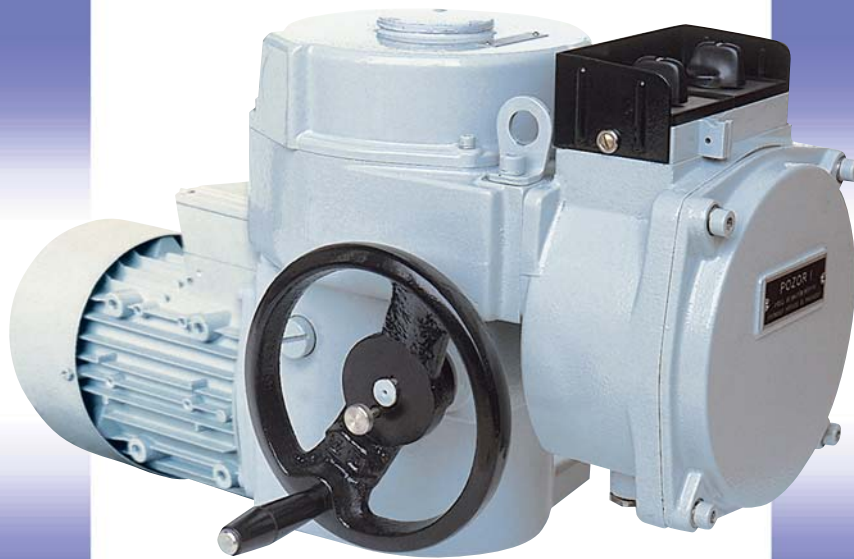


ZPA PEČKY, a.s.



Electric rotary multi-revolution actuators

MODACT MON
MODACT MON CONTROL

Type No. 52 030 - 52 036



EN ISO 9001:2000
Certificate No. 041005161/000-E01



CERTIFICATE

The TÜV CERT Certification Body
for QM systems of RWTÜV Systems GmbH

hereby certifies in accordance with TÜV CERT
procedure that

ZPA Pečky, a.s.
Třída 5. května 166
289 11 Pečky
Czech republic

has established and applies a quality system for

**Development and production of electric actuators,
enclosures and sheet metal production**

An audit was performed, Report No. 624362

Proof has been furnished that the requirements according to

ISO 9001 : 2000 / EN ISO 9001 : 2000


are fulfilled. The certificate is valid until **11. November 2006**

Certificate Registration No. **041005161/000-E01**

The company has been certified since **1995**



Essen, 14.11.2003



TÜV CERT Certification Body
of RWTÜV Systems GmbH

APPLICATION

The MODACT MON actuators have been designed for changing position of control devices by reversing rotary motion (e.g. slide valves and other devices for which they are suitable in their characteristics).

A typical example of application is remote two-position or multi-position control of devices which are required to close tight in their end positions.

Depending on their design, the MODACT MON Control actuators can be fitted with a position regulator, reversing contactors, overcurrent motor protection and the BAM electronic brake. They can be used to adjust control devices working in control systems, depending on the value of analogue input signal of the position regulator. They can also be equipped with reversing contactors only or with reversing contactors and the BAM electronic brake.

OPERATING CONDITIONS

The MODACT MON (MODACT MON Control) actuators should withstand the effect of operating conditions and external influences, Classes AA7, AB7, AC1, AD5, AE5, AF2, AG2, AH2, AK2, AL2, AM2, AN2, AP3, BA4 and BC3, according to ČSN Standard 33 2000-3 (mod. IEC 364-3:1993).

If the actuator is to be installed in the open-air space it should be provided with light roofing for protection against direct atmospheric effects.

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

Installation of the actuators at a location with incombustible and non-conducting dust is possible only if this has no adverse effect on the motor function. Herewith, the standard ČSN should strictly be observed. It is advisable to remove dust whenever its layer 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 into 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:

Basic characteristics - as extracted from ČSN Standard 33 2000-3 (mod. IEC 364-3:1993).

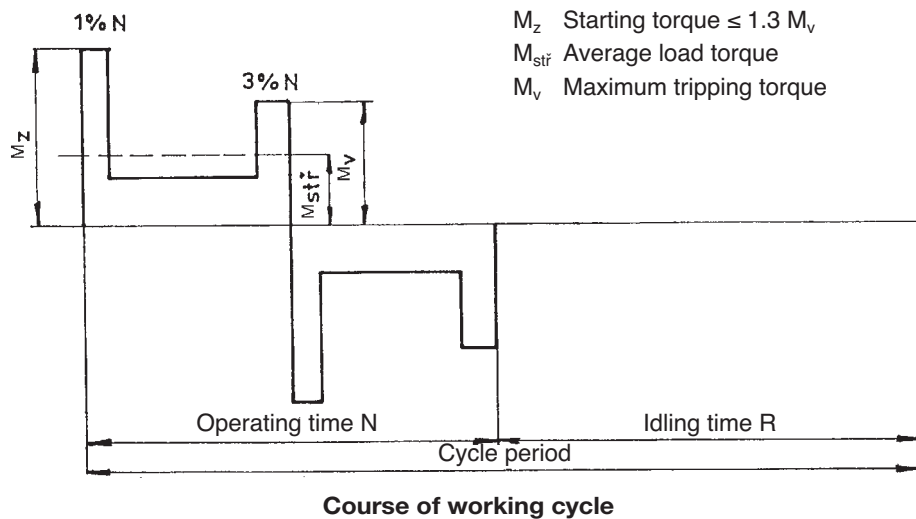
Class:

- 1) AA7 - Simultaneous effect of ambient temperature of $-25\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$ with relative humidity from 10 % upwards
- 2) AB7 - Ambient temperature to Point 1); minimum relative humidity 10%, maximum relative humidity 100% with condensation
- 3) AC1 - Altitude $\leq 2,000$ m above sea level
- 4) AD5 - Splashing water in all directions
- 5) AE5 - Small dust content of air; mean layers of dust; daily dust fall more than 35 mg/m^2 , but not exceeding 350 mg/m^2
- 6) AF2 - Corroding atmosphere and pollutants; the presence of corroding pollutants is significant.
- 7) AG2 - Average mechanical stress; in common industrial plants
- 8) AH2 - Medium vibrations; in common industrial plants
- 9) AK2 - Serious risk of growth of vegetation and moulds
- 10) AL2 - Serious danger of the occurrence of animals (insects, birds, small animals)
- 11) AM2 - Harmful effect of escaping vagabond currents
- 12) AN2 - Medium solar radiation with intensities $> 500\text{ W/m}^2$ and $\leq 700\text{ W/m}^2$
- 13) AP3 - Medium seismic effects; acceleration $> 300\text{ Gal}$ $\leq 600\text{ Gal}$
- 14) BA4 - Personal abilities; instructed people
- 15) BC3 - Frequent contact with the earth potential; persons coming frequently into contact with „live“ parts or standing on a conducting base

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 $+50^{\circ}\text{C}$ shall be 10 minutes, the average load torque shall be below or equal to 60 per cent of the maximum tripping torque (M_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 $\frac{N}{N+R}$ 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 load torque at load factor of 25 per cent and 50°C shall not exceed 40 per cent of the maximum tripping torque (M_v). The mean load torque shall not exceed the nominal torque of the actuators.



TECHNICAL DATA

Supply voltage

The MODACT MON, MODACT MON Control actuators have been designed to operate at a supply voltage of 3 x 230/400 V, 50 Hz within + 10% to - 15% of the rated value. The MODACT MONJ actuators have been designed to operate at a supply voltage 1 x 230 V, 50 Hz. The permissible frequency fluctuation of the supply voltage is within $\pm 2\%$. 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.

Operating position

The servomotor is usually mounted in the position that the output shaft axis is vertical and the control chamber is at the top. However, it can also be operated in other position as long as the electric motor axis is not more than 15° below the horizontal plane.

Tripping torque

At the factory, the tripping torque has been adjusted as shown in Tab.1, according to the customer's requirements. If no tripping torque adjustment has been specified by the customer the maximum tripping torque is adjusted.

Protective enclosure

Protection of the actuators MODACT MON (MODACT MON Control) is IP 55. For the design variant with a brake motor the actuator protection is IP 54.

Insulation resistance

Under normal operating conditions, the insulation resistance of electric circuits with respect to the frame or to each other should be at least 20 M Ω . After a damp test, it should be at least 2 M Ω . For more details, refer to the technical conditions.

Electric strength

The insulation strength of electric circuits of the actuators should correspond to TP 27-02.1-38/88.

Test voltages of the individual circuits:

- Remote position transducer	500 V, 50 Hz
- Microswitches and anticondensation heater	1,500 V, 50 Hz
- Electric motor	1,000 V + 2 · U_{nom} , 50 Hz, at least 1,500 V

Noise

- Acoustic pressure level max. 85 dB (A)
- Acoustic power level max. 95 dB (A)

DESCRIPTION

A) MODACT MON actuators

The MODACT MON actuators have been designed for direct mounting on the control device. They can be connected by means of a flange and a clutch, according to ISO DIN 5210 and DIN 3338. Adapters are available for connecting the actuators to valves with different attachment dimensions.

A three-phase asynchronous motor drives, via a geared countershaft, the sun gear of an 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, which is 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 fixedly coupled to the planet-gear carrier. It is extended to the control box in which all controls of the actuator are concentrated.

The operation of the position-limit switches, the signalling switches and the position transducer is derived from the rotary motion of the output shaft via drive mechanisms. The operation of the torque-limit switches is derived from the axial displacement of the „floating“ worm of the manual control unit, which is sensed and transferred to the control box by means of a lever.

All controls are accessible after removal of the cover of the control box.

Actuator terminal board

The electric actuator is equipped with a terminal block for connection to external circuits. This terminal block uses screw terminals allowing conductors with a maximum cross-section 2.5 mm^2 to be connected. Access to the terminal block is obtained after removal of the terminal box cover. All control circuits of the electric actuator are brought out to the terminal block. 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, the electric actuators can be supplied with a push-on cable connection (HARTING connector) - see the table of design variants.

Connector HARTING

According to the customer's requirements the MON actuators can be fitted with the connector HARTING to provide for connection of control circuits. 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 (supplied by HARTING Company on Order No. 0999 000 0021; e-mail: info@contex.cz).

Self-locking

The actuator is self-locking provided that the load is applied only in the opposite direction to the output shaft motion of the actuator. Self-locking is provided by an arresting roller that stops the electric motor even in the manual control mode.

For safety reasons, it is strictly prohibited to use the actuators for driving lifting appliances that may be used for the transport of persons or equipment in cases where people might be present under the lifted load is strictly prohibited.

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 being determined by the function of differential gear). If the handwheel is rotated clockwise (when viewing the shaft towards the control box) the output shaft of the actuator rotates in the CLOSE direction.

Local control of the MODACT MON actuators

Local control serves for controlling the actuators from the site of their installation. It consists of two selector switches: one with positions "Remote control - Off - Local control", the other with positions "Opens - Stop - Closes".

If required by the customer, the actuator can be fitted with a blinker that produces electrical pulses during output shaft rotation. No power supply for the blinker, has been built in the actuator.

Position transducers

The MODACT MON (MODACT MON Control) electric actuators can be supplied without position transducer, or can be equipped with a resistance transducer of $2 \times 100 \Omega$ or a current transducer with a unified signal of 4 to 20 mA. The current transducer uses a two-wire connection, no power supply being built in the actuator. In the Control variant, it is advisable to use a current position transducer only.

The maximum load resistance is $R_z = 500 \Omega$. The supply voltage of the transducer is $24 V_{DC}$. This voltage need not be stabilized, but it should not exceed 30 V since otherwise there is the risk of damage to the transducer. The power supply, the position transducer and the load should be connected in series. The positive pole of the power supply should be connected to the positive pole of the transducer. At a single point (outside the electric actuator), this loop should be connected to the load grounding.

Current and voltage ratings of the potentiometer

The potentiometric position transducer can be used at a voltage of up to $48 V_{DC}$. However, the maximum permissible current of 100 mA should not be exceeded.

Position indicator

The actuator can be fitted with a local position indicator (excepting the actuator design variant with a current transducer).

Position-limit switches

The OPEN and CLOSE position-limit switches limit the actuator working stroke, each being adjusted to operate in either end position.

Torque-limit switches

The torque-limit switches incorporate facilities whereby the electric motor is prevented from being switched on again when the load torque has been lost. Moreover, they are locked for the duration of up to 2 revolutions of the output shaft during actuator run reversion.

Current rating and maximum voltage of microswitches

250 V AC/2 A, 250 V DC/0.2 A, blinker 250 V AC/0.2 A, $\cos \phi = 1$

The microswitches can only be used as single-circuit devices. Two voltages of different values and phases cannot be connected to the terminals of the same microswitch.

Anti-condensation heater

The anti-condensation heater consists of one or two resistance heater elements. It is connected to the AC mains of voltage 230 V. In applications where the temperature is expected to exceed 35 °C, just one resistance element is connected.

B) MODACT MON Control actuators

The MODACT MON Control actuators are fitted with an electronic position regulator. In conjunction with the valve having a suitable control characteristic, they constitute a position servo-loop. The output shaft of these actuators is automatically brought into the position corresponding to the input signal value of the regulator.

For application possibilities, operating conditions, technical parameters, a functional description, packaging and storing, functional tests and location of the instrument, attachment to a valve, adjustment of the actuator with the valve, operation and maintenance, failures and their removal, reference should be made to the part dealing with the MODACT MON actuators. The provisions included therein also apply even to the MODACT MON Control actuators. A survey of the MODACT MON Control actuators now in current production are shown in Tab. 1.

In addition, the MODACT MON Control actuators are fitted with a position regulator of the output shaft, a contactor combination for reversing the output shaft, a thermal relay to protect the electric motor against overloading, and the BAM electronic brake (brake of asynchronous motors).

All of the above instruments are housed in the contactor box which can be mounted instead of the terminal box of MON actuators. These actuators can also be supplied without position regulator and the BAM electronic brake - see Table of design variants.

The connection of electric circuits of the control box to external circuits is carried out on the terminal board having additional terminals for connecting the voltage supply of 3 x 230/400 V, 50 Hz.

POSITION REGULATOR

The position regulator built-in in the actuator enables to control position of the output shaft of the actuator and thus also the valve by the input analog signal.

The regulator includes a micro-computer programmed for regulating the actuator, ascertaining and repairing error conditions, and for simple setting of regulation parameters.

The regulator design enables to switch off the regulator feeding. If the regulator is not under voltage it does not regulate but, after its feeding is switched on, the regulator function is automatically restored; the parameters and diagnostic data stored in the regulator memory are retained.

The regulator circuits compare the input signal with the feedback signal from the position transducer of the actuator output shaft. If there is a difference between the input and feedback signals the regulator closes one of the built-in contactors in the actuator so that the actuator shaft is reset to the position corresponding to magnitude of the input signal. When the feedback signal is equal to the input signal the actuator stops.

The control parameters are set by functional push-buttons on the regulator or by PC connected to the regulator via a serial interface for the period of setting the parameters or during the regulator diagnostics.

The following parameters can be set by the regulator push-buttons:

- type of control signal
- response to the TEST signal and to an error detected by the regulator
- mirroring
- regulator insensitivity
- type of control

Other parameters can be set by PC. The computer can also be used for ascertaining diagnostic data on the regulator operation, e.g. the time for which the regulator has been in operation.

After setting the control parameters, during the so-called auto-calibration, the regulator is adjusted to the actuator and the valve it should control. The type of the feedback transducer, end positions and inertia of the actuator output shaft are automatically detected and recorded into the regulator as parameters.

Error conditions detected by the regulator are signaled by LED diodes on the regulator. The signal on error conditions can be provided by the regulator; on the wiring diagram P-0781 this is drawn as a contact in the regulator and marked as KOK. During a faultless operation and with the switched-off regulator, this contact is opened; during an error condition it is closed.

If PC is connected to the regulator the detected error is displayed on the computer. In case of an error, the regulator responds according to the set parameter "response to the signal TEST".

TECHNICAL PARAMETERS OF THE REGULATOR

Alternative supply voltages:	A. 230 V +10%, -15% 50 - 60 Hz B. 120 V +10%, -15% 50 - 60 Hz C. 24 V +10%, -15% 50 - 60 Hz
Control signal	0 to 20 mA, 4 to 20 mA, 0 to 10 V
Position sensor	Potentiometer of 100 to 10,000 Ω Current transducer of 4 to 20 mA
Regulator linearity	0.5%
Regulator insensitivity	1 to 10% (adjustable)
Operating temperature range	- 25 °C to + 75 °C
LED error messages	- TEST mode - Failure of position sensor - Reversed position switches - Control signal is missing - Actuator switched off in an intermediate position on torque-limit switch
Response to failure:	Failure of sensor - Actuator in the TEST position, LED error message Control signal is missing - Actuator in the TEST position, LED error message TEST mode - Actuator in the TEST position, LED error message
Output signal:	Power outputs - 2x relay of 5 A, 230 V Central failure - Switching contact of 24 V, 2 W 5x LED (power supply, failure, adjustment, opens, closes)
Adjusting devices:	- 2x calibrating and parameter adjusting push-button - Communication connector
Dimensions:	- 75 x 75 x 25 mm

Local control of the MODACT MON Control actuators

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 "Opens – Stop – Closes".

On the customer's requirement, the actuator can also be fitted with a blinker providing electric pulses when the output shaft is moving. The power supply unit for the blinker is not built-in in the actuator.

Electronic brake BAM

After the power supply has been disconnected the running-down time of the actuator is reduced from 0.5 through 1.3 s to 40 through 60 ms as compared with the design variant without electronic brake. This permits the control accuracy to be enhanced. The electronic brake is suitable for electric motors operating at a supply voltage of 3 x 230/400 V, 50 Hz and power of 120 W, 180 W, 370 W or 550 W.

Reversing contact combination and thermal relay

Due to its configuration and outfit, the actuator can be connected to external electric circuits in a simple way. It is sufficient to connect the actuator power supply unit to the three-phase power supply system. A whole group of actuators can be connected via a single power supply cable. This enables power cables coming from the reversing contactors mounted in the switchboard of each controlled actuator to be saved. If the signalling switches are not required to be brought out it is sufficient to connect the actuator to the control circuits.

ORDERING INFORMATION

When ordering, please specify the following:

- Number of actuators required
- Actuator designation
- Type Number, according to the tables of design Nos 1, 1a, 2, 2a
- Special design (increased working stroke - see Tab.1, 1a)
- Aluminium engineering variant (in words), if required
- Power supply voltage and frequency (for electric motor)
- Tripping torque adjustment (if required by the customer)

Example:

In the order, the MODACT MON rotary multi-turn actuator, Type No. 52 032 with the tripping torque within a range of 160 to 250 Nm and the speed of output shaft adjustment of 25 rpm, with the connector wired, C-Group attachment, a local position indicator, and a local control; fitted with signalling switches and a potentiometer of 2 x 100 Ω ; designed to meet the requirement that tripping torque other than the maximum torque is set, and to operate at supply voltage of 3 x 230/400 V, 50 Hz, should be specified as follows:

1 x Actuator 52 032.C503, torque-limit switches adjusted to 200 Nm, electric motor supply voltage 3 x 230/400 V, 50 Hz.

Table No.1 - Basic parameters of MODACT MON electric actuators - supply voltage 1x230/400V, 50 Hz

Basic outfit: (except design 52 03x.60x9); 2 position-limit switches (OPEN - PO, CLOSE - PZ); 2 torque-limit switches (OPEN - MO, CLOSE - MZ)
1 electric motor (brake motor upon special request); 2 anti-condensation heaters

Type marking	Control	Moment [Nm]		Adjusting speed [1/min]	Power stroke [r.p.m.]	Electric motor				Weight [kg]	Type No.		Type of el. motor					
		Tripping	Starting			Power [kW]	RPM [1/min]	I _n (400 V) [A]	I _z / I _n		basic			additional				
				1	2					3	4	5		6	7	8	9	10
MON40/135-7	C	20÷40	135	7	2-250	0,09	630	0,36	2,2	28	5 2 0 3 0	x x J x N	1LA7070-8AB					
MON40/220-9	C		220	9		0,18	850	0,74	2,3	28		x x 0 x N	1LA7070-6AA					
MON40/135-15	C		135	15		0,18	850	0,74	2,3	28		x x 1 x N	1LA7070-6AA					
MON40/100-25	C		100	25		0,25	1350	0,77	3,0	27		x x 2 x N	1LA7070-4AB					
MON40/60-40	C		60	40		0,25	1350	0,77	3,0	27		x x 3 x N	1LA7070-4AB					
MON40/95-50	C		95	50		0,37	2740	1,00	3,5	27		x x 4 x N	1LA7070-2AA					
MON40/60-80	C		60	80		0,37	2740	1,00	3,5	27		x x 5 x N	1LA7070-2AA					
MON80/135-7	C		40÷80	135		7	2-250	0,09	630	0,36		2,2	28	5 2 0 3 0	x x K x N	1LA7070-8AB		
MON80/220-9	C	220		9	0,18	850		0,74	2,3	28	x x 6 x N	1LA7070-6AA						
MON80/135-15	C	135		15	0,18	850		0,74	2,3	28	x x 7 x N	1LA7070-6AA						
MON80/100-25	C	100		25	0,25	1350		0,77	3,0	27	x x 8 x N	1LA7070-4AB						
MON75/95-40	C	40÷75		95	40	0,37		1370	1,05	3,3	28	x x 9 x N	1LA7073-4AB					
MON70/95-50	C	40÷70		95	50	0,37		2740	1,00	3,5	27	x x A x N	1LA7070-2AA					
MON70/90-80	C			90	80	0,55		2800	1,36	4,3	28	x x B x N	1LA7073-2AA					
MON125/200-7	C	80÷125		200	7	2-250		0,12	645	0,51	2,2	28	5 2 0 3 1		x x L x N	1LA7073-8AB		
MON125/220-9	C		220	9	0,18		850	0,74	2,3	28	x x C x N	1LA7070-6AA						
MON125/200-15			200	15	0,25		860	0,79	2,7	28	x x D x N	1LA7073-6AA						
MON120/155-25	C		80÷120	155	25		0,37	1370	1,05	3,3	27	x x E x N		1LA7073-4AB				
MON115/150-50	C		80÷115	150	50		0,55	2800	1,36	4,3	28	x x H x N		1LA7073-2AA				
MON95/125-7	C		63÷95	125	7		2-250	0,09	630	0,36	2,2	49		5 2 0 3 1	x x C x N	1LA7070-8AB		
MON100/210-9	C			210	9			0,18	850	0,74	2,3	49			x x 0 x N	1LA7070-6AA		
MON100/185-15	C			185	15			0,25	860	0,79	2,7	49			x x 1 x N	1LA7073-6AA		
MON100/150-25	C	150		25	0,37	920		1,20	3,1	41	x x 2 x N	1LA7080-6AA						
MON100/170-40	C	63÷100		170	40	0,55		1395	1,45	3,9	41	x x 3 x N	1LA7080-4AA					
MON100/150-63				150	63	0,75		1395	1,86	4,0	42	x x 4 x N	1LA7083-4AA					
MON100/200-80				200	80	1,1		2845	2,40	6,1	43	x x E x N	1LA7083-2AA					
MON100/130-100				130	100	1,1		1415	2,55	4,3	50	x x 5 x N	1LA7090-4AA					
MON100/150-145		150	145	1,5	2860	3,25	5,5	51	x x F x N	1LA7090-2AA								
MON125/190-7	C	100÷125	190	7	0,12	645	0,51	2,2	49	x x D x N	1LA7073-8AB							
MON160/210-9	C	100÷160	210	9	2-250	0,18	850	0,74	2,3	49	5 2 0 3 2	x x 6 x N	1LA7070-6AA					
MON160/220-16	C		220	16		0,37	920	1,20	3,1	50		x x 7 x N	1LA7080-6AA					
MON160/250-25	C		250	25		0,55	910	1,60	3,4	42		x x 8 x N	1LA7083-6AA					
MON160/245-40			245	40		0,75	1395	1,86	4,0	42		x x 9 x N	1LA7083-4AA					
MON160/300-65			300	65		1,5	1420	3,40	5,0	54		x x A x N	1LA7096-4AA					
MON160/250-80			250	80		1,5	2860	3,25	5,5	46		x x H x N	1LA7090-2AA					
MON160/210-100			210	100		1,5	1420	3,40	5,0	54		x x B x N	1LA7096-4AA					
MON160/250-145			250	145		2,2	2880	4,55	6,3	54		x x J x N	1LA7096-2AA					
MON245/340-7	C	160÷245	340	7	2-250	0,25	680	1,03	2,6	52	5 2 0 3 2	x x 6 x N	1LA7083-8AB					
MON250/350-9	C	160÷250	350	9		0,37	920	1,20	3,1	50		x x 0 x N	1LA7080-6AA					
MON250/360-16	C		360	16		0,55	910	1,60	3,4	52		x x 1 x N	1LA7083-6AA					
MON250/360-25			360	25		0,75	915	2,10	3,7	45		x x 2 x N	1LA7090-6AA					
MON240/310-40			160÷240	310		40	1,1	1415	2,55	4,3		45	x x 3 x N	1LA7090-4AA				
MON230/300-65		160÷230	300	65		1,5	1420	3,40	5,0	54		x x 4 x N	1LA7096-4AA					
MON250/425-80		160÷250	425	80		2,2	2880	4,55	6,3	49		x x 5 x N	1LA7096-2AA					
MON195/250-145		160÷195	250	145		2,2	2880	4,55	6,3	54		x x 7 x N	1LA7096-2AA					
MON500/720-16		250-500	720	16	2-240	1,1	680	2,90	3,4	97	5 2 0 3 3	x x 0 x N	1LA7107-8AB					
MON500/650-25			650	25		1,1	915	2,90	3,8	90		x x 1 x N	1LA7096-6AA					
MON500/690-40			690	40		2,2	940	5,20	4,6	93		x x 2 x N	1LA7113-6AA					
MON500/765-63			765	63		3,0	1420	6,40	6,2	90		x x 3 x N	1LA7107-4AA					
MON500/650-100			650	100		4,0	1440	8,20	6,5	97		x x 4 x N	1LA7113-4AA					
MON630/900-16			320÷630	900		16	1,5	705	3,90	3,7		99	5 2 0 3 4	x x 0 x N	1LA7113-8AB			
MON630/835-20		835		20	1,5	925	3,90	4,2	99	x x 1 x N	1LA7106-6AA							
MON630/945-35		945		35	2,2	1420	4,70	5,5	97	x x 2 x N	1LA7106-4AA							
MON630/1000-63		1000		63	4,0	1440	8,20	6,5	97	x x 3 x N	1LA7113-4AA							
MON1250/1640-45		630÷1250	1640	45	2-240	5,5	950	12,80	5,0	211	5 2 0 3 5	x x 0 x N	1LA7134-6AA					
MON1250/1720-70			1720	70		7,5	1455	15,20	6,7	206		x x 1 x N	1LA7133-4AA					
MON930/1200-100		630÷930	1200	100	7,5	1455	15,20	6,7	206	x x 2 x N	1LA7133-4AA							
MON2500/3550-20		1000-2500	3550	20	1-100	5,5	950	12,80	5,0	309	5 2 0 3 6	x x 0 x N	1LA7134-6AA					
MON2500/3700-30			3700	30		7,5	1455	15,20	6,7	304		x x 1 x N	1LA7133-4AA					
MON2000/2600-40		1000-2000	2600	40	7,5	1455	15,20	6,7	304	x x 2 x N	1LA7133-4AA							

- Notes:**
- The rated torque is 60% of the maximum tripping torque for duty S2 and 40% of the maximum tripping torque for duty S4.
 - As a special design variant, the actuator with a potentiometer is available with the adjustment range of the working stroke of 1 to 620 revolutions or of 1 to 280 revolutions (Type No. 52 036). When ordering, this modification should be specified in words.
 - Rated currents for feeding voltages different from those given in the table – on request at the manufacturer.
 - Electric motors are fitted with built-in thermistors PTC connected to 2 terminals on the terminal board cover. This built-in thermal protection, in combination with the control system, shall disconnect the electric motor from supply mains if, during thermal overloads caused by failures, temperature of the electric motor winding exceeds 145 °C.
 - Connection of the winding of electric motors 4KTC can be either "delta" or "star" (electric motor for feeding voltage 3 x 400 V with the "star" connection is supposed in data of this table). Feeding voltages and currents for both variants of connection are stated on the name plate of the electric motor

Table No. 1a: Basic parameters of MODACT MONJ electric actuators - supply voltage 1x230V, 50 Hz

Type marking	Control	Moment [Nm]		Adjusting speed [1/min]	Power stroke [r.p.m.]	Elektromotor					Weight [kg]	Type No.									
		Tripping	Starting			Type with starting-up and running capacitor.	Power [kW]	RPM [1/min]	I _n (230 V) [A]	I _z [A]		basic					additional				
				1								2	3	4	5	6	7	8	9	10	
MONJ 40/75-25		20÷40	75	25	2-250	1LF7070-4	0,25	1400	1,86	3,4	52 030						x	x	2	x	NJ
MONJ 40/50-40			50	40		1LF7070-4	0,25	1400	1,86	3,4		x	x	3	x	NJ					
MONJ 40/60-50			60	50		1LF7070-2	0,37	2895	2,85	3,5		x	x	4	x	NJ					
MONJ 40/60-80			60	80		1LF7073-2	0,55	2860	4,15	3,7		x	x	5	x	NJ					
MONJ 80/135-25		40÷80	135	25		1LF7073-4	0,37	1400	2,6	3,2		x	x	8	x	NJ					
MONJ 70/90-40		40÷70	90	40		1LF7073-4	0,37	1400	2,6	3,2		x	x	9	x	NJ					
MONJ 75/100-50		40÷75	100	50		1LF7073-2	0,55	2860	4,15	3,7		x	x	A	x	NJ					
MONJ 110/143-25		80÷110	143	25		1LF7073-4	0,37	1400	2,6	3,2		x	x	E	x	NJ					
MONJ 100/130-40		63÷100	130	40		1LF7080-4	0,55	1415	3,5	3,6		52 031	x	x	3	x	NJ				
MONJ 95/124-63		63÷95	124	63		1LF7083-4	0,75	1405	4,8	3,9			x	x	4	x	NJ				
MONJ 100/230-80		63÷100	130	80		1LF7083-2	1,1	2860	6,7	4,4	x		x	E	x	NJ					
MONJ 100/130-100			130	100		1LF7096-4	1,5	1430	8,7	4,3	x		x	5	x	NJ					
MONJ 95/124-145		63÷95	124	145		1LF7090-2	1,5	2845	9,25	4,5	x		x	F	x	NJ					
MONJ 150/195-40		100÷150	195	40		1LF7083-4	0,75	1405	4,8	3,9	x		x	9	x	NJ					
MONJ 160/208-65		100÷160	208	65		1LF7096-4	1,5	1430	8,7	4,3	x		x	A	x	NJ					
MONJ 160/208-80				80		1LF7090-2	1,5	2845	9,25	4,5	x		x	H	x	NJ					
MONJ 130/170-145		100÷130	170	145		1LF7096-2	2,2	2830	13,3	4,8	x		x	J	x	NJ					
MONJ 250/325-40		160÷250	325	40		1LF7096-4	1,5	1430	8,7	4,3	52 032		x	x	3	x	NJ				
MONJ 220/286-80		160÷220	286	80		1LF7096-2	2,2	2830	13,3	4,8		x	x	5	x	NJ					

Table No. 2 - MODACT MON electric actuators - designs, attachment, electric wiring

Type No 5 2 0 3 X . X X X X X

6th position

Attachment	Design	
	Bushings	Connector
Group A	5	F
Group B1	6	G
Group C	7	H
Group D	8	J
Group E	9	K

7th position

Local controls, position indicator	Resistance transmitter or design without transmitter	Current transmitter CPT 1/A
Without local control	1	B
Local position indicator	2	-
Local control	4	E
Local control and position indicator	6	-
Local control for MODACT MON Control actuators	7	H
Local control and position indicator for MODACT MON Control actuators	8	-

8th position

The tripping torque, rate of speed change and other technical parameters are given in Tab. 1a, including designation. In this position, give the number or letter corresponding to the required parameters.

9th position

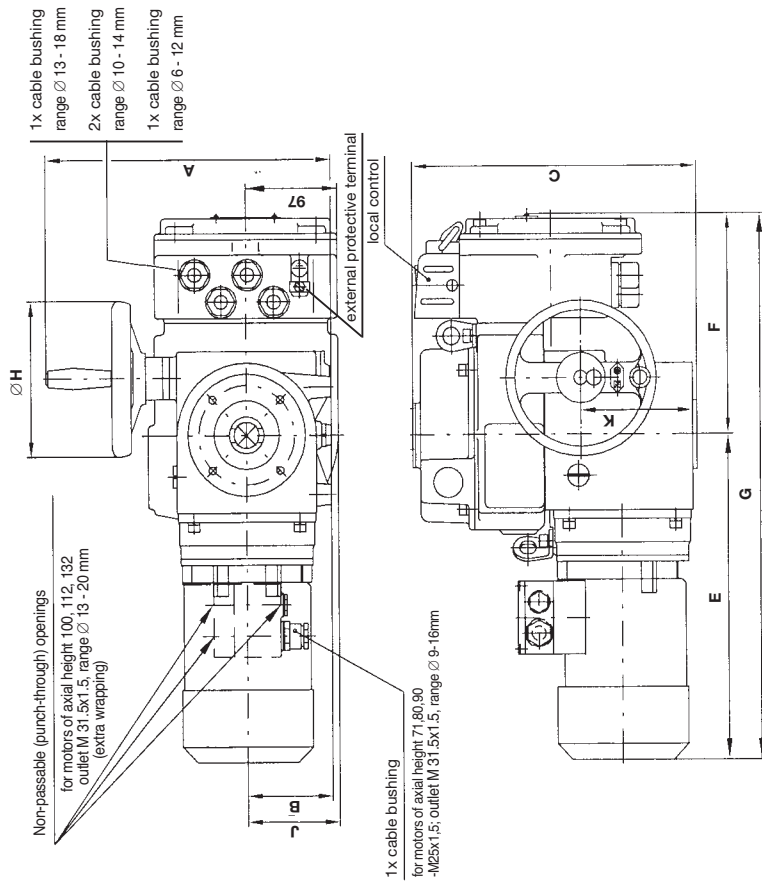
Signalling, position transmitter, blinker	MODACT MON	MODACT MON Control		
		1) complete outfit	without position regulator	without position regulator and brake of motor
Without signalling, position transmitter and blinker	0	-	E	M
Position transmitter	1	A	F	N
Signalling switches	2	-	G	Q
Signalling switches and position transmitter	3	B	H	P
Blinker	4	-	I	R
Position transmitter, blinker	5	C	J	S
Signalling switches and blinker	6	-	K	T
Signalling switches, position transmitter and blinker	7	D	L	U

10th position

Letter "N" to be given - jointly for all designs.

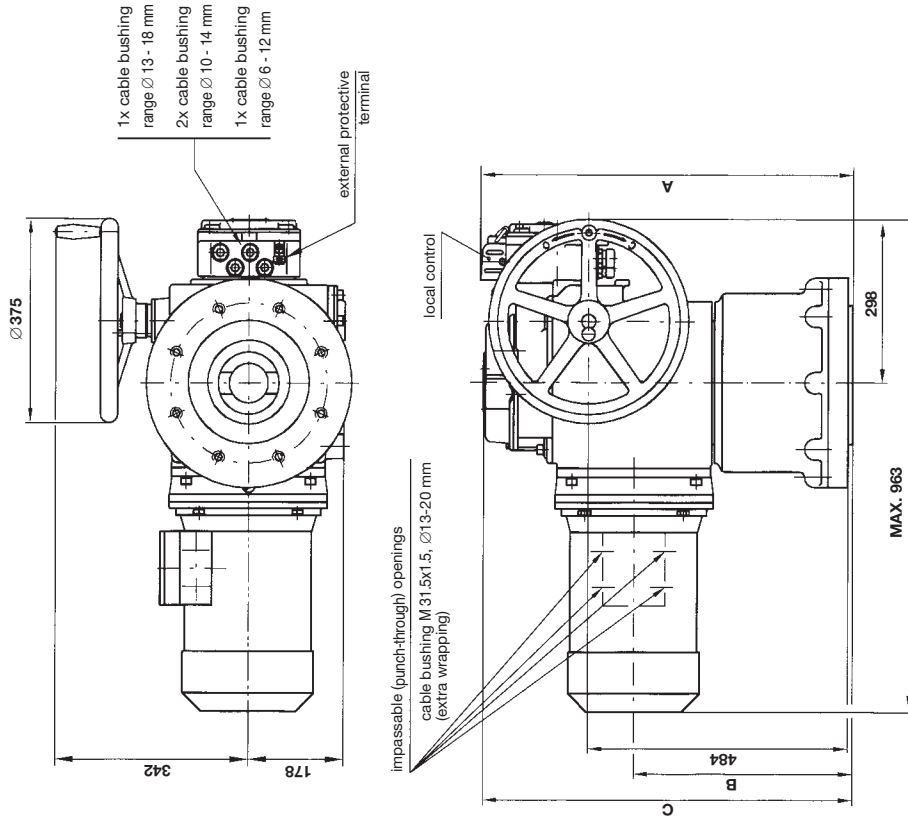
Notice: Actuators MODACT MON Control with controller ZP2 RE4 – without additional marking; actuators MODACT MON Control with controller ZP2 RE5 – the digit "5" is pun on the 11th place.

Dimensional sketch of **MODACT MON** electric actuators,
T. No. 52 030.xxxxN up to 52 035.xxxxN,
design with a terminal board



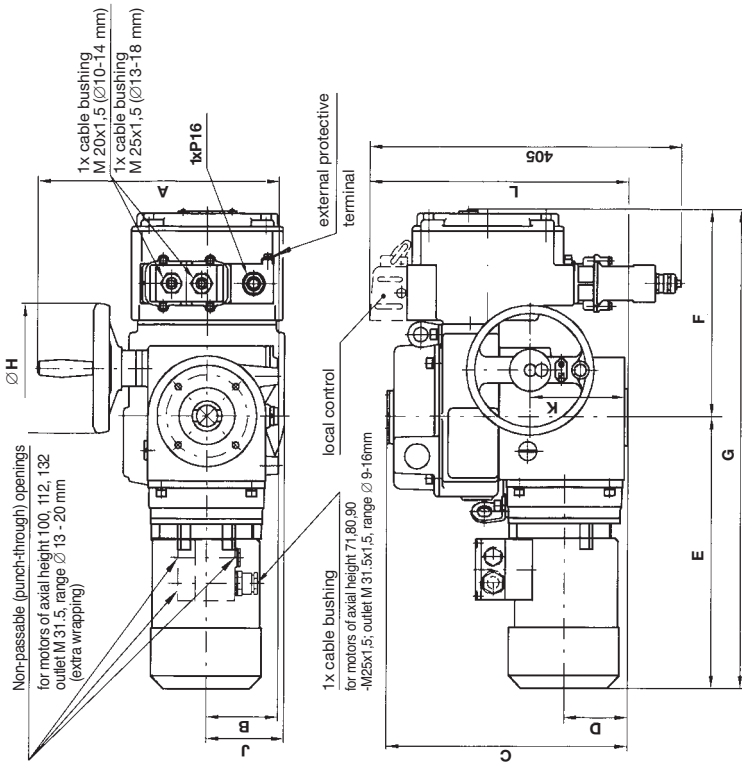
Type marking	A	B	C	D	E	F	G	H	J	K	L
52 030.xxxxN	305	90	300	78	334	228	562	160	99	120	300
52 031.xxxxN 52 032.xxxxN	376	120	328	92	436	228	664	200	-	144	328
52 033.xxxxN 52 034.xxxxN	455	145	382	123	519	258	777	250	-	190	387
52 035.xxxxN	540	178	442	153	598	298	896	375	-	234	445

Dimensional sketch of **MODACT MON** electric actuators,
T. No. 52 036.xxxxN,
design with a terminal board



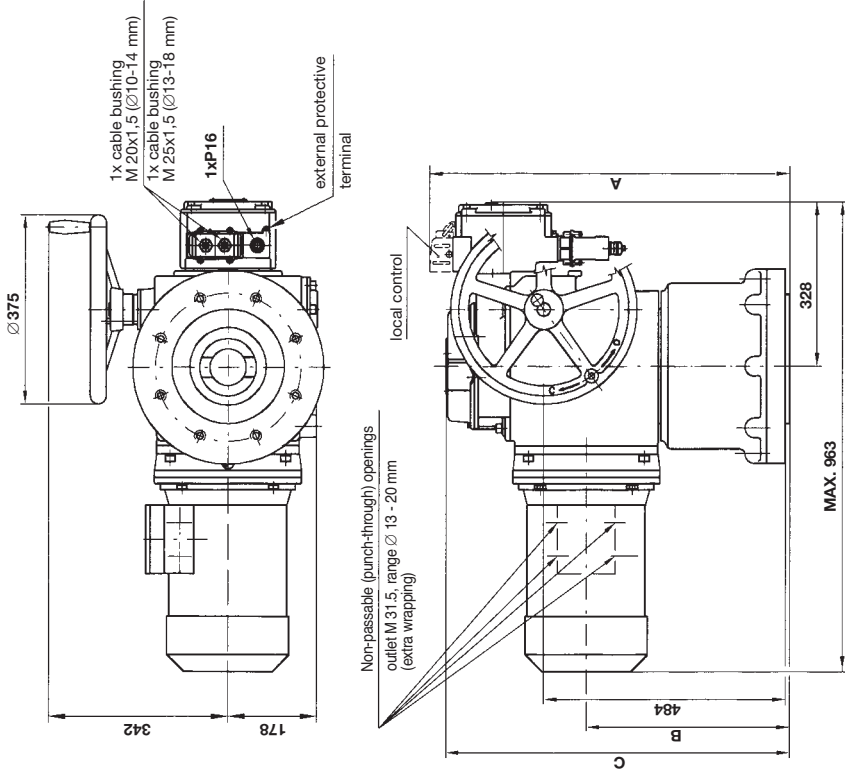
Type marking	A	B	C
52 036.xxxxN design A	757	463	750
52 036.xxxxN design B, C, D, E	712	418	705

Dimensional sketch of **MODACT MON** electric actuators,
T. No. 52 030.xxxxN up to 52 035.xxxxN
(design with a connector)



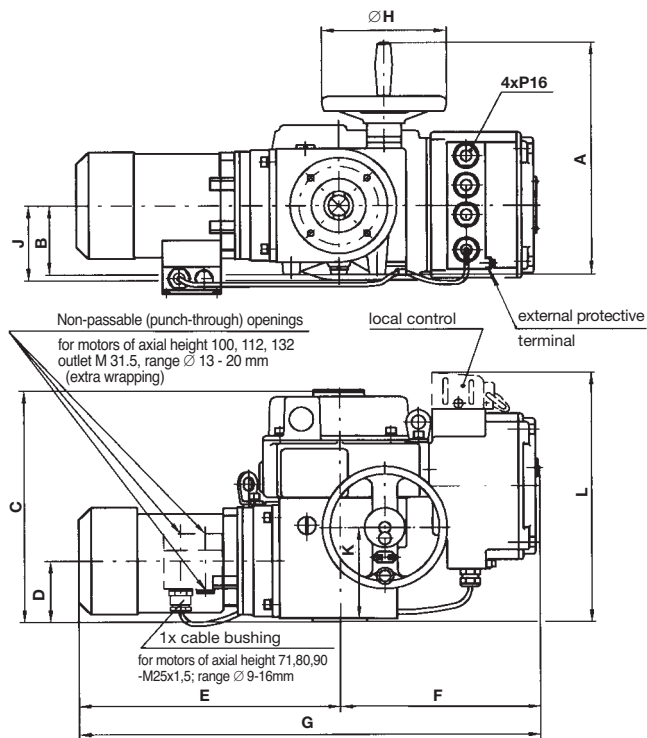
Type marking	A	B	C	D	E	F	G	H	J	K	L
52 030.xxxxN	305	90	300	78	334	258	592	160	99	120	325
52 031.xxxxN 52 032.xxxxN	376	120	328	92	436	258	694	200	-	144	350
52 033.xxxxN 52 034.xxxxN	455	145	382	123	519	288	807	250	-	190	410
52 035.xxxxN	540	178	442	153	598	328	926	375	-	234	470

Dimensional sketch of **MODACT MON** electric actuator,
T. No. 52 036.xxxxN
(design with a connector)



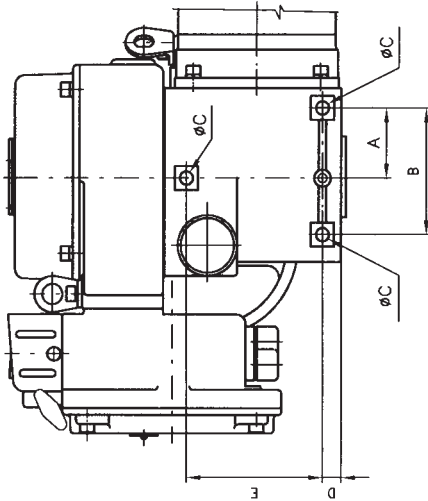
Type marking	A	B	C
52 036.xxxxN tvar A	785	463	750
52 036.xxxxN design B, C, D, E	740	418	705

Dimensional sketch of **MODACT MON Control** electric actuators,
T. No. 52 030.xxxxN up to 52 035.xxxxN
(design with a terminal board)



Type marking	A	B	C	D	E	F	G	ØH	J	K	L
52 030.xxxxN	305	90	300	78	334	258	592	160	99	120	325
52 031.xxxxN 52 032.xxxxN	376	120	328	92	436	258	694	200	-	144	350
52 033.xxxxN 52 034.xxxxN	455	145	382	123	519	288	807	250	-	190	440
52 035.xxxxN	540	178	442	153	598	328	926	375	-	234	500

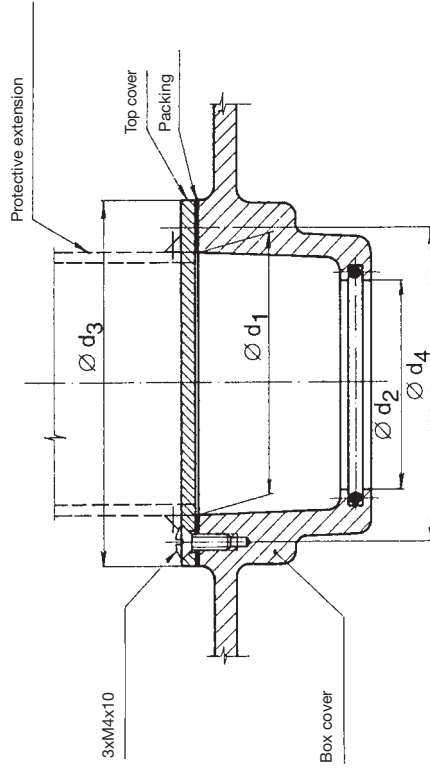
Holes for additional fixing of **MODACT MON** actuators,
Type No. 52 030.xxxxN - 52 035.xxxxN



Actuator Type No.	Dimension [mm]				
	A	B	ØC	D	E
52 030.xxxxN	61	110	M10	16	120
52 031.xxxxN 52 032.xxxxN	90	160	M12	21	140
52 033.xxxxN 52 034.xxxxN	110	210	M16	23	200
52 035.xxxxN	120	240	M20	47	220

Note:
Intended only for additional fixing of the MODACT actuators to carry their weight, these holes should not be stressed by another additional force.

Modifications for rising spindle



Dimension [mm]	Type No.			
	52 030	52 031 52 032	52 033 52 034	52 035 52 036
d ₁	45	60	80	90
d ₂	35,5	50,5	75	80,5
d ₃	65	80	110	110
d ₄	55	70	100	100

The protective extension should be made by the customer, including the hole in its cover.

Attachment dimensions of **MODACT MON** actuators,
Type No. 52 030 - 52 036 - Basic design (without adapter)

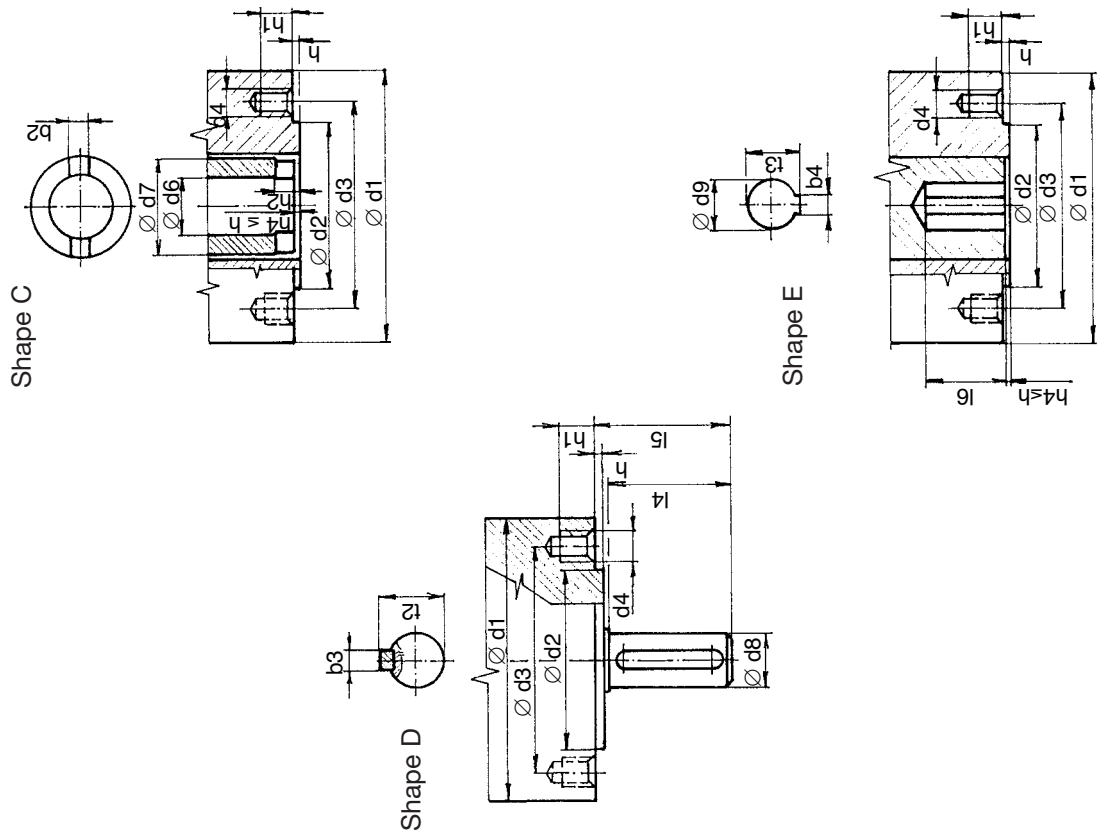
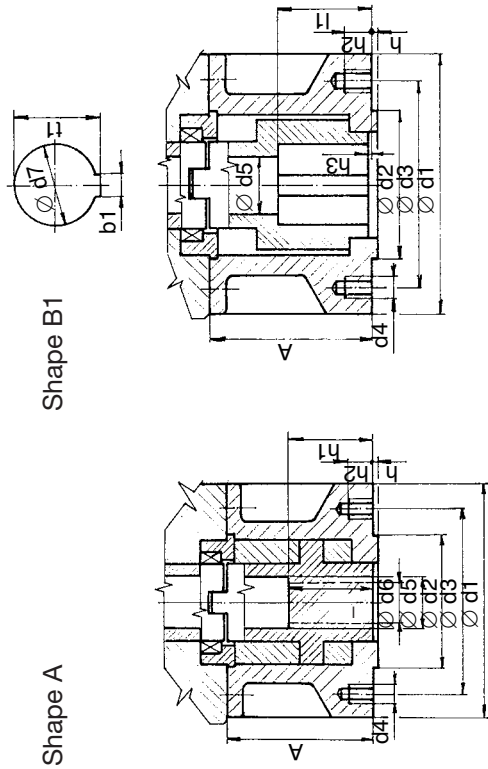


Table of basic attachment dimensions of **MODACT MON** actuators
(without adapter)

Shape	Dimension [mm]	Type No. / Flange				
		52 030 F10	52 031 52 032 F14	52 033 52 034 F16	52 035 F25	52 036 F30
C, D, E (identical dimensions)	$\varnothing d1$ informative value	125	175	210	300	390
	$\varnothing d2$ f8	70	100	130	200	230
	$\varnothing d3$	102	140	165	254	298
	d4	M 10	M 16	M 20	M 16	M 20
	Number of tapped holes	4	4	4	8	8
hmax	3	4	5	5	5	
C	h1 min. 1,25d4	12,5	20	25	20	25
	$\varnothing d7$	40	60	80	100	120
	h2	10	12	15	16	18
	b2 H11	14	20	24	30	40
	$\varnothing d6$	28	41,5	53	72	72
D	$\varnothing d8$ g6	20	30	40	50	60
	l4	50	70	90	110	120
	t2max	22,5	33	43	53,5	64
	b3 H9	6	8	12	14	18
	l6	55	76	97	117	127
E	$\varnothing d9$ H8	20	30	40	50	60
	l6 min.	55	76	97	117	127
	t3	22,8	33,3	43,3	53,8	64,4
	b4 Js9	6	8	12	14	18
	l6	55	76	97	117	127

The dimensions $\varnothing d6$ and l6 should not be smaller than those tabulated.
The dimensions are given in mm.

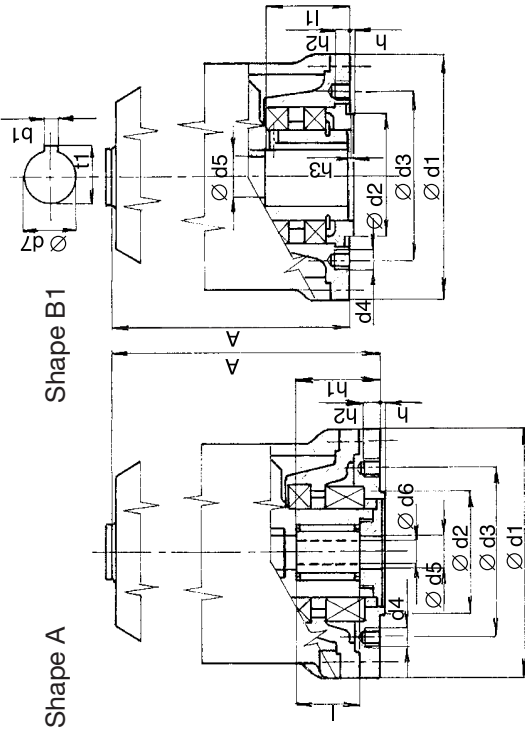
Adapters for **MODACT MON** actuators, Type No. 52 030 - 52 035



Assignment of adapters to actuators

Shape	Dimension [mm]	Type No.			
		52 030	52 031 52 032	52 033 52 034	52 035
A, B1 (identical dimensions)	Ød1	125	175	210	300
	Ød2 f8	70	100	130	200
	Ød3	102	140	165	254
	d4	M 10	M 16	M 20	M 16
	Number of holes Ød4	4	4	4	8
	h	3	4	5	5
	h2 min.	12,5	20	25	20
	A	63,5	110	179	155
	Ød5	30	38	53	63
	Ød6 max	26	36	44	60
A	h1 max	43,5	65	92	110
	l min	45	55	70	90
	A	63,5	110	122	155
	Ød5	30	40	50	65
	l1 min	45	65	80	110
	h3 max	3	4	5	5
	b1	12	18	22	28
	Ød7 H9	42	60	80	100
	t1	45,3	64,4	85,4	106,4
	B1	Ød1	125	175	210
Ød2 f8		70	100	130	200
Ød3		102	140	165	254
d4		M 10	M 16	M 20	M 16
Number of holes Ød4		4	4	4	8
h		3	4	5	5
h2 min.		12,5	20	25	20
A		63,5	110	179	155
Ød5		30	38	53	63
Ød6 max		26	36	44	60
B1	h1 max	43,5	65	92	110
	l min	45	55	70	90
	A	63,5	110	122	155
	Ød5	30	40	50	65
	l1 min	45	65	80	110
	h3 max	3	4	5	5
	b1	12	18	22	28
	Ød7 H9	42	60	80	100
	t1	45,3	64,4	85,4	106,4

Adapters for **MODACT MON** actuators, Type No. 52 036



Shape	Dimension [mm]	52 036		
		Ød1	390	390
A, B1 (identical dimensions)	Ød2 f8	230	230	
	Ød3	298	298	
	d4	M 20	M 20	
	Number of holes Ød4	8	8	
	h	5	5	
	h2 min.	25	25	
	A	740	740	
	Ød5	72	72	
	Ød6 max	70	70	
	h1 max	165	165	
A	l min	110	110	
	A	695	695	
	Ød5	72	72	
	l1 min	130	130	
	h3 max	5	5	
	b1	32	32	
	Ød7 H9	120	120	
	t1	127,4	127,4	
	B1	Ød1	390	390
		Ød2 f8	230	230
Ød3		298	298	
d4		M 20	M 20	
Number of holes Ød4		8	8	
h		5	5	
h2 min.		25	25	
A		740	740	
Ød5		72	72	
Ød6 max		70	70	
B1	h1 max	165	165	
	l min	110	110	
	A	695	695	
	Ød5	72	72	
	l1 min	130	130	
	h3 max	5	5	
	b1	32	32	
	Ød7 H9	120	120	
	t1	127,4	127,4	

Notes:
1+) Nut built in actuator
2+) Bush built in actuator

Wiring diagrams of MODACT MON and MODACT MON Control actuators

Legend:

SQ1 (MO)	OPEN torque-limit switch	BQ1, BQ2	potentiometer 2x 100 W
SQ1 (MZ)	CLOSE torque-limit switch	CPT1	current position transducer CPT 1/A 4-20 mA
SQ3 (PO)	OPEN limit switch	ZP2.RE	electronic position regulator
SQ5 (PZ)	CLOSE limit switch	KO	contactor for OPEN direction
SQ4 (SO)	OPEN signalling switch	KZ	contactor for CLOSE direction
SQ6 (SZ)	CLOSE signalling switch	F	thermal relay
EH	anti-condensation heaters 2x TR 551 10k/A	SA1	LOCAL/REMOTE change-over switch
BAM	electromagnetic brake	SA1	OPEN/CLOSE change-over switch
		B	blinker

Positions of the LOCAL/REMOTE control switches:

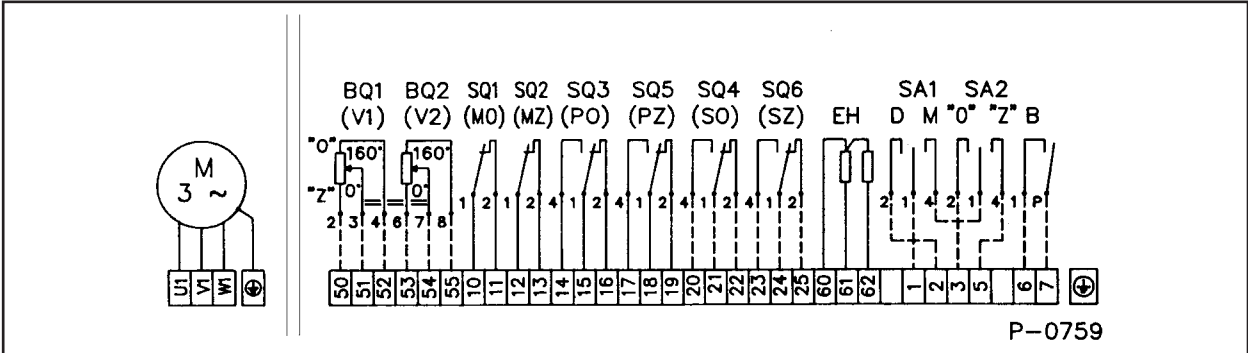
„M“ - local
„D“ - remote

„O“ - open
„Z“ - close

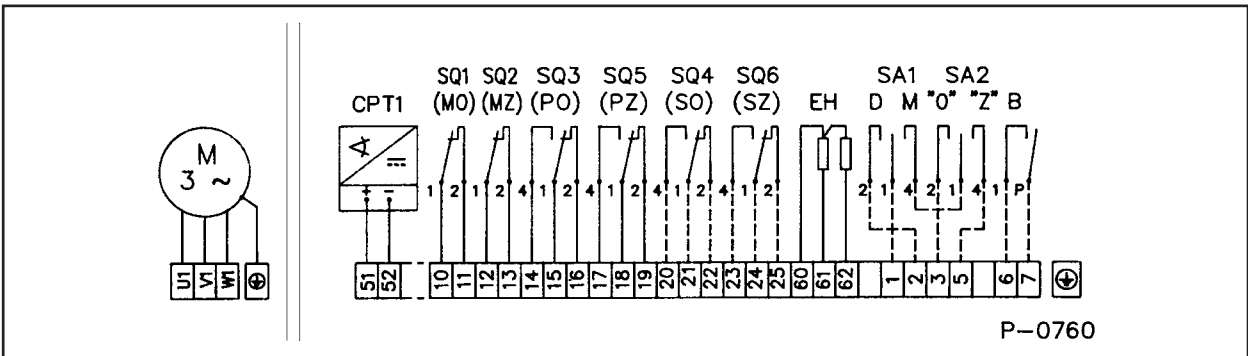
Wiring diagrams of **MODACT MON** electric actuators

Design: terminal board

Position transducer: potentiometer 2 x 100 Ω or no transducer



Position transducer: current transducer CPT 1/A 4 - 20 mA

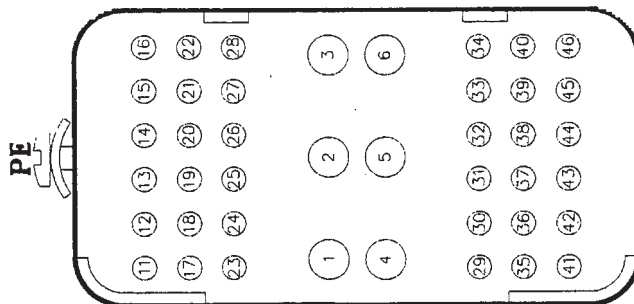
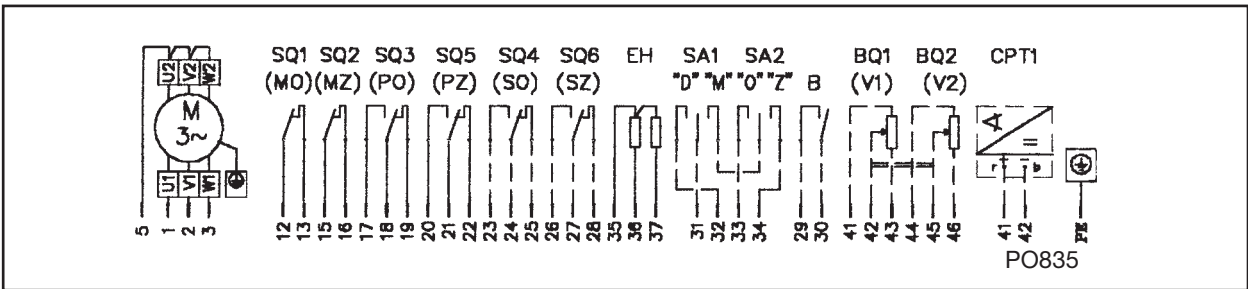


Electric motor

Control box

Local regulator

Design: HARTING connector



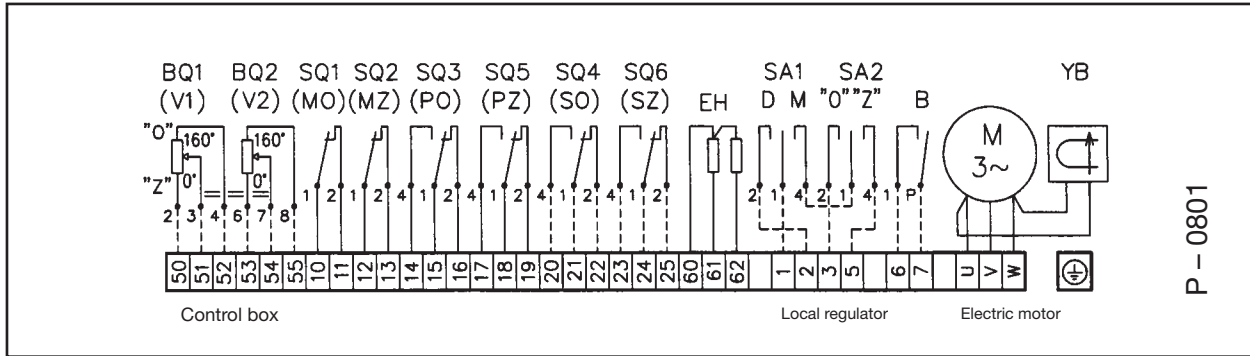
Note:

In the design variant with the CPT1/A current transducer, the user should provide for connection of the two-wire circuit of the current transducer to the electric earth of the associated regulator, computer, etc. The connection should only be made at a single point in any section of the circuit outside the electric actuator. The voltage between electronics and the current transducer case should not exceed 50 V DC.

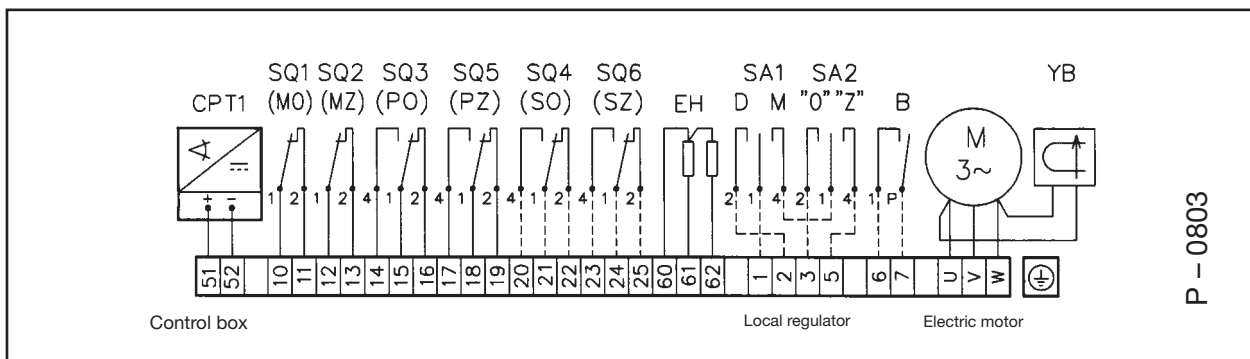
Wiring diagrams of **MODACT MON** electric actuators, Type No. 52 031, 52 032 - with brake motor

Design: terminal board

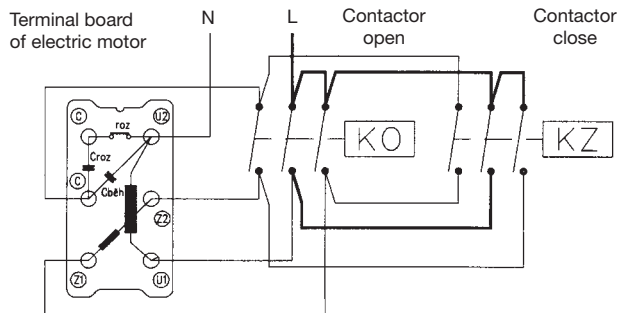
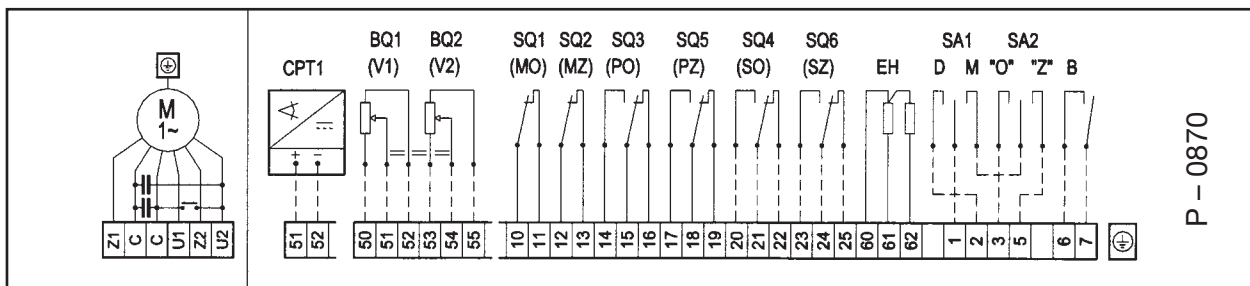
Position transducer: potentiometer 2 x 100 Ω or no transducer



Position transducer: current transducer CPT 1/A 4 - 20 mA



Wiring diagram of **MODACT MONJ** electric actuators



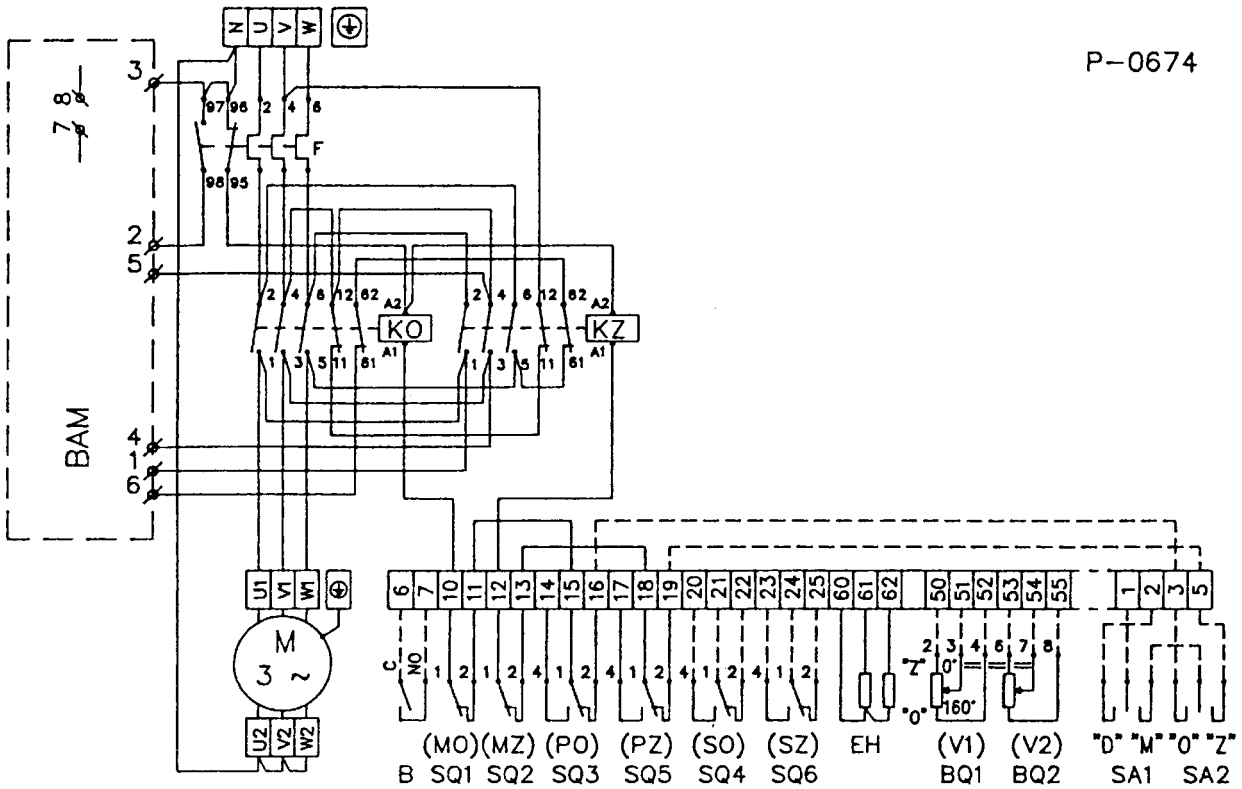
Example of wiring power circuits for controlling a single-phase electric motor for selecting both directions of rotation. Control circuits are not a part of the actuator.

Note:

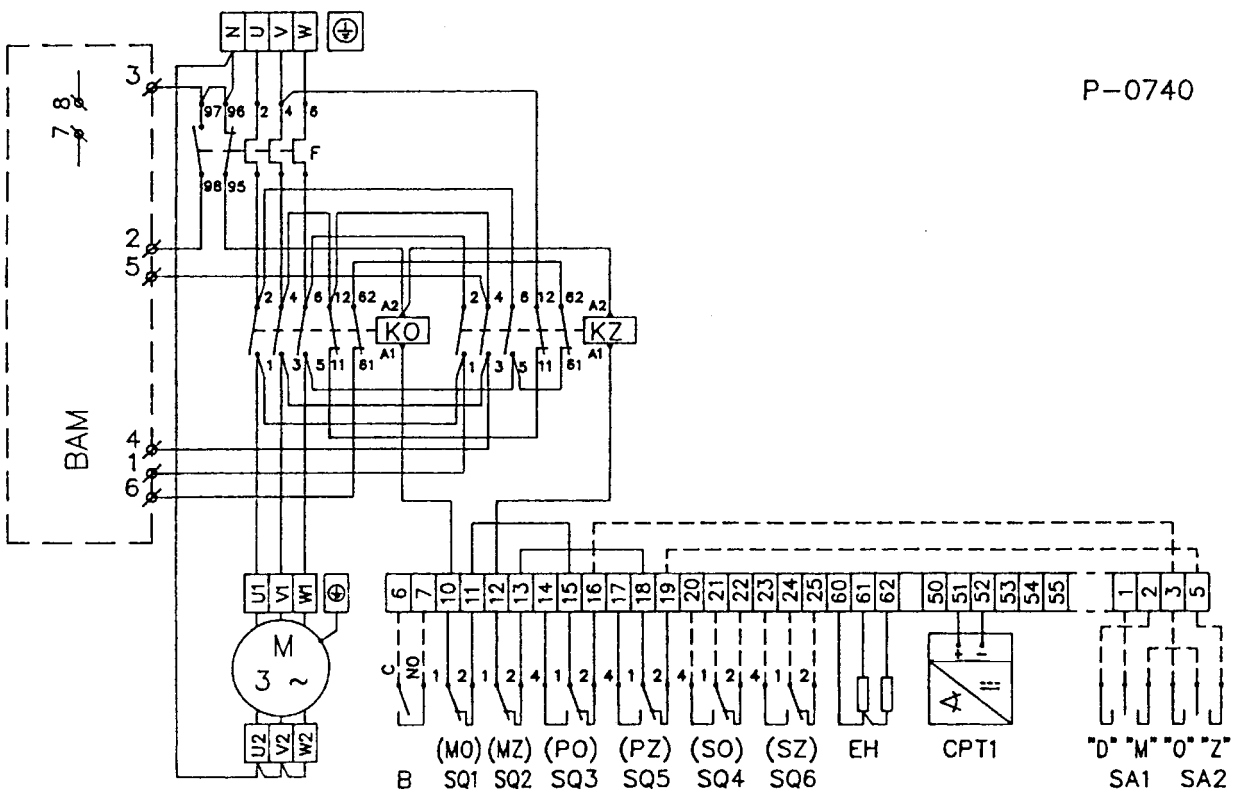
In the design variant with the CPT1/A current transducer, the user should provide for connection of the two-wire circuit of the current transducer to the electric earth of the associated regulator, computer, etc. The connection should only be made at a single point in any section of the circuit outside the electric actuator. The voltage between electronics and the current transducer case should not exceed 50 V DC.

Wiring diagrams of **MODACT MON Control** actuators with built-in contactor combination and brake BAM

Position transducer: potentiometer 2 x 100 Ω or no transducer

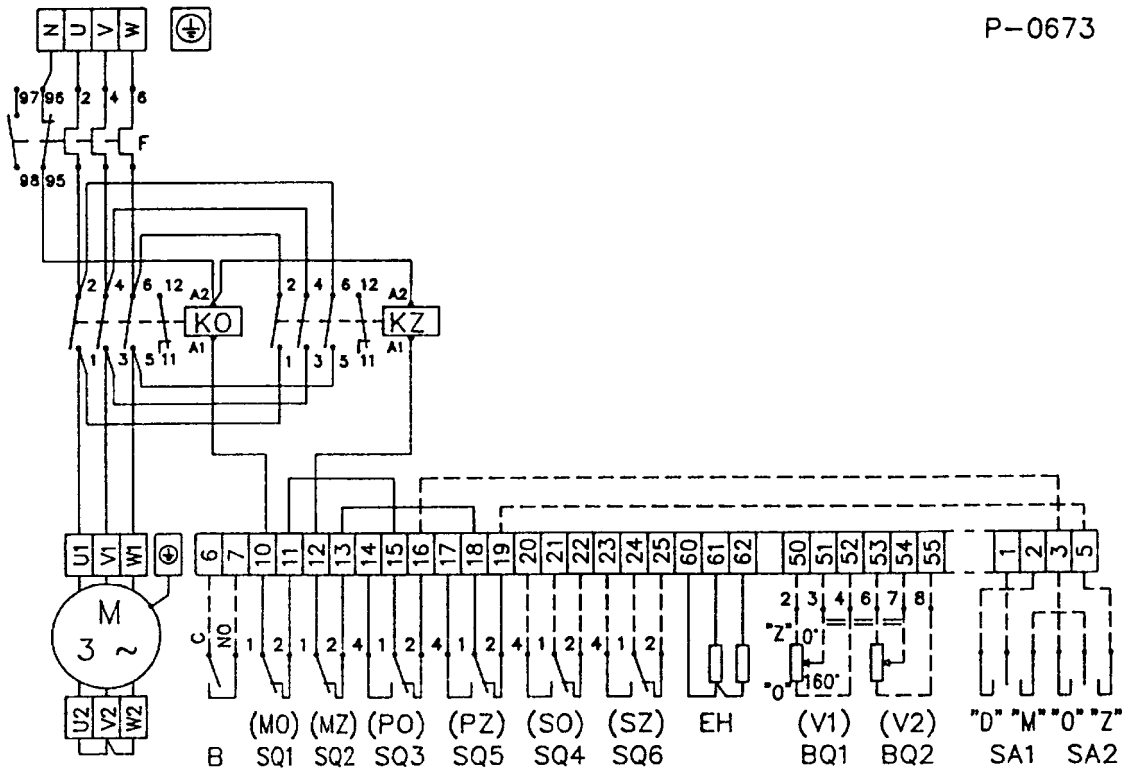


Position transducer: current transducer CPT1/A 4 - 20 mA

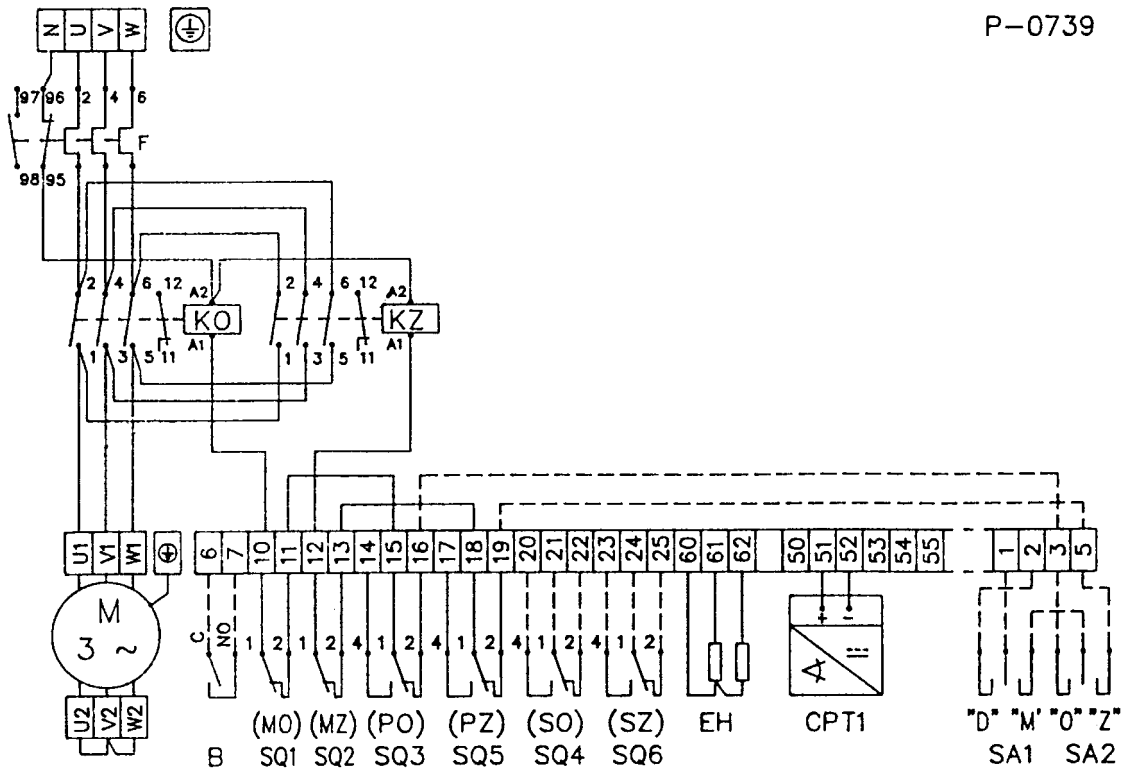


Wiring diagrams of **MODACT MON Control** actuators with built-in contactor combination

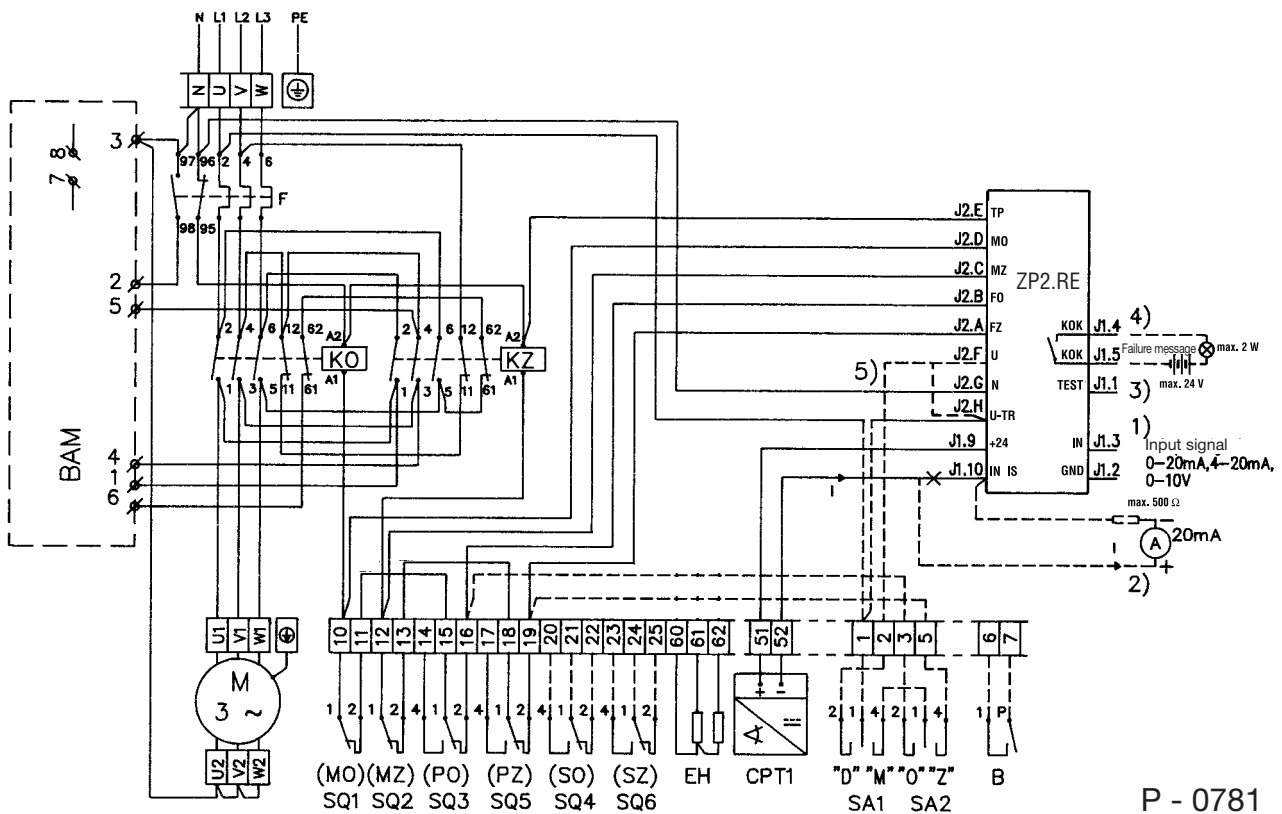
Position transducer: potentiometer 2 x 100 Ω or no transducer



Position transducer: current transducer CPT1/A 4 - 20 mA



Internal wiring diagram of **MODACT MON Control** electric actuators
 - with current transducer, built-in contactor combination, thermal relay,
 regulator ZP2.RE and dynamic brake BAM.



P - 0781

NOTES:

- add 1) The input signal should be connected to the regulator terminals designated J1-3 (positive pole) and J1.2 (negative pole).
- add 2) The feedback signal can be brought out only when its galvanic separation from the input signal is secured.
- add 3) The TEST signal can be activated by an external make contact. This signal need not be connected.
- add 4) The failure signal can be brought out from terminals J11.4 and J1.5. This signal is galvanically separated from the regulator circuits. The maximum voltage which can be applied to these terminals, is 24 V.
- add 5) The link J2.F-J2.H has been connected at the factory provided that the actuator has no built-in local control unit. In this case, the terminal J2.H is connected directly to terminal 2 of the thermal relay F.



Electric actuators and switchboards
Development, production, sales, services

SURVEY OF PRODUCED ACTUATORS

KP Mini

Electric part-turn actuators (up to 30 Nm)

Modact MOK, MOK-P, MOK-P EEx

Electric part-turn actuators for ball valves and flaps

Modact MON

Electric multi-turn actuators

Modact MO EEx

Explosion proof electric multi-turn actuators

Modact MOA

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

Modact MOA OC

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

Modact Variant MPR

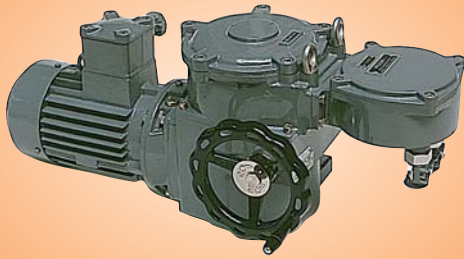
Electric part-turn lever actuators with a variable output speed

Modact Konstant MPS

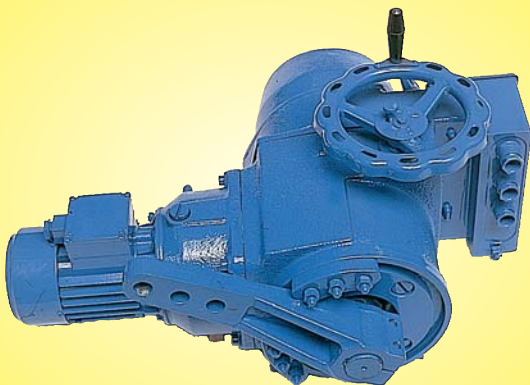
Electric part-turn lever actuators with a constant output speed

Modact MTN

Electric linear thrust actuators with a constant output speed



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