

**Rotary single-revolution  
electric actuators  
for ball cocks and flaps**

## **KP MIDI**

**Type number 52 999**

**CATALOGUE  
+ ASSEMBLY SHEET**



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

# 1. APPLICATION

The **KP MIDI** electric actuators have been specially designed for actuating valves (ball and flap valves), louvers, air flaps and other devices for which they are in respect of their characteristics suitable.

# 2. OPERATING CONDITIONS

The **KP MIDI** electric actuators should withstand the effects of operating conditions and external influences, Classes AC1, AD7, AE6, AF2, AG2, AH2, AK2, AL2, AM-2-2, AN2, AP3, BA4 and BC3, according to IEC 364-3:1993.

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

**Class:**

- 1) AC1 – elevation above sea level  $\leq 2000$  m
- 2) AD5 – spouting water; water can spout in any direction  
AD7 – water occurrence – shallow dipping, possible sporadic partial or full coverage (*only MOP*)
- 3) AE4 – medium dustiness  
AE6 – strong dustiness (*only MOP*)
- 4) AF2 – occurrence of corrosive or polluting substances from atmosphere. Presence of corrosive polluting substances is significant.
- 5) AG2 – medium mechanical stress by impacts – common industrial processes
- 6) AH2 – medium mechanical stress by vibrations – common industrial processes
- 7) AK2 – serious risk of growth of vegetation and moulds
- 8) AL2 – serious danger of the occurrence of animals (*insects, birds, small animals*)
- 9) AM-2-2 – normal level of the signal voltage. No additional requirement.
- 10) AN2 – medium solar radiation with intensities  $> 500$  and  $\leq 700$  W / m<sup>2</sup>.
- 11) AP3 – medium seismic effects; acceleration  $> 300$  Gal  $\leq 600$  Gal.
- 12) BA4 – personal abilities. Instructed people.
- 13) BC3 – frequent contact with the earth potential. Persons coming frequently into contact with “live” parts or standing on a conducting base.

## 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 category of corrosion aggressiveness according to ČSN EN ISO 12944-2.

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

### 3. DESCRIPTION AND FUNCTION

The **KP MIDI (KP MIDI Control)** electric actuators consist of the following basic units:

- reversible synchronous motor with a permanently connected starting capacitor
- power gearing with a shaft, fitted with a square  $s = 14 \text{ mm}$
- electric outfit.

The power gearing consists of a pinion attached to the output shaft of the electric motor, spur gearings and a geared wheel coupled with the output shaft of the electric actuator. The output shaft is fitted with a square  $s = 14 \text{ mm}$  providing for connection to the driven shaft of valve. For control of the position-limit and signalling switches, adjustable cams are fitted at the other end of the output shaft, which is extended in length into the actuator control part.

Electric outfit consists of four microswitches of which two are used for tripping the actuator when the end positions of the output shaft have been reached and two can be used for the position signalling of the output shaft.

Outlets of the micro-switches and electric motor are connected to a-terminal board which serves for electric connection of the actuator to external circuits by means of a-cable with conductors of maximum cross-section  $1.5 \text{ mm}^2$ .

For sealing of inlet cables, the actuator is fitted with two cable bushings.

Protection against shock voltage is provided for by internal protective terminal.

The actuators can be fitted with anti-condensation heater.

### 4. TECHNICAL PARAMETERS

These instructions the user with installation, control, adjustment, and maintenance of the actuators **KP MIDI**. Electric installation, maintenance, and using of these drives must comply with valid regulations and directives concerning safe using in the given country.

Installation, maintenance, and repairs of the actuators can only be performed by particularly trained and/or experienced persons. In carrying out works, the instructions in the manual must followed. The user operating this device should be familiar with safety elements related to these operations.

Where necessary, the user must ensure proper protection of the drive against external effects. If you have any questions about safe using of the drives **KP MIDI** please contact ZPA Pečky a.s..

In case the drive is not installed immediately it should be stored in a dry environment until connected. If the actuator has been installed but is not connected electrically it is recommended to replace the plastic bushings by metallic ones and seal them with a PTFE tape.

ZPA Pečky a.s. does not assume any responsibility for damages at the place of installation if the covers have already been removed.

#### WARNING

It is prohibited to exert excessive force in manual opening or closing of valves. This could result in damaging the valve and/or the drive, or in jamming of movable part of the valve.

#### NOTES:

1 – Before installing the drive, check supply voltage.

2 – Before carrying out maintenance, disconnect the drive from supply voltage.

3 – After connecting the voltage, seal the cover and inlet holes to provide protection against penetration of water and dust.

4 – The angle of working position must be between  $0^\circ$  and  $180^\circ$ . The drive must not be installed upside down.

5 – Do not connect the drive if dangerous or explosive gases are present at the place of installation.

6 – Frequency of opening and closing is limited to every 5 min. Higher frequency is not allowed.

7 – In case that parallel run of several drives is required connect them with individual cables.

8 – Connect the earthing cable to the ground terminal inside the drive.

9 – The guarantee is provided in accordance with general business conditions.

### 5. LUBRICATION

Gears in the drive **KP MIDI** are closed and treated at the manufacturer with an appropriate lubricant for two-year operation.

### 6. POSITION CAMS AND SWITCHES - SETTING

The position Open – Closed is given by setting the position cams. As soon as particular cam closes the position switch, the motor switches off in a given position.

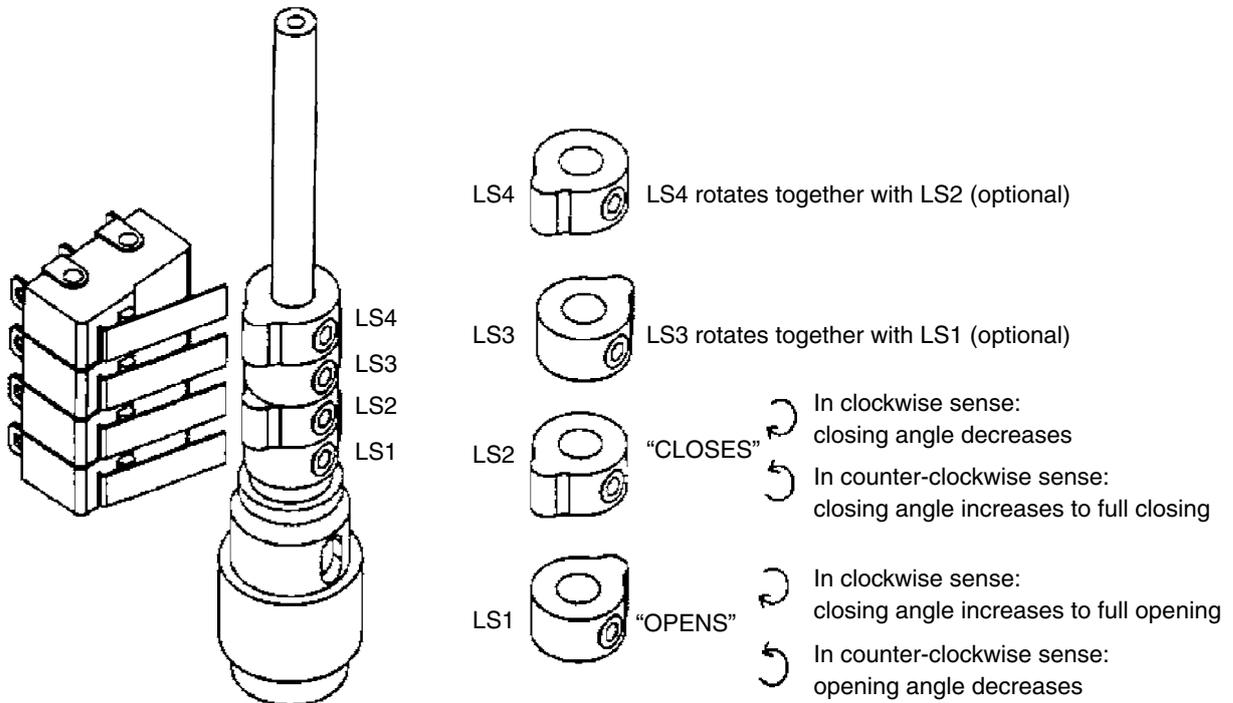
As a standard, the drive is fitted with four switches.

A hexagonal wrench 2.5 mm is used for setting the cams.

Both the cams and the switches should be checked before starting for being set to the given application.

In setting the switch/cam, exact electrical operation of the switch should be specified.

An error in checking or setting the switches and cams can result in the situation when these switches do not close and the motor does not switch off.

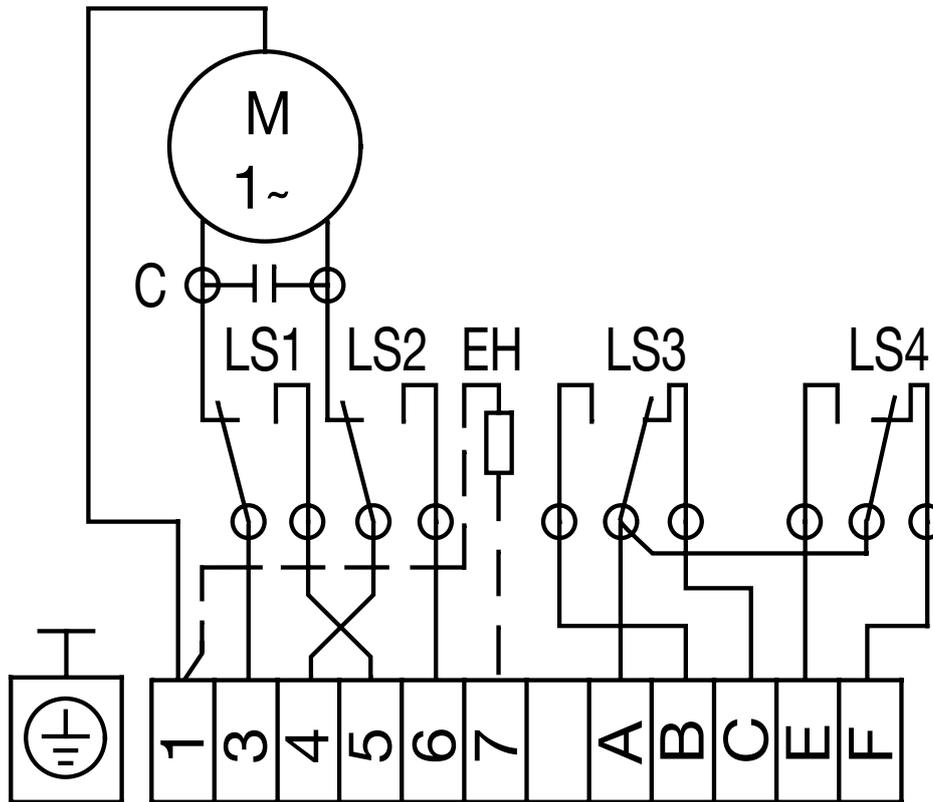


**Setting of cam tracks**

## POSSIBLE FAILURES AND THEIR REMEDY

Failure description	Possible failure	Remedy
Motor does not run.	<ol style="list-style-type: none"> <li>1. Are supply voltage and current OK?</li> <li>2. Are there any bubbles/blisters on the capacitor?</li> <li>3. Transmission gears loosened?</li> </ol>	<ol style="list-style-type: none"> <li>1. Check power supply.</li> <li>2. If so replace it for new one.</li> <li>3. Take the motor out for testing.</li> </ol>
Motor stops during running.	<ol style="list-style-type: none"> <li>1. Short circuit in power supply?</li> <li>2. Any foreign object in the piping?</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the connection.</li> <li>2. Check the piping for obstacles.</li> </ol>
Motor does not open/close fully.	<ol style="list-style-type: none"> <li>1. Loosened / non-coaxial cams?</li> <li>2. Valve shaft bended?</li> </ol>	<ol style="list-style-type: none"> <li>1. Use wrench to tighten / set the cams.</li> <li>2. Replace the shaft.</li> </ol>
Valve stops with motor running.	<ol style="list-style-type: none"> <li>1. Warn-out shaft?</li> <li>2. Warn-out nut in the drive?</li> <li>3. Broken shaft of the valve or gear shaft of the drive?</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the shaft.</li> <li>2. Replace the nut.</li> <li>3. Replace broken part.</li> </ol>
Motor overheating .	<ol style="list-style-type: none"> <li>1. Is electric voltage correct?</li> <li>2. High frequency of starts.</li> <li>3. Jammed motor shaft or bearing?</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the voltage.</li> <li>2. Check working cycle.</li> <li>3. Replace jammed parts.</li> </ol>

## Wiring diagram of **KP MIDI**, type number 52 999



### WARNING

Switching load of systems using switches at the actuator inputs must be min. 1 W and 24 V with time constant at least 10 ms in order to minimize sensitivity to contact vibrations.

### Technical parameters

Supply voltage	220 – 240 V <sub>AC</sub> , 50 – 60 Hz
Shifting time	13 s/90° (50 Hz), 12 s/90° (60 Hz)
Nominal torque	35 Nm
Starting current I <sub>start</sub>	1 A
Rated current I <sub>NGM</sub>	0,3 A
Protective enclosure	IP 67
Weight	2 kg
Power input of motor	10 W

1	ZERO	N
3	L OPEN	L OPEN
4	L CLOSE	L CLOSE
B	SIGNALIZATION O	LS OPEN
E	SIGNALIZATION Z	LS CLOSED
7	ANTI-CONDENSATION HEATER (OPTIONAL)	HEATER (OPTIONAL)

### Specification of type number

KP MIDI 52 999.xxxx			
Supply voltage (frequency 50 Hz)	230 V <sub>AC</sub>	52 999	.1xxx
Connection	square s=14 mm, depth 17 mm according to DIN 3337, ISO 5211 (F03/F05)		.x0xx
Shifting time [s/90°] (50 Hz)	13		.xx1x
Version with anti-condensation heater			.xxx1
Version without anti-condensation heater			.xxx2



Development, production and services of electric actuators and switchboards.  
Top-quality sheet-metal processing (TRUMPF equipment), powder paint shop.

## SURVEY OF PRODUCED ACTUATORS

### **KP MINI, KP MIDI**

Electric rotary (90°) actuators (up to 30 Nm)

### **MODACT MOK, MOKED, MOKP Ex**

Electric rotary (90°) actuators for ball valves and flaps

### **MODACT MOKA**

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

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

Electric rotary multi-turn actuators

### **MODACT MO EEX, MOED EEX**

Explosion proof electric multi-turn actuators

### **MODACT MOA**

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

### **MODACT MOA OC**

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

### **MODACT MPR VARIANT**

Electric rotary (160°) lever actuators with a variable output speed

### **MODACT MPS KONSTANT, MPSED**

Electric rotary (160°) lever actuators with a constant output speed

### **MODACT MTN, MTP, MTNED, MTPED**

Electric linear thrust actuators with a constant output speed

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



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