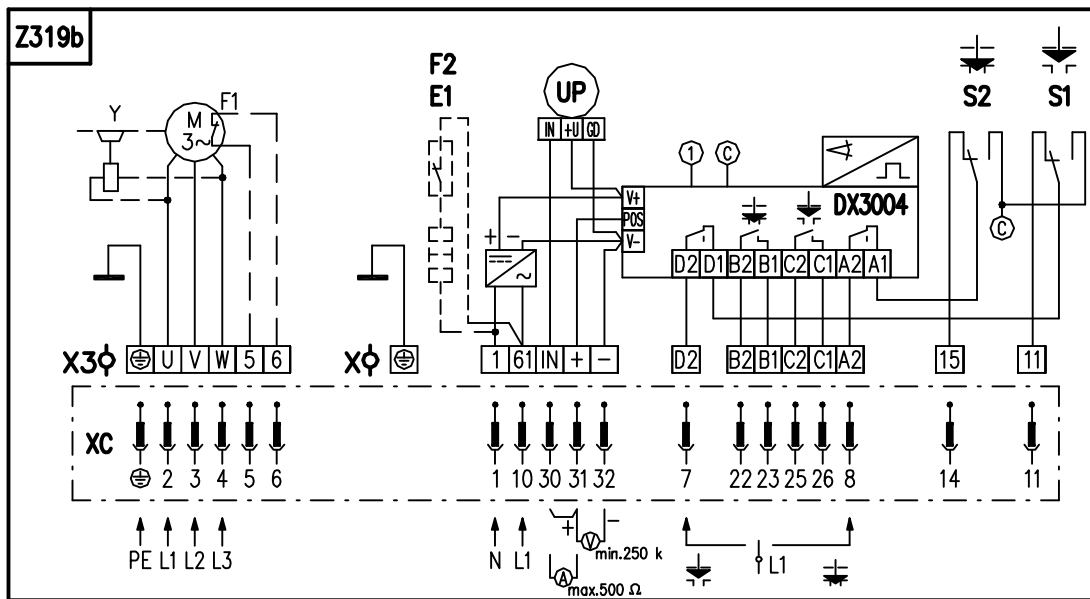
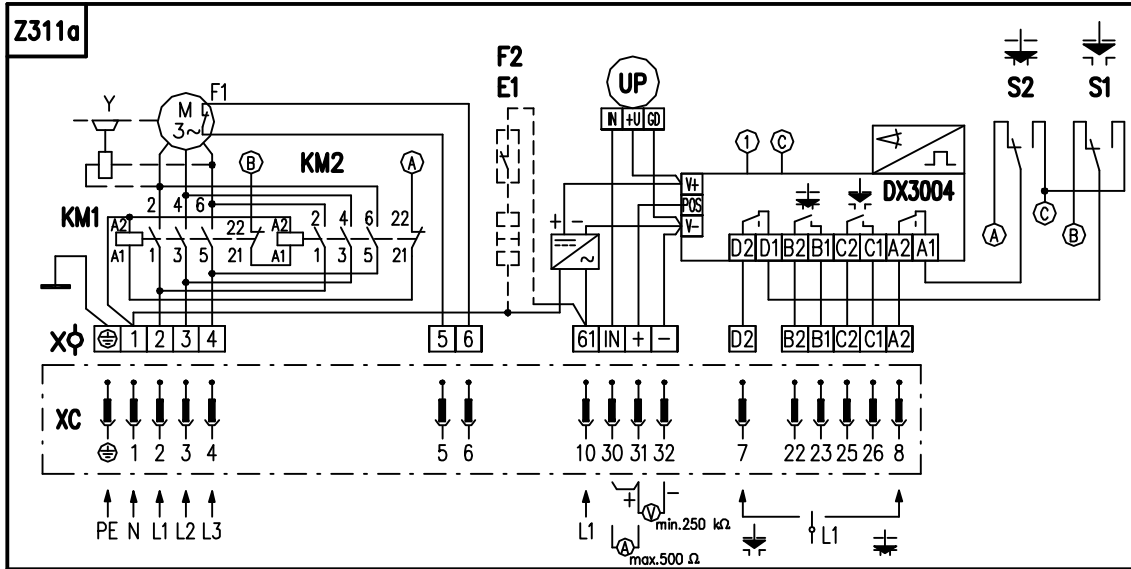
## 6. Accessories and spare parts

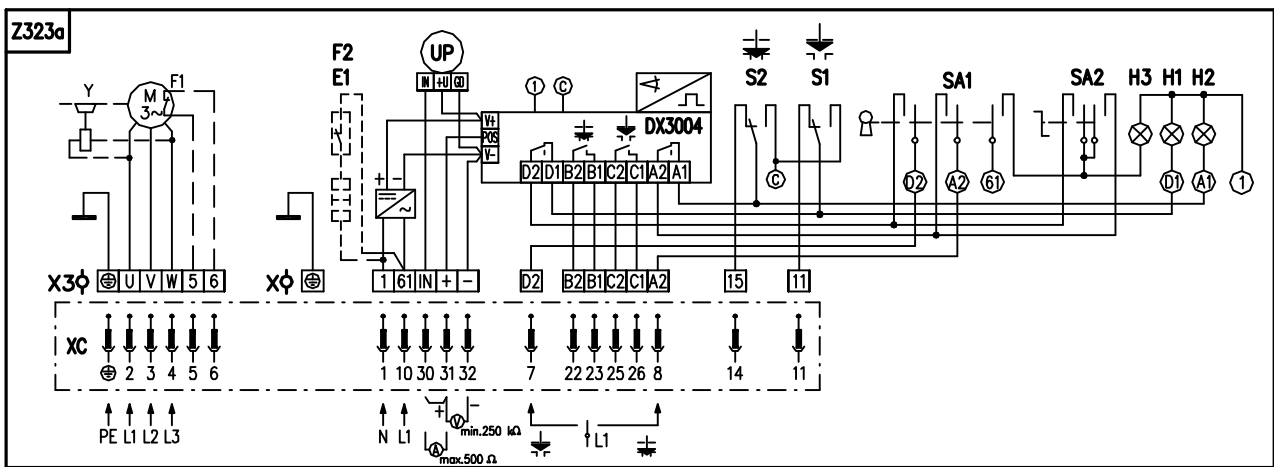
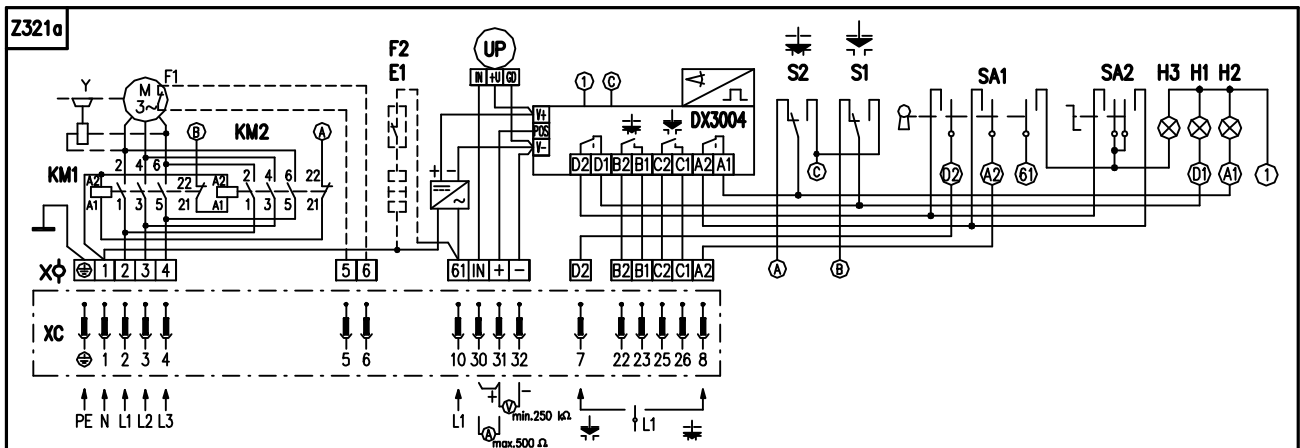
### 6.1 The list of spare parts

Name of part - Type	Order number PNm	Position	Picture
Electric motor 1LA9113-4LA11-ZK17 5.5 kW; Y/Δ 400/230V AC;	63 592 238	M1	1
Electric motor 1LA7113-4AA11-ZK17 4 kW; Y/Δ 400/230V AC;	63 592 222	M1	1
Electric motor 1LA7107-4AA11-ZK17 3 kW; Y/Δ 400/230V AC;	63 592 223	M1	1
Elektromotor 1LA7113-6AA11-ZK17 2.2 kW; Y/Δ 400/230V AC;	63 592 224	M1	1
Electric motor 1LA7106-6AA11-ZK17 1.5 kW; Y/Δ 400/230V AC;	63 592 225	M1	1
Module of electronics DX3004.RMS	64 051 177	6	3

## 7. Enclosures

### 7.1 Wiring diagrams





**Legend:**

- Z319b ..... connection drawing of EA with 3-phase electromotor without contactors
- Z311a..... connection drawing of ES with 3-phase electromotor and with reversing contactors
- Z321a connection drawing of ES with 3-phase electromotor with reversing contactors and local control
- Z323a connection drawing of ES with 3-phase electromotor without reversing contactors with local control
- S1..... torque switch “open”
- S2 ..... torque switch “closed”
- M3 ..... 3 – phase electric motor
- KM1,KM2..reversing contactors
- Y..... brake of electromotor (not valid for this type of EA)
- E1 ..... space heater
- F1..... motor’s thermal protection (not valid for this type of EA)
- F2..... space heater’s thermal switch
- H1..... indication of “open” limit position
- H2 ..... indication of “closed” limit position
- H3 ..... indication of “electric local control”
- SA1 ..... rotary switch with key “remote – 0 - electric local” control
- SA2 ..... rotary switch “opening – stop – closing “
- UP ....electronic position indicator
- X ..... terminal board

XC ..... conector  
 Terminated clamps B1-B2.....additional position relay for signalling “closed”  
 Terminated clamps C1-C2.....additional position relay for signalling “opened”

DX 3004 . module of electronics

Remark 1: ..... To terminals 5 and 6 is connected thermal protection of electromotor only in case of EA  
 ..... with provided thermal protection.

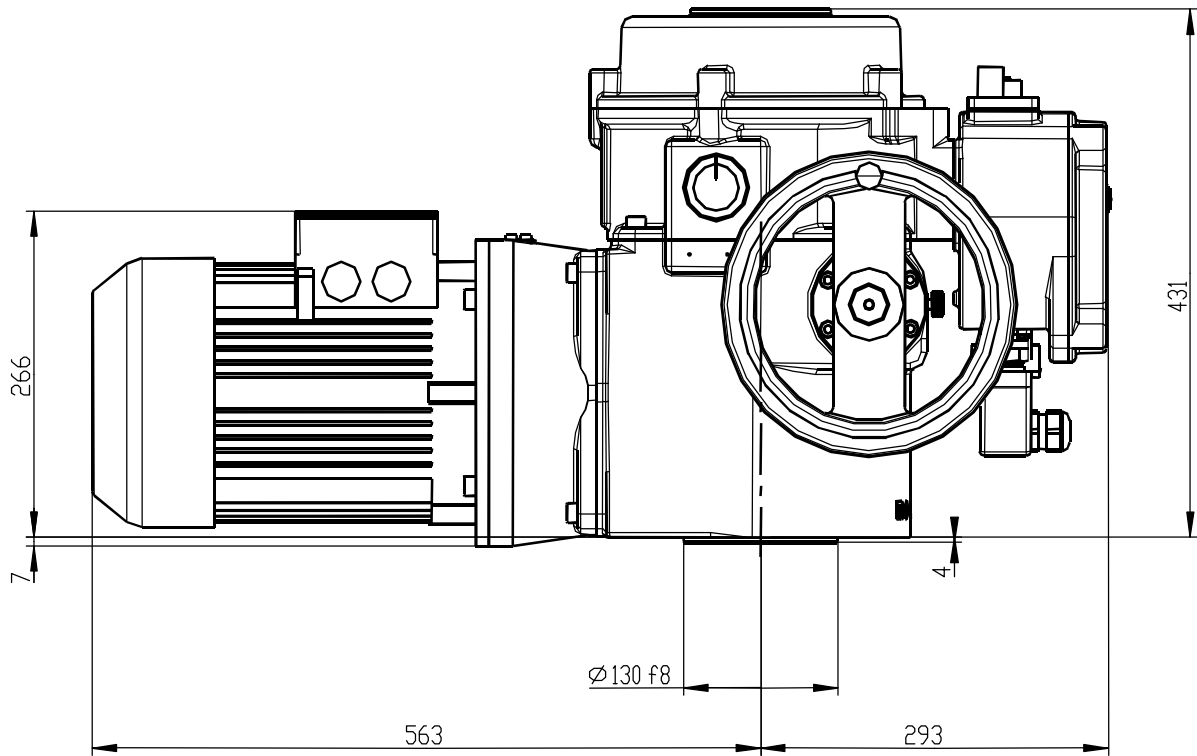
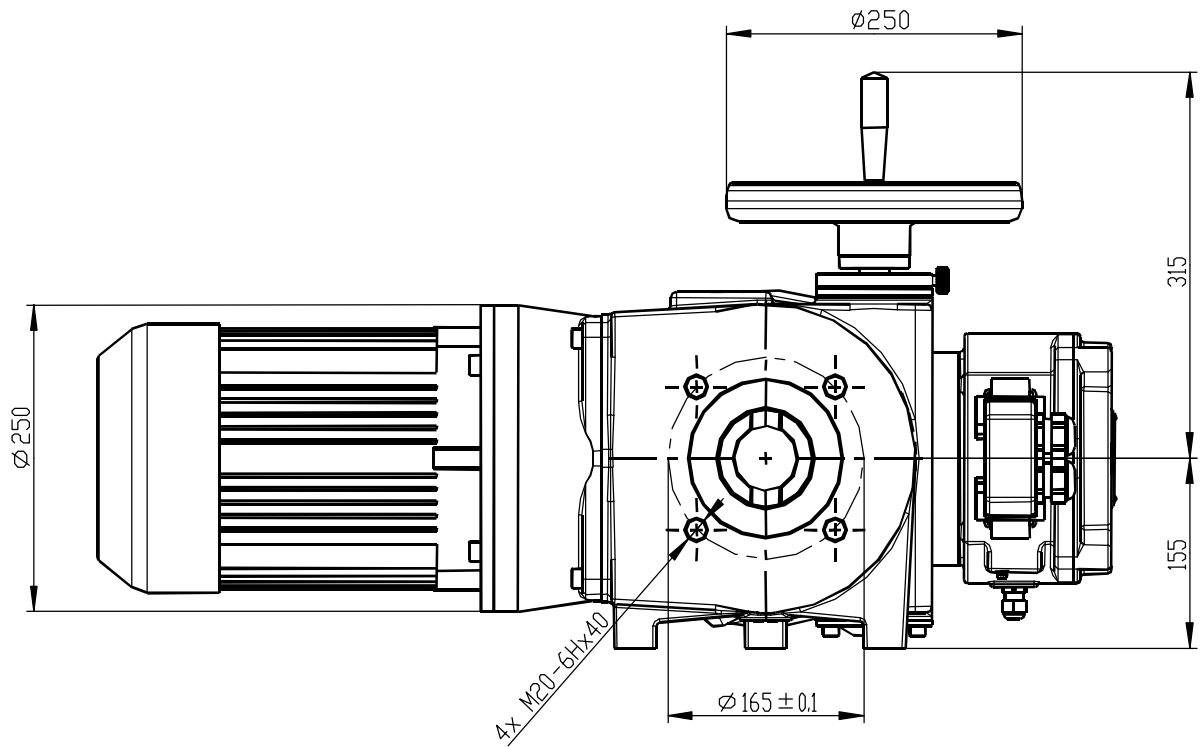
Remark 2: Maximum load resistance at electric current output signal.....500 W  
 .....Minimum load resistor at voltage output signal .....250 kW

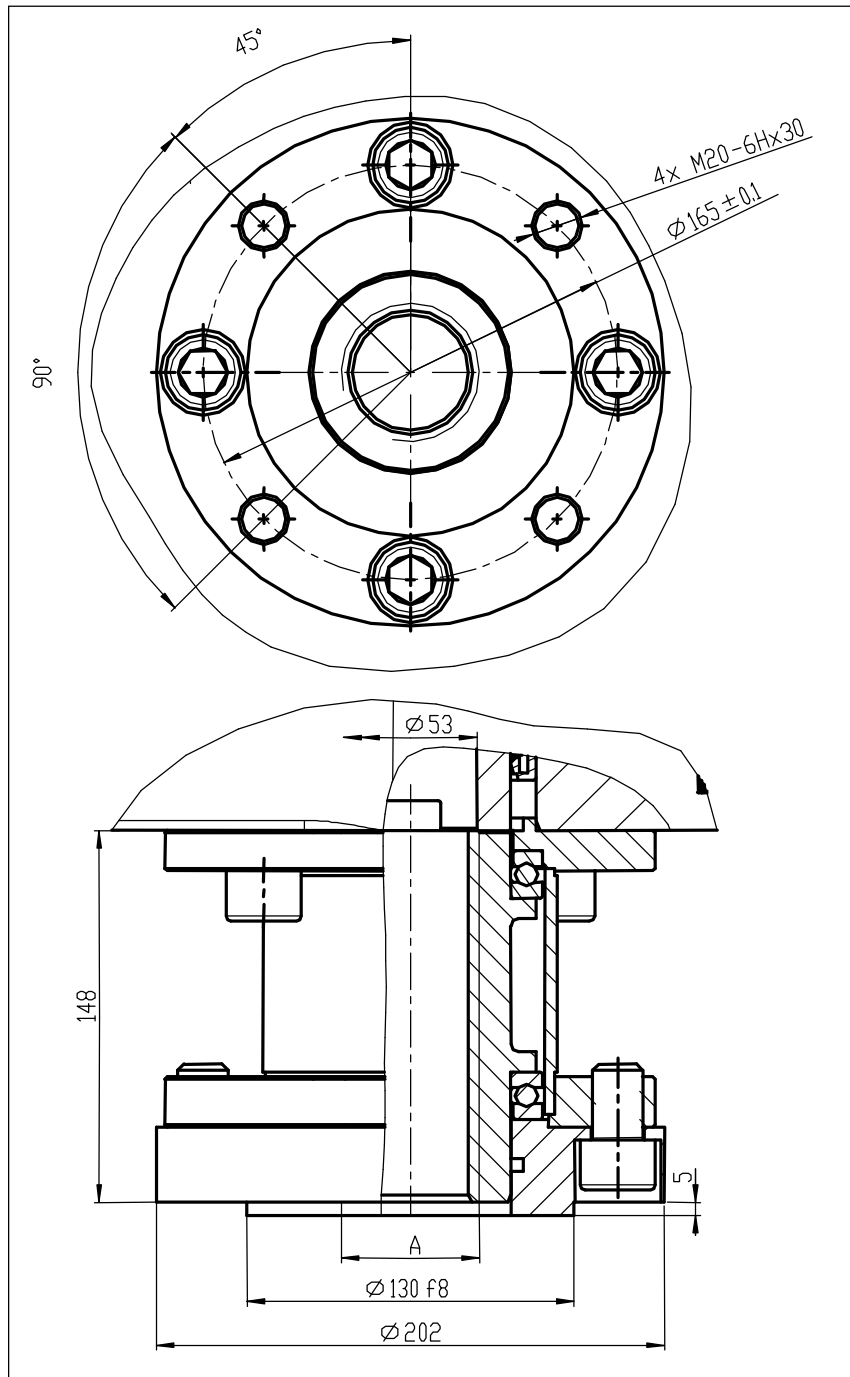
Remark 3: To terminals **IN** and **+** is connected a jumper allowing measurement of output voltage sig- ..... nal on terminals + and -. Should current output signal is to be measured, the jumper must be removed and perform the measurement of current signal on terminals **IN** and **+**.

## 7.2 Dimension drawings and mechanic connections

P-1424	ES	MO 5P	Connections ISO 5210, STN 18 6314, DIN 3338 F16
P-1424/A	ES	MO 5P	ISO 5210, STN 18 6314 shape A
P-1424/B	ES	MO 5P	ISO 5210, STN 18 6314 shape B3
P-1424/C	ES	MO 5P	STN 18 6314, DIN 3338 shape C
P-1424/D	ES	MO 5P	STN 18 6314, shape D
P-1425	ES	MO 5P	Connections OST 26-07-763 $\phi$ 220/4xM20
P-1425	ES	MO 5P	shape five toot 35°/37°

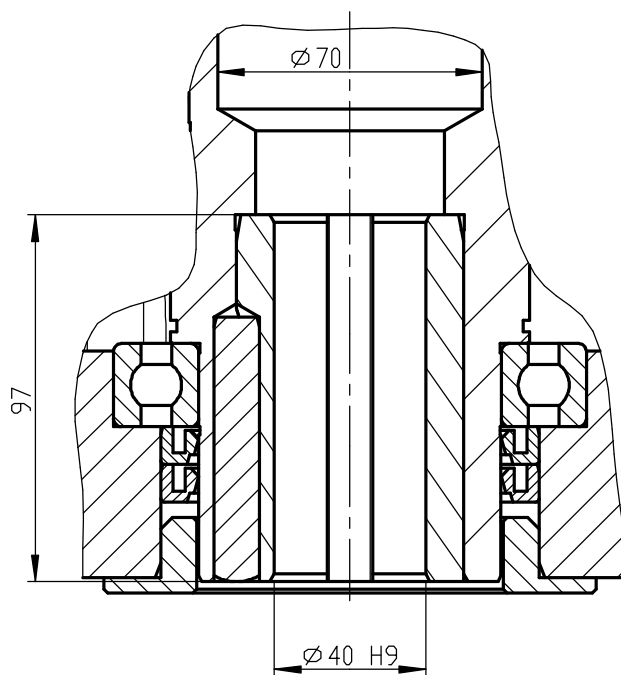
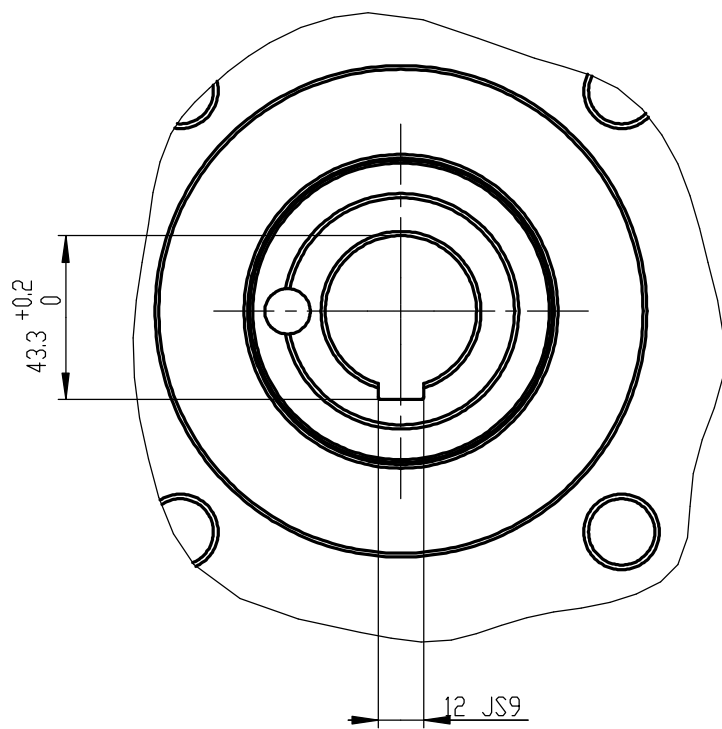
Dimensional connection drawings according to OST 26-07-763

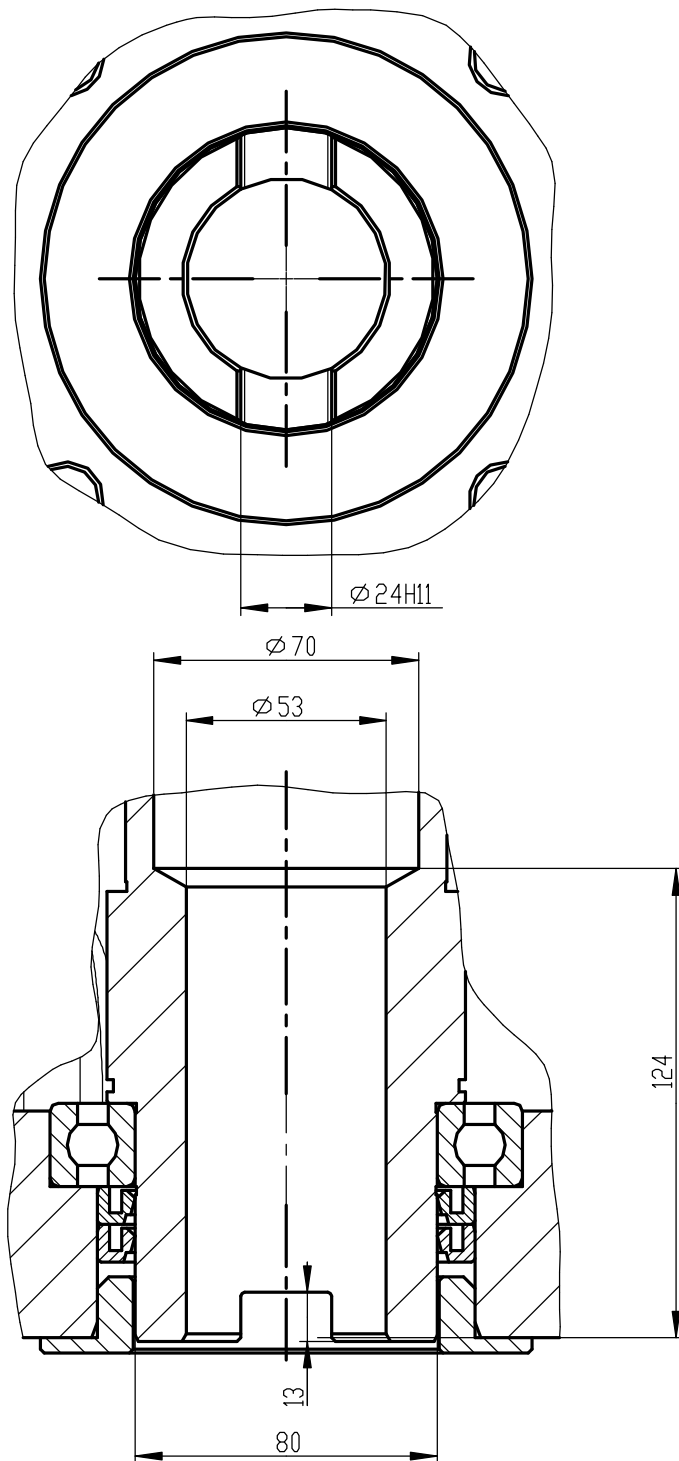


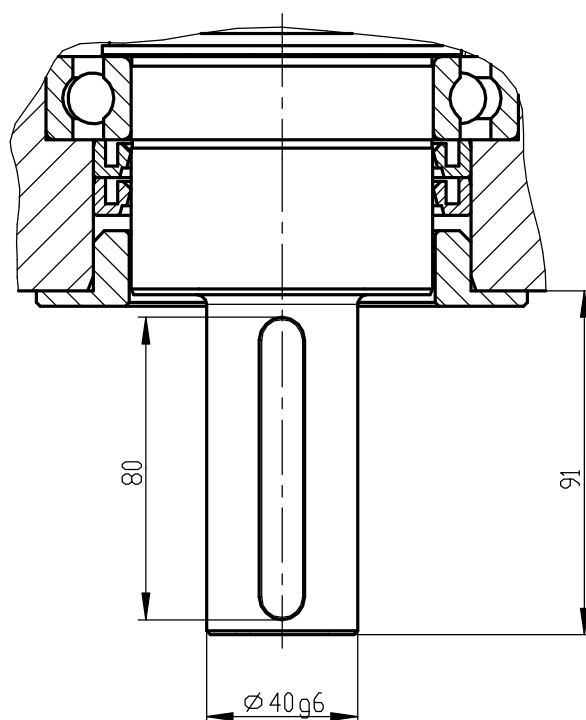
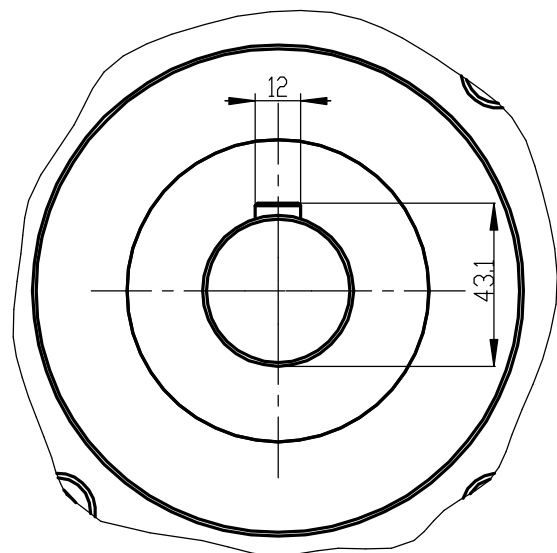


Dimension is in table of version

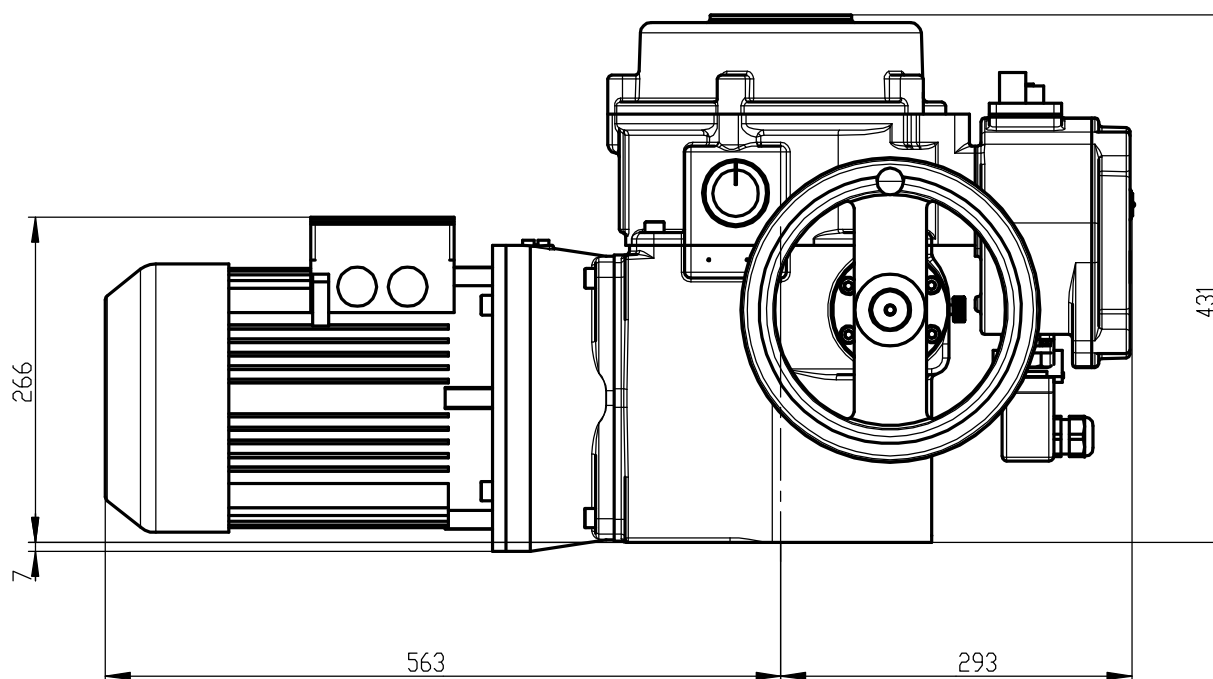
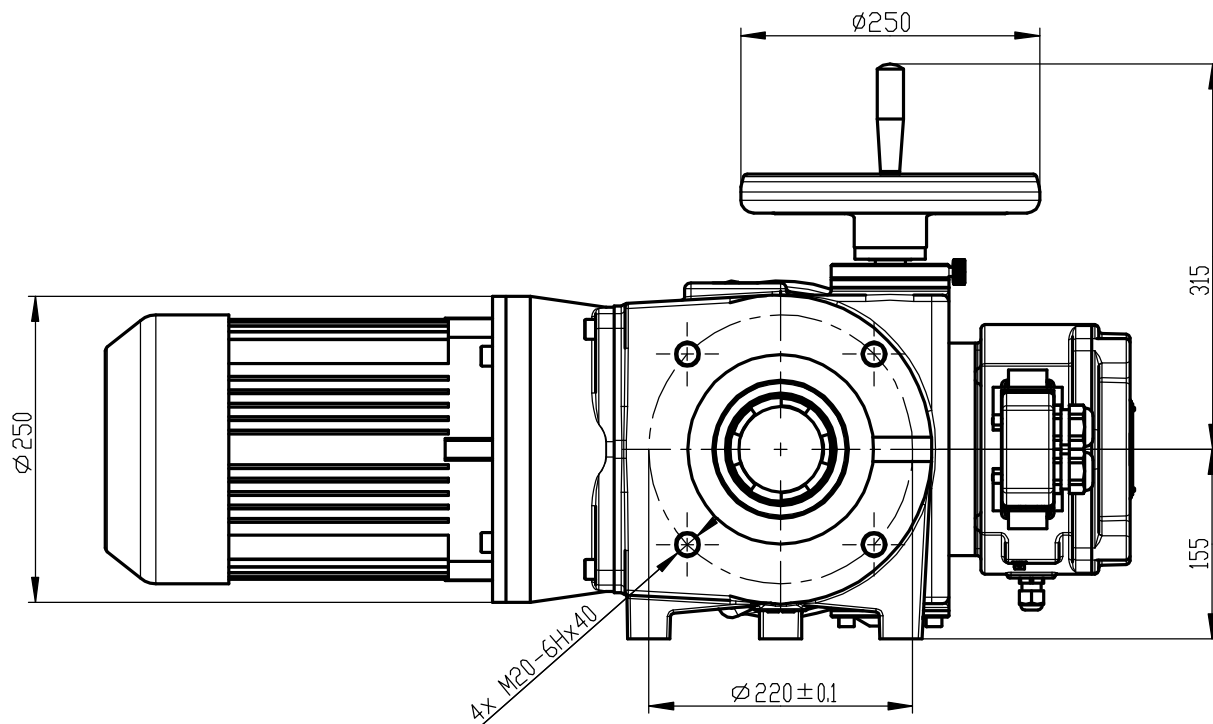


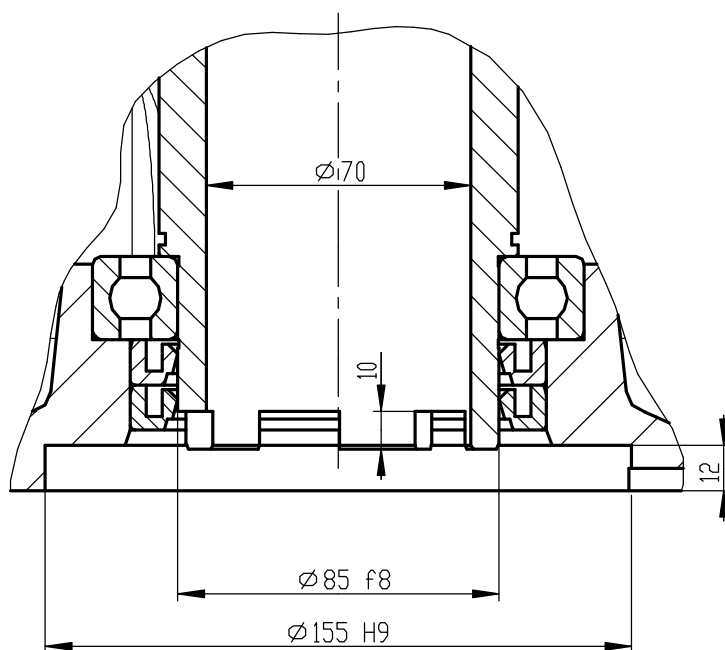
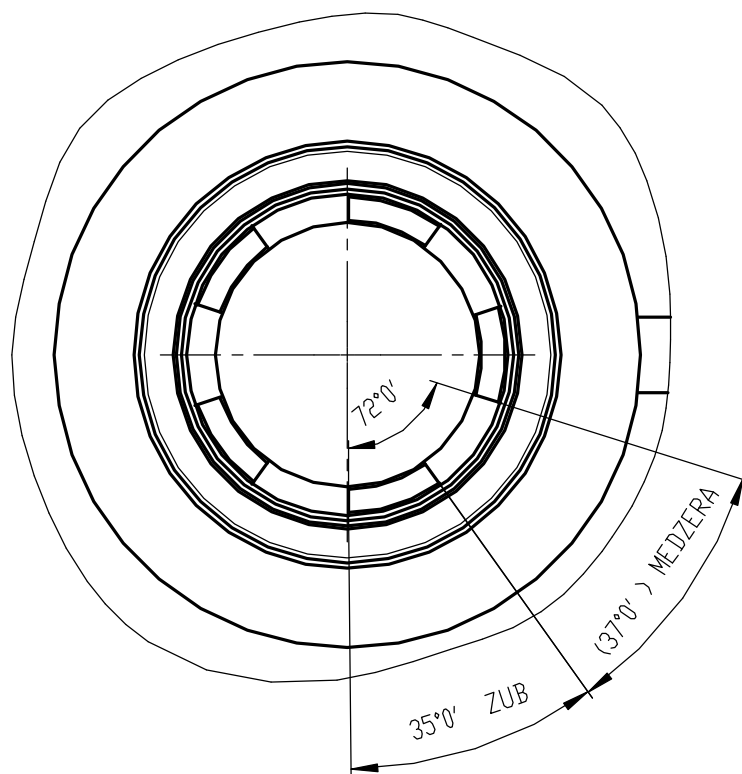






Dimensional connection drawings according to OST 26-07-763





### 7.3 Guarantee service check report

<b>Service center:</b> D	
<b>Date of repair:</b>	<b>Guarantee repair no.:</b>
<b>User of actuator:</b>	<b>Claim applied by:</b>
<b>Actuator type number:</b>	<b>Actuator production number:</b>
<b>Product claim fault:</b>	<b>Detected product fault:</b>
<b>Used spare parts:</b>	
<b>Remarks:</b>	
<b>Issued on a day:</b>	<b>Signature:</b>

**7.4 Post guarantee service check report**

<b>Service center:</b>	
<b>Date of repair:</b>	
<b>User of actuator:</b>	<b>Actuator operating place :</b>
<b>Actuator type number:</b>	<b>Actuator production number:</b>
<b>Detected product fault:</b>	
<b>Used spare parts:</b>	
<b>Remarks:</b>	
<b>Issued on a day:</b>	<b>Signature:</b>

## **7.5 Commercial representations**

### **Slovak Republic:**

**Regada, s.r.o.,**  
Strojnícka 7,  
080 01 Prešov  
Tel.: +421 (0)51 7480 460,  
Fax: +421 (0)51 7732 096,  
E-mail: [regada@regada.sk](mailto:regada@regada.sk)

### **Czech Republic:**

Exclusive representation Regada, s.r.o. (Ltd.) for sale of electric actuators

**Regada Česká, s.r.o.**  
Nám. 5. května 17,  
252 25 Jinočany,  
PRAHA – západ,  
Tel.: +420 257 961 302  
Fax: +420 257 961 301

### **Poland:**

**REGADA Połská, Sp.z.o.o.**  
ul. Sekundowa 1  
02 178 Warszawa,  
Tel.: +4822 868 0815  
Fax.:+4822 211 1246