

Electric Linear
Thrust Actuators

MODACT MTNED, MTPED

Type numbers 52 442, 52 443



www.zpa-pecky.cz

ZPA Pečky, a.s. is certified company in accordance with ISO 9001 as amended.

1. APPLICATION

The actuators **MODACT MTNED, MTPED** are used for remote two-position or three-position control of valves by reciprocating linear motion.

The actuators can also be used for other devices for which they are appropriate due to their performance and parameters. Using in special cases should be discussed with the manufacturer.

2. OPERATING CONDITIONS, OPERATING POSITION

Operating conditions

The **MODACT MTNED, MTPED** actuators should withstand the effect of operating conditions and external influences, Classes AC1, AD5, AD7, AE4, AE6, AF2, AG2, AH2, AK2, AL2, AM2-2, AN2, AP3, BA4 and BC3, according to ČSN Standard 33 2000-5-51 ed. 3.

When installed on a free area the actuator should be fitted with a light shelter 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.

Installation of the actuators at a location with incombustible and non-conducting dust is possible only if this has no adverse effect on their function. At the same time, it is necessary to strictly observe the ČSN Standard 34 3205. It is advisable to remove dust whenever the layer of dust becomes as thick as about 1 mm.

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.

Temperature

Operating temperatures for **MODACT MTNED** electric actuators ranges from -25 °C to +70 °C and -40 °C to +60 °C.

Operating temperatures for **MODACT MTPED** electric actuators ranges from -25 °C to +60 °C and -40 °C to +60 °C.

Classes of external effects – extract from ČSN 33 2000-5-51 ed 3.

Class

- 1) AC1 – above-sea level ≤ 2000 m
- 2) AD5 – spouting water; water may spout in all directions
AD7 – shallow immersion, possible sporadic partial or full coverage (only MTPED)
- 3) AE4 – slight dust formation
AE6 – strong dust formation (only MTPED)
- 4) AF2 – occurrence of corrosive or polluting agents is atmospheric; presence of corrosive pollutants is significant
- 5) AG2 – mean mechanical strain; in normal industrial operations
- 6) AH2 – mean vibrations; in normal industrial operations
- 7) AK2 – serious risk of plant and moulds growth
- 8) AL2 – serious risk of occurrence of animals (*insects, birds, small animals*)
- 9) AM-2-2 – normal level of signal voltage. No additional requirements.
- 10) AN2 – mean solar radiation. Intensity > 500 and ≤ 700 W / m²
- 11) AP3 – mean seismic impacts; acceleration > 300 Gal ≤ 600 Gal
- 12) BA4 – capability of persons; instructed persons
- 13) BC3 – frequent contact of persons with ground potential; persons often touch foreign conductive parts or stand on conductive substrate

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

The actuators can be used in any operating position. It is not recommended to position actuator vertically downwards by motor in case of it is filled by oil.

3. OPERATION MODE, SERVICE LIFE OF ACTUATORS

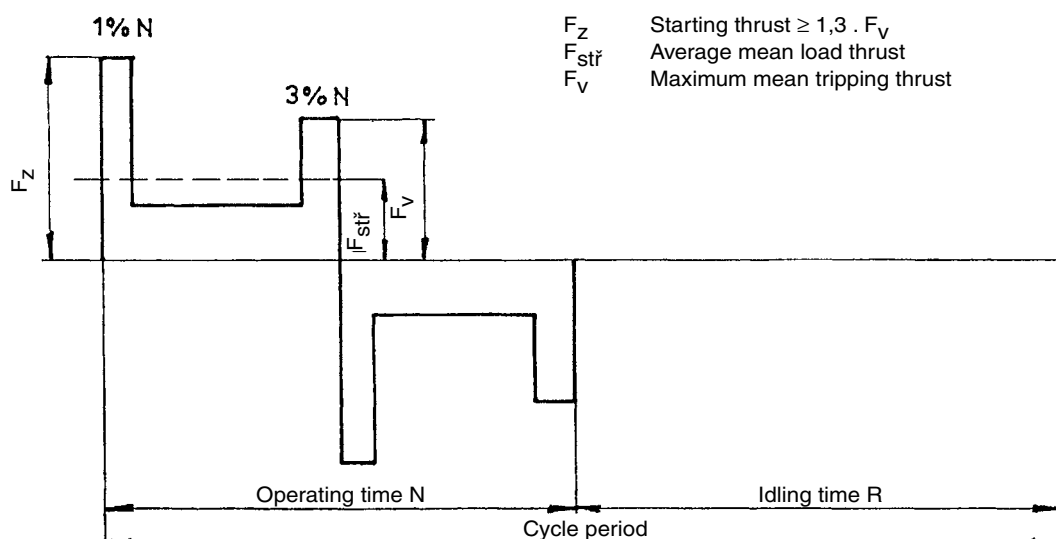
Operation mode

According to ČSN EN 60 034-1, actuators can be operated in S2 load category (*the course of load is shown in the picture*). The operation time at +50 °C shall be 10 minutes, the average mean load thrust value shall be below or equal to 60 per cent of the maximum tripping thrust F_V .

According to ČSN EN 60 034-1, the actuators can also be operated in the S4 mode (*interrupted operation with acceleration intervals*).

The load factor $N/N+R$ shall be maximum 25 per cent, the longest operation cycle $N + R$ is 10 minutes. The maximum number of switching actions in automatic control mode is 1200 actions per hour. The average mean load thrust at load factor of 25 per cent and 50 °C shall not exceed 40 per cent of the maximum tripping thrust F_V .

The maximum average mean of the load thrust equals the rated thrust of the actuator.



Course of working cycle

Service life of actuators

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.

When using reversing contactor unit the service life of actuator is 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]	3600	3000	1500	750

4. TECHNICAL DATA

Supply voltage

Supply voltage of electric motor: **MODACT MTNED, MTPED:** 3 x 230/400 V, +10 %, -15 %, 50 Hz ±2 %
3 x 220/380 V, +10 %, -15 %, 50 Hz +3 % - 5 %

Actuators designed to operate at another voltage and frequency than those given above are available upon special request. For more details, refer to the Technical conditions.

Protective enclosure

Protective enclosure of actuators: **MODACT MTNED – IP 55**
MODACT MTPED – IP 67

Noise

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

Tripping thrust

At the factory, the tripping thrust has been adjusted within the min./max. range giving in Table 1, according to the customer's requirements. If no tripping thrust adjustment is required the actuator is adjusted to its maximum tripping thrust.

Starting thrust

The starting thrust 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 thrust 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. Blocking time is adjustable in range 0 – 20 s.

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.

Working stroke

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

Manual control

The actuators are controlled by the hand wheel directly (*without a clutch*) and they can be controlled even with the electric motor running. By rotating the hand wheel in the clockwise direction, the actuator output tie rod is shifted out (*closes*). During turning of handwheel, it is necessary to use it gently, because actuator is not equipped by overload protection due safety aspects. Moment and position switches are not working in this moment.

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

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

5. ACTUATOR OUTFIT

Position indicator

The actuator can be fitted with a display as an option for electronic system **DMS2 ED**. Actuator with electronic system DMS2 is equipped with two-line display.

Anti-condensation heater

Anti-condensation heater is connected to DMS and DMS ED electronic circuit. Switching of the anti-condensation heater is controlled by a thermostat. From the factory is the switching temperature set to 10°C. The temperature is adjustable by adjusting software DMS2. Input power of the anti-condensation heater is 10 W / 230 V.

Local control

Local control serves for controlling the actuator from the site of its installation. For **DMS2 ED** electronic system includes two change-over switches: one with positions "Remote control - Off - Local control", the other "Open - Stop - Close".

The first change-over switch can be built-in as two-pole or four-pole. The change-over switches are installed at a terminal-board box. If the actuator is equipped with **DMS2** electronic system local control consists of 3 buttons – "Open", "Stop", "Close" and rotary switch "Local, Remote, Off".

Dynamic brake

The brake is an optional accessory to the actuators fitted with electronics **DMS2** and **DMS2 ED Control**. As switching elements are used contactors (*mechanical contacts*) or SSR (*modern contactless switching elements*).

After opening the switching element (*contactor or SSR*), it induces dynamic braking moment in the motor for several tenths of second. When the actuator is in a standstill no braking moment is exerted. The brake reduces dramatically time of the actuator run-down and regulation is thus more precise. The used brakes BR2 are controlled, impulse for action comes from the control unit. Corresponding variant of the brake is chosen according to the electric motor output and the type of switching elements.

Corresponding variant is chosen according to the electric motor power:

contactors	BR2 550	output up to 550 W
	BR 2,2	output up to 2.2 kW
SSR	BR2 BK 550	output up to 550 W
	BR BK 2,2	output up to 2.2 kW

Switching of electric motor, contactor unit

The actuators in variants Control are fitted with built-in reversing contactor combinations or SSR switches. First variant is assembled from two contactors and second variant from contactless switches.

The combination also includes mechanical blocking that prevents both contactors from being closed at the same time. This could, for instance, happen in case of wrong connection of jumpers on the terminal board. The blocking is not dimensioned for long-term action. The over-current relays protects the electric motor against over-loading and is dimensioned with respect to its output. According to the actuator version, the contactors are controlled by the regulator, change-over switch of local control or external input. Control voltage is 230 V / 50 Hz as a standard; it is supplied via contacts of position and/or moment micro-switches. Thus, these micro-switches need not be led out of the actuator. Contactors have defined service life at least 1 million cycles.

To extend the service life we recommend using contactless reversing unit with a minimum service life of 3 million cycles. The standard control voltage is 24V DC. It is used for output into 4 kW or 7.5 kW. The unit consists of semiconductor elements - thyristors.

6. ELECTRIC PARAMETERS

External electric connection

a) Actuator terminal board

The electric actuator is equipped with a terminal board for connection to external circuits. This terminal board uses screw terminals allowing conductors with a maximum cross-section 4 sqmm to be connected. For connecting of signalling conductors to control circuits terminals it is used by conductors of maximal midship 1,5 sqmm. Access to the terminal board is obtained after removal of the terminal box cover. All control circuits of the electric actuator are brought out to the terminal board. The terminal box is fitted with cable bushings for connecting the electric actuator. The electric motor is fitted with an independent box with a terminal board and a bushing. Alternatively it is possible to deliver actuators with connector.

b) Connector

According to the customer's requirements the **MODACT MTNED**, **MTPED** actuators can be fitted with the connector to provide for connection of control circuits. This connector uses screw terminals allowing conductors with

a maximum cross-section 4 sqmm to be connected. For connecting of signalling conductors into the crimp terminals of control circuits it is used by conductors of maximal midship 1,5 sqmm. ZPA Pečky, a.s. also supplies a counterpart for the cable. In order to connect the cable to this counterpart it is necessary to use special crimping pliers. After an agreement it is possible to rent or buy crimp pliers in ZPA Pečky, a.s. based under certain conditions.

Actuator internal wiring

The internal wiring diagrams of the **MODACT MTNED, MTPED** 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. Terminals are marked by numbers on source board. Carrying strap and self-adhesive label with numbers is at electromechanical board.

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

Circuits of anti-condensation heater	1 500 V, 50 Hz
Electric motor Un = 3 x 230/400 V	1 800 V, 50 Hz

Deviations of basic parameters

Tripping thrust	±12 % of max. value of range
Adjusting speed	- 10 % of max. value of range +15 % of rated value (<i>idle run</i>)
Clearance of output part	max. 1 mm

Protection

The actuators are fitted with one internal and one external protection terminal for ensuring protection against electric shock injury according to ČSN 33 2000-4-41 ed. 2. One protection terminal is also installed on the electric motor. The protection terminals are marked according to ČSN EN 60 417-1 and 2 (013760).

7. DESCRIPTION

The **MTNED, MTPED** actuators are based on MODACT MONED actuator series. Moreover, they are designed with linear transmission unit for converting rotary motion into linear motion.

An asynchronous motor drives, via a geared countershaft, the sun gear of a epicyclic gear unit enclosed in the supporting actuator box (*power transmission*). In the mechanical power control mode, the crown gear of a planet epicyclic gear unit is held in steady position by a self-locking worm gear drive. Alternatively, the handwheel, connected with the worm allows manual control to be accomplished even during motor operation without any risk of operator's injury.

The output shaft is fix-connected with the planet gearing carrier and passes into the control box where all control elements of the actuator are installed. The control elements are accessible after taking off the control box lid.

8. 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	Main part of the system DMS2.ED - includes microcomputer, position sensor, 3 signal lamps LED, 4 push-buttons for simple setting and checking the actuator, connectors for connecting the torque sensor, source board, and interface RS 232 (<i>connection of computer for setting and diagnostics</i>).
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Torque unit
 Source unit Electronic power supply, user's terminal board (*connection of power supply and control signals*), 2 torque relays, 2 position relays, 2 signalling relays, 1 relay for signalling errors (*READY*), switch of resistance anti-condensation heater, connectors for connecting electronic brake, resistance heater of analog module, and connector for interconnection with the control unit.

Optional outfit:

Feed-back signal 4 – 20 mA,
 Analog module output of feed-back signal 4 – 20 mA, in version CONTROL input of control signal 0/4 – 20 mA
 Position indicator LED display
 Local control
 Contactors or block of contact-less 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 see Table 1
 Torque blocking 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 (*MO, MZ, PO, PZ, SO, SZ, READY*)
 Position signal 4 – 20 mA max. 500 ohm, active/passive, galvanic-isolated,
 LED display
 Electronic brake (*optional*)
 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 (*contactors or contact-less switching*).
 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*):

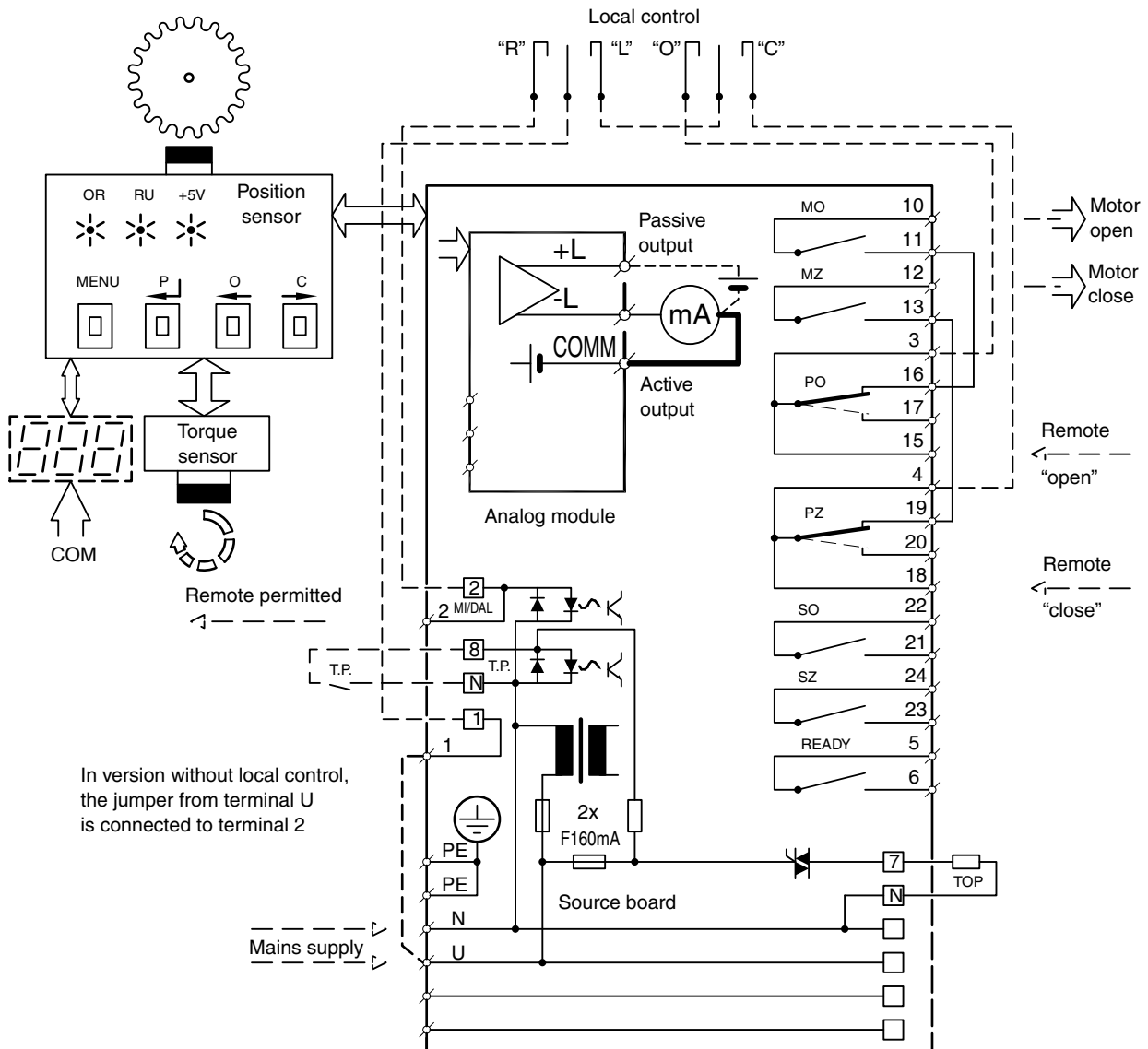
Unit of two- and three-position control – Control of the electric actuator by shifting to position "Open" and "Close" or by analog signal 0 (4) – 20 mA.

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.

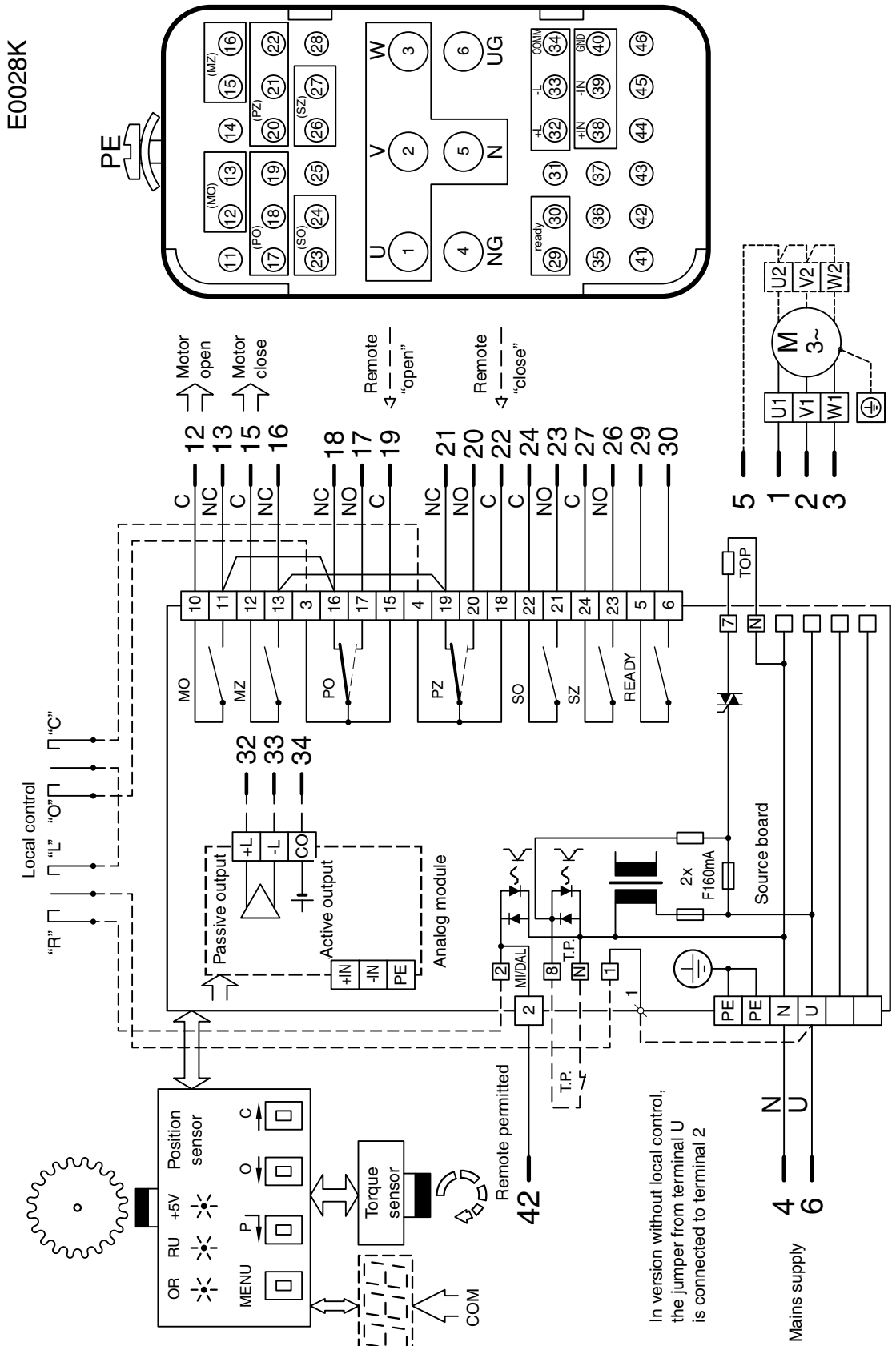
Example of wiring diagram of electronics **DMS2 ED** in version
Substitution of electro-mechanical board
(actuators MODACT MTNED, MTPED)

E0001



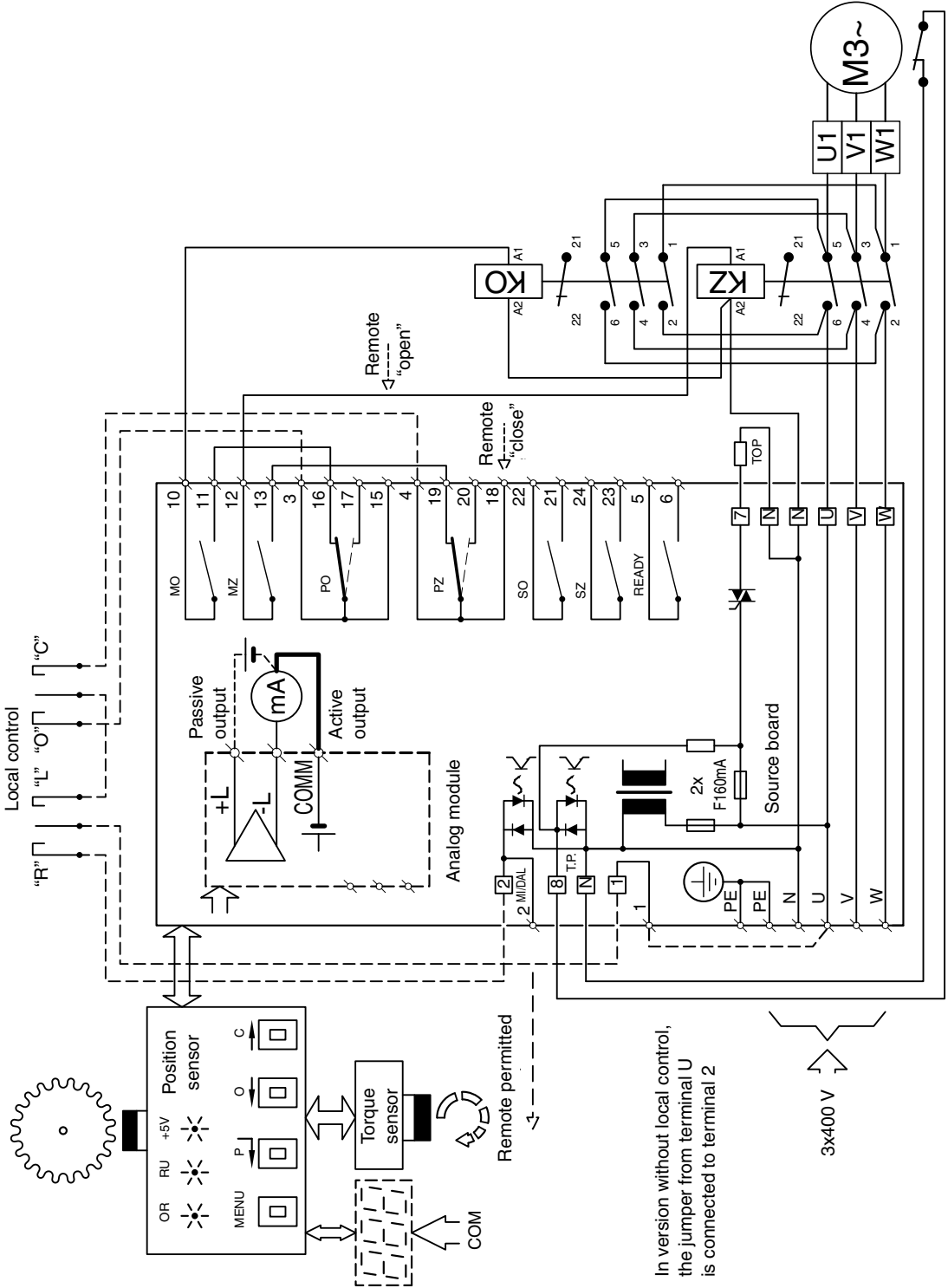
Note: Here, contacts of relays MO, MZ, SO, SZ are shown with power supply switched off; with power supply switched off contacts PO, PZ are shifted to the position drawn in dashed line.

Example of wiring diagram of electronics **DMS2 ED** in version **Substitution of electro-mechanical board with connector connection**
(actuators MODACT MTNED, MTPED)



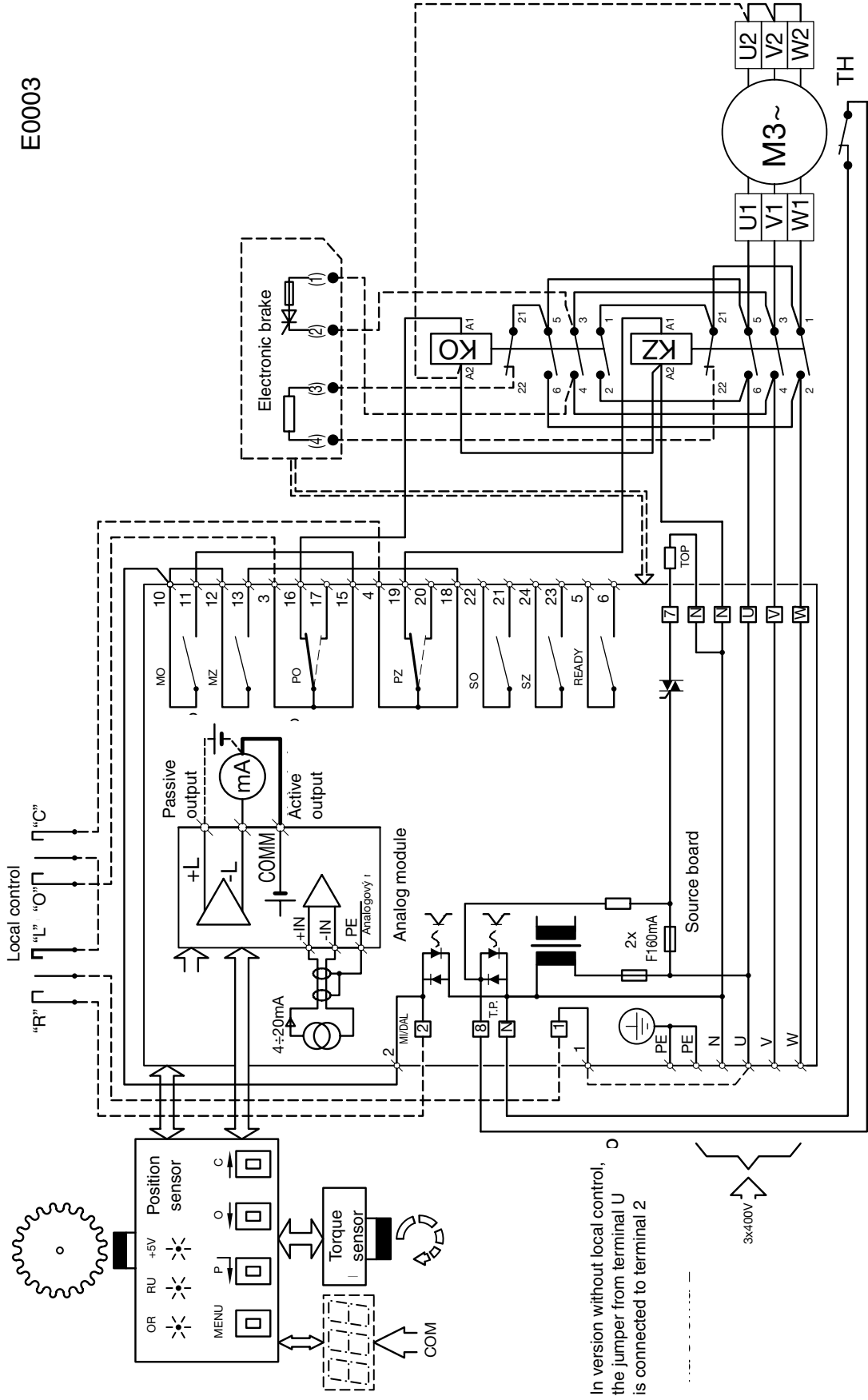
Example of wiring diagram Substitution of electro-mechanical board with contactors and thermal relay
 (actuators MODACT MTNED, MTPED)

E0002



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

Example of wiring diagram of electronics DMS2 ED in version Control (actuators MODACT MTNED, MTPED)



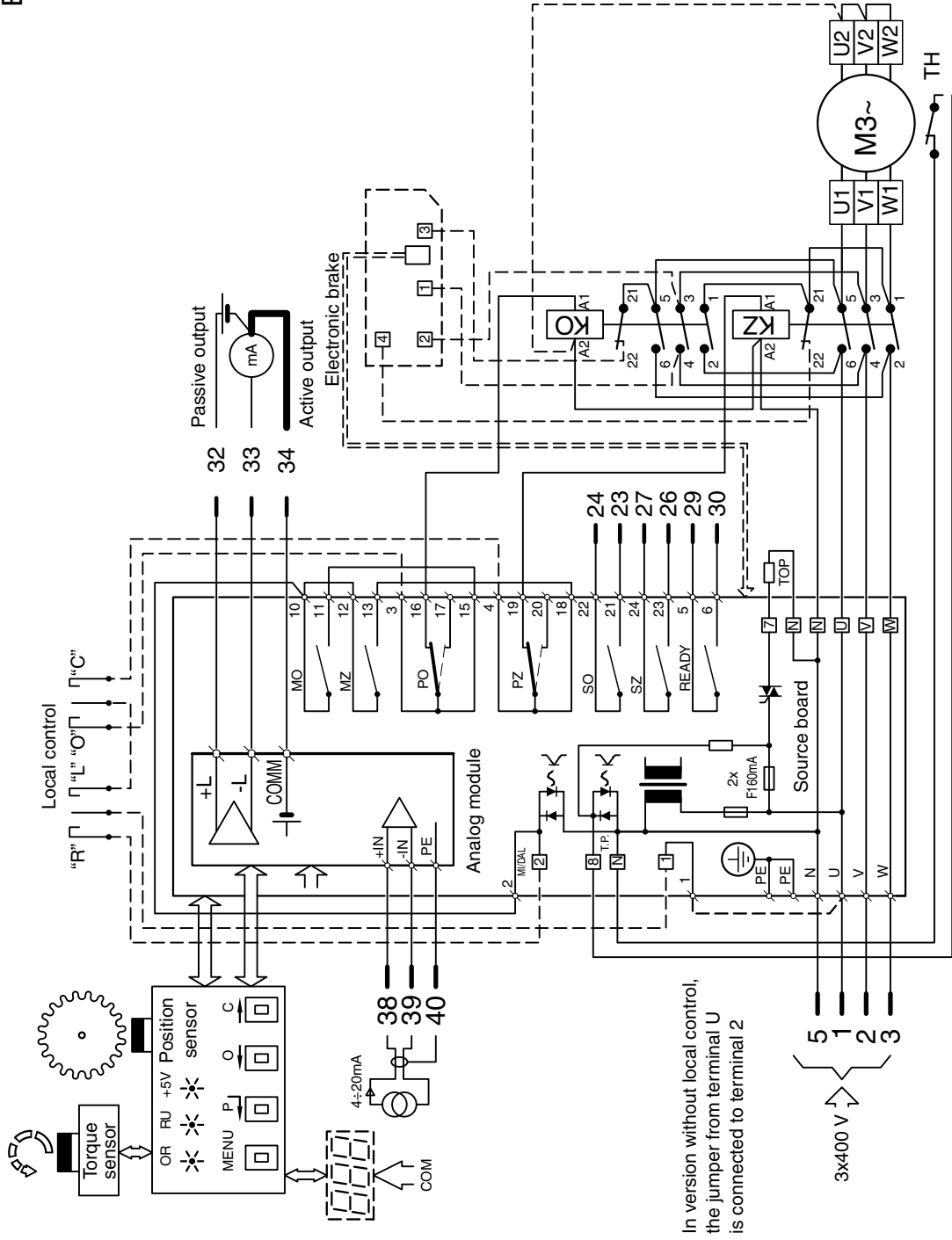
E0003

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.

Example of wiring diagram of electronics DMS2 ED in version Control with connector connection
(actuators MODACT MTNED, MTPED)

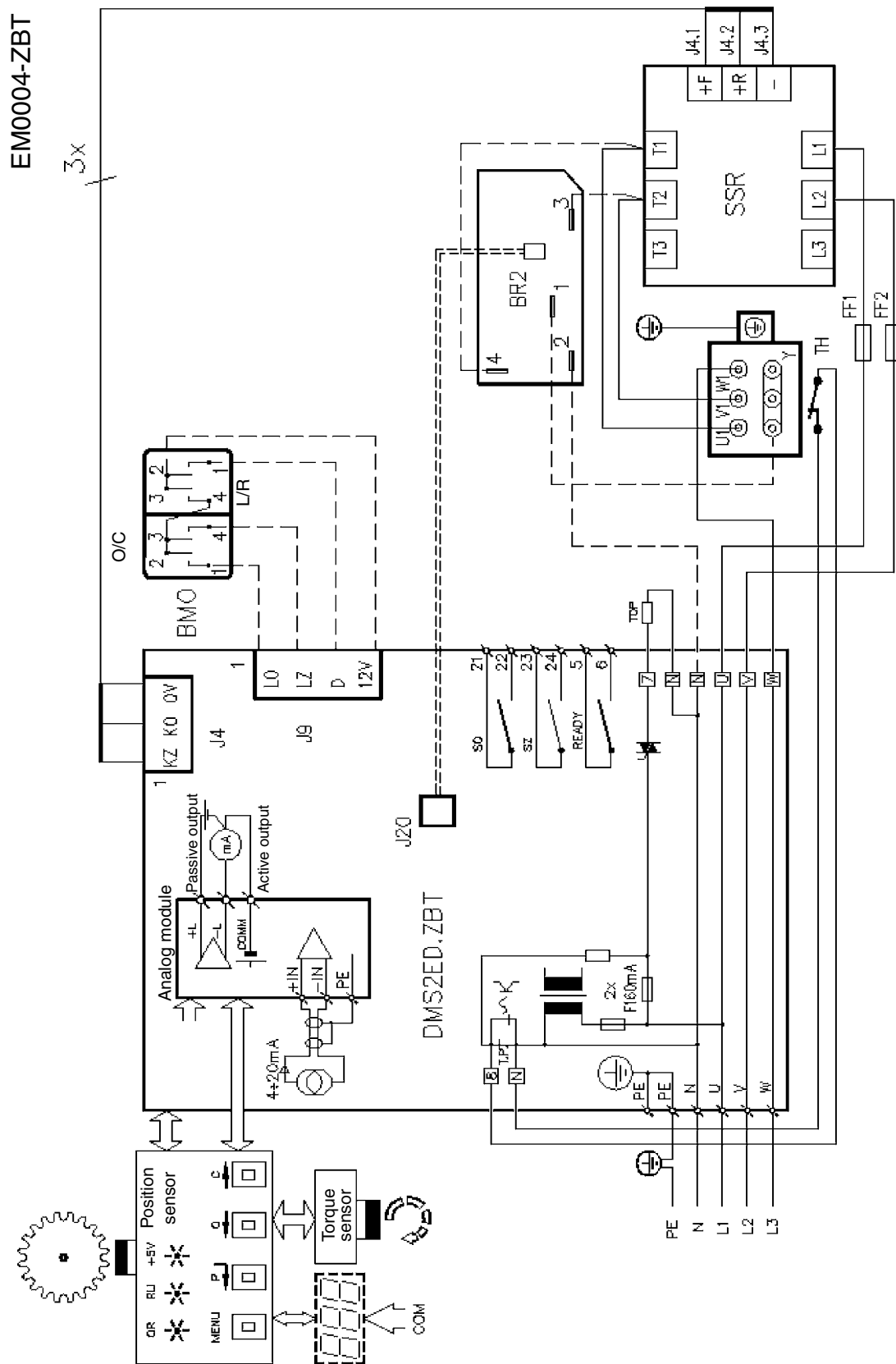
E0027K



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

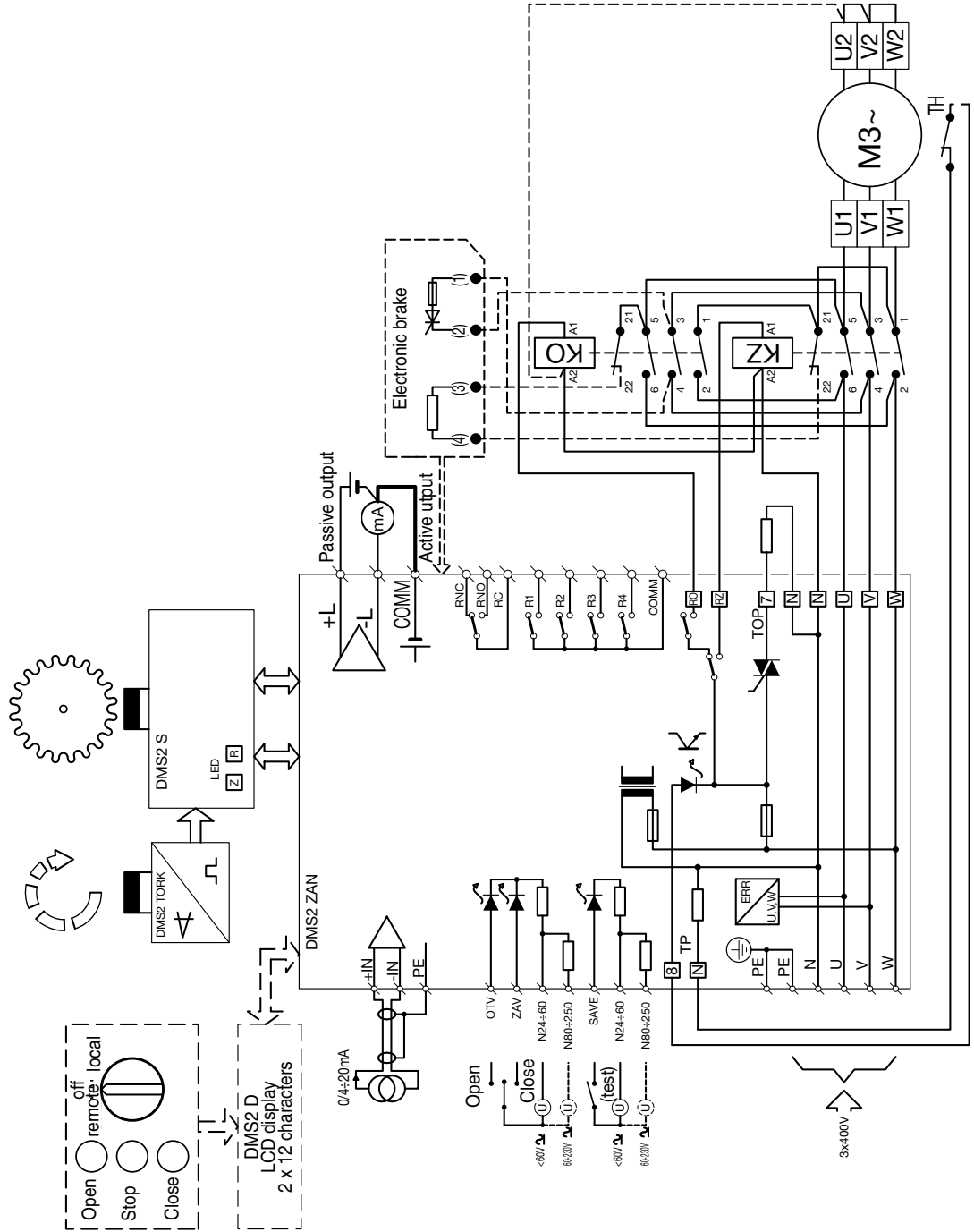
3x400 V

Example of wiring diagram of electronics **DMS2 ED** in version **Control** with contact-less switching of electric motor



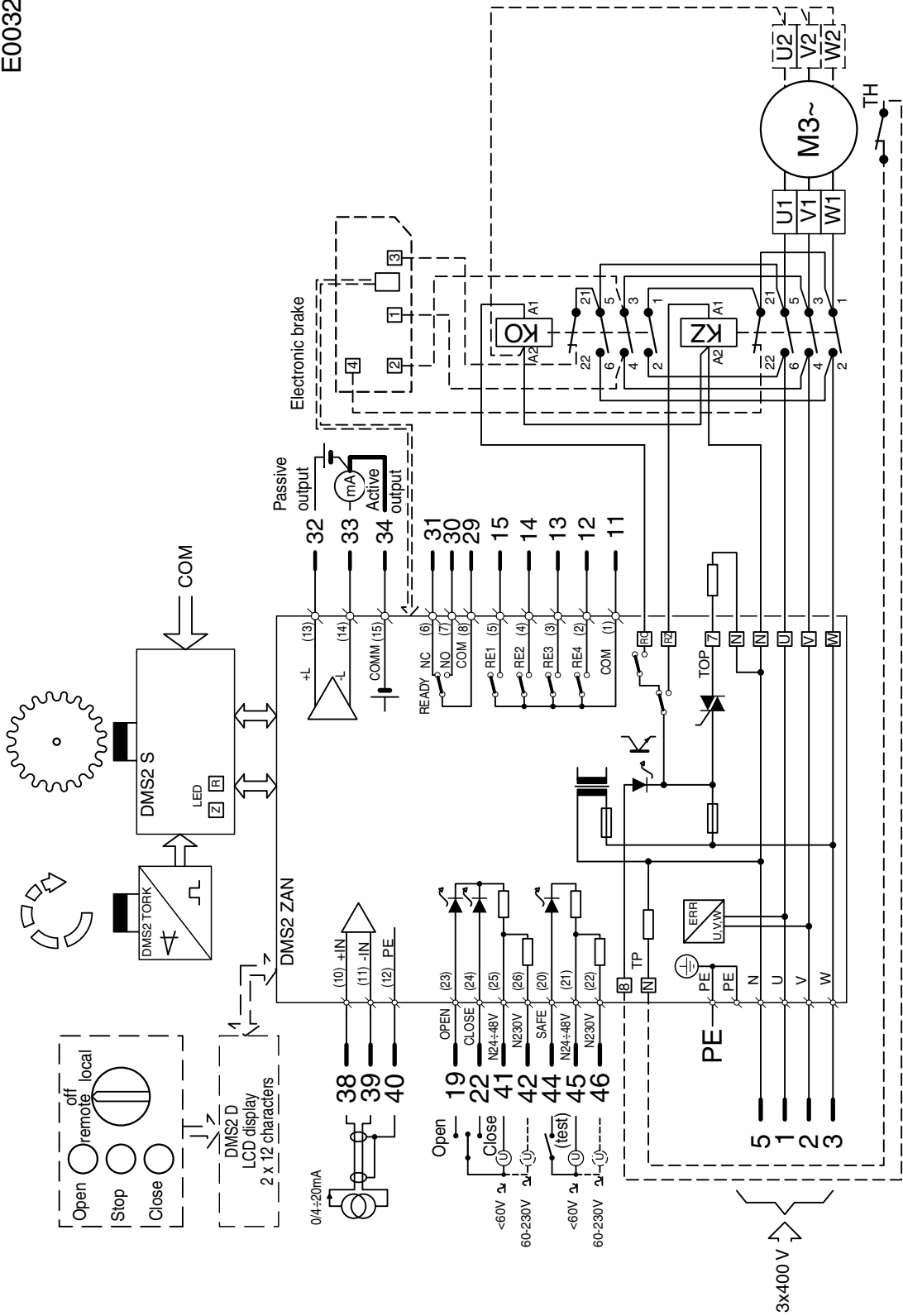
Example of wiring diagram of electronics **DMS2 Analog** in version **Control (actuators MODACT MTNED, MTPED)**

E0006



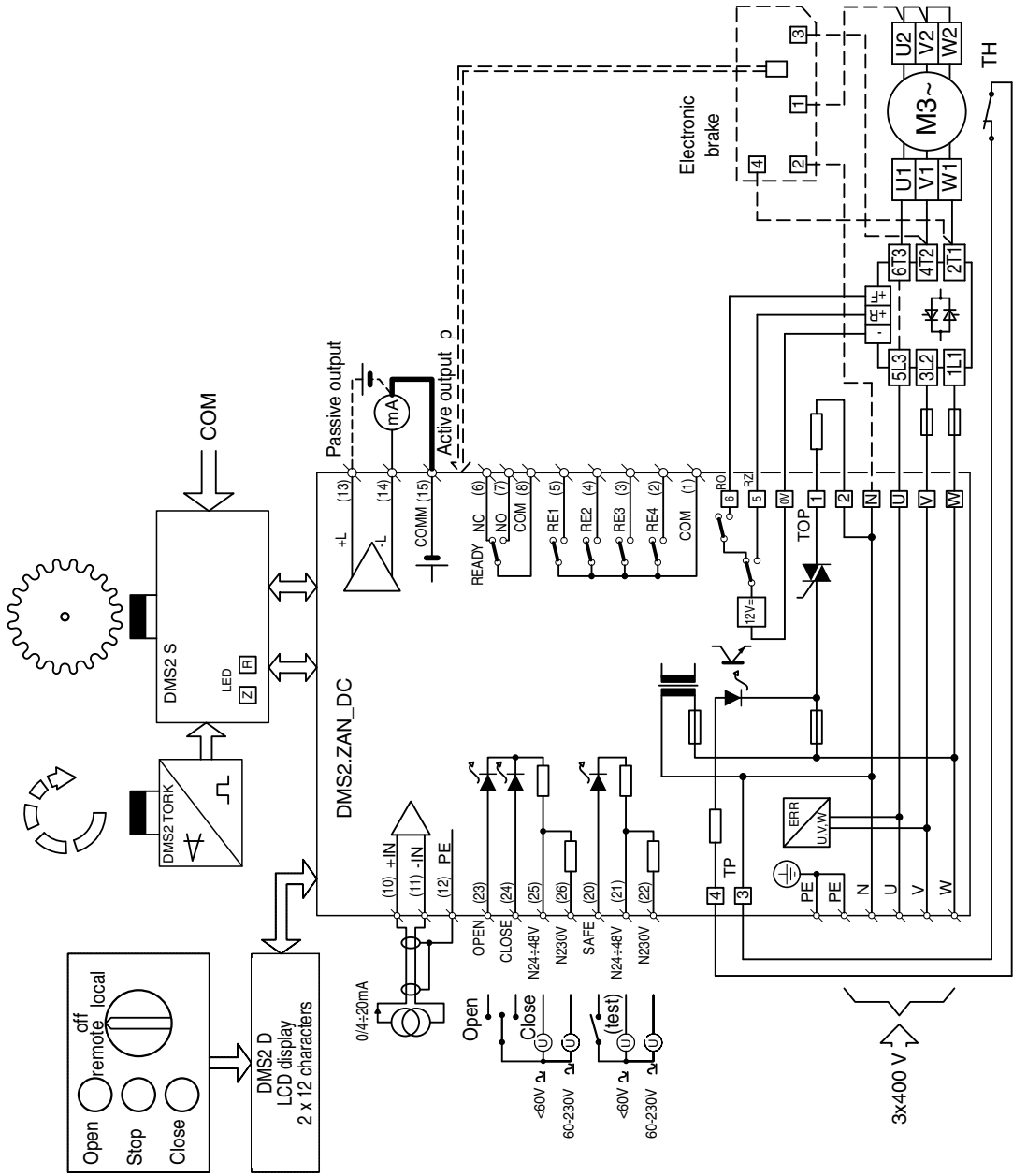
Example of wiring diagram of electronics **DMS2 Analog** in version **Control** with connector connection
(actuators MODACT MTNED, MTPED)

E0032K



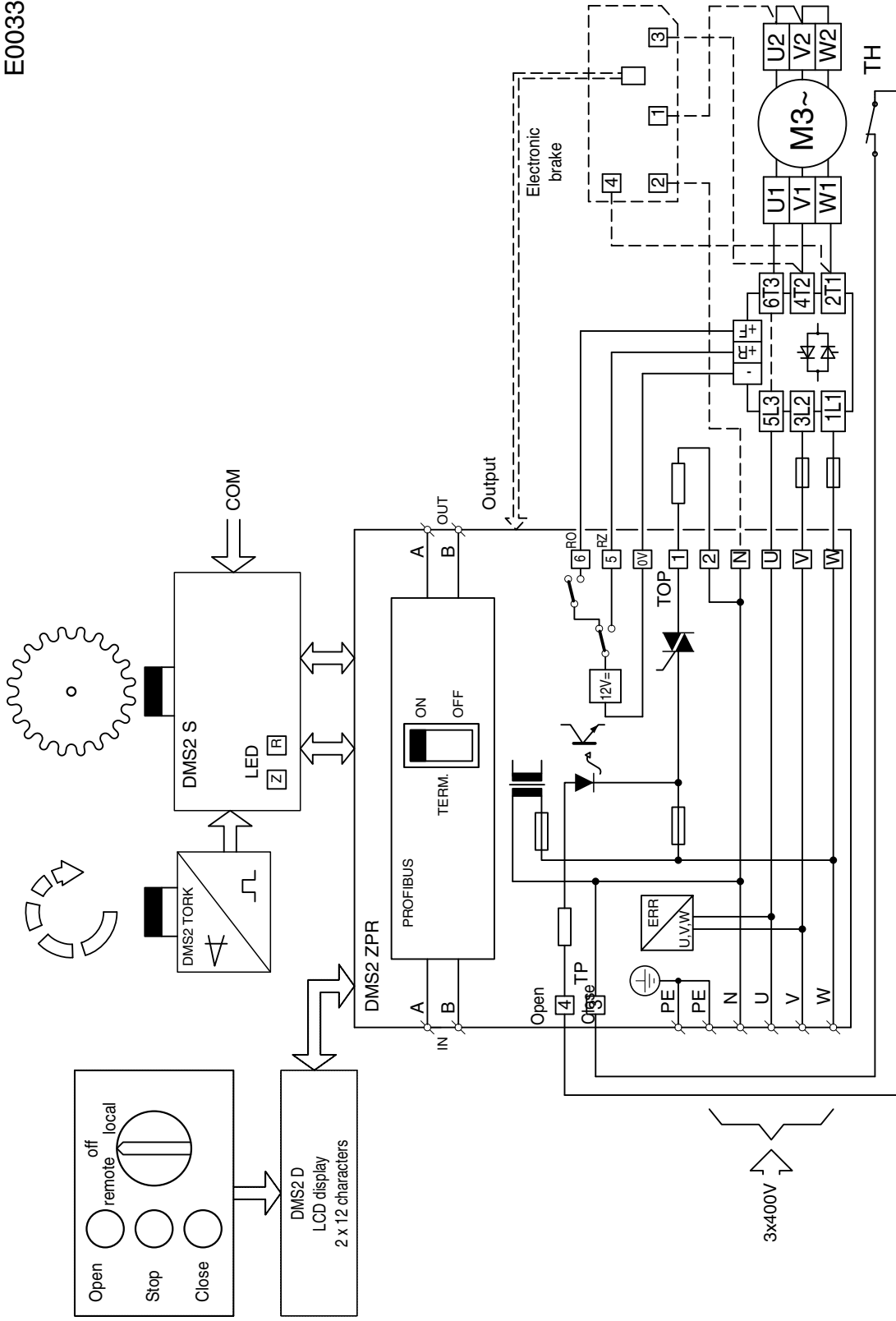
Example of wiring diagram of electronics **DMS2 Analog** with contact-less switching of electric motor
(actuators MODACT MTNED, MTPED)

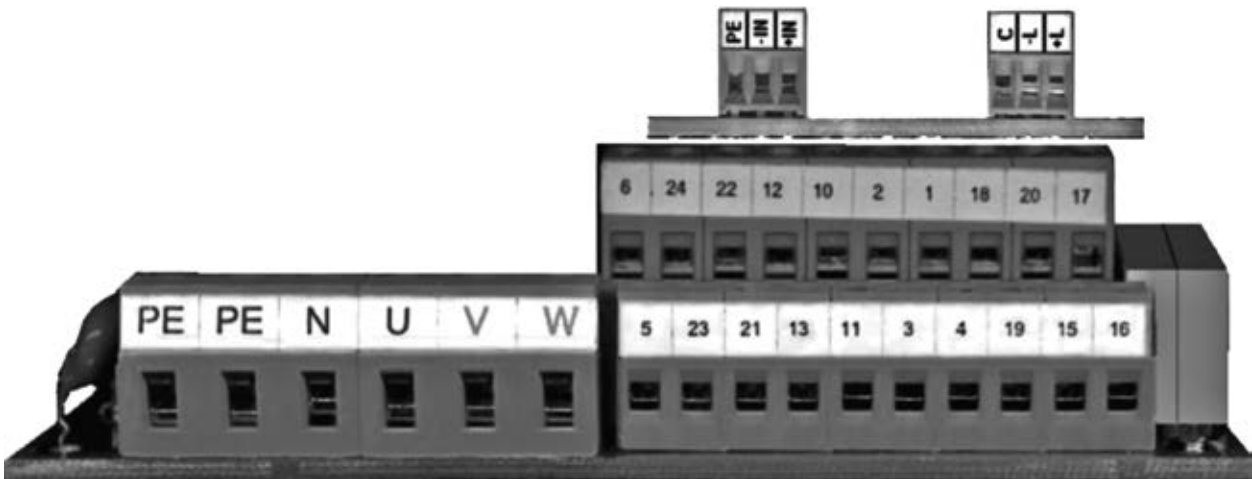
E0031



Example of wiring diagram of electronics **DMS2 Profibus** with contact-less switching of electric motor
(actuators MODACT MTNED, MTPED)

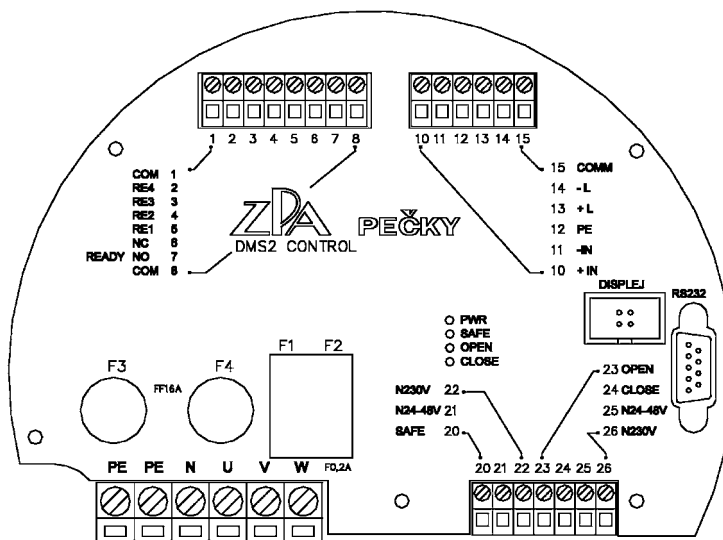
E0033



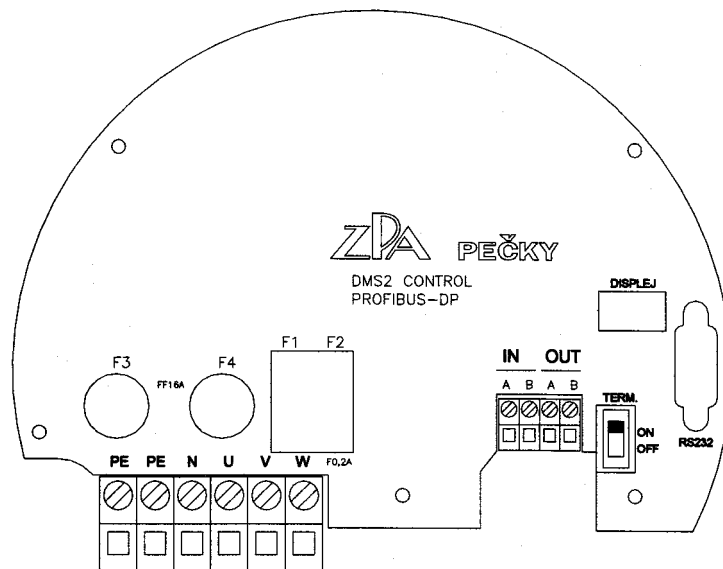


Terminal board of actuator with electronics DMS2 ED

If the actuator is of the version Replacement of electro-mechanical board without contactors the power supply is only connected to terminals PE, N U. Terminals V, W shall remain unconnected.



Terminal board DMS2 Analog



Terminal board DMS2 Profibus

Table 1 – MODACT MTNED, MTPED electric actuators
– basic technical parameters

Basic technical parameters (8 th place of Type No.)																						
Type	Adjustment range of tripping thrust [kN]	Starting thrust [kN]	Speed [mm/min]	Stroke [mm]	Electric motor					Weight [kg]	Type Number											
					Type	Power [W]	Revolutions per minute [1/min]	I _n (400 V) [A]	I _z /I _n		basic		additional									
											12	345	6	7	8	9	10					
MTNED 15 MTPED 15	11,5 – 15	17	50	10 – 100	1TZ9002-0CC2	180	875	0,85	2	33	52 442	x	x	0	x	x						
			80		1TZ9002-0CC2	180	875	0,85	2			x	x	1	x	x						
			125		1TZ9002-0CB2	250	1365	0,8	3			x	x	3	x	x						
			36		1TZ9002-0CD3	120	625	0,82	2			x	x	2	x	x						
			27		1TZ9002-0CD3	120	625	0,82	2			x	x	A	x	x						
MTNED 25 MTPED 25	15 – 25	32,5	50		10 – 100	1TZ9002-0CC2	180	875	0,85			2	33	52 442	x	x	4	x	x			
			80			1TZ9002-0CC2	180	875	0,85			2			x	x	5	x	x			
			125			1TZ9002-0CB2	250	1365	0,8			3			x	x	6	x	x			
			36			1TZ9002-0CD3	120	625	0,82			2			x	x	7	x	x			
			27			1TZ9002-0CD3	120	625	0,82			2			x	x	8	x	x			
MTNED 40 MTPED 40 ¹⁾	25 – 40	52	80	20 – 120		1TZ9002-0DC3	550	900	1,68	2,7	60	52 443			x	x	1	x	x			
			125			1TZ9002-0DB2	550	1385	1,44	3,7					x	x	2	x	x			
MTNED 63 MTPED 63	40 – 63	82	80			20 – 120	1TZ9002-0EC0	750	940	2,3					3,8	63	52 443	x	x	4	x	x
			125				1TZ9002-0EB0	1,1	1405	2,5					4,5			x	x	5	x	x

Notes: 1) Design with clutch internal threads and a flange (non-standard) is available only in the design variants, Type No. 52 443.x21xNED and 52 443.x22xNED (Type MTNED, MTPED 40).

Electric actuators MODACT MTNED, MTPED
– Specification of meaning of the 6th to 11th place of the type number

Table 2 – Specification of respective positions in the type number

6 th place	Connection (terminal board/connector), electronics type		Table No. 3	
7 th place	Connecting dimensions	for type 52 442	Table No. 4	
		for type 52 443	according to Fig. 3, 4	1
			according to Fig. 5	2
8 th place	Force, speed		Table No. 1	
9 th place	Type of electronic see table 3 (letter on 6 th place)	DMS2	R – Analog, P – Profibus	
		DMS2 ED	Table No. 5	
10 th place	Protective enclosure	IP 55	MTNED	
		IP 67	MTPED	
11 th place	Surrounding temperatures		Table No. 6	

6th place of Type No.

Table 3 – Version, electric connection, electric outfit

Electronics	Terminal board	Connector	Terminal board, brake	Connector, brake
DMS2 ED (version see Table No. 4)	E	F	H	K
DMS2 ED, contact-less switches	A	B	C	D
DMS2, Profibus, contactors	P	T	U	Y
DMS2, Profibus, contact-less switches	I	J	L	M
DMS2 two- or three-position control*), contactors	R	V	W	1
DMS2 two- or three-position control*), contact-less switches	N	S	2	Z

*) The two or three-position control of the actuator will be installed at the manufacturers plant. Unless otherwise specified in the purchasing order, the **three-position control** will be installed (4 – 20 mA signal control)

7th place of Type No.

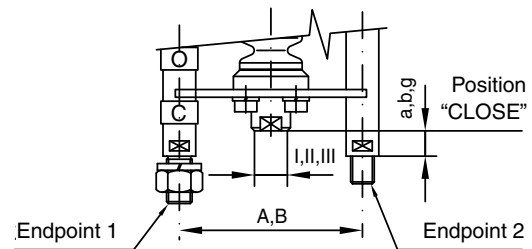
Table 4 – Connecting dimensions (Type No. 52 442)

Design spacing of columns A (160 mm)	Character on 7th place	Design spacing of columns B (160 mm)	Character on 7th place
Aa1I	0	Ba1I	C
Aa1II	1	Ba1II	D
Aa1III	2	Ba1III	E
Aa2I	3	Ba2I	F
Aa2II	4	Ba2II	G
Aa2III	5	Ba2III	H
Ab1I	6	Bb1I	I
Ab1II	7	Bb1II	J
Ab1III	8	Bb1III	K
Ab2I	9	Bb2I	L
Ab2II	A	Bb2II	M
Ab2III	B	Bb2III	P
		Bg2I	R

Deliveries in design III with coupling M 10 x 1 upon special request only.

Spacing of columns
Thread of coupling
Ending of columns
Position "Closed"

Spacing of columns	A	160 mm	Long columns c	see table "Design variants" Fig. 1 and 2
	B	150 mm		
Position "Closed"	a	30 mm	Long columns h	
	b	74 mm		
	g	130 mm		
Thread of coupling	I	M20 x 1,5		
	II	M16 x 1,5		
	III	M10 x 1		



9th place of Type No.

Table 5 – Outfit of electronics DMS2 ED

Outfit DMS2 ED	Character on 9th place																							
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	H	J	K	L	M	N	V	W
Local control		x		x		x		x		x		x		x		x		x		x		x		x
Display			x	x			x	x			x	x			x	x			x	x			x	x
Contactors or contact-less switch					x	x	x	x					x	x	x	x					x	x	x	x
Analog module	Transmitter									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Regulator																	x	x	x	x	x	x	x

Note: If the electric motor used is not fitted with a built-in temperature sensor the contactors include a thermal relay. If the actuator has DMS2 ED electronic system in configuration Electromechanics board replacement, the electronic brake will not be delivered.

11th place of Type No.

Table 6 – Surrounding temperatures

For surrounding temperature from -25 °C to +70 °C	without designation
For surrounding temperature from -40 °C to +60 °C	F1

Dimensional sketch of **MODACT MTNED, MTPED 40,**
MTNED, MTPED 63 electric actuators,
 Type No. 52 443.x1xxNED, 52 443.x1xxPED

– with connector

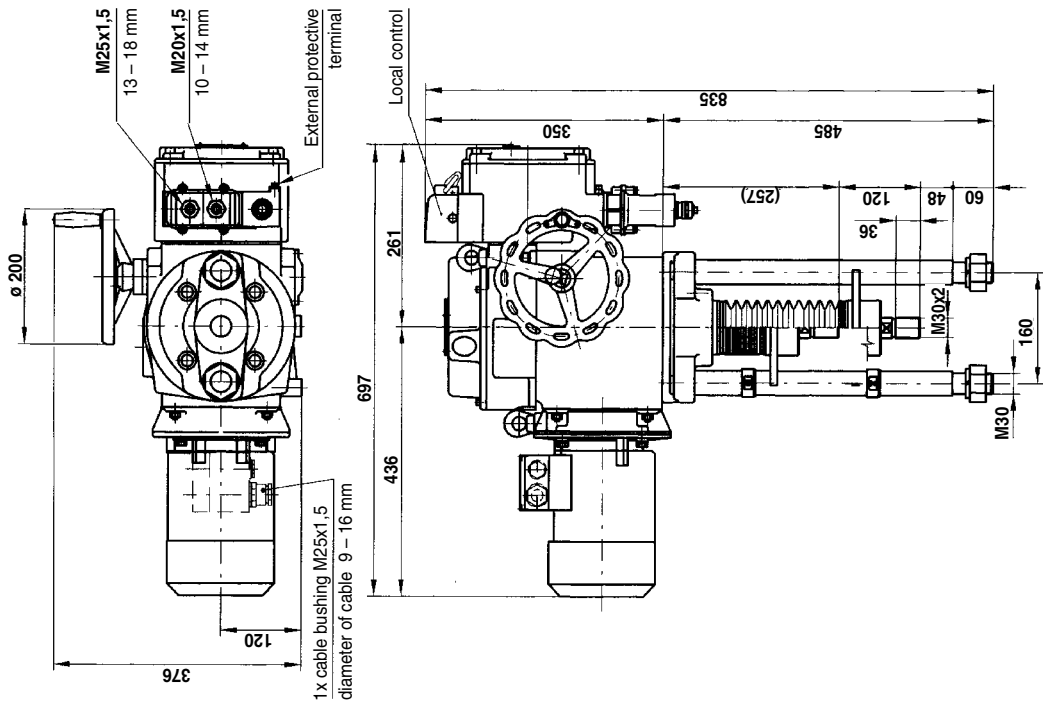


Fig. 3

Dimensional sketch of **MODACT MTNED, MTPED 40,**
MTNED, MTPED 63 electric actuators,
 Type No. 52 443.x1xxNED, 52 443.x1xxPED

– with block of terminals

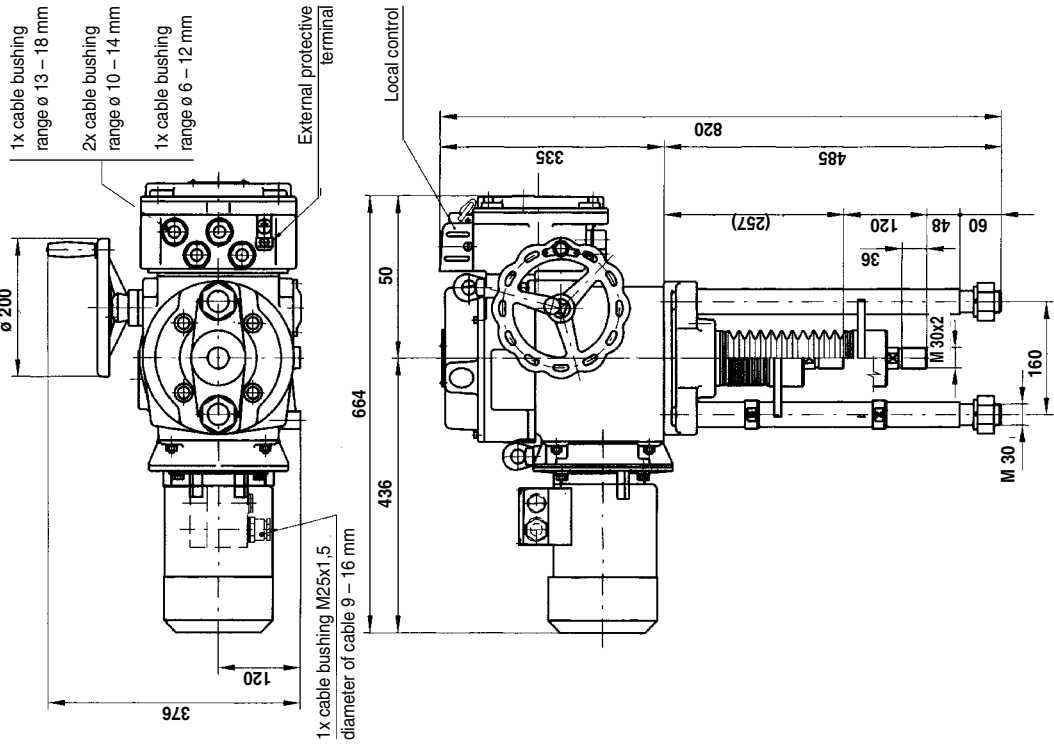
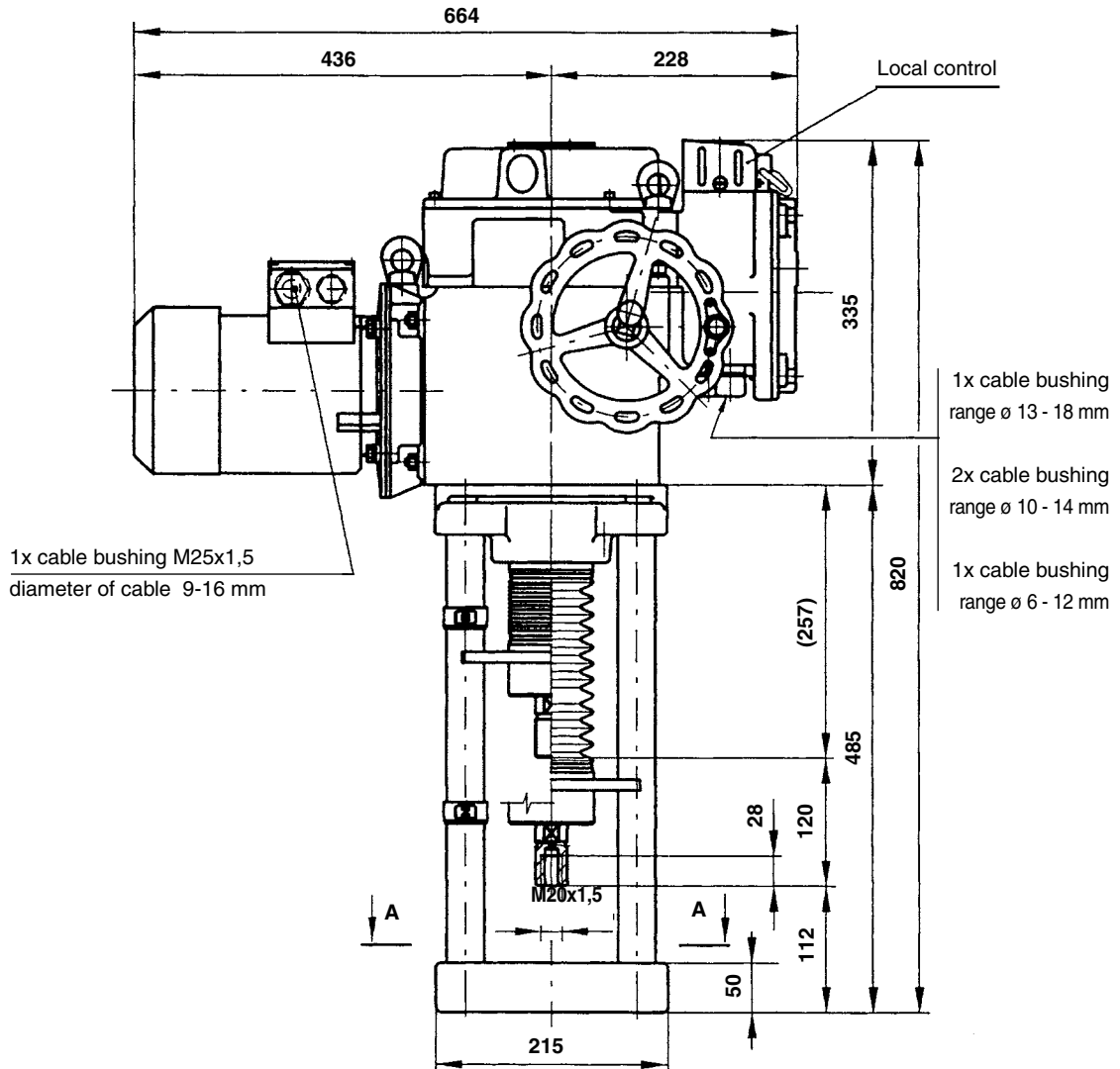


Fig. 4

Dimensional sketch of **MODACT MTNED 40, MTPED 40** electric actuators,
 Type No. 52 443.x2xxNED, 52 443.x2xxPED
 – design with flange – non standard

– with block of terminals



A - A

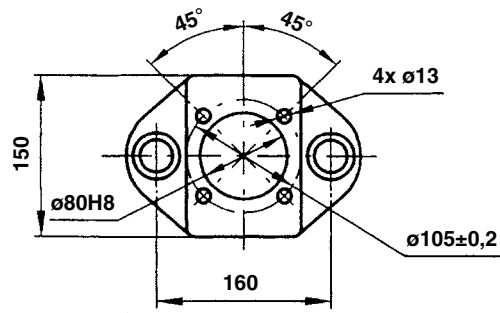


Fig. 5



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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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