



**Explosion - Proof Electric Rotary
Multi-turn Actuators**

MODACT MOED EEx

Type numbers 52 120 - 52 125



www.zpa-pecky.cz

ZPA Pečky, a.s. is certified company in accordance with ISO 90001 as amended.

APPLICATION

The **MODACT MOED EEx** electric rotary multi-turn actuators are specially intended for controlling devices by a reversing rotary motion, e.g. slide valves and valves, and, in connection with an appropriate gearbox, also flap or ball valves, and other devices for which they are suitable due to their properties.

They can be operated in an environment with a danger of explosion of explosive gaseous atmosphere in zone 1 and zone 2 according to ČSN EN 60079-10-1. The actuators are designed as a device of group **II**, category **2G** in compliance with standards ČSN EN 60079-0:2013 and ČSN EN 60079-1:2015 for explosive gaseous atmosphere.

The actuators are marked with a label of protection against explosion and symbols of the group and category of the device **Ex II 2G** and according to version for surrounding temperature from -25 °C to +55 °C with marking **Ex db IIB T4 Gb** (type No. 52 125 with marking *Ex db IIB T4 Gb*) or for surrounding temperature from -50 °C to +55 °C or -60 °C to +55 °C with marking **Ex db IIB T4 Gb** (see *Data on actuators*).

Marking of actuators for surrounding temperature -50 °C to +55 °C is with the letter F at the 11th place of the type number, i.e. 52 120.xxxxEDF. The electronic outfit of the version **Ex db IIB T4** should be discussed with the manufacturer.

Nomenclature:

Environment with explosion danger – Environment in which an explosive atmosphere can be created

Explosive gaseous atmosphere – A mixture of flammable substances (*in the form of gases, vapours or mist*) with air under atmospheric conditions in which, after initialization, burning spreads out to non-consumed mixture.

Maximum surface temperature – The highest temperature created during operation under the most unfavourable conditions (*however within approved limits*) on any surface part of the electric device, which could induce ignition of surrounding atmosphere.

Closure – All walls, doors, covers, cable bushings, shafts, rods, pull-rods, etc. which contribute to the type of protection against explosion and/or to the level of protection (*IP*) of the electric device.

Explosion-proof closure “d” – Type of protection in which the parts capable of causing ignition of an explosive atmosphere are installed inside the closure; in case of internal explosion this closure should withstand pressure of the explosion and prevent spreading of the explosion into the surrounding atmosphere.

Standards

The following basic standards apply to explosion-proof actuators:

ČSN EN 60079-0 Electrical devices for explosive gaseous atmosphere. General requirements.

ČSN EN 60079-1 Electrical devices for explosive gaseous atmosphere. Explosion-proof closure “d”.

ČSN EN 60079-10 Electrical devices for explosive gaseous atmosphere. Specification of dangerous areas.

ČSN EN 60079-14 Regulations for electrical devices in areas with a danger of explosion of flammable gases and vapours.

ČSN IEC 60721 Types of environment for electrical devices.

ČSN 33 0371 Non-explosive mixtures. Classification and testing methods.

ČSN 34 3205 Operation of electric rotating machines and work with them.

Designation of explosion-proof properties

It consists of the following symbols:

Ex Electric device complies with the standard ČSN EN 60 079-0 and related standards for various types of protection against explosion.

db Designation of the type and level of protection against explosion, explosion-proof closure according to ČSN EN 60 079-1.

II Designation of the group of explosion-proof electric device according to ČSN EN 60 079-0.

B, C Designation of the sub-group of the group of explosion-proof electric device according to ČSN EN 60 079-0.

T4 Designation of temperature class of explosion-proof electric device of the Group II according to ČSN EN 60 079-0.

Gb Designation of an explosion-proof electric device for explosive gas atmospheres with a “high” level of protection and is not a source of ignition in normal operation or during expected malfunctions, according to ČSN EN 60079-0.

OPERATING CONDITIONS, OPERATING POSITION

Operating conditions

The **MODACT MOED EEx** actuators should withstand the effect of operating conditions and external influences, Classes AC1, AD5, AE4, AE5, AF2, AG2, AH2, AK2, AL2, AM-2-2, AN2, AP3, BA4, BC3 and BE3, according to ČSN Standard 33 2000-5-51 ed. 3.

When placed on an open area, the actuator is recommended to be fitted with a light shelter to protect it against direct action of atmospheric effects. The shelter should overhang the actuator contour by at least 10 cm at the height of 20 – 30 cm.

If the actuator is used at a location with an ambient temperature under +10 °C and/or relative humidity above 80 %, at a sheltered location, or in the tropical atmosphere, the anti-condensation heater built-in in all actuators, should always be used. One or two heater elements should be connected, as required.

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

Notes:

A sheltered location is considered a space where atmospheric precipitations are prevented from falling at an angle of up to 60° from the vertical.

The location of the electric motor should be such that cooling air has free access to the motor and no heated-up blown-out air is drawn in the motor again. For air inlet, the minimum distance from the wall is 40 mm. Therefore, the space in which the motor is located should be sufficiently large, clean and ventilated.

Classes of external influences – as extracted from ČSN Standard 33 2000-5-51 ed. 3.

Class:

- 1) AC1 – elevation above sea level ≤ 2000 m
- 2) AD5 – splashing water in all directions
- 3) AE4 – small dustiness
AE5 – medium dustiness
- 4) AF2 – occurrence of corrosive or polluting substances from atmosphere Presence of corrosive polluting substances is significant
- 5) AG2 – medium mechanical stress by impacts – common industrial processes
- 6) AH2 – medium mechanical stress by vibrations – common industrial processes
- 7) AK2 – serious risk of growth of vegetation and moulds
- 8) AL2 – serious danger of occurrence of animals (*insects, birds, small animals*)
- 9) AM-2-2 – harmful effects of escaping stray currents
- 10) AN2 – medium sun radiation. Intensity from 500 to 700 W/m²
- 11) AP3 – medium seismic effects. Acceleration from 300 to 600 Gal
- 12) BA4 – staff capability. Instructed persons.
- 13) BC3 – frequent contact of persons with earth potential. Persons often touch foreign conductive parts or stand on conductive base.
- 14) BE3 – danger of explosion, production and storage of explosive substances

Corrosion protection

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

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

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

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

Operating position

Working position of actuators **MODACT® MOED EEx** actuators with plastic lubricant – any position.

The actuators with plastic lubricant are labelled “*Filled: solid grease*” on the power box at the side of the hand-wheel.

Actuators with oil charge – position limited only by slope of electric motor axis – max. 15° under the horizontal level. In this way, reducing of service life of rubber sealing of the electric motor shaft by possible fragments or impurities from the oil filling is prevented.

When the actuator is assembled with the electric motor above the horizontal plane the oil filling should be topped up so that reliable lubrication of the motor pinion is ensured.

The actuators with oil filling are not labeled.

Lubricants

Type number of actuator	Adjusting speed of output shaft [min ⁻¹]	Surrounding temperature [°C]			
		-25 +60	-40 +60	-50 +60	-60 +60
52 120, 52 121, 52 122	up to 40	M	M	M	M
52 123, 52 124	above 40	O	O	–	–
52 125	applies to all speeds	O	O	O	O

Note: M – plastic lubricant, O – gearbox oil

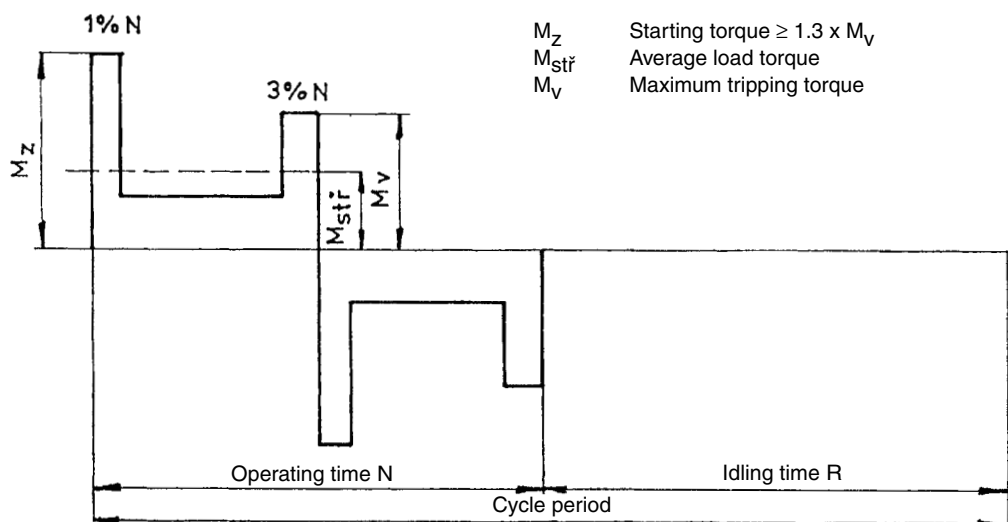
OPERATION MODE, SERVICE LIFE OF ACTUATORS

Operation mode

According to ČSN EN 60 034-1, the electric actuators can be operated in the S2 load category. The run time at temperature +50 °C is 10 min, the mean load torque is max. 60 % of the value of the maximum tripping torque M_V .

According to ČSN EN 60 034-1, the electric actuators can also be operated in S4 load category (*interrupted operation with starting-up*). The load factor $N/N+R$ is max. 25 %; the longest operating cycle $N+R$ is 10 min (*the course of load is shown in the picture*). The maximum number of switching actions in automatic control mode is 1200 h⁻¹. The mean load torque with load factor 25 % and ambient temperature of 50 °C shall not exceed 40 % of the maximum tripping torque M_V .

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



M_z Starting torque $\geq 1.3 \times M_v$
 M_{str} Average load torque
 M_v Maximum tripping torque

Course of operating cycle

Service life of actuators

Service life of actuators is 6 years, at the least.

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

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

Service life of actuators for 1 million starts

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

When using reversing contactless unit the service life of actuator is 3 million starts

Service life [h]	2490	3000	6000	12000
Number of starts [1/h]	1200	1 000	500	250

TECHNICAL DATA

Supply voltage

The actuators have been designed to operate at supply voltage of 3 AC 400 V / 50 Hz. However, they are available in design variants operating at another three-phase AC supply voltage, upon special request. The supply voltage of the electric motor should be within the tolerance limits of $\pm 10\%$ of the rated value and the supply voltage frequency should be within $\pm 2\%$ of the rated value. Within this supply voltage range, all parameters are kept up except the starting torque which varies with the square of the supply voltage deviation from the rated value. This dependence is directly proportional to the supply voltage variation; no larger supply voltage and frequency fluctuations are permitted.

Protective enclosure

Protective enclosure of actuators **MODACT MOED EEx** IP54, IP55, IP65 (according to the plate and it is in accordance with the order).

Noise

Level of acoustic pressure A	max. 85 dB (A)
Level of acoustic output A	max. 95 dB (A)

Tripping torque

Tripping torque is set at the manufacturer according to the customer's requirements within the range given in Table No. 1, 2. If setting of tripping torque is not required maximum tripping torque of the required type number of the electric actuator is set.

Starting torque

The starting torque of the actuator is a calculated value determined by the starting torque of the electric motor and the total gear ratio and efficiency of the actuator. After run reversion, the actuator can produce a starting torque for the duration of 1 to 2 revolutions of the output shaft when torque-limit switching is locked. This can take place in either end position or in any intermediate position.

Self-locking

The actuator is self-locking provided that the load only acts in the direction against motion of the actuator output shaft. Self-locking is ensured by a roller arrest immobilizing the electric motor rotor even in the case of manual control.

In order to observe safety regulations, the actuators cannot be used for driving transportation lifting devices with possible transport of persons or for installations where persons can stand under the lifted load.

Sense of rotation

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

Working stroke

The ranges of working stroke are given in Table No. 1 or No. 2.

Rising spindle

In the design variants with connecting dimensions, Shapes A and C, the actuators can be adapted for mounting to the valve with a rising spindle that projects over the upper end of the actuator output shaft in the end position of the valve. The space reserved for the rising spindle is clearly shown in the dimensional sketches. The user should mount a cylindrical guard of the rising spindle instead of the port cover at the control box top, if required. This guard has not been included in the delivery of the actuator.

Manual control

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

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

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

ACTUATOR OUTFIT

Anti-condensation heater

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

Local control

Local control serves for controlling the actuator from the site of its installation. It includes two change-over switches: one with positions "Remote control - Off - Local control", the other "Open - Stop - Close".

The former change-over switch can be built-in as two-pole or four-pole. The change-over switches are installed in a terminal-board box and the control elements on the lid of this terminal-board box.

ELECTRIC PARAMETERS

External electric connection

Electrical equipment of **MOED EEx** actuator with DMS2 electronics consists of electronics power supply circuit and motor control circuit. Connection of power grid is realized by terminal box mounted on the source unit. The terminal block is designed that the total connection don't need any other terminals. This terminal board uses screw terminals allowing copper and aluminum conductors with a maximum cross-section 2,5 mm² to be connected. Arrangement and identification of terminals (*except actuator's terminal board*) is on the another page of this mounting instructions.

Actuator internal wiring

The internal wiring diagrams of the **MODACT MOED EEx** actuators with terminal designation are shown in this catalogue.

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

Isolation resistance

Isolation resistance of electric control circuits against the frame and against each other is min. 20 Mohm. After a dump test, isolation resistance of control circuits is min. 2 Mohm. Isolation resistance of the electric motor is min. 1.9 Mohm. See Technical specifications for more details.

Electric strength of electric circuits isolation

Circuits of anti-condensation heater + DMS2 ED and DM2 output relay contacts circuits	1 500 V, 50 Hz
Circuits of electric motor $U_n = 3 \times 230 / 400$ V	1 800 V, 50 Hz
Circuits of CPT 1 transmitter + DMS2 ED and DMS2 outgoing and control signal circuits	50 V DC

Deviations of basic parameters

Tripping torque	± 12 % of max. value of range
Adjusting speed	- 10 % of max. value of range +15 % of rated value (<i>idle run</i>)

Protection

The actuators are fitted with one internal and one external protective terminals ensuring protection against electric shock according to ČSN 33 2000-4-41. One protective terminal is also fitted to the electric motor. The protective terminals are labelled with a mark according to ČSN EN 60417-1a2 (013760).

If isn't the actuator equipped with overcurrent protection when purchased is needed to ensure that the protection is secured externally.

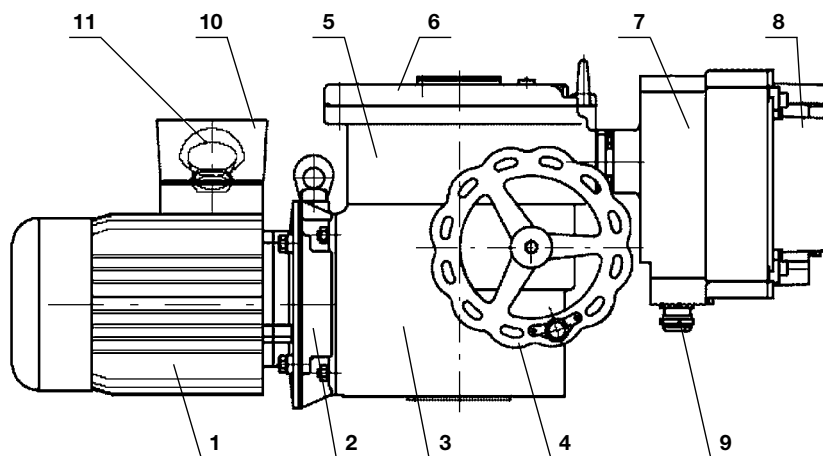
DESCRIPTION

The electric actuators are designed for direct attachment on the controlled device. (*valve etc.*). The actuators are connected by means of a flange and a clutch according to ČSN 18 6314. The actuator flanges also comply with ISO 5210. The following clutches are available for transmission of the output shaft motion to the valve:

- Shape A (*with adapter*), according to ISO 5210 and DIN 3210
- Shape B1 (*with adapter*), according to ISO 5210 (*shape B according to DIN 3210*)
- Shape B3 (*without adapter*), according to ISO 5210 (*shape E according to DIN 3210*)
- Shape D (*without adapter*), according to DIN 3210
- Shape C (*without adapter*), according to DIN 3338

The adapters are mounted between the actuator and the valve.

Moreover, the actuators can be delivered with connection according to Russian standards OCT (*connection M, A, B, B, Γ*), see the version in Table no. 3.



Description:

- 1 – three-phase asynchronous motor
- 2 – countershaft gear box
- 3 – power gearing
- 4 – wheel of manual control
- 5 – control box
- 6 – control box cover
- 7 – terminal box
- 8 – terminal box cover
- 9 – cable bushings
- 10 – terminal board
- 11 – cable bushing for electric motor

Fig. 1 – Actuator set-up (with DMS2 ED electronic system)

The electric actuator configuration is shown in Fig. 1. The three-phase asynchronous motor 1 drives, via the countershaft gearing 2, the sun gear of the differential gear unit installed in the actuator supporting box (*power gearing*) 3.

In the motor control mode, the crown gear of the planet differential unit is held in fixed position by a self-locking worm gearing. The handwheel 4 connected with the worm allows manual control even when the motor is running. The output hollow shaft is fix-connected to the driver of the planet gear and passes to the control box -5- where scanning and control elements of the actuator are installed.

Operation of the torque-limit switching is derived from axial displacement of the “floating worm” of the manual control unit which is scanned and transferred to the control box by means of a lever. The control box forms an explosion-proof closure “d” with designation Ex d IIC T4. The control elements are accessible after removing the cover 6 of this box. Access to the terminal box is possible after removing the cover 8.

The terminal board box also includes a firm closure “d” marked Ex d IIC T4. The cable inlets are secured by certified cable bushings HAWKE, type ICG 623, with a certificate; they can be used within the temperature range from -60 °C to +80 °C. The bushings of the following sizes are used in the terminal board box:

Pcs	Designation	Thread	Cable ø	Using
2 pieces	ICG 623/B	M25x1,5	13,0 – 20,2 mm	Both cliental
2 pieces	ICG 623/A	M20x1,5	11,0 – 14,3 mm	One serves for interconnection with the electric motor, the other is cliental.

The cable outlet system should meet the requirement of ČSN EN 60079-14 art. 10.3.2.d for direct inlet to the firm closure of class IIC.

Therefore, in connecting the actuator, the client should provide for a non-explosive sealing (*filling-in individual cable wires*) by means of the enclosed two-component filling-in putty according to the instructions.

ELECTRONIC OUTFIT

Electro-mechanical control board is replaced with the electronic system **DMS2** or **DMS2 ED**. Both systems scan position of the output shaft and torque of the electric actuator by contact-free magnetic sensors. The sensor of the output shaft position is absolute and does not require any backup power supply in case supply voltage is disconnected during operation of the electric actuator. Both systems can be set and monitored by a computer with controlling programme or manually without a computer.

The more simple system **DMS2 ED** substitutes electromechanical parts and/or provides for controlling the electric actuator by input analog signal as in the version Control.

The system **DMS2** enables the electric actuator to be used for two-position and three-position regulation or to be connected to the industrial bus bar Profibus.

DMS2 ED

Basic outfit:

Control unit It also contains the sensor of position of the output shaft, 4 push-buttons and 3 signal LEDs for setting and checking the actuator.

Torque-limit unit

Source unit Contacts of seven relays (*MO, MZ, PO, PZ, SO, SZ, Ready*) are connected to the terminal board; state of each relay is signalized by LED. The unit enables the heating resistor to be connected and controlled by the thermostat.

Optional outfit:

Feedback signal 4 – 20 mA

Analog regulator

Position Indicator – LED display

Local control

Contactors or block of contact-less control – for version Control

Electronic brake

Main merits:

Absolute scanning of position independent of backup power supply.

Simple setting by 4 push-buttons, computer PC or PDA.

Possibility of back-up making of set parameters on PC.

Intended for direct substitution of electromechanical components of the electric actuator.

Parameters:

Scanning of position	Contact-less magnetic
Scanning of torque	Contact-less, magnetic
Working stroke	2 – 1700 rev.
Blocking of torque	0 – 20 s at reversing in limit positions
Input signal	0 (4) – 20 mA with switched on regulator function Local/Remote control, Local open/close
Output signal	7 x relay 250 V AC, 3 A (<i>MO, MZ, PO, PZ, SO, SZ, READY</i>) Position signal 4 – 20 mA max. 500 ohm, active/passive, galvanic-isolated (<i>optional</i>), LED display (<i>optional</i>) Electronic brake (<i>optional</i>)
Power supply of electronic	230 V AC, 50 Hz, 4 W, over-voltage category II

DMS2**Basic outfit:**

Control unit	It also includes a sensor of the output shaft position, 2 signal LED.
Torque-limit unit	
Source unit	It includes: 2 relays for electric motor control; Relay Ready with change-over contact connected to the terminal board; Signalling relays 1 – 4 with one pole of the switching contact connected to the terminal board; Second poles of the switching contacts of relays 1 – 4 are interconnected and brought out to the terminal COM. Heating resistor switched by a thermostat is connected to the unit. The unit controls power switches of the electric motor (<i>contactors or contact-less switching</i>). The electronic brake can be connected to the unit.
Unit of display	Two-row display, 2 x 12 alpha-numeric characters.
Unit of push-buttons	Push-buttons " Open ", " Close ", " Stop ", selector switch " Local ", " Remote ", " Stop ".

Recommended outfit:

Electronic brake – the actuator can be fitted with the electronic brake – this reduces the actuator run-down after switching-off.

Optional outfit (*the electric actuator must be fitted with one of these units*):

Unit of two- and three-position control – Control of the electric actuator by shifting to position "Open" and "Close" or by analog signal 0 (4) – 20 mA.

Unit of connection Profibus – Control of the electric actuator by industrial bus bar Profibus.

The electronic control DMS2 checks, within its function, sequence and fall-out of phases of supply voltage too.

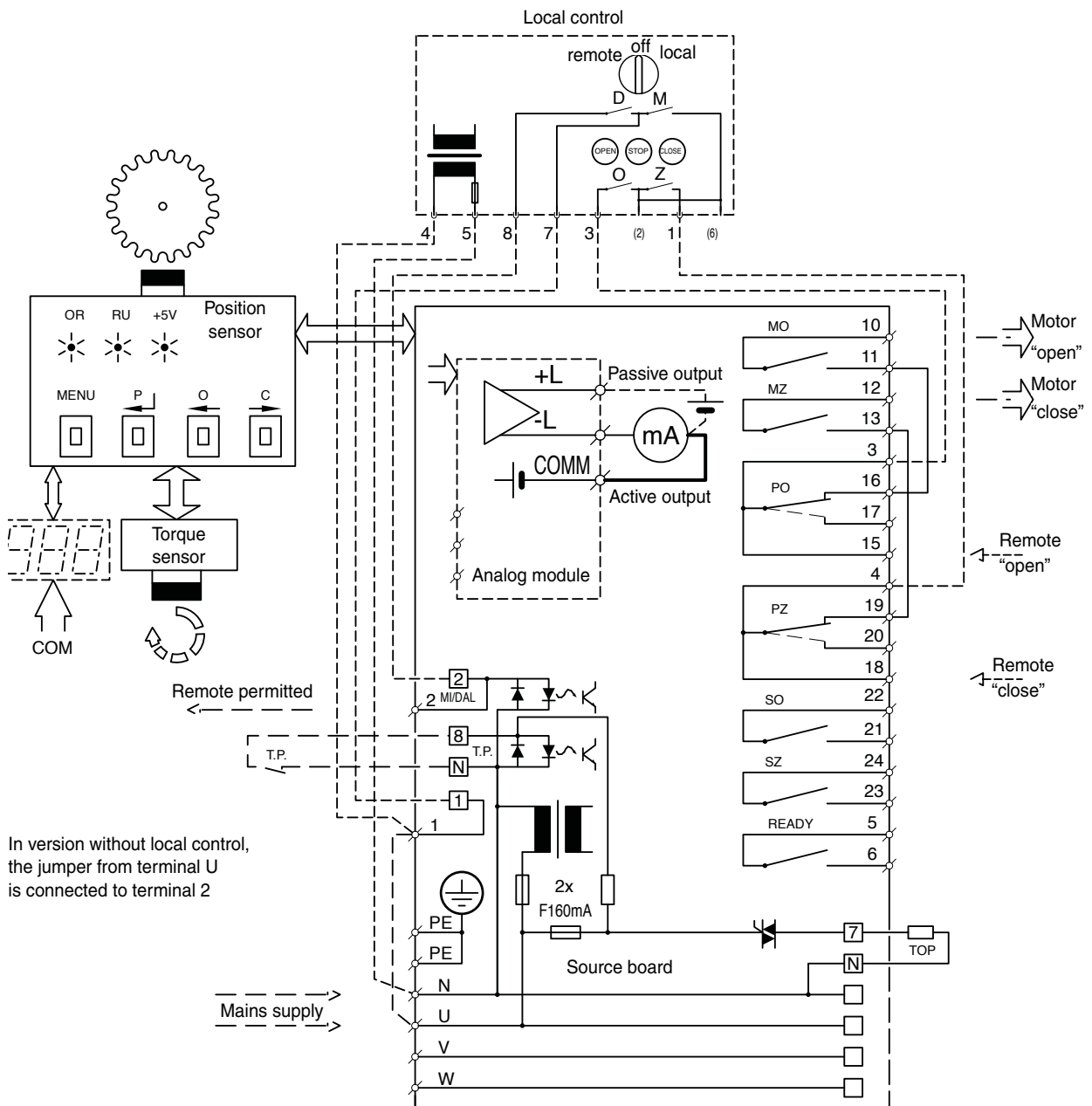
ORDERING INFORMATION**Technical specification of the order:**

When ordering, please specify the following:

- Number of actuators required
- Actuator designation
- Type Number, according to the Tables of design variants Nos 1 – 7
- Supply voltage and frequency of electric motor
- Tripping torque adjustment (*If another tripping torque than the maximum is required by the customer*).

Wiring diagram of electronics **DMS2 ED** in version Substitution of electro-mechanical board

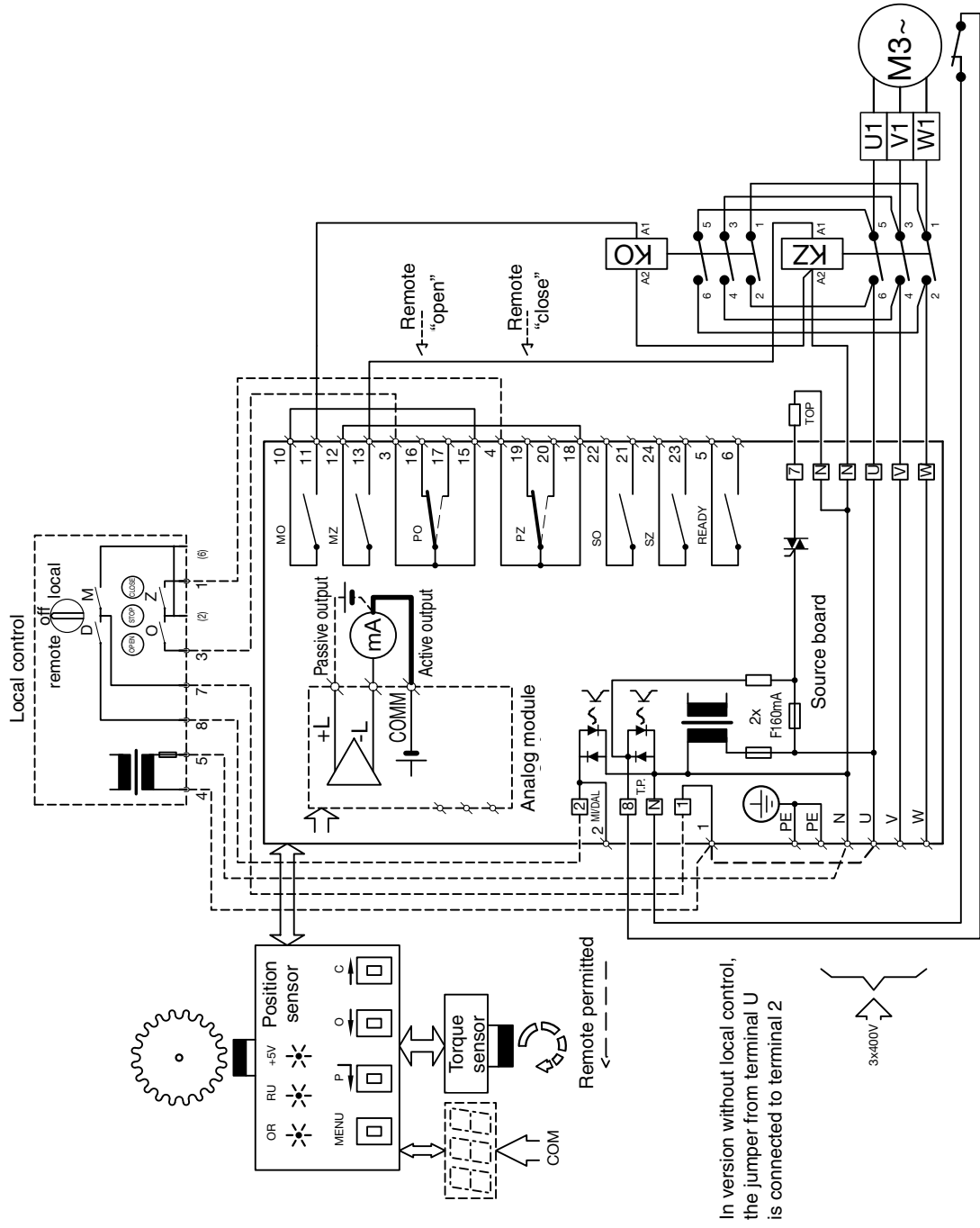
E0021



Note: Here, contacts of relays MO, MZ, SO, SZ are shown with power supply switched off; with power supply switched off contacts PO, PZ are shifted to the position drawn in dashed line.

Wiring diagram of electronics **DMS2 ED** in version Substitution of electro-mechanical board with block of contactors

E0022

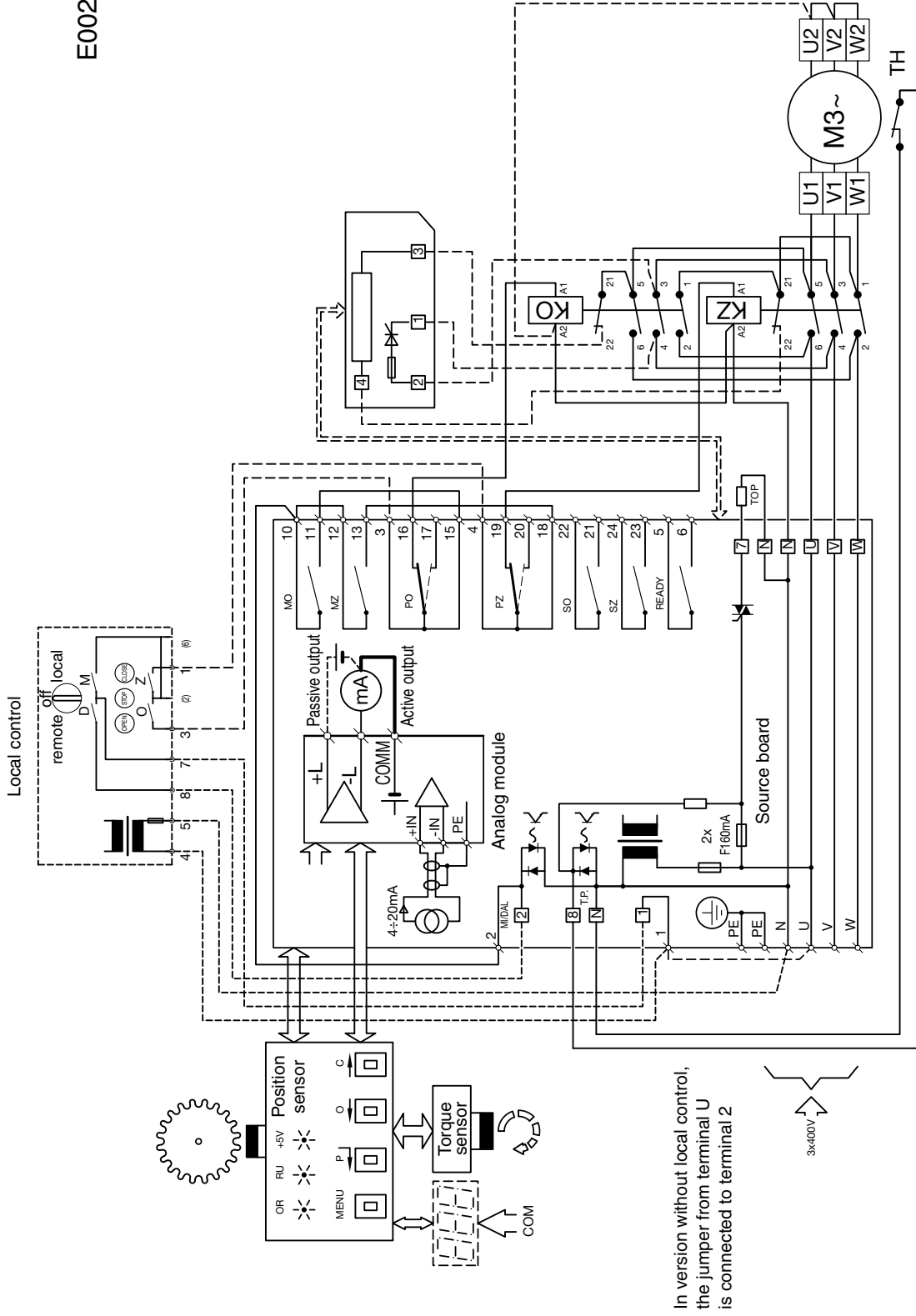


In version without local control, the jumper from terminal U is connected to terminal 2

Note: Here, contacts of relays MO, MZ, SO, SZ are shown with power supply switched off; with power supply switched on, PO, PZ are shifted to the position drawn in dashed line.

Wiring diagram of electronics DMS2 ED in version Control with three-phase electric motor

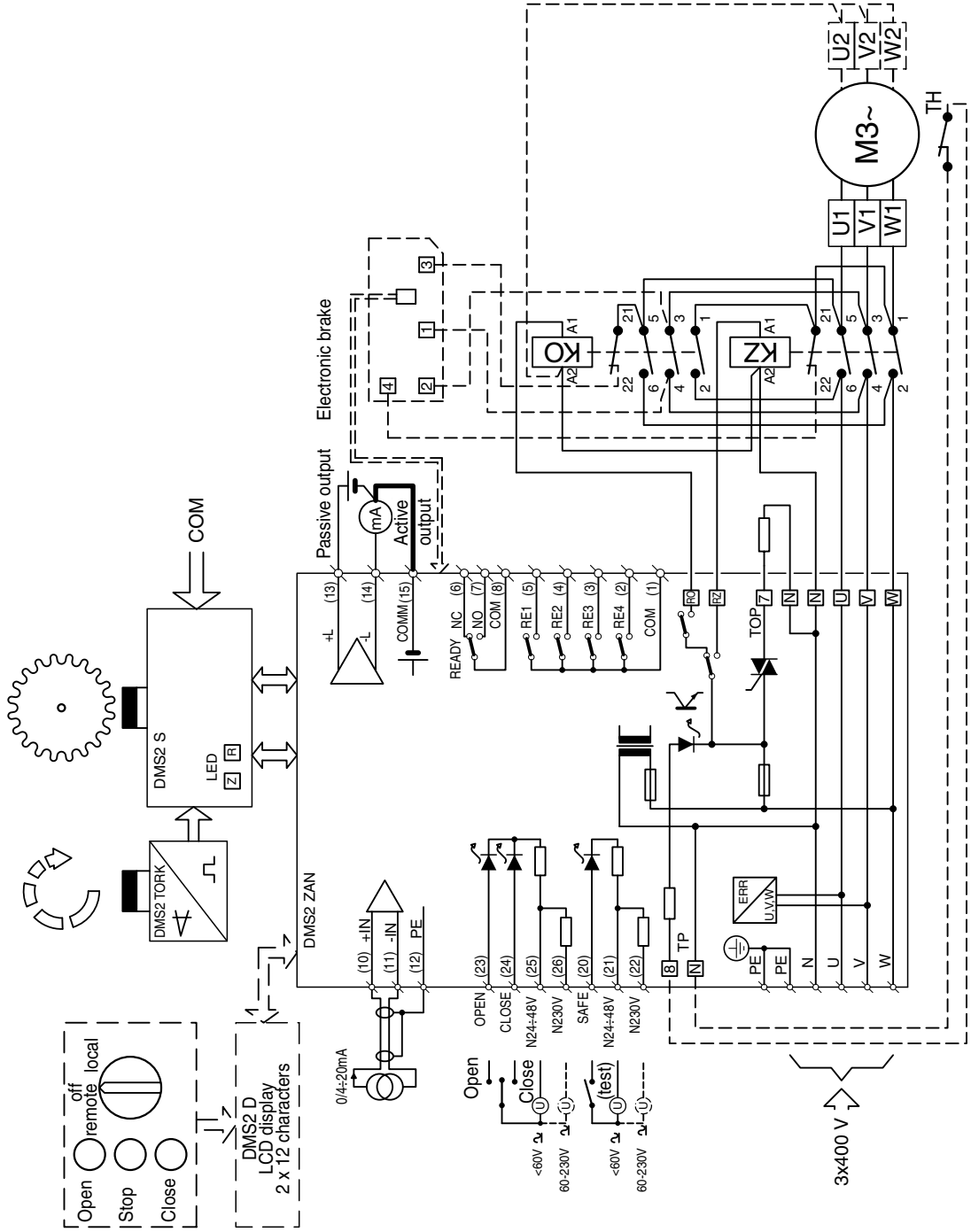
E0023



Note: Here, contacts of relays MO, MZ, SO, SZ are shown with power supply switched off; with power supply switched on, PO, PZ are shifted to the position drawn in dashed line.

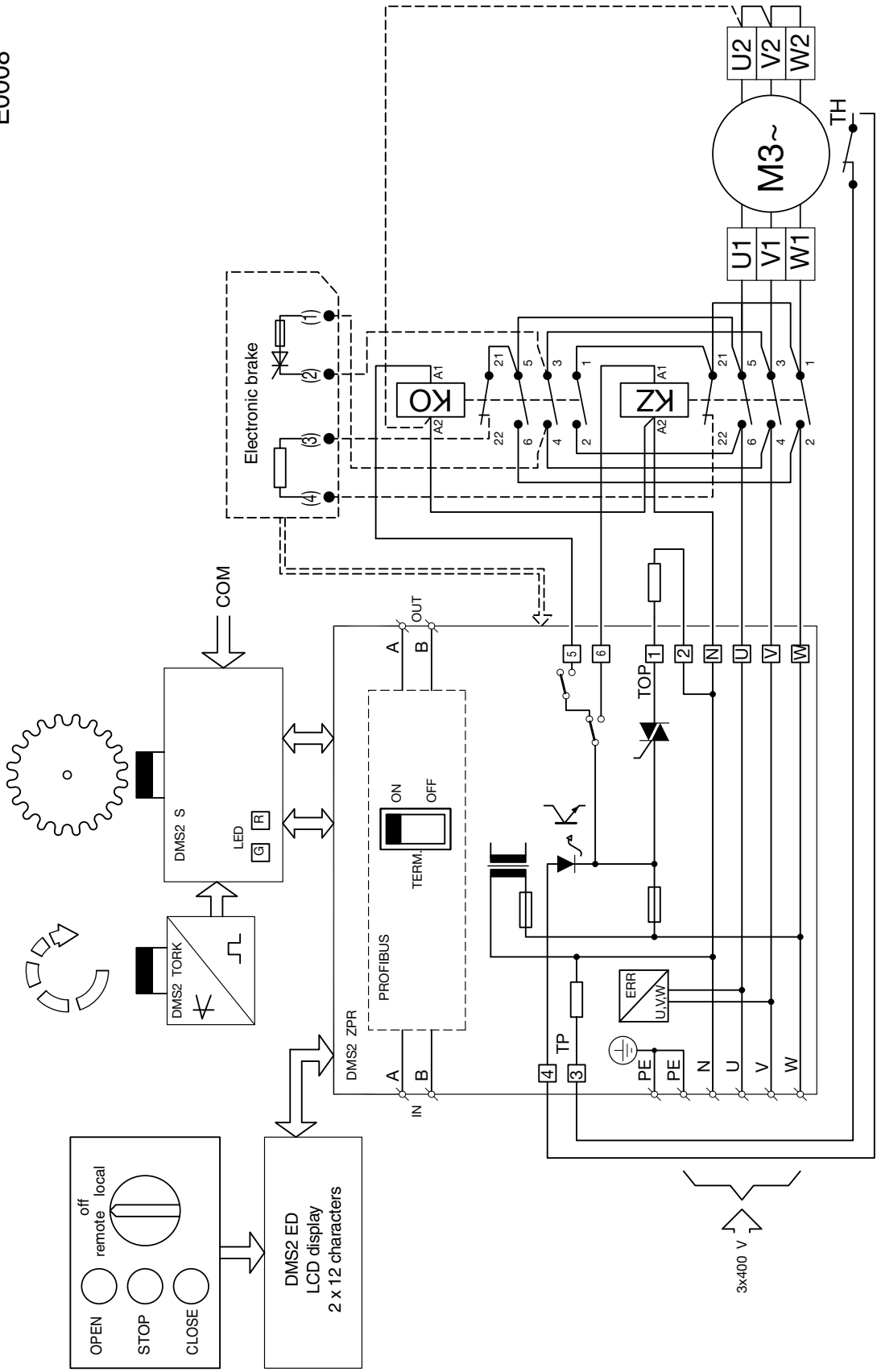
Example of wiring diagram of electronics **DMS2 Analog** in version **Control**

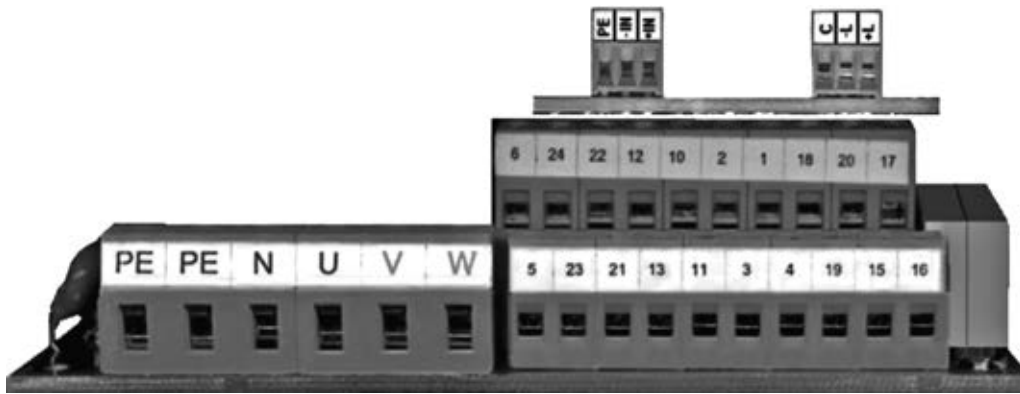
E0006



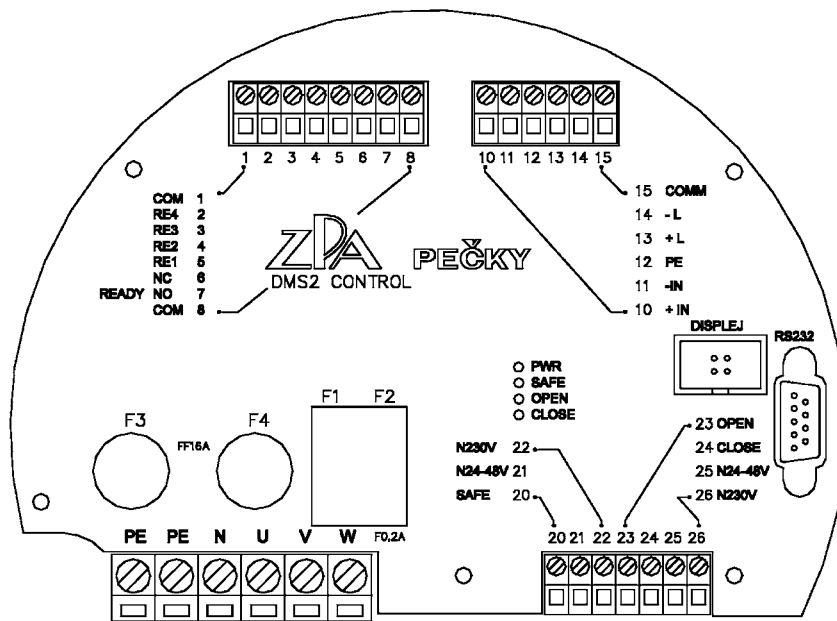
Wiring diagram of electronics **DMS2 Profibus** with three-phase electric motor

E0008

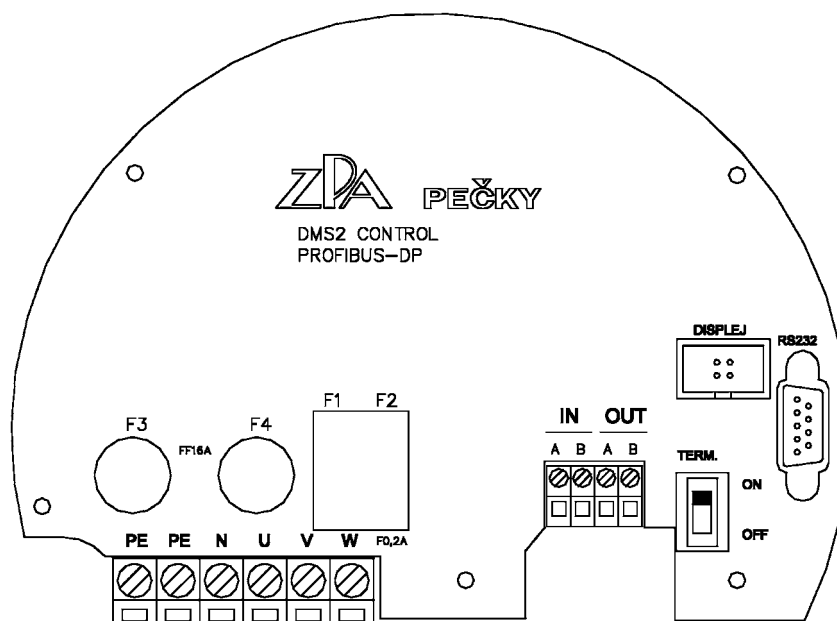




The terminal board of the actuator with electronics DMS2 ED.



Terminal board DMS2 Analog



Terminal board DMS2 Profibus

Explosion – proof electric rotary multi-turn actuators MODACT MOED EEx

Place in the type number	1	2	3	4	5		6	7	8	9	10	11
Type number	5	2	1	2	x	.	x	x	x	x	ED	x

6th place of type number:

Table 3 – Connecting dimensions

Connecting dimensions according ISO and DIN	Shape A	5
	Shape B	6
	Shape C	7
	Shape D	8
	Shape E	9
Connecting dimensions according OST (Russia)	Connection M	M
	Connection A	A
	Connection Б	B
	Connection B	V
	Connection Г	G

According to the actuators size, the connection OST (Russia) is as follows:

Type number 52 120	Connection M, A, Б
Type number 52 121 and 52 122	Connection A, Б, B
Type number 52 123 and 52 124	Connection Б, B
Type number 52 125	Connection B, Г

7th place of type number:

If one of numerals 1, 3, 5, 7 or 9 is on the 9th place of the type number the character from Table 4 is on the 7th place.

If one of numerals 2, 4, 6 or 8 is on the 9th place of the type number the character from Table 5 is on the 7th place.

Table 4 – Actuator fitted with electronics DMS2 ED

Outfit	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	M	N	V	W	
Local control		x		x		x		x		x		x		x		x		x		x	
Display			x	x			x	x			x	x			x	x				x	x
Contactors or contact-less switching					x	x	x	x					x	x	x	x	x	x	x	x	x
Analog module										x	x	x	x	x	x	x	x	x	x	x	
	transmitter																				
regulator																	x	x	x	x	

Table 5 – Actuator fitted with electronics DMS2

Two-position or three-position control *)	R
Profibus	P

*) Two- or three-position regulation of the actuator is set at the manufacturer. Unless otherwise specified in the order, the actuator will be set for three-position regulation (control by signal 4 – 20 mA).

8th place of type number:

Tripping torque, adjusting speed – Table 1 or 2

9th place of type number:

Table 6 – Type of electronics, power switches, brake

Electronics DMS2 ED – without contactors	1
Electronics DMS2 – with contactors	2
Electronics DMS2 ED – with contact-less switches	3
Electronics DMS2 – with contact-less switches	4
Electronics DMS2 ED – with contactors and brake	5
Electronics DMS2 – with contactors and brake	6
Electronics DMS2 ED – with contact-less switches and brake	7
Electronics DMS2 – with contact-less switches and brake	8
Electronics DMS2 ED – with contactors	9

10th place of type number:

ED – actuators with electronics DMS2 or DMS2 ED

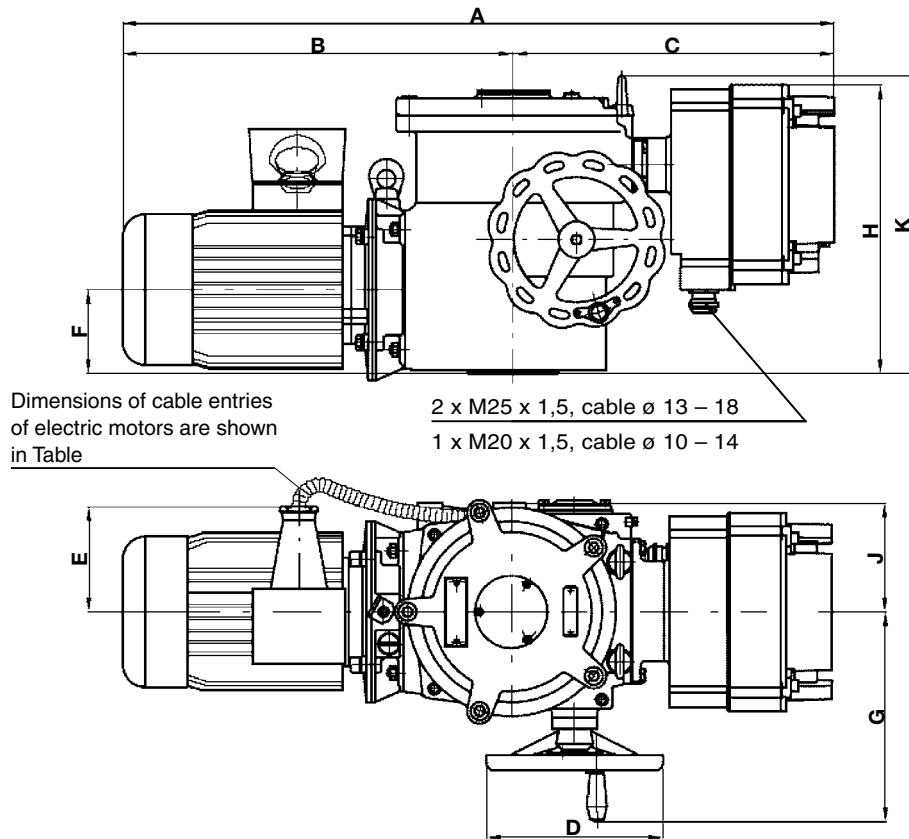
11th place of type number:

Table 7 – Ambient temperatures

For ambient temperature of -25 °C to +55 °C	without designation
For ambient temperature of -50 °C to +55 °C *)	F

*) *The electronic outfit should be discussed with the manufacturer.*

Dimensional sketch of MODACT MOED EEx electric actuator



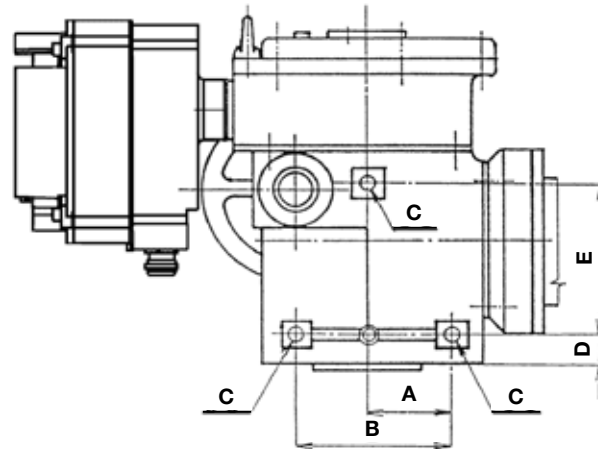
Cable entries of electric motors used in multi-revolution actuators MODACT MOED EEx

Type of electric motor	Axial height of motor	Number of entries x range of cable Ø (thread size)
AVM	71, 80, 90, 100	1 x ø 13 to 16 mm
	112, 132	2 x ø 17 to 20 mm

The above listed cable entries of electric motors (see the table) and the actuator are available as a standard. Requirement for other diameters of connecting cables should be specified in the order.

Dimension	Type number			
	52 120	52 121, 2	52 123, 4	52 125
A max.	662	791	915	1049
B max.	340	462	573	684
C	322	329	342	365
D	ø 160	ø 200	ø 250	ø 375
E	130	130	165	165
F	80	92	123	153
G	215	256	310	362
H max.	336	348	412	468
J	90	120	145	178
K	315	335	400	442

Holes for additional attachment of **MODACT MOED EEx** electric actuator

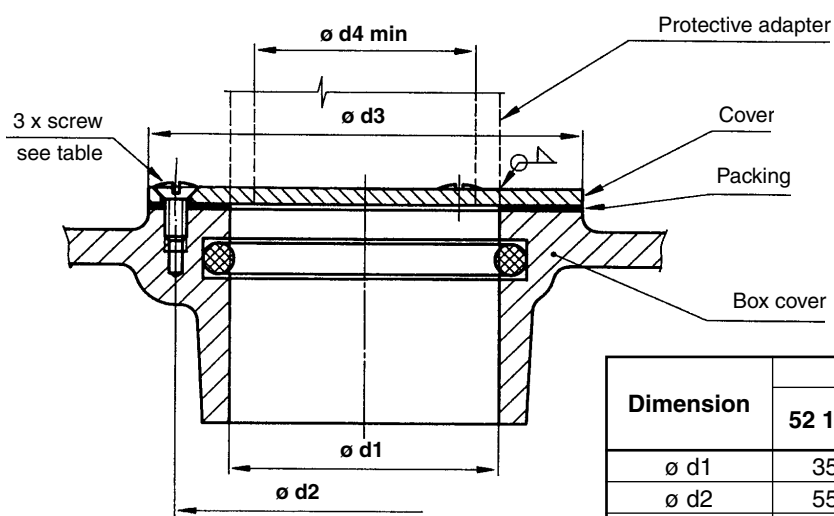


Dimension	Type number			
	52 120	52 121, 2	52 123, 4	52 125
A	61	90	110	120
B	110	160	210	240
C	M 10	M 12	M 16	M 20
D	16	21	23	47
E	120	140	200	220

Note:

The holes intended for additional attachment of MODACT electric actuators only serve for supporting the actuator weight and may not be subjected to load with any additional force.

Modification for rising spindle

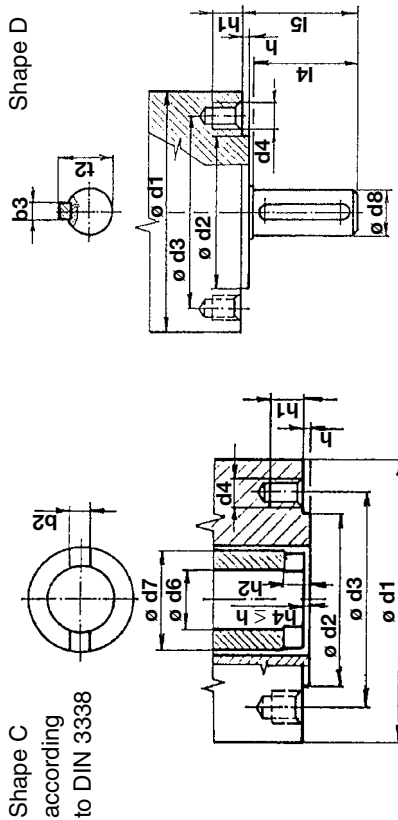


Dimension	Type number			
	52 120	52 121 52 122	52 123 52 124	52 125
$\varnothing d1$	35	50	75	80
$\varnothing d2$	55	70	100	100
$\varnothing d3$	65	80	112	112
$\varnothing d4$	30	41.5	53	72
Screw ISO 2010 (ČSN 021155)	M4x10	M4x10	M5x10	M5x10

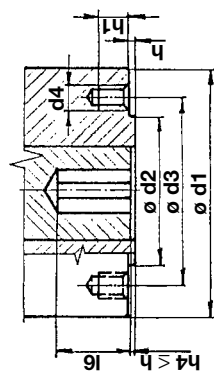
Attachment dimensions of **MODACT MOED EEX** electric actuators (basic design without adapter)

The electric actuators are designed for direct mounting onto the controlled device (valve etc.). They are attached by means of a flange or clutch according to ČSN 186314. The flanges of the electric actuators also comply with ISO 5210. The clutches for transmission of motion to the valve are:

- Shape A (with adapter), according to ČSN EN ISO 5210 (13 3090)
- Shape B1 (with adapter), according to ČSN EN ISO 5210 (13 3090)
- Shape B3 (without adapter), according to ČSN EN ISO 5210 (13 3090)
- Shape D (without adapter)
- Shape C (without adapter), according to DIN 3338



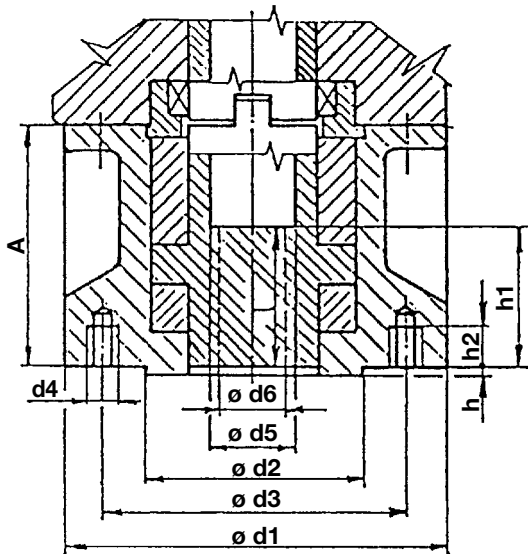
Shape B3 according to ČSN EN ISO 5210 (13 3090)



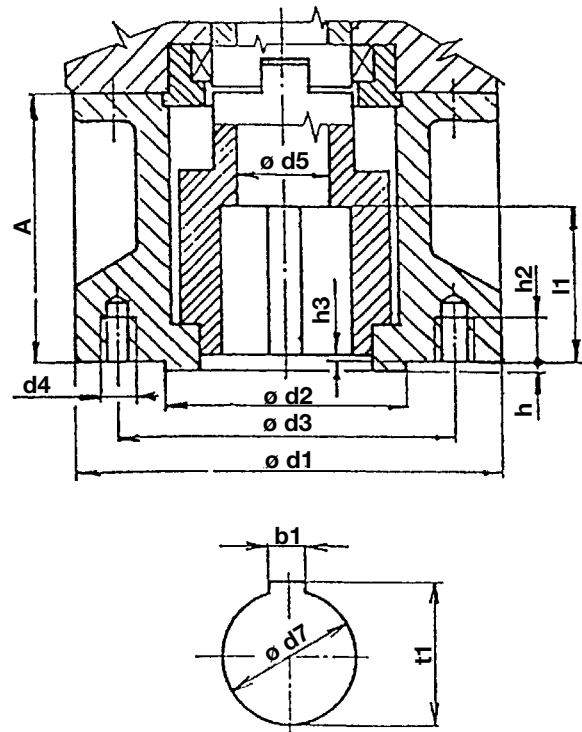
Shape	Dimension	Type number / Flange			
		52 120	52 121, 2	52 123, 4	52 125
C, D, B3	ø d1 (orientation value)	125	175	210	300
	ø d2 f8	70	100	130	200
	ø d3	102	140	165	254
	d4	M 10	M 16	M 20	M 16
C	Number of tapped holes	4	4	4	8
	h ⁰ _{-0,2}	3	4	5	5
	h1 min. 1,25 d4	12,5	20	25	20
	ø d7	40	60	80	100
D	h2 min.	10	12	15	16
	b2 H11	14	20	24	30
	ø d6	30	41,5	53	72
	ø d8 g6	20	30	40	50
B3	l4	50	70	90	110
	t2 max.	22,5	33	43	53,5
	b3 h9	6	8	12	14
	ø l6	55	76	97	117
B3	ø d9 H8	20	30	40	50
	l6 min.	55	76	97	117
	t3	22,8	33,3	43,3	53,8
	b4 Js9	6	8	12	14

Adapters to MODACT MOED EEx electric actuators

Shape A
according to ČSN EN ISO 5210
(13 3090)

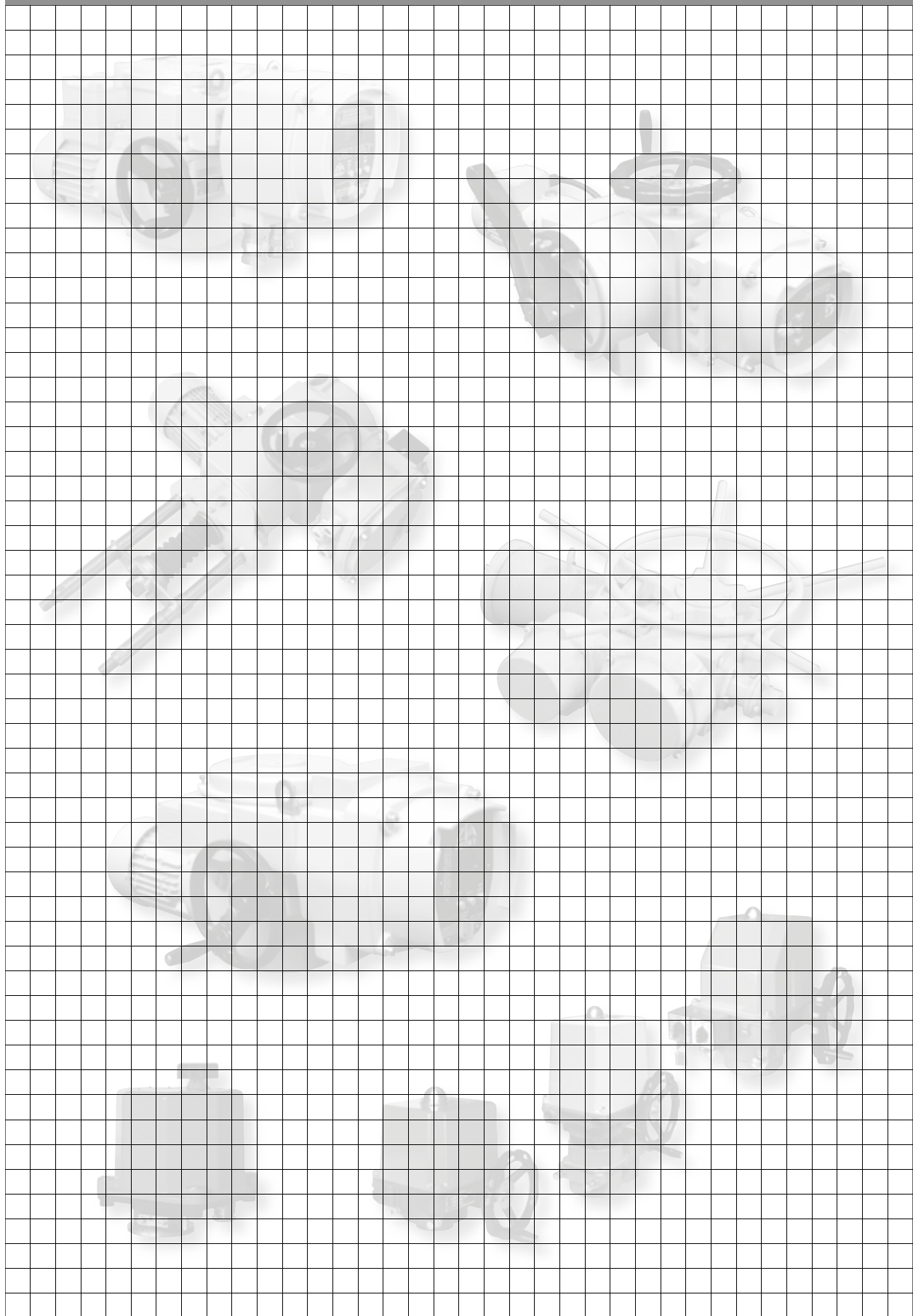


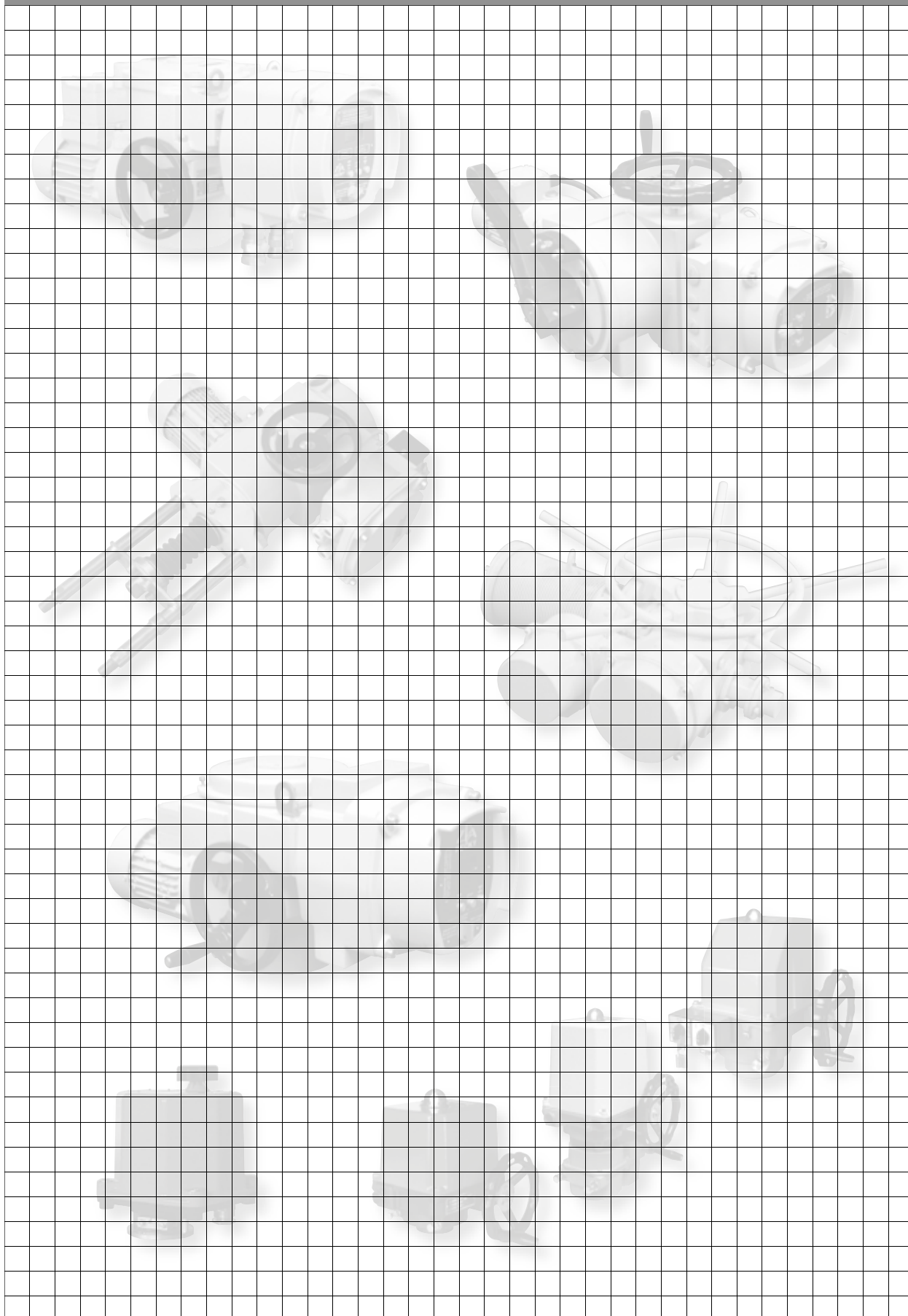
Shape B1
according to ČSN EN ISO 5210
(13 3090)

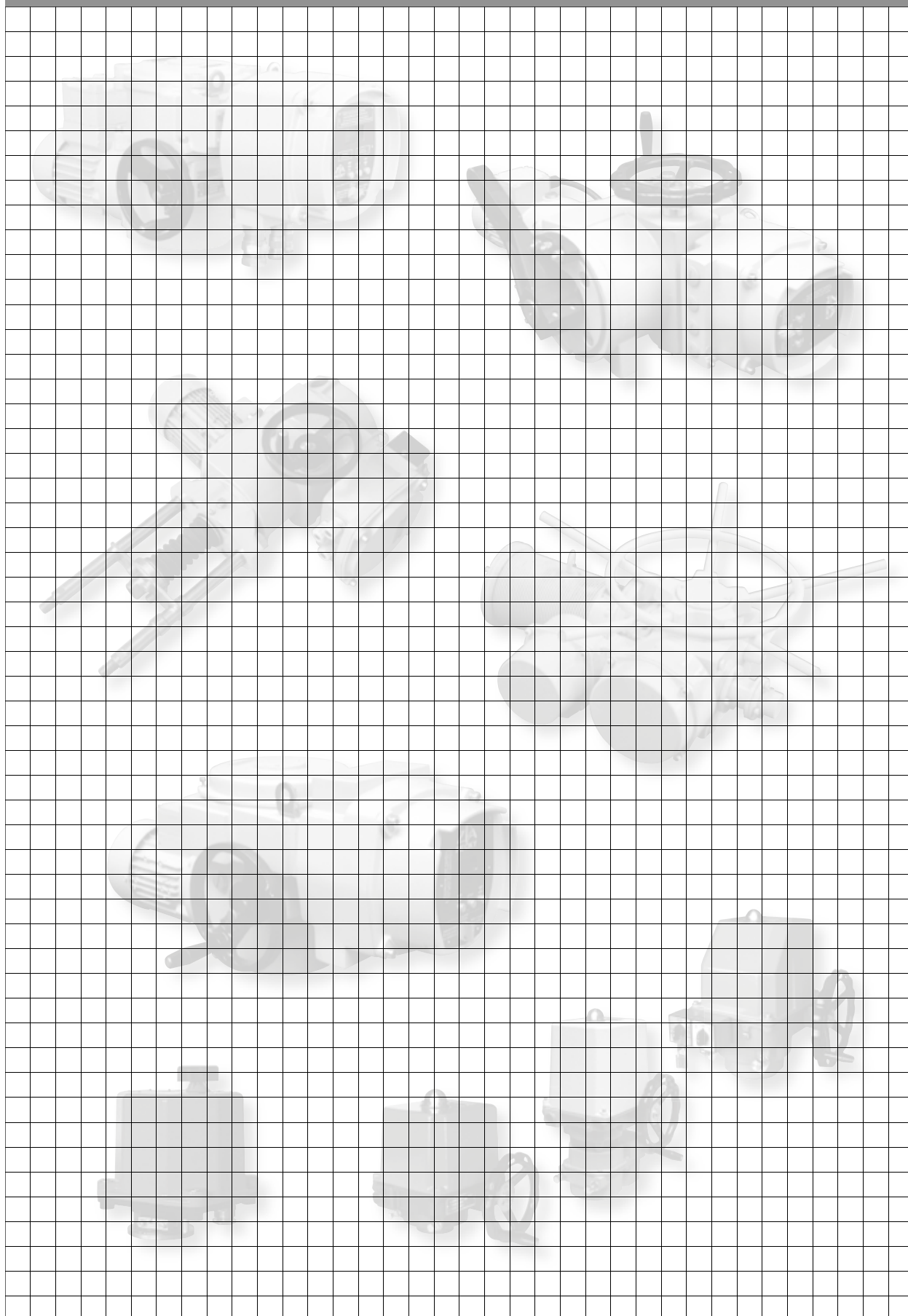


Assignment of adapters to electric actuators

Shape	Dimension	Type number			
		52 120	52 121, 2	52 123, 4	52 125
A, B1 (identical dimensions)	ø d1	125	175	210	300
	ø d2 f8	70	100	130	200
	ø d3	102	140	165	254
	d4	M 10	M 16	M 20	M 16
	Number of holes d4	4	4	4	8
	h	3	4	5	5
	h2 min.	12,5	20	25	20
A	A	63,5	110	179	155
	ø d5	30	38	53	63
	ø d6 max.	28	36	44	60
	h1 max.	43,5	65	92	110
	l min.	45	55	70	90
B1	A	63,5	110	122	155
	ø d5	30	40	50	65
	l1 min.	45	65	80	110
	h3 max.	3	4	5	5
	b1	12	18	22	28
	ø d7 H9	42	60	80	100
	t1	45,3	64,4	85,4	106,4









Development, production and services of electric actuators and switchboards.
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MODACT MOKA

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

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

Electric rotary multi-turn actuators

MODACT MO EEX, MOED EEX

Explosion proof electric multi-turn actuators

MODACT MOA

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

MODACT MOA OC

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

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