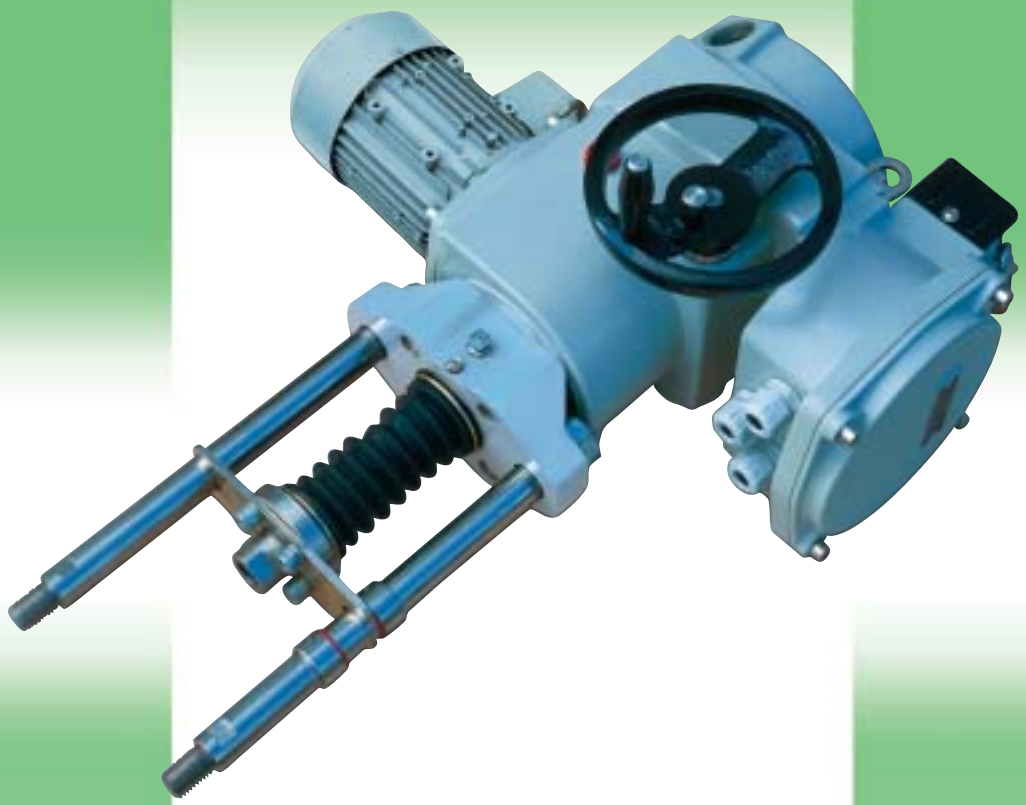
ZPA PEČKY, a.s.



Electric Linear Thrust Actuators

MODACT MTN
MODACT MTN CONTROL

Type No. 52 442, 52 443

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

TÜV CERT

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**

Deutscher Akkreditierungs Rat
DAR
TGA-ZM-30-96-00

Essen, 14.11.2003

RWTÜV

TÜV CERT Certification Body
of RWTÜV Systems GmbH

APPLICATION

The MODACT MTN actuators are used for remote two-position or three-position control of the valves by a reverse rectilinear motion.

The MODACT MTN Control actuators are fitted with an electronic position controller. In association with the valve exhibiting a suitable control characteristic, they form a position servo-loop. The output pull-rod of these actuators is automatically brought into a position corresponding to the input signal value of the controller.

The actuators can be used even for other devices for which they are in respect of their characteristics and parameters suitable. In some special cases, the contemplated use of the actuators should be consulted with the manufacturer.

OPERATING CONDITIONS

The MODACT MTN (MODACT MTN 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).

When installed on a free area, the electric actuator should be fitted with a light shelter against direct action of atmospheric effects.

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 which has been 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 their function. 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.

Classes of external influences

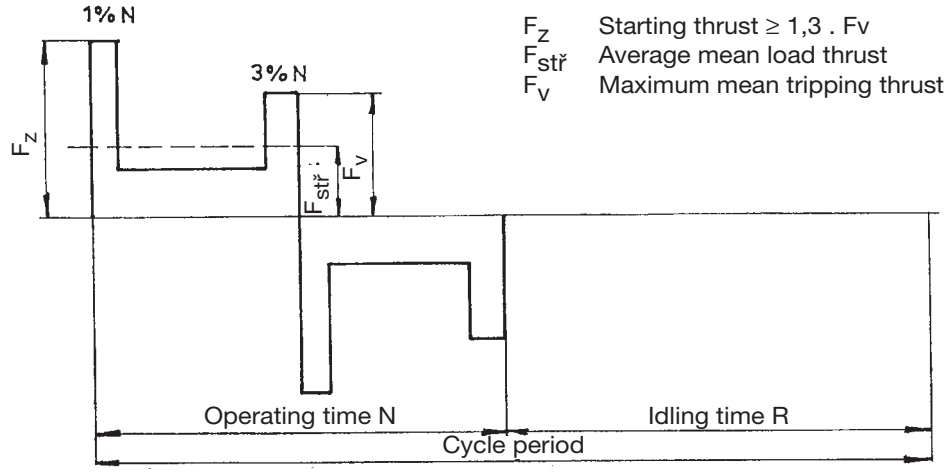
Basic characteristics - as extracted from ČSN Standard 33 2000-3 (mod. IEC 364-3:1993).

1) AA7 - Simultaneous effect of ambient temperature of - 25 °C to + 55 °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 ≤ 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 current industrial plants
8) AH2 - Medium vibrations; in current industrial plants
9) AK2 - Serious risk of growth of vegetation and moulds
10) AL2 - Serious danger of the occurance of animals (insects, birds, small animals)
11) AM2 - Harmful effect of escaping vagabond currents
12) AN2 - Medium solar radiation with intensities > 500 W/m^2 and ≤ 700 W/m^2
13) AP3 - Medium seismic effects; acceleration > 300 Gal ≤ 600 Gal
14) BA4 - Personal abilities; instructed people
15) BC3 - Frequent contact with the earth potential; persons coming frequently into contat with „live“ parts or standing on a conducting base

Working 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 mean load moment value shall be below or equal to 60 per cent of the maximum switch off moment Fv. 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 mean load moment at load factor of 25 per cent and 50°C shall not exceed 40 per cent of the maximum tripping moment Fv.

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



F_Z Starting thrust ≥ 1,3 . Fv
$F_{stř}$ Average mean load thrust
F_V Maximum mean tripping thrust

Course of working cycle

TECHNICAL REQUIREMENTS

Rated supply voltage

The rated supply voltage of the actuators is 3 x 230 V/400 V at 50 Hz with permissible line voltage fluctuations between + 10% and - 15% and frequency shift within ± 2%. Over these ranges, the rated values of all parameters are retained except for the readjusting speed of the output part and the starting force; the latter is directly proportional to the square of line voltage variation. Actuators employing another voltage and/or frequency are available upon special request. The basic technical parameters should be determined individually for each supply voltage and frequency.

Operating position

The actuator is usually mounted in a position with the vertical axis of the output shaft and the control box upwards, but can also be operated in another position provided that the axis of the electric motor is not more than 15° under the horizontal plane.

Tripping thrust

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

Coverage::

Coverage of the electric actuators MODACT MTN (MODACT MTN Control) is IP 55. The coverage IP67 can be provided on request.

Insulation resistance

Insulating resistance of electric circuits against the frame or between each other at normal conditions should be at least 20 MΩ; after the test under damp conditions it should be at least 2 MΩ. For more detailed information see the technical specifications.

Electric strength

The electric strength of circuit insulation of the actuators must correspond to TP 27-02.1-54/94.

Test voltage:

circuit of remote position transmitter	500 V, 50 Hz
circuits of microswitches and anti-condensation heater	1,500 V, 50 Hz
circuit of electric motor	1,000 V + 2.U_r, 50 Hz, at least 1,500 V

Noise

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

DESCRIPTION AND FUNCTION

The design of the MTN actuators has been based on the modular series of actuators trade-named MODACT. The MTN - actuators consist of the following building modules:
- Three-phase asynchronous motor and speed reducing gearbox
- Power gearing
- Rectilinear mechanism
- Control box

The control box encloses the following functional units:
- Torque control unit ith two torque-limit switches and an unlocking device that disables the torque control on reversal of the direction of movement of the actuator output pull-rod after the starting torque has been attained. The tripping force can be adjusted indirectly by adjusting the torque-switching unit. During this adjustment, the axial force is measured on the output pull-rod.
- Limit-switching unit with stepping gear drive and two position-limit switches. The stepping gearing allows position-dependent switching to be adjusted with high accuracy.
- Signalling unit with a gearbox, having two signalling switches. Driven by the output shaft, the gearbox is also used for driving the position transmitter.
- Position transmitter - This is a dual resistance transmitter rated at 2 x 100 Ω, whose drive is provided by the gearbox of the signalling unit and adjustable gearing or current transmitter CPT 1/A.
- Anti-condensation heaters which serve for producing a microclimate in the control and terminal boxes to prevent condensation from occuring in these spaces when the ambient temperature decreases.

Terminal block

The actuator is fitted with a terminal block for connecting external circuits. Using screw terminals, the terminal block allows conductors with a maximum cross section of 2.5 mm^2 to be connected. Access to the terminal block is obtained after removal of the terminal box cover. All electric control circuits of the actuator are brought out to the terminal block. The terminal box is provided with cable bushings for connecting the actuator. The electric motor is equipped with a separate box with a terminal block and a cable bushing. Alternatively, actuators with a push-on cable connection (hereinafter referred to as HARTING connector) can be supplied - see the table of design variants.

Push-on cable connection

According to the customer's requirements, the MODACT MTN electric actuators can be fitted with a push-on cable connection (the HARTING connector) allowing control circuits to be connected and, in the case of Type No. 52 442, even with an unlocking switch of the electric motor.

Self-locking

The actuator is self-locking.

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 movement of the output pull-rod being determined by the function of differential gear). When the handwheel is rotated clockwise (when looking at the shaft towards the control box) the output pull-rod of the actuator is shifted out.

Position transmitters

The MODACT MTN (MODACT MTN Control) electric actuators can be supplied without position transmitter or can be fitted with a potentiometer of 2 x 100 Ω or a current transmitter with a unified signal of 4 to 20 mA. For the current tramsmitter, a two-wire connection is used, no power supply being built in the actuator. In the Control design variant, it is advisable to make use of the current position transmitter only.

The maximum load resistance is RZ_{max} = 500 Ω. The supply voltage of the transmitter is 24 V DC. This voltage need not be stabilized, but should not exceed 30 V since otherwise there is the risk of damage to the transmitter. The power supply, the position transmitter and the load are connected in series, the positive pole of the power supply being connected to the positive pole of the position transmitter. This loop should be connected at a single point (outside the actuator) to the electric ground of the load.

Rating capacity and rated voltage of the resistance position transmitter:

The position transmitters can be used for voltage up to 48 V DC; however, maximum permitted current 100 mA must not be exceeded.

Position indicator

The electric actuator can be equipped with a local position indicator (with the exception of the design variant with a capacitance transmitter).

Position-limit switches

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

Torque-limit switches

The electric actuators are fitted with 2 torque-limit switches to be switched off when the tripping force on the output pull-rod has been reached. Each switch operates in either direction of movement of the actuator output shaft. The torque-limit switches can operate at any point of the working stroke excepting the region of pull-rod travel after reversing in which they are inactive. i.e., 3 to 6 mm or 5 to 10 mm in the actuators, Type Nos 52 443 and 52 442, respectively.

Current-carrying capacity and maximum voltage of the microswitches

250 V AC/2 A, 250 V DC/0.1 A, blinker 250 V AC/0.2 A, cos ϕ = 1

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

Local control of the MODACT MTN electric actuators

Local control of the MODACT MTN electric actuators with a connection to the KBNS connector can be performed by a control switch (having three positions: CLOSE, STOP and OPEN) with the stable STOP position or by the so-called unlocking switch which, in the local control mode, is used to disconnect remote control from the switchboard or control console. The electric actuators which are connected via a terminal block, use the same local control box as the MODACT MTN Control electric actuators.

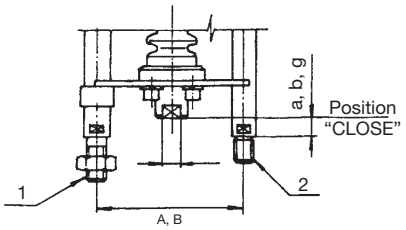
Anti-condensation heater

Consisting of one or two resistors (see the circuit diagram), the anti-condensation heater should be connected to the AC mains of 230 V. In applications where a temperature exceeding 35 °C is expected only one anti-condensation heater should be connected.

Table 2 - Connecting dimensions, specification of the additional Type No.

Design	Type No.		Design	Type No.	
	basic	additional		basic	additional
Aa1I	52 422	x 0 x x	Ba1I	52 442	x C x x
Aa1II	52 422	x 1 x x	Ba1II	52 442	x D x x
Aa1III	52 422	x 2 x x	Ba1III	52 442	x E x x
Aa2I	52 422	x 3 x x	Ba2I	52 442	x F x x
Aa2II	52 422	x 4 x x	Ba2II	52 442	x G x x
Aa2III	52 422	x 5 x x	Ba2III	52 442	x H x x
Ab1I	52 422	x 6 x x	Bb1I	52 442	x I x x
Ab1II	52 422	x 7 x x	Bb1II	52 442	x J x x
Ab1III	52 422	x 8 x x	Bb1III	52 442	x K x x
Ab2I	52 422	x 9 x x	Bb2I	52 442	x L x x
Ab2II	52 422	x A x x	Bb2II	52 442	x M x x
Ab2III	52 422	x B x x	Bb2III	52 442	x P x x
			Bg2I	52 442	x R x x

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



Spacing of columns	A	160 mm
	B	150 mm
„Closed“ position	a	30 mm
	b	74 mm
	g	130 mm
Thread of coupling	I	M 20 x 1,5
	II	M 16 x 1,5
	III	M 10 x 1

a - Short columns
b - Long columns
g - Column length 130 mm

MODACT MTN Control electric actuators

The MODACT MTN Control electric actuators are fitted with an electronic position controller. In association with a fitting having a suitable regulating characteristic, they create a position servo-loop. The output shaft of these actuators is automatically brought into the position which corresponds to the input signal value of the controller.

For application, operating conditions, technical parameters, a functional description, packing, storing, functional checks, installation, mounting to fittings, adjustment of the actuator with fittings, operation, maintenance, failures and their remedies, refer to the part dealing with the MODACT MTN electric actuators. All provisions therein also apply to the MODACT MTN Control electric actuators. A list of the types of MODACT MTN Control electric actuators now in production can be found in Tab.1.

In addition, the MODACT MTN CONTROL electric actuators are fitted with a position controller of the output shaft, a reversing contactor combination of the output shaft, a thermal relay providing for overload protection of the electric motor and an electronic brake of asynchronous motors (hereinafter referred to as BAM brake).

All these units are enclosed in the contactor box which is installed instead of the terminal box of the MODACT MO actuators. These electric actuators can be supplied without position controller and BAM brake - see Tab. 2.

Connection of electric circuits from the control box to external circuitry is made via a terminal block; the latter has added terminals for connecting the supply voltage of 3 x 230/400 V, 50 Hz.

POSITION REGULATOR ZP2.RE

A built-in position controller allows automatic positioning of the actuator output shaft to be performed, depending on the analog input signal. At the controller input, the input control signal is compared with the feedback signal of the position transmitter. The resulting control deviation, if any, is used for actuator run control, the actuator output shaft being brought into the position corresponding to the input control signal value.

This controller uses the high performance of the RISC processors MICROCHIP for performing all its functions, while at the same time enabling continuous system self-diagnosis to be effected and error messages to be displayed whenever a failure occurs. Due to this facility, the user need not make complicated adjustment as in the case of a current analog controller. For this purpose, it is sufficient to start the initializing program to make the controller perform all necessary functions.

REGULATOR SOFTWARE

1) The regulator can be programmed to perform the required functions in the following two ways:
   - By a PC after the RS 232 interface.
   - By means of the functional keys and LEDs on the regulator.

The following parameters can be programmed:

- Control signal
- Regulator response to the TEST signal and the error state (depending on the programmed requirements)
- Mirroring (ascending or descending characteristic of the control signal)
- Regulator insensitivity
- Type of feedback transmitter (potentiometer, current transmitter)

2) All operating states of the regulator can be monitored by a PC after the RS 232 interface. In this case, the regulator issues error messages by means of LEDs or PC.
   - Presence of the TEST signal
   - Control signal is missing
   - Limit switches (faulty connection)
   - Failure of position sensor
   - Failure of thermal protection

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 transmitter 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 - Control signal is missing - Reversed position switches - Failure of position sensor - Failure of thermal protection
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) Brake - Control signal of 2 mA (signal for additional module)
Actuator position	- I2C bus (signal for additional module)
Adjusting devices:	- 2x calibrating and parameter adjusting push-button - Communication connector
Dimensions:	- 75 x 75 x 25 mm

Local control of the MODACT MTN Control electric actuators

In any design variant, the MODACT MTN Control electric actuators can be supplemented with a local control box. The local control unit allows the electric actuator to be controlled with disabled remote control and thus performs the same function as the unlocking switch of the MODACT MTN electric actuators.

Electronic brake BAM

When the power supply is switched off the electric brake BAM can reduce the run-down time of the electric actuator from 0.5 - 1.3 s to 40 - 60 ms, as compared with the design variant without electronic brake. This may increase control accuracy. The electronic brake is suitable for electric motors with a supply voltage of 3 x 230/400 V, 50 Hz (3 x 220/380 V) and power output of 120 W, 180 W, 370 W or 550 W.

Reversing contactor combination and thermal relay

Due to its configuration and outfit, the electric actuator can be easily connected to external circuits. For this purpose, it is sufficient to connect the actuator to a three-phase power supply system, a group of electric actuators being connectable to the power supply system by a single power supply cable. This arrangement saves power cables of the reversing contactors which can be built in the electric control box of each controlled actuator. Provided that the signalling switches are not required to be brought out it is sufficient to connect the electric actuator to control circuits.

Deviations of basic parameters

Tripping thrust	± 12% of the maximum value on the range
Readjusting speed	- 10% of the rated value + 15% (in no-load operation)
Setting of signalling switches	± 2.5% of the maximum value on the range (for the ranges, refer to the Mounting instructions).
Hysteresis of signalling switches	max. 4% of the maximum value on the range
Setting of position-limit switches	± 0.2 mm of the output pull-rod displacement (without the influence of running-down)
Hysteresis of position-limit switches	max. 1.2 mm of the output pull-rod displacement
Transmitters linearity, incl. gears	± 2.5% of the rated signal
Transmitter 2x100 Ω hysteresis, incl. gears	max. 4% of the rated resistance
Transmitter CPT1/A hysteresis, incl. gears	max. 2.5% of the rated current
Clearance of output part	max. 1 mm

Ordering information

When ordering, please specify the following:

- number of actuators required.
- actuator designation and type (basic and additional Type Number).
- working stroke of output part (If the working stroke has not been specified the equipment will be adjusted to the maximum working stroke of the output part).
- tripping force (If the tripping force has not been specified the equipment will be adjusted to the maximum tripping force).
- supply voltage of electric motor (Another supply voltage than that given above, should be agreed upon beforehand with the manufacturer).

Example:

MODACT MTN 40 electric actuator, Type no. 52 443, with working stroke 100 mm, adjusting speed 125 mm.min^{-1}, maximum adjusted tripping force 40 kN, 3 x 230/400 V, 50 Hz, version according to ČSN 186314, clutch B, without moment blocking, resistance transmitter, without local controller and position regulator should be specified in the order as the type number 52 443.6124N. The version without moment blocking and without transmitter should be specified in words.

The meaning of the 6th, 8th and 9th digit of the Type No. is given in the Table 1.

The meaning of the 7th digit: Type No.52 442 - in the Table 2
Type No.52 443 - next to the Figs 4, 5, 6 and 7

Table 1 - MODACT MTN electric actuator - Basic technical parameters, design, Type number.

Basic electrical equipment:
2 thrust-limit switches (OPEN - MO, CLOSE - MZ)
2 position-limit switches (OPEN - PO, CLOSE - PZ)
2 position signalling switches (OPEN - SO, CLOSE - SZ)
1 potentiometer of 2 x 100 Ω or current position transmitter CPT 1/A
2 anti-condensation heaters
1 three-phase asynchronous motor

Basic technical parameters:

Type	MTN Control	Adjustment range of tripping thrust [kN]	Starting thrust [kN]	Speed [mm/min]	Stroke [mm]	Electric motor: Power [W]	Revolutions per minute [1/min]	I_n (400 V) [A]	$\frac{I_z}{I_n}$	Weight, Design variant: Aluminium	Weight, Design variant: Cast iron	Type Number: basic	Type Number: additional
MTN 15	C	11,5 - 15	17	50	10 - 100	180	850	0,74	2,3	33	45	52 442	x x 0 x N
	C			80		180	850	0,74	2,3				x x 1 x N
	C			125		250	1350	0,77	3,0				x x 3 x N
	C			36		120	645	0,51	2,2				x x 2 x N
	C			27		120	645	0,51	2,2				x x A x N
	C	15 - 25	32,5	50		180	835	0,74	2,3				x x 4 x N
	C			80		180	835	0,74	2,3				x x 5 x N
	C			125		250	1350	0,77	3,0				x x 6 x N
	C			36		120	645	0,51	2,2				x x 7 x N
	C			27		120	645	0,51	2,2				x x 8 x N
MTN 40 [1]	C	25 - 40	52	80	20 - 120	550	910	1,6	3,4	60	78	52 443	x x 1 x N
	C			125		550	1395	1,45	3,9				x x 2 x N
MTN 63		40 - 63	82	80		750	915	2,1	3,7				x x 4 x N
				125		1100	1415	2,55	4,6	63	81		x x 5 x N

Weather resistance, electrical connection	
with block of terminals	6 x x xN
with connector	7 x x xN
Connecting dimensions	
Type No. 52 442.xxxx (Tab.2)	
Type No. 52 443.x1xx (Figs 13, 14)	
Type No. 52 443.x2xx (Fig. 15)	

Transmitters for MODACT MTN actuators	Current transmitter CPT 1/A 4 to 20 mA (MODACT MTN, MODACT MTN Constant)	x x x 0N
	Potentiometer 2 x 100 Ω (MODACT MTN)	x x x 2N

ATTACHMENTS			with potentiometer 2 x 100 Ω	with current transmitter CPT 1/A
Design MODACT MTN	with local control switch		x x x 3N	x x x 1N
Design MODACT MTN Control (with built-in contactor combination)	without local control	without BAM brake and position regulator	x x x 4N	x x x AN
		with BAM brake, without position regulator 2)	x x x 5N	x x x BN
		with BAM brake and position regulator 2) 5)		x x x CN
	with local control	without BAM brake and position regulator	x x x 7N	x x x DN
		with BAM brake, without position regulator 2)	x x x 8N	x x x EN
		with BAM brake and position regulator 2) 5)		x x x FN

Notes:
[1]) Design with clutch internal threads and a flange (non-standard)is available only in the design variants, Type No. 52 443.x21x and 52 443.x22x (Type MTN 40).
[2]) Design variant with BAM brake is available only in the case of servoactuators with up to 550 W of electric motor power, inclusive.
[3]) If a design variant with flashing indication is required this should be specified in words: Design with flashing indication.
[4]) Design without force locking after reversation have at end position capital letter M (for example 52 442.6211M).
[5]) The actuators MODACT MTN Control with position controllers are available in the version with a connector only.

Dimensional sketch of **MODACT MTN 15, MTN 25** electric actuators, Type No. 52 442.xxxxN

- with block of terminals

Design 1	
A	160
B	150
a	30
b	74
g	130
c (a)	323
d (b)	367
h (g)	423
e (a)	620
f (b)	664
ch (g)	720

Design 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	605
f (b)	649
ch (g)	705

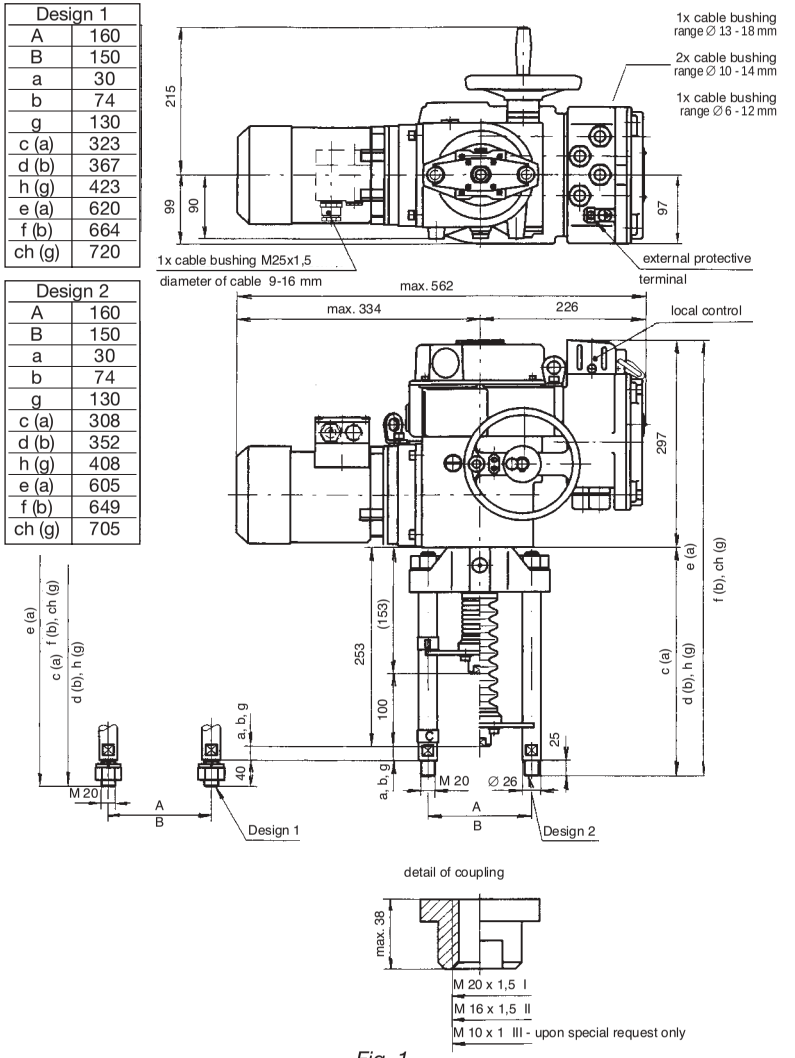


Fig. 1

Dimensional sketch of **MODACT MTN 15, MTN 25, MTN 15 Control, MTN 25 Control** electric actuators, Type No. 52 442.xxxxN

- with Harting connector

Design 1	
A	160
B	150
a	30
b	74
g	130
c (a)	323
d (b)	367
h (g)	423
e (a)	648
f (b)	692
ch (g)	748

Design 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	633
f (b)	677
ch (g)	733

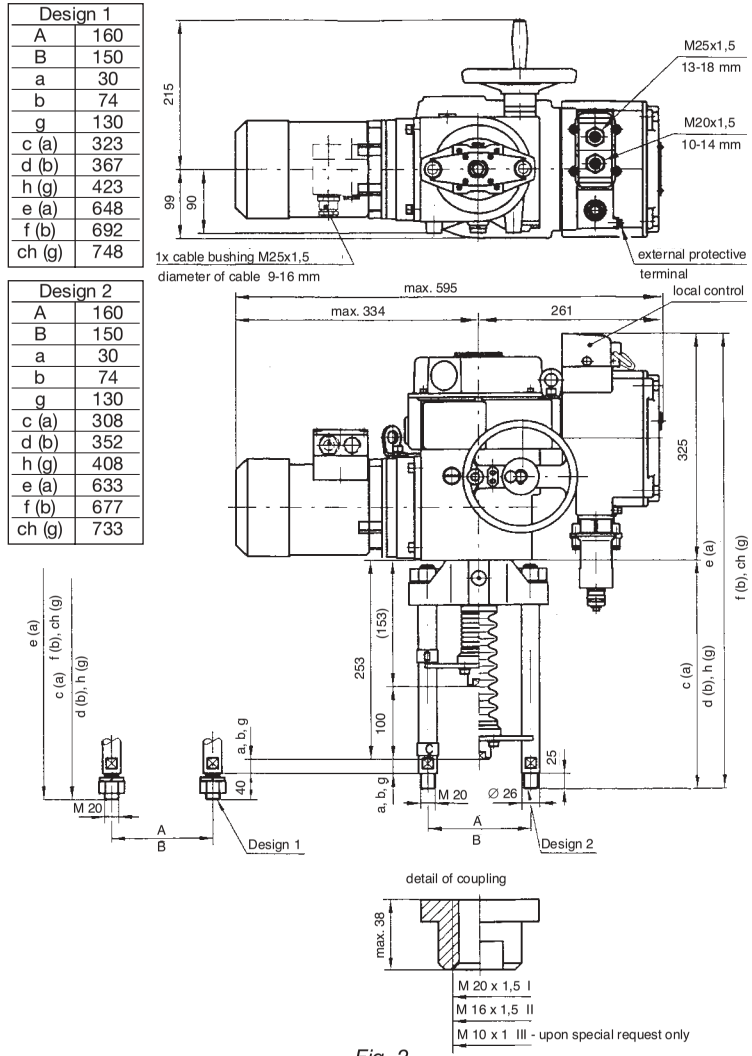


Fig. 2

Dimensional sketch of **MODACT MTN 15 Control, MTN 25 Control** electric actuators, Type No. 52 442.xxxxN

- with block of terminals

Design 1	
A	160
B	150
a	30
b	74
g	130
c (a)	323
d (b)	367
h (g)	423
e (a)	648
f (b)	692
ch (g)	748

Design 2	
A	160
B	150
a	30
b	74
g	130
c (a)	308
d (b)	352
h (g)	408
e (a)	633
f (b)	677
ch (g)	733

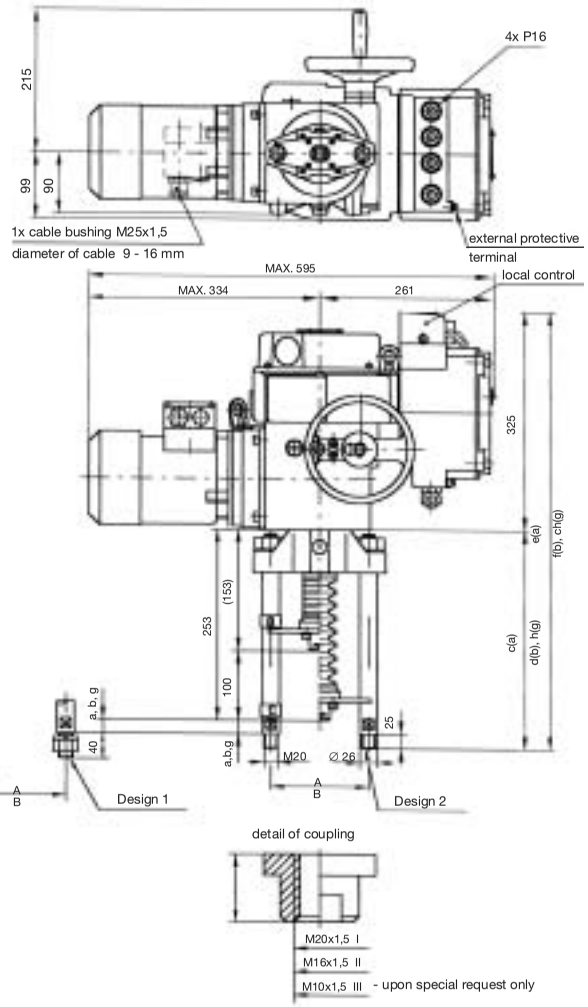


Fig. 3

Dimensional sketch of **MODACT MTN 40, MTN 63** electric actuators, Type No. 52 443.x1xxN

- with block of terminals

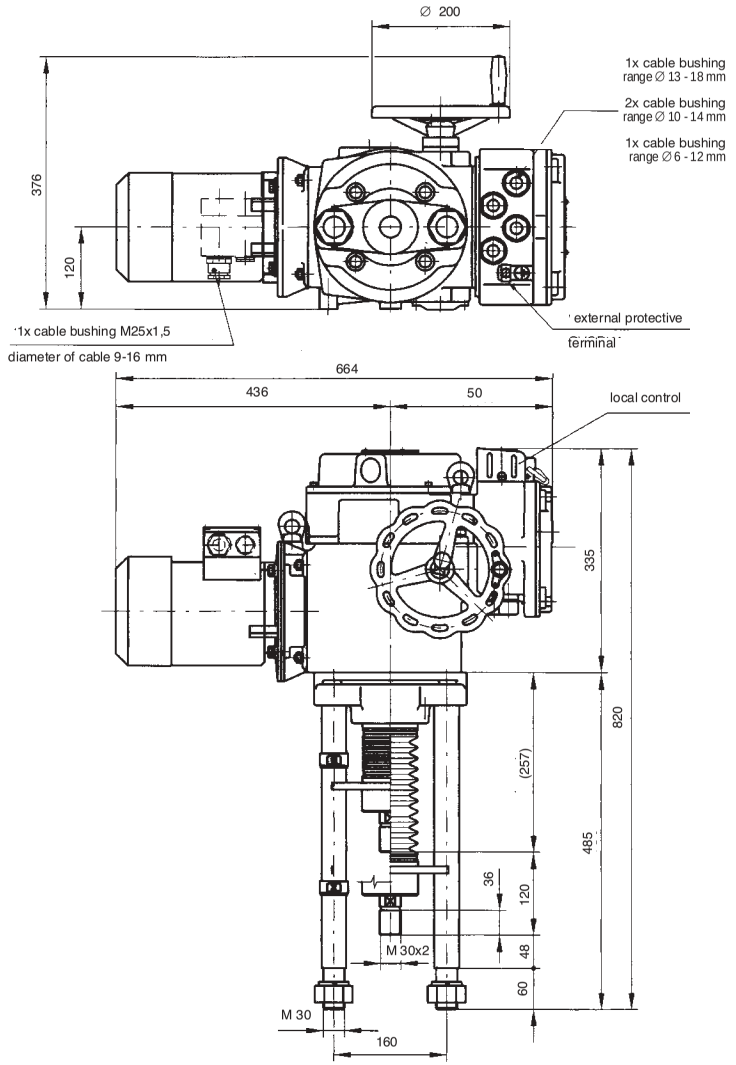


Fig. 4

Dimensional sketch of **MODACT MTN 40, MTN 63**
MTN 40 Control, MTN 63 Control
Type No. 52 443.x1xxN

- with Harting connector

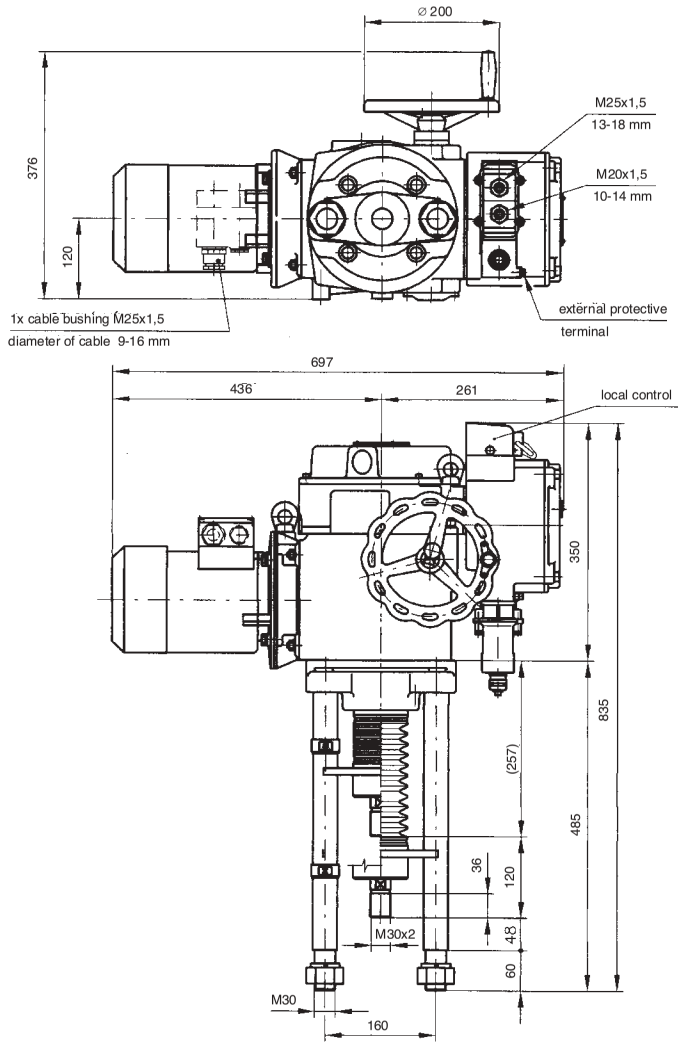


Fig. 5

Dimensional sketch
of **MODACT MTN 40 Control, MTN 63 Control**
electric actuators, Type No. 52 443.x1xxN

- with block of terminals

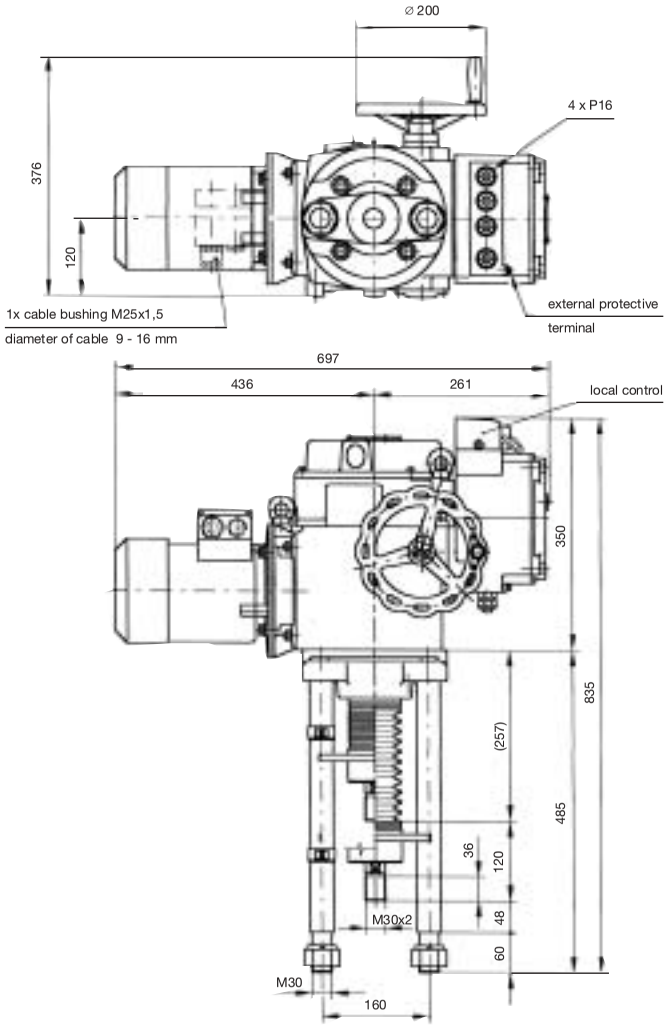


Fig. 6

Dimensional sketch of **MODACT MTN 40,** electric actuators,
Type No. 52 443.x2xxN

- design with flange - non standard

- with block of terminals

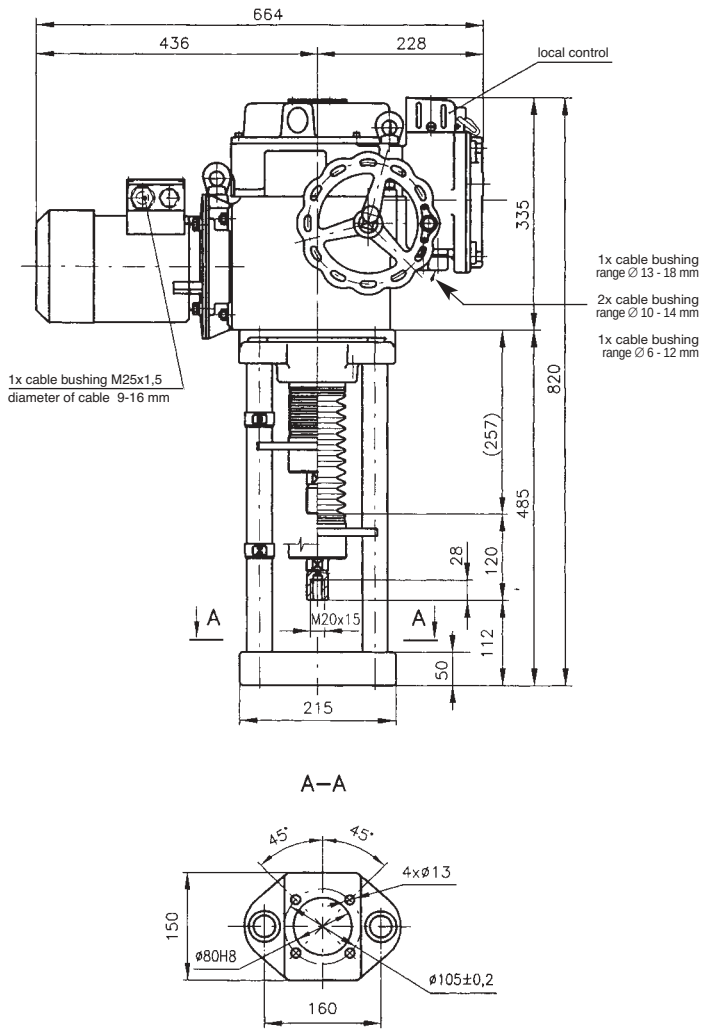


Fig. 7

Wiring diagrams of MODACT MTN electric actuators

Legend:

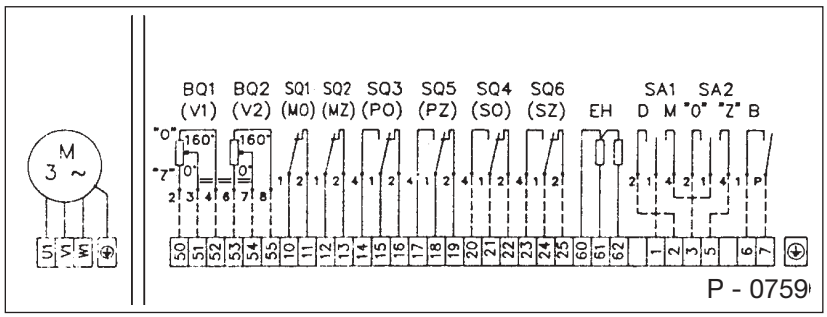
SQ1 (MO)	- OPEN torque-limit switch	SA2	- OPEN-CLOSE control switch
SQ2 (MZ)	- CLOSE torque-limit switch	CPT1	- Current position transmitter CPT1/A
SQ3 (PO)	- OPEN position-limit switch	B	- Blinker
SQ5 (PZ)	- CLOSE position-limit switch	M3~	- Three-phase motor
SQ4 (SO)	- OPEN signalling switch	BAM-001	- Electronic brake
SQ6 (SZ)	- CLOSE signalling switch	KO	- OPEN-direction contactor
BQ1, BQ2	- Resistance position transmitter of 2 x 100 Ω	KZ	- CLOSE-direction contactor
EH	- Anti-condensation heaters	F	- Thermal relay
SA1	- LOCAL-REMOTE control switch	ZP2	- Three-position motor regulator

Positions of the LOCAL/REMOTE control switches:
„M“ -local, „D“ -remote, „O“ -open, „Z“ -close

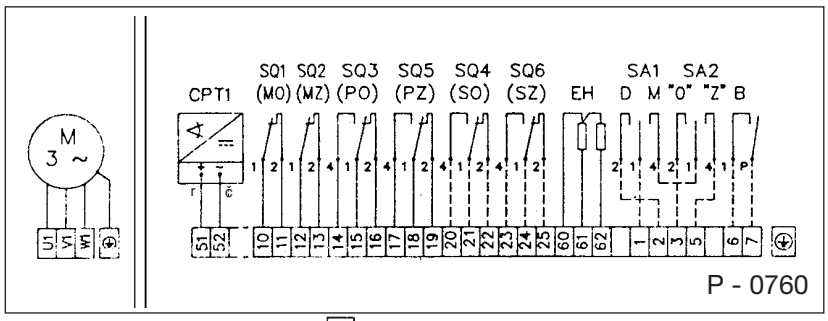
Wiring diagrams of **MODACT MTN** electric actuators

Design: with block of terminals

Position transmitter: Potentiometer 2 x100 Ω or no transmitter

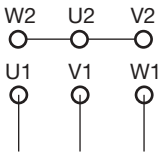


Position transmitter: Current transmitter CPT 1/A 4-20 mA

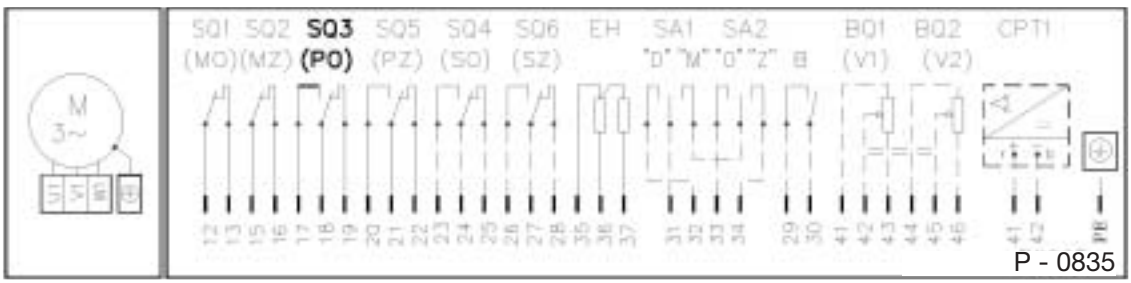


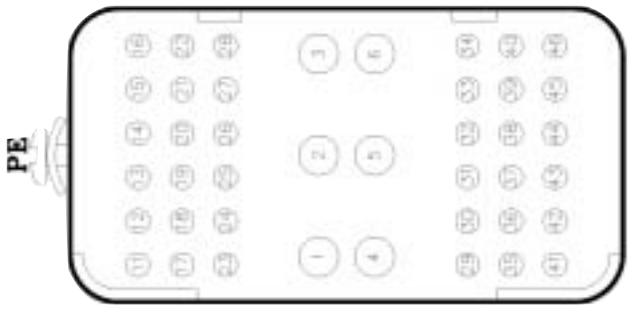
electric motor control box external protective terminal local control

connection of motor terminals for voltage 3 x 400 V



Design: with Harting connector

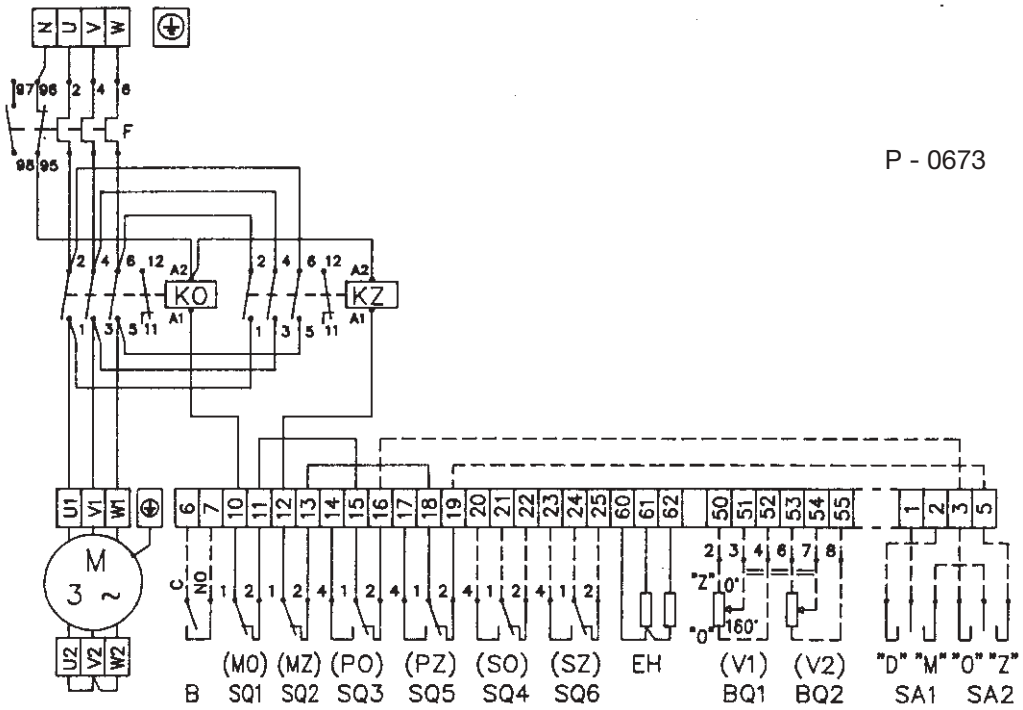




Note:
In the design variant with the CPT 1/A current transmitter, the user should provide for connection of the two-wire circuit of the current transmitter to the electric earth of the associated regulator, computer, etc. The connection should be made only at a single point in any section of the circuit outside the electric actuator. The voltage between electronics and the current transmitter case should not exceed 50 V DC.

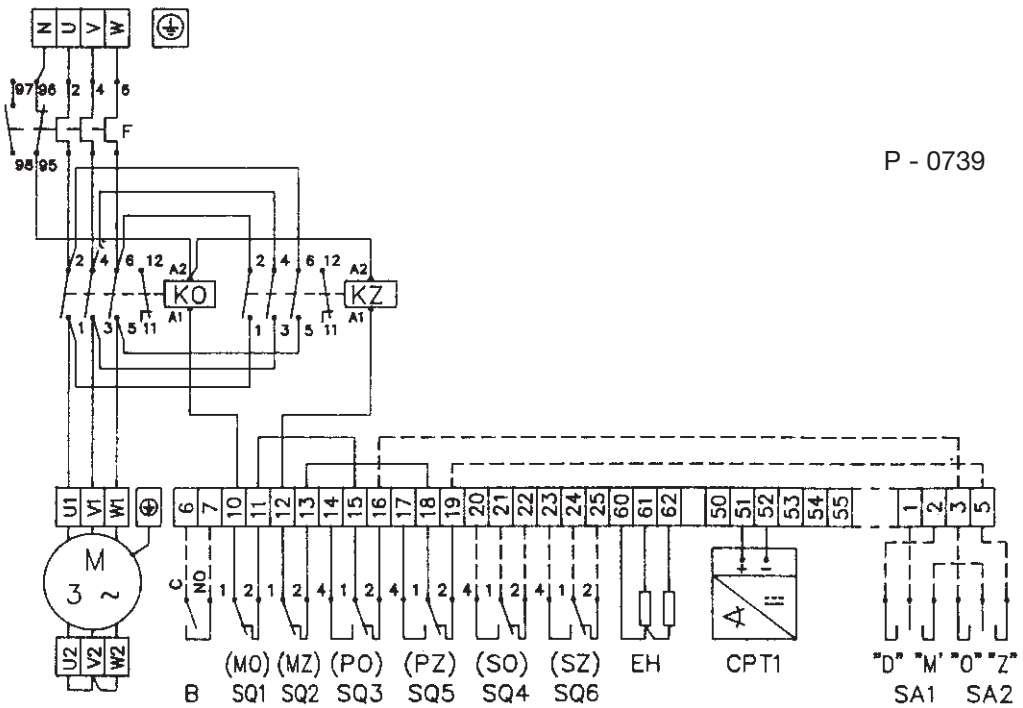
Wiring diagrams of **MODACT MTN Control** electric actuators with build-in contactor combination

Position transmitter: Potentiometer 2 x 100 Ω or no transmitter



P - 0673

Position transmitter: Current transmitter CPT 1/A 4-20 mA

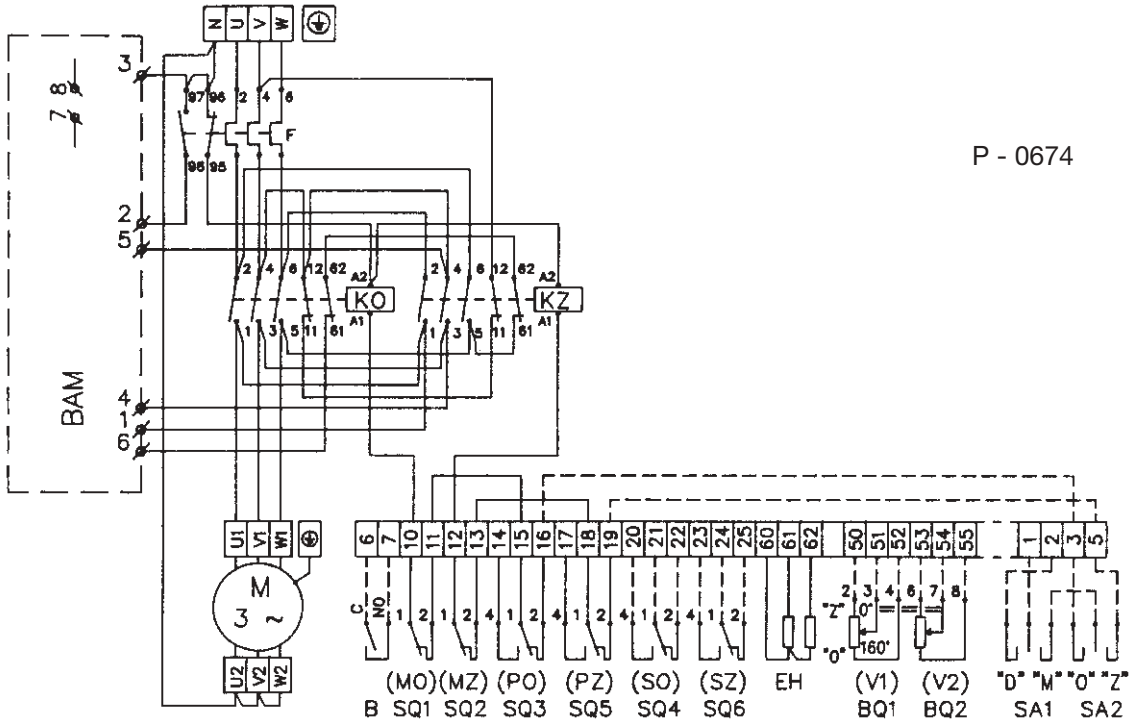


P - 0739

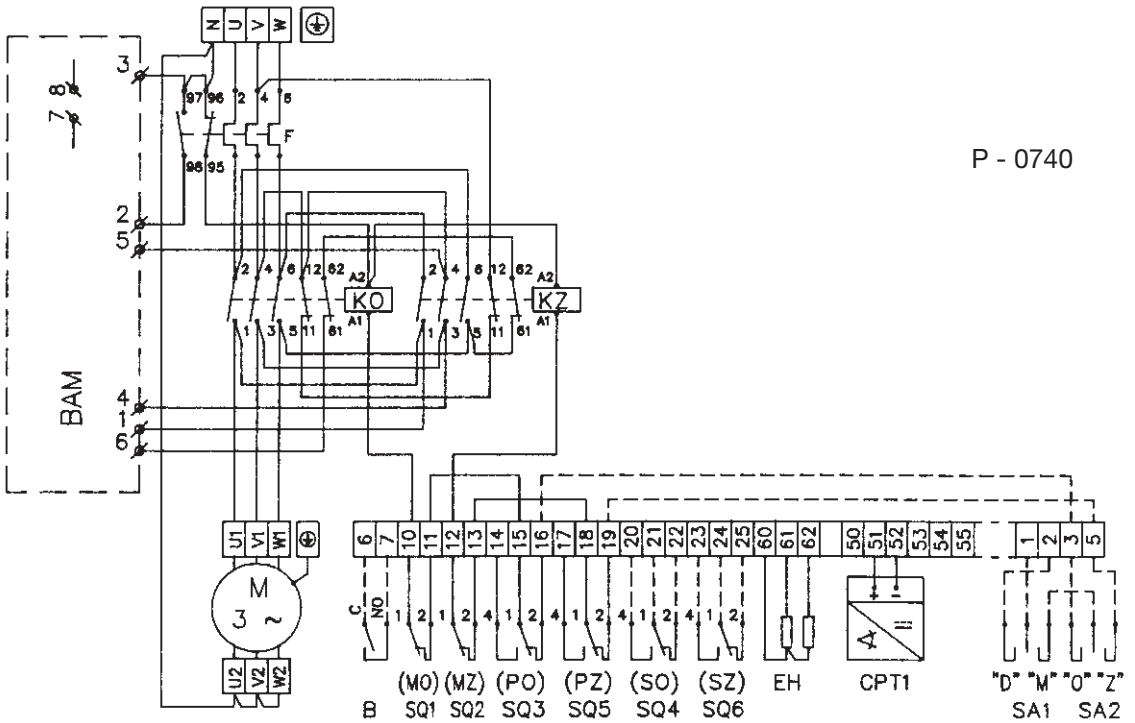
Note:
In the design variant with the CPT 1/A current transmitter, the user should provide for connection of the two-wire circuit of the current transmitter to the electric earth of the associated regulator, computer, etc. The connection should be made only at a single point in any section of the circuit outside the electric actuator. The voltage between electronics and the current transmitter case should not exceed 50 V DC.

Wiring diagrams of **MODACT MTN Control** electric actuators with build-in contactor combination and electronic brake BAM

Position transmitter: Potentiometer 2 x 100 Ω or no transmitter



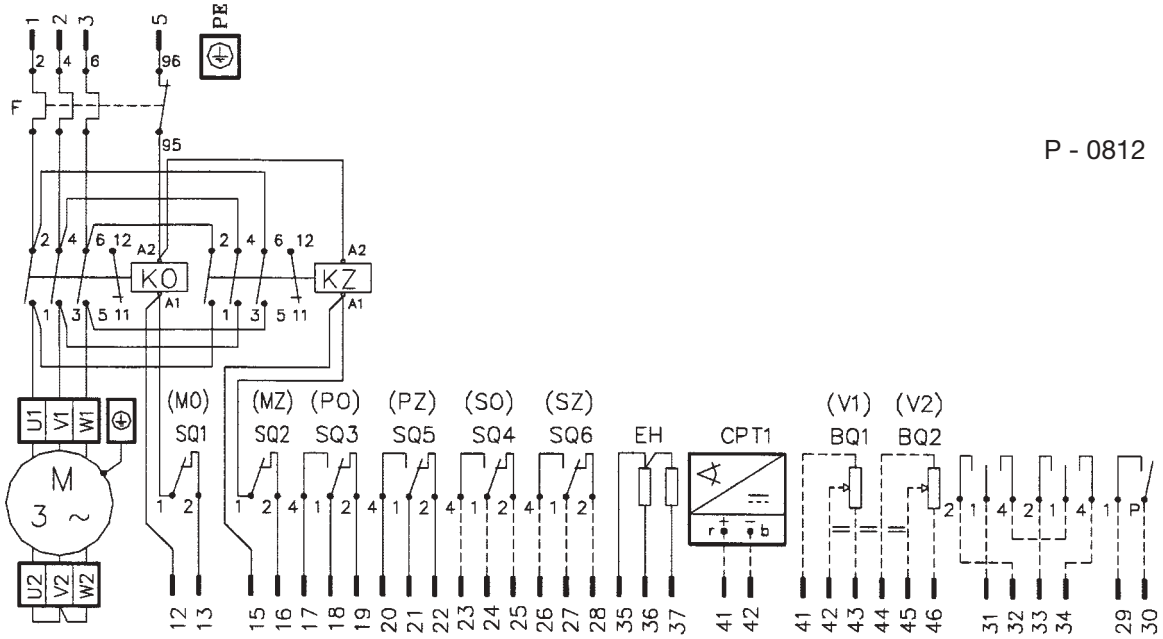
Position transmitter: Current transmitter CPT 1/A 4-20 mA



Note:
In the design variant with the CPT 1/A current transmitter, the user should provide for connection of the two-wire circuit of the current transmitter to the electric earth of the associated regulator, computer, etc. The connection should be made only at a single point in any section of the circuit outside the electric actuator. The voltage between electronics and the current transmitter case should not exceed 50 V DC.

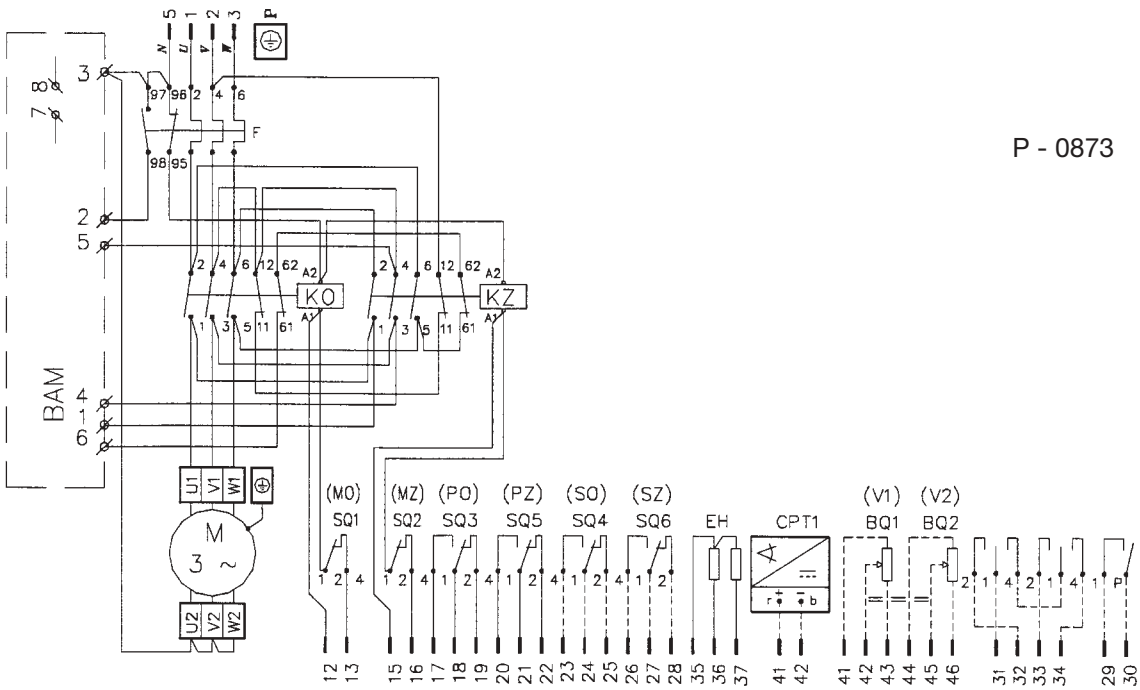
Wiring diagrams of **MODACT MTN Control** electric actuators with connector connecting

Design: contactor combination, thermal relay
Optional accessories: signalling switches, resistance or current position transmitter, local control, blinker



P - 0812

Design: contactor combination, thermal relay, dynamic brake
Optional accessories: signalling switches, resistance or current position transmitter, local control, blinker



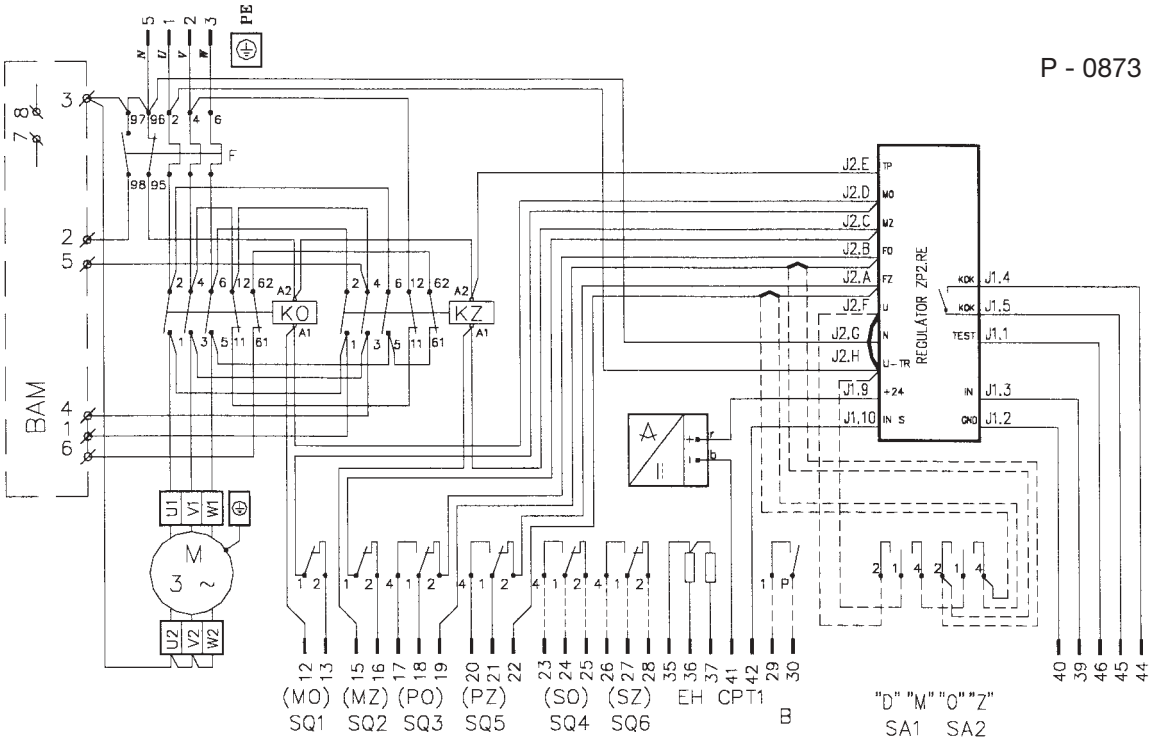
P - 0873

Note:
In the design variant with the CPT 1/A current transmitter, the user should provide for connection of the two-wire circuit of the current transmitter to the electric earth of the associated regulator, computer, etc. The connection should be made only at a single point in any section of the circuit outside the electric actuator. The voltage between electronics and the current transmitter case should not exceed 50 V DC.

Wiring diagram of **MODACT MTN Control** electric actuators

Design: eletronic regullator ZP2RE, current transmitter, contactor combination, thermal relay, dynamic brake
Optional accessories: signalling switches, local control, blinker.

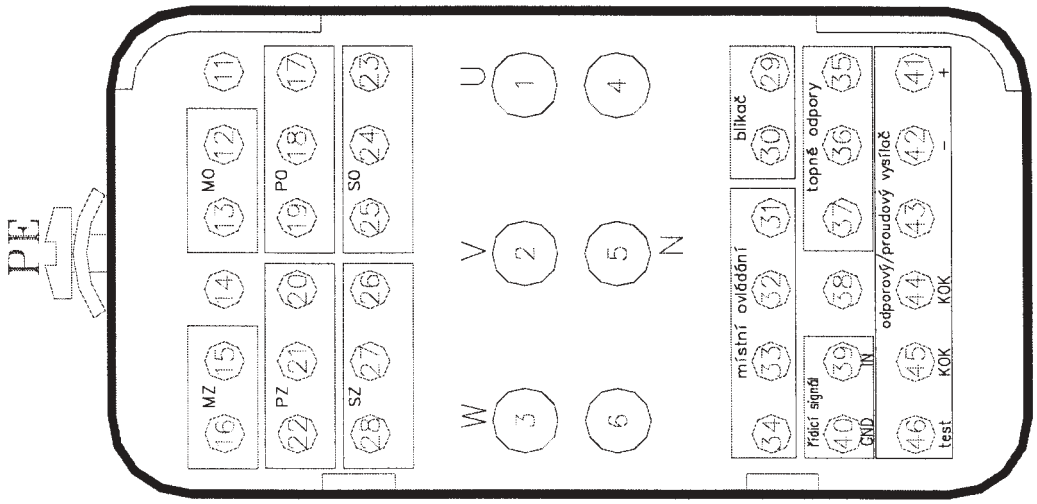
P - 0873



Notes:

1) According to this wiring diagram the actuators are connected in the versions with a block of local control as well as without local control. The connection of local control (SA1, SA2) is drawn as dashed lines. The version without local control includes connections drawn as solid bended line in this wiring diagram.
2) The feedback signal (pins 41, 42) can be exported to the control system provided that its galvanic separation from the output signal (pins 39, 40) is ensured. An ohmic resistor of max. 500 Ω can be inserted in the feedback signal circuit. If the feedback signal need not be exported the terminals 41, 42 on the cable socket must be interconnected.
3) The signal TEST (pin 46) can be activated by an external closing contact (connection with signal GND - pin 40). This signal need not be connected.
4) A failure signal can be exported from the terminals 44, 45. The terminals are galvanically separated from other circuits of the controller. A voltage of max. 24 V can be connected to these terminals; the switched-on output can be max. 1 W.

Distribution of signal on the connector pins:



ZPA PEČKY, a.s.

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

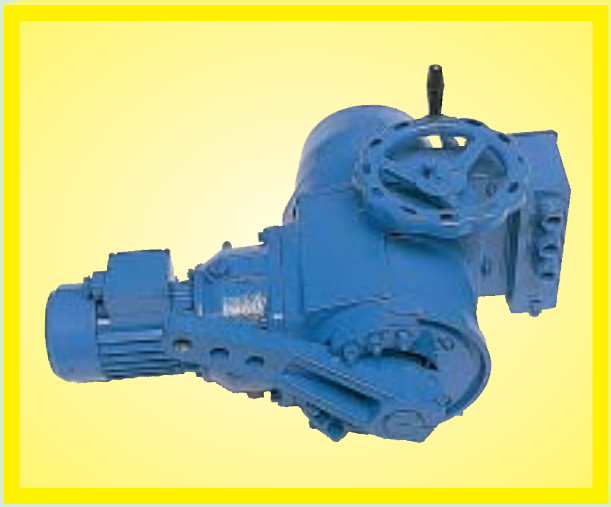
Modact Variant MPR
Electric part-turn lever actuators with a variable output speed

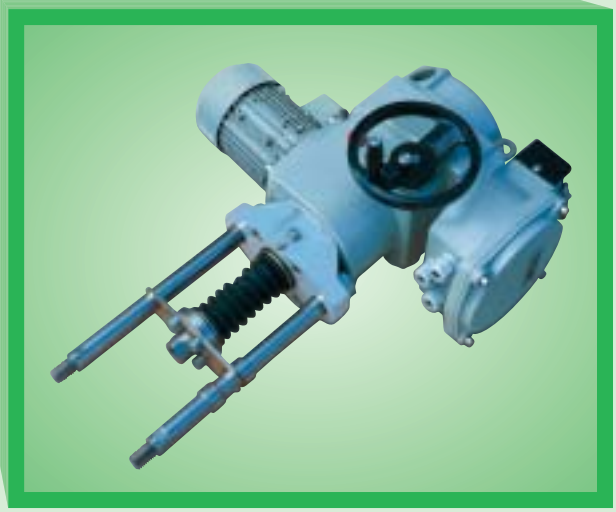
Modact Konstant MPS
Electric part-turn lever actuators with a constant output speed

Modact MTN
Electric linear thrust actuators with a constant output speed

Deliveries of assembled actuator + fitting (or MASTERGEAR gearbox) combinations

ZPA PEČKY, a.s.





tř. 5. května 166
289 11 PEČKY, Czech Republic
e-mail: zpa@zpa-pecky.cz
www.zpa-pecky.cz

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

tel.: +420 321 785 141-9
fax: +420 321 785 165
+420 321 785 167