SCHISCHEK
EXPLOSIONPROOF

InMax - Revolution

Electrical, industrial rotary actuators - size M
On-off, 24..230 VAC/DC, 95° angle of rotation, potential free contacts,
30 Nm - 50 Nm with safety operation (spring return), with integrated thermal circuit limiter

InMax- 30 - F3
InMax- 50 - F3
InMax- 30 - SF3
InMax- 50 - SF3
InMax- 30 - BF3
InMax- 50 - BF3

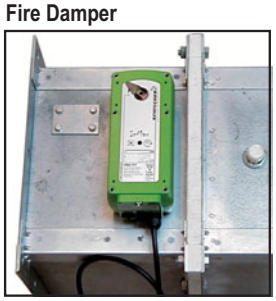
Subject to change

Compact - Easy installation - Universal - Cost effective - Safe

Type	Torque	Supply	Motor running time	Spring return	Control mode	Additional features	Wiring diagram
InMax- 30 - F3	30 Nm	24..230VAC/DC	40/60/90/120/150 sec. at 90°	< 3 sec. at 90°	On-off	-	SB 1.4/1.5
InMax- 50 - F3	50 Nm	24..230VAC/DC	40/60/90/120/120 sec. at 90°	< 3 sec. at 90°	On-off	-	SB 1.4/1.5
InMax- 30 - SF3	30 Nm	24..230VAC/DC	40/60/90/120/150 sec. at 90°	< 3 sec. at 90°	On-off	2 contacts (5/85°⊲)	SB 1.4/1.5
InMax- 50 - SF3	50 Nm	24..230VAC/DC	40/60/90/120/120 sec. at 90°	< 3 sec. at 90°	On-off	2 contacts (5/85°⊲)	SB 1.4/1.5
InMax- 30 - BF3	30 Nm	24..230VAC/DC	40/60/90/120/150 sec. at 90°	< 3 sec. at 90°	On-off	2 contacts (5/85°⊲) + circuit	SB 7.5/7.6
InMax- 50 - BF3	50 Nm	24..230VAC/DC	40/60/90/120/120 sec. at 90°	< 3 sec. at 90°	On-off	2 contacts (5/85°⊲) + circuit	SB 7.5/7.6
InMax- ... - CTM	Type as above but with AL - housing and amercoat paint, gearbox parts, cable gland and hollow rivet nickel-plated						

Application

Fire Damper



Ball valve

Throttle valve

Description size M

The new InMax actuators are a revolution for safety, fire and shut-off dampers other motorized applications in chemical, pharmaceutical, industrial and Offshore-/Onshore plants, for use in safe areas. IP 66 protection, small dimensions, only 9,5 kg weight, universal functions and technical data, an integrated heater guarantee safe operation even under difficult environmental conditions. High quality brushless motors guarantee long life.

All actuators are programmable and adjustable on site. Special tools or equipment are not required. Motor running times selectable or adjustable on site. The integrated universal power supply is self adaptable to input voltages in the range of 24 to 230 VAC / DC. The actuators are 100% overload protected.

InMax-...-F3 actuators are equipped with spring return fail safe function. Futher the **InMax-..-SF3** with integrated aux. switches for end position indication and the **InMax-..-BF3** with an additional circuit to connect an external passive potential free thermostat Type NormSafe. Standard shaft connection is a double squared direct coupling with 16 x 16 mm. Different accessories are available to adapt aux. switches, terminal boxes or adaptations for ball valves and throttle valves.

Highlights

- Industrial actuators
- Universal supply unit from 24 to 230 V - AC/DC
- Circuit for directly connection of a passive potential free safety thermostat
- 2 integral aux. switches , switching at 5° and 85° angle of rotation
- 5 different motor running times (40-60-90-120-150 sec./90°), adjustable on site
- spring return running time < 3 sec./90°
- On-off control with spring return function
- 30 - 50 Nm actuators in the same size (M)
- 100 % overload protected
- Compact design and small dimension (L × W × H = 287 × 149 × 116 mm)
- Direct coupling to the damper shaft with double-squared connection 16 × 16 mm
- 95° Angle of rotation incl. 5° pre-tention
- Robust aluminium housing (optional amercoat painting)
- IP 66 protection
- Simple manual override include + preparation for comfortable manual override
- Gear made of stainless steel and sinter metal
- Only 9,5 Kg weight
- Integral heater for ambient temperatures down to -40°C
- Integral safety temperature sensor
- Integral equipment for manual adjustment (push button, lamp, switch)
- Preparation for adaptable aux. switches (type InSwitch)
- Range of accessories

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Technical data	InMax-30-..F3	InMax-50-..F3
Torque motor	30 Nm	50 Nm
Torque spring return (F)	min. 30 Nm	min. 50 Nm
Dimension of external torque	minimum 15 Nm lower load reduce lifetime	minimum 25 Nm lower load reduce lifetime
Supply voltage/Frequency	24...230 VAC/DC, + 15 % / - 20% , self adaptable, Frequency 50...60 Hz +/- 20 %	
Dimension	max. starting currents see table "EL-M" (in acc. with voltage, $I_{start} >> I_{rated}$), max. 20 W blocking position, approx. 16 W for heater	
Protection class	class I (grounded)	
Angle of rotation and indication	95°, incl. ~ 5° pre-tention, mechanical value indication	
Working direction	selectable by left/right mounting to the damper/valve shaft	
Motor running time	40 / 60 / 90 / 120 / 150 sec. at 90° selectable on site	
Motor	brushless DC Motor	
Spring return (F)	spring return in the event of loss of power	
Spring return running time (F)	spring return in < 3 sec. at 90°	
Safety operations	min. 1.000 in acc. with construction of damper and ambient, consider minimum load	
Response time spring return	up to 1 sec. after power failure	
Control mode	On-off	
Intrinsic safe circuit	Additional circuit to connect a passive potential free thermostat as a safety sensor, e.g. type NormSafe in version **..-BF3**	
FireSafe connection	direct to the actuator with M12 fast connection	
Integrated aux. switches	2 aux. switches, switching at 5° and 85° Angle of rotation in types **..-SF3 and ..-BF3**	
Axle of the actuator	double squared 16 × 16 mm, direct coupling, 100 % overload protected	
Electrical connection	cable, ~1 m, diameter of wires 0,5 mm².	
Diameter of cable	~ ∅ 7,3 ... 9,6 mm acc. to type	~ ∅ 7,3 ... 9,6 mm acc. to type
Cable gland	M16 x 1,5 standard	
Manual override	Manual override only if supply voltage is cut, use delivered socket wrench, slow motion, enough torque/force is required	
	Attention: with manual operation of actuators with spring return danger of injury exists, with release/let go the socket wrench.	
Integral heater	integral heater, controlled, for ambient temperature down to - 40°C	
Housing material	Aluminium die cast housing, painted (optional in amercoat painting type InMax **...-CTM**)	
Dimensions	L × W × H = 287 × 149 × 116 mm, for diagramm see extra information “ME-M”	
Weight	~ 9,5 Kg Aluminium housing	
Ambients	storage temp. - 40..+ 70°C, working temperature - 40...+ 50°C, humidity in acc. with EN 60335-1	
Operation mode	100 % ED	
Self adjustment	if you select 40 sec. and 60 sec. mode for motor or rotation angle < 90° you need to start the self adjustment mode	
Maintenance	maintenance free, maintenance must be complied with regional standards, rules and regulations	
Wiring diagrams (SB)	**SB 1.4 / 1.5 / 7.5 / 7.6**	**SB 1.4 / 1.5 / 7.5 / 7.6**
Delivery	1 actuator, 1 m cable, double squared shaft connection 16x16 mm, 4 screws M 8 × 140, 4 nuts M 8	
	socket wrench for simple manual override	
Parameter at delivery	30 Nm, 90 sec./90°	50 Nm, 90 sec./90°

Certification	InMax actuators - size M
EMV	EMV-RL 89/336/EG
Low voltage	Low-voltage RL 73/23/EG
IP-Protection	IP 66, in acc. with EN 60529
Potential compensation	external PA-terminal, 4 mm²

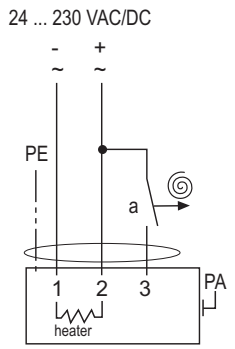
Accessories or special solutions - size M	
InMax-..-CTM	above listed types in Al-housing with amercoat painting, parts nickel-plated
InBox-...	Terminal boxes
InSwitch	2 external aux. switches, adjustable
MKK-M	mounting bracket for terminal boxes type InBox-... direct on actuator
HV-M	comfortable manual override for InMax actuators size M
Adaptations	various adaptations for dampers/valves on request
BFH-M	Mounting holder for actuators at fire danger area
NormSafe	Passive temperature Sensor.
AR-16-xx	Reduction of square damper connection from 16 mm to 14, 12

Electrical connection

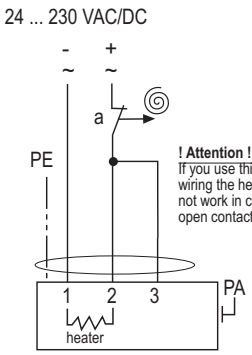
InMax actuators are equipped with a universal supply unit working at a voltage range from 24 to 230 VAC/DC. The supply unit is self adjustable to the connected voltage! The safety operation of the spring return function works if the supply voltage is cut or open the wire no 3.

Connection

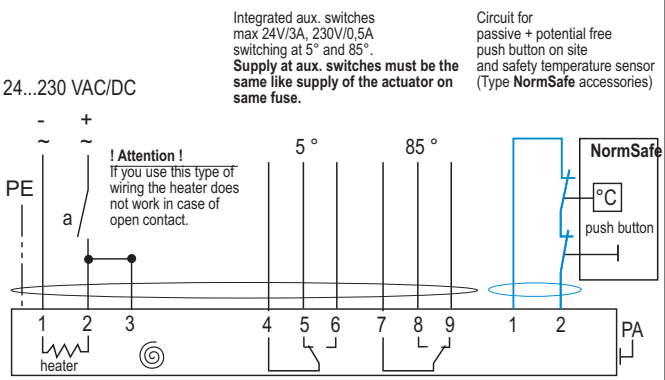
On / Off SB 1.4



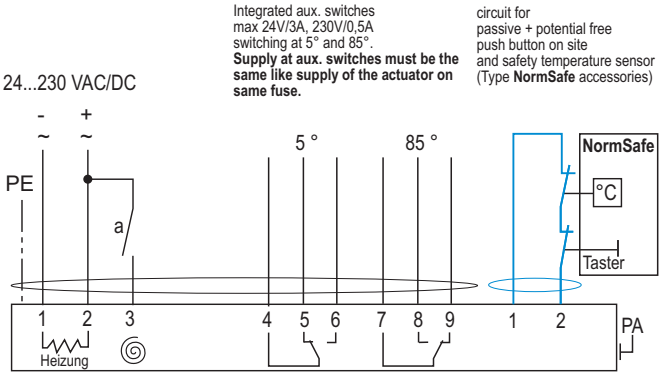
On / Off 1-wire SB 1.5



On-off 1-wire- spring return + circuit SB 7.5



On-off - spring return + circuit SB 7.6



EEx-i intrinsic safe data

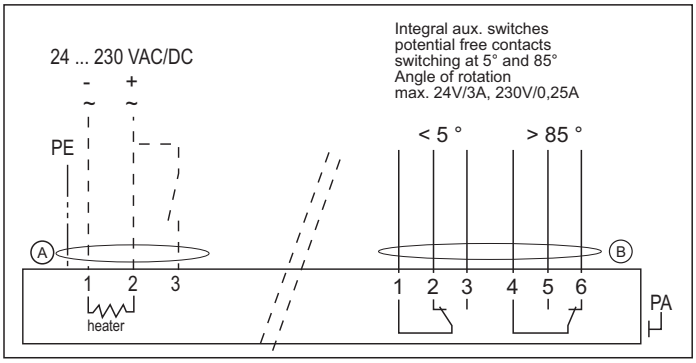
U_0 = 10,6 V
I_0 = 11 mA
P_0 = 30 mW
C_i = 0
L_i = 0

	IIC	IIB	IIA
C_0	830 nF	3,7µF	4,5 µF
L_0	2 mH	5 mH	10 mH

Attention!

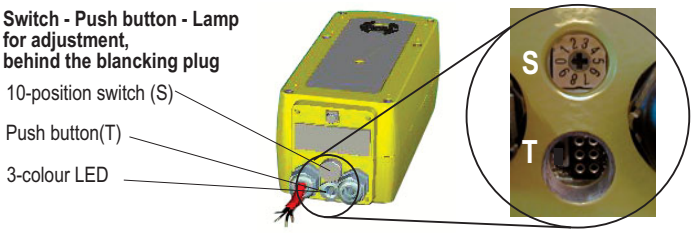
Never use actuators in this mode without external torque/force..

Wiring diagram InMax-..-.F3 with integral aux. switches



Parameter, Adjustment - Failure indication

Switch - Push button - Lamp for adjustment, behind the blancking plug



Parameter selection

Example: InMax-30-BF

Requested parameter:
Torque 30 Nm
Running time motor 90 sec/90°

Result: switch position (S) 02

Type	Torques	
InMax- **30-BF3** ▶	**30 Nm**	
▼	▼	▼
Running times	**Position of switch S**	
40 sec./90° ▶	00	05
60 sec./90° ▶	01	06
90 sec./90° ▶	02	07
120 sec./90° ▶	03	08
150 sec./90° ▶	04	09

Function, adjustment and parameter

A) Self adjustment of Angle of rotation:
Switch (S) into position 02, then push button (T) for minimum 3 seconds. The actuator will drive into both end positions to be adjusted.
LED indicates green flashing. The actuator must be in position off.
Adjusmtent time needs approx. (90 sec. On, 3 sec. Off). After that, switch S into position 00-09 in acc. with your required torque and running time.

B) Selection of running time and torque:
Put switch (S) into the correct/selected position in acc. to above table.
The selected parameter will work at next operation of the actuator.
Adjustment can be done even without supply voltage. If supply voltage is available turn switch only if actuator is not running.

C) Additional information for 3-pos operation:
a closed = actuator goes ON
a opened = spring return mode
Direction depends on left/right mounting of the actuator to the damper/valve.

D) Function of a passive sensor in the circuit:
If the sensor opens the circuit the actuator runs into its safety end-position with spring return.

Error indication

See extra information “EL-M”

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Mounting instructions and important information for operation and installation

Important information for installation and operation

A. Installation, commissioning, maintenance
The cable of the actuator must be installed in a fixed position and protected against mechanical and thermical damage. In acc. with operation InMax actuators are maintenance free. Nevertheless maintenace must comply with regional standards, rules and regulations.
The actuators must not be opened by the customer. For outdoor installation a protective housing against rain, snow and sun should be applied to the actuator, as well as a constant supply at terminal 1 and 2 for the integral heater.

B. Shaft connection, selection of running time, heater
InMax actuators are equipped with a direct coupling double squared shaft connection of 16 x 16 mm. The housing of the actuator is axially symmetrically built to select open/close direction of the spring return function by left/right mounting. In acc. to the actuator type 5 different motor running times can be selected on site. The integral heater is for ambient temperatures down to -40°C.

C. Spring return
Spring return function works if the supply voltage (terminal 1 or 2) is cut or open the wire 3. In the event of an electrical interruption, the spring returns to its end position.

D. Operation at an ambient temperature below - 20°C
See extra information “EL-M”.

E. Excess temperature
An internal thermostat guarantees the temperature class in the event of failure. If this thermostat is working the actuator must be sent to the factory.
InMax actuators are equipped with an additional temperature sensor to stop the actuator before reaching this max. temperature. In this case the failure must be eliminated immediately on site.

F. NormSafe
The actuator works only with the temperature sensor type NormSafe

G. Synchronous mode
To link two or more actuators together is not permitted.

Important information for routine test

For periodic inspection of fire dampers cut of the the supply line (cut off the current of the actuator)
The switch contact on NormSafe is only for test aims of actuators function.

Extra information "EL-M" (see additional data sheet)

extra technical information, versions of circuit diagrams and failure indication

Extra information "ME-M" (see additional data sheet)

extra technical information, dimensions, installation instruction and illustration

Mounting on air dampers with double squared shaft connection

Details see extra information “ME”.

Mounting of quarter turn valves

Details see extra information “ME”.

Safety temperature sensor - NormSafe

The safety thermostat type NormSafe is for use in circuits, directly connectable to InMax-...-BF actuators. The sensor switches at an ambient temperature of 72°C and starts the fail safe spring return function of the actuator

InSwitch - adaptable external aux. switches

InSwitch is an accessory to InMax actuators size S, fixing directly onto the actuator. InSwitch are aux. switches with with 2 potential free contacts, adustable on site. .

InBox - adaptable terminal box

For electrical connection of an InMax actuator. To adapt the InBox direct to the actuator housing an additional accessory **type MKK-M** is required.
InBox-3P
InBox-YS
InBox-BF

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InMax - extra information EL-M

The "EL"-data sheet contains additional information for InMax actuators of the size "M", for the optimization and simplification in regard to planning, installation and initial startup. It provides influences of external factors in reference to the safe initiation of the actuators, as well as technical references and problem solutions (error indication). With the error indication, functions can be examined and different error/problems can be adjusted locally.

- Power supply design
- Design of line cross section 24...48 VAC/DC
- Wiring alternatives for on-off, 3-pos, BF actuators
- Wiring alternatives for modulating actuators
- Use at ambient temperatures down to -20°C / - 40°C ( )
- Error indication - problem treatment/solution

For additional mechanical data have a look at "extra information ME-M"

Power input depending of supply voltage

Power supply design

The design of the on-site supply, depends on the selected motor running time and selected supply voltage. Accompanying values are "about values", since there can be construction unit dispersions within electronics. The power consumption in the blocking position is run time independently with max. 20 W. The power consumption for the heater is betwen 5 and 12 W. The heading is running only if the motor is in idle position! The initial starting supply voltage required by the actuators power supply unit is around 2,0 A for about 1 Sec. (Please consider this while concepting the cross section ot the supply line)

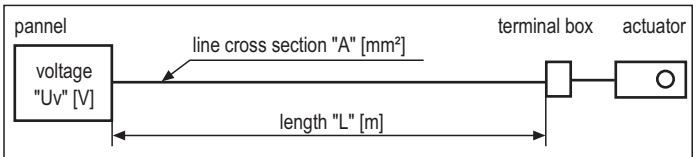
		Rated current in acc. with motor running time				
Voltage	**Current**	**40s**	**60s**	**90s**	**120s**	**150s**
230 V	I_{rated}	0,3 A	0,3 A	0,15 A	0,10 A	0,10 A
24 V	I_{rated}	1,0 A	0,7 A	0,5 A	0,4 A	0,4 A

		Rated current in acc. with motor running time (Spring return)				
Voltage	**Current**	**40s**	**60s**	**90s**	**120s**	**150s**
230 V	I_{rated}	0,4 A	0,3 A	0,15 A	0,10 A	0,10 A
24 V	I_{rated}	2,0 A	1,8 A	1,4 A	1,4 A	1,4 A

Dimensioning of the line cross section with 24 ....48 VAC/DC supply voltages

Dimensioning/Design of the supply line

On long distances between voltage supply and drive, voltage drops occur due to line resistances. As a consequence with 24 VAC/DC the actuator receives a too low tension and does not start. In order to prevent this, the cross section of the inlet line is to be designed/dimensioned accordingly. The accompanying formula allows the calculation of the necessary line cross section, perhabs provides the maximally permitted conduit length utilizing the existing line cross section. Alternatively the secondary voltage can be increased by selecting a transformer. For calcualtion purposses, following characteristics are essential:
UV = supply voltage in [V]
A = line cross section in [mm²]
L = conduit length in [m]
Factor 0.0714 = drive-specific factor
[Vmm²/m] (based on the electrical conductivity of electrolytic copper with a coefficient of 56m/Wmm²)



Formula for max. cable length "L" at cable cross section "A"

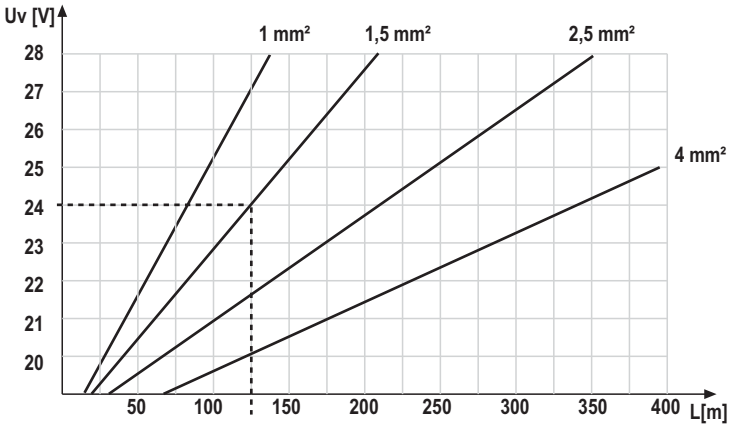
L = A • (Uv-18V) : 0,0714

Example: A = 1,5 mm², Uv = 24 V
Lengthof cable L = 126 m

Formula of needed cable cross section "A" at a cable length of "L"

A = 0,0714 • L : (Uv-18V)

Example: L = 250 m, Uv = 30 V
Cross section of A = 1,5 mm²

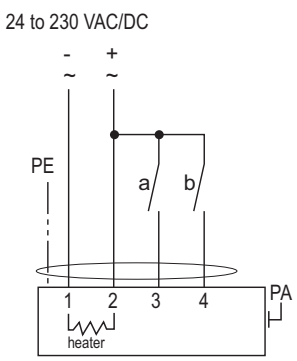


Example:
24 V power supply with wire diameter 1,5 mm² = 126 m

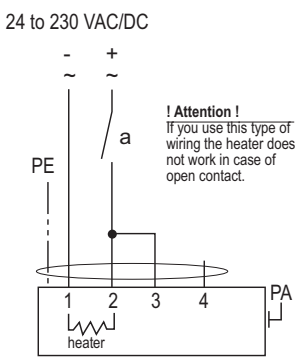
Wiring alternatives for on-off and 3-pos actuators with spring return

InMax-...-F, InMax-...-SF

On-off and 3-pos SB 1.0



On-off 1-wire SB 1.1



Attention!

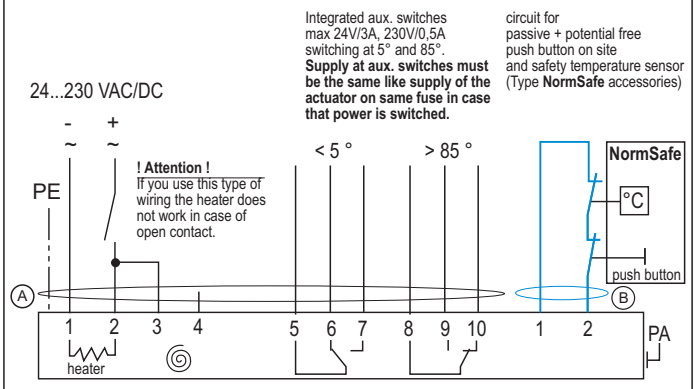
If 40 sec. or 60 sec. mode is selected for motor and/or spring return, the self adjustment of angle of rotation must be started.

Never use actuators without external torque/force min. 10 Nm.

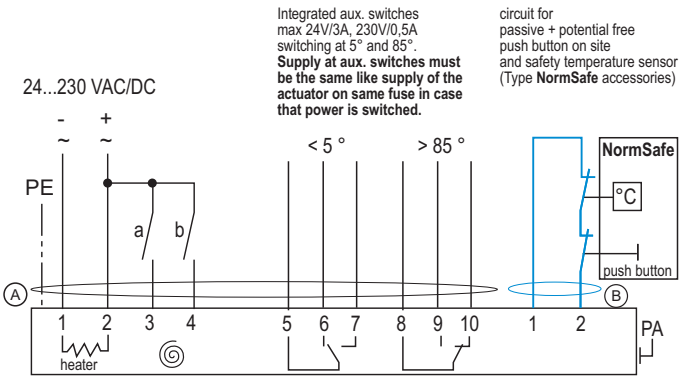
Wiring alternatives for BF actuators

InMax-...-BF

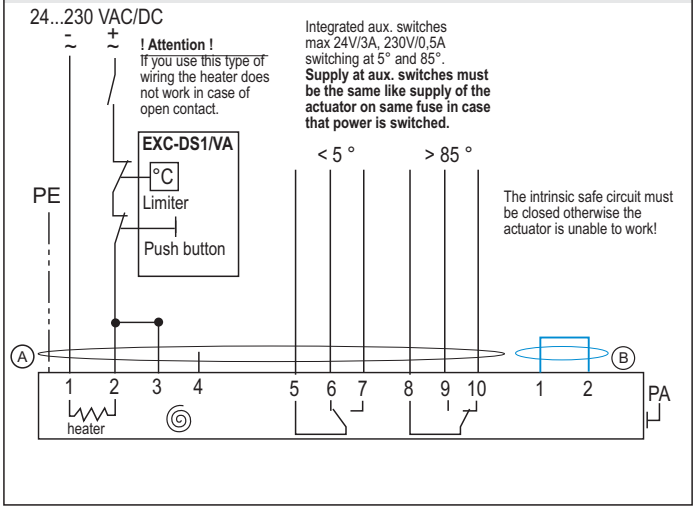
On-off 1-wire - spring return + circuit for thermal trigger SB 7.3



O-off/3-pos - spring return + circuit for thermal trigger SB 7.4



On-off 1-wire - spring return + EEx-d limiter SB 7.5



Achtung!

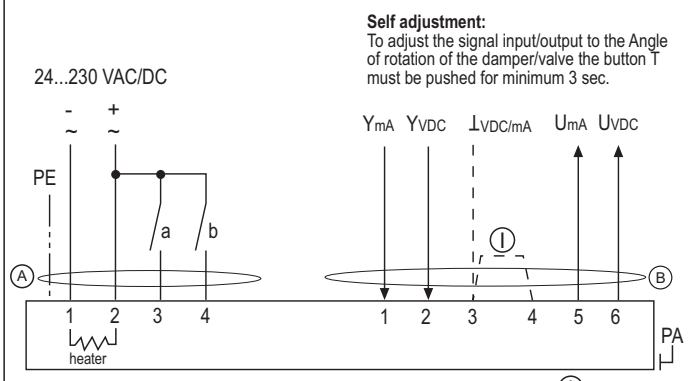
If 40 sec. or 60 sec. mode is selected for motor and/or spring return, the self adjustment of angle of rotation must be started.

Never use actuators without external torque/force min. 10 Nm.

Wiring alternatives for modulating actuators with or without spring return

InMax-...-Y..

Modulating or 3-pos with/without spring return — SB 4.0

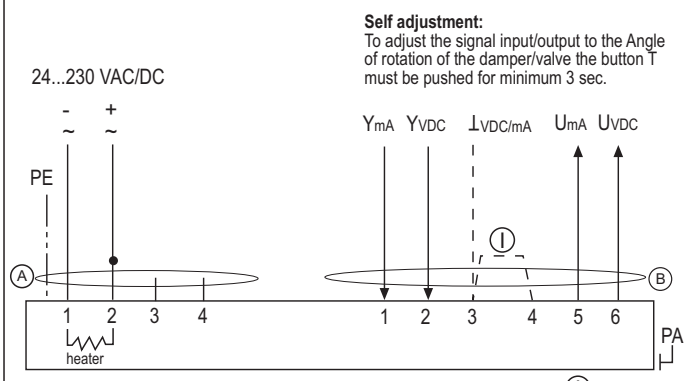


Self adjustment:
To adjust the signal input/output to the Angle of rotation of the damper/valve the button T must be pushed for minimum 3 sec.

Reverse function: (I)
bridge 3--4 reverse input and output signals.

Function of switch a and b:
- **a** closed, On (Off) - in acc. to left/right mounting ot the actuator
- **b** closed, Off (On) - in acc. to left/right mounting ot the actuator

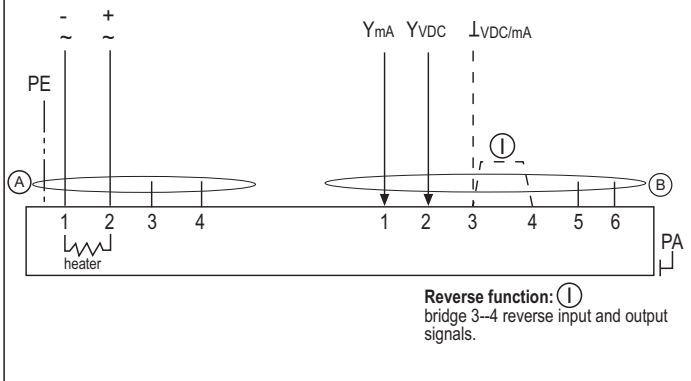
Modulating with/without spring rturn — SB 4.1



Self adjustment:
To adjust the signal input/output to the Angle of rotation of the damper/valve the button T must be pushed for minimum 3 sec.

Reverse function: (I)
bridge 3--4 reverse input and output signals.

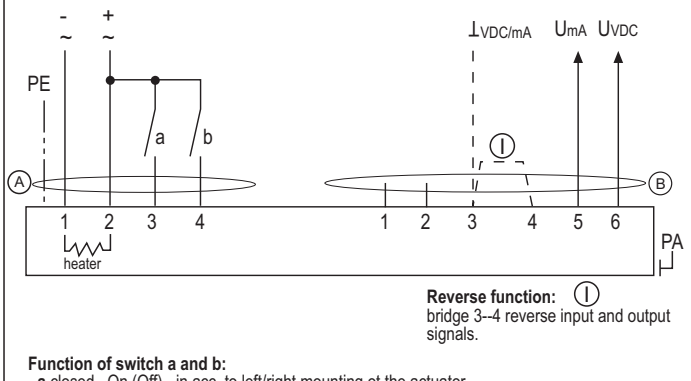
Modulating with/without spring return, no feedback — SB 4.2



Self adjustment:
To adjust the signal input/output to the Angle of rotation of the damper/valve the button T must be pushed for minimum 3 sec.

Reverse function: (I)
bridge 3--4 reverse input and output signals.

3-pos with/without spring return, plus feedback — SB 4.3



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Over temperature, 3-pos-operation, heating by low ambient temperatures

I. Temperature rise
While operating the actuator following parameters have to be aligned:
At overload resp. temperature rise the actuator will remain functionless until cooling.
During cooing the LED is red.

II. 3-pos operation
Actuators are in the best way suitable for the 3-pos operation.To protect such elements as gears and mounting elements against harmful influences like minimum pulse time, actuators are protectet via internal electronics. The internal electronic permits 20 impulses with < 0.5 > sec. cyclic duration, afterwards at least
1 impulse > 1 sec. must follow. If clocked with more than 20 impulses each < 1 sec. the actuator will adjust into a suspend mode.There after a reset is mandadory and will be achieved by briefly switching of the supply voltage for about 2 sec..The controll unit has to be parameterized in order to be set within the above mentioned duration limits.

III. Use at low ambient temparature below - 20°C
All actuators are equipped with a regulated integrated heating device designed for employments down to -40°C ambient temperature.
The heater will be supplied automatically by connecting the constant voltage supply on the clamps 1 and 2.
Following parameters are to be considered by ambient temperaure < 10°C:
1. After mounting the actuator must bei immediately electrically connected.
2. The actuator will only be activated after the operating temperature has reached at least -20°C .
3. The adjustment options are only ensured after this heating up period.

IV. Mechanical protection
1. The actuator must be operated with an outside load of at least 10 Nm.
2. After installing the actuator to the damper/armature an automatic alignment has to be accomplished, in order to obtain a "gentle blockade/stop". This function protects the damper/armature by reducing the end positions/blockade speed in order to avoid mechanical overload. The actuator alignes specifically once with 90 Sec/90° onto each position, recognizes the blockade position in order to reduce the motor performance during operation briefly before reaching the end /blockade position.

Error indication

	Error/Symptom	Reason	Solution
01	Actuator does not work LED does not lights	● No power supply attached	● Attache power supply and turn on
		● The actuator is operated beyond ex-prevention ambient temperature specifications and the internal temperature sensor did irreversibly shut down operations	● Because of inadmissable operation the actuator drove out of safety relevant reasons into an irreversible condition and must be exchanged. Accompanying new installation the ambient temperature has to be reduced accordingly
02	Actuator does not work LED ligths red	● The actuator is operated by a too high ambient temperature and the internal temperature sensor responded	● Shut off actuator and let temperature decrease, reduce ambient temperature by suitable measures e.g. ventilation or other mounting position of the actuator
03	Actuator does not work LED lights green	● 3-Pos control signal is wired on both entrances	● Readjust/correct circuit
		● Required torque is greater than actuators torque	● Adjust a higher torque at the actuator if possible otherwise exchange for a type with higher torque.
		● Control signals are not attached or attached on a wrong conductor	● Examine rule and adjusting signal in accordance with attached diagram
		● Actuator is incorrect mounted and is blocked by an external stop unit	● Dismount actuator and testdrive without load for operability. Install actuator accordingly that the power transmissions runs without external blockade or torsion
		● Actuator is clocked with more than 20 impulses <0,5 per sec. and therefore adjusted into suspend mode	● Switch off supply voltage for at least 2 sec. thereby a reset is conducted Readjust controller in order to extend control pulses
		● Interchanged supply lines	● Wire 1 must be (-, N) and wire 2 (+, L)
04	Acuator does not work LED is red blinking	● The actuator has been mounted by temperatures of less than -20°C and did not reach is operating temperatur of at least -20°C.	● Ensure that a constant voltage supply on conductor 1--2 is existing. ● Wait until the required operating temperature is achieved by the actuators internal heating system.The actuator will start operating independently
05	Y-drive in the 3-pos mode can not gear into intermediate positions	● The conversion of constant mode on 3-pos-modus was not set	● Recalibrate the actuator in accordance with assembly instructions
06	Actuator sits diagonally on the squared damper shaft	● The actuators have an angle of rotation of 95° inclusive 5° pre-tention. While assembling the pre-loading was not considered	● Dismount actuator of the damper, use the enclosed socket wrench to draw up approx. 5° over the hand operated control device before remounting on the damper shaft. Consider additional information ME-M of the assembly instructions
07	A modulating actuator (Y) works with reduced angle of rotation and already reaches its end positions before 0 V/4 mA, respectively before 10V/20mA.	● At start up no self adjustment of angle of rotation was accomplished	● Accomplish self adjustment of angle of rotation in accordance with assembly instruction
08	LED flashes irregularly and actuator does not work	● Actuator does not receive sufficient supply voltage	● Increase line cross section or increase tension at the transformer/power suply unit
		● Cable to long, voltage drop in the supply line to large	● Increase line cross section or increase tension

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InMax - extra information ME-M

The "ME-M"-data sheet contains additional information for InMax actuators of the size "M", for the optimization and simplification in regard to planning, installation and initial start up. It provides influences of external factors in reference to the safe initiation of the actuators. In particular it represents the installation, as well as different dampers, fire dampers and armatures. Additionally describing different accessory elements and their mounting to the actuator.

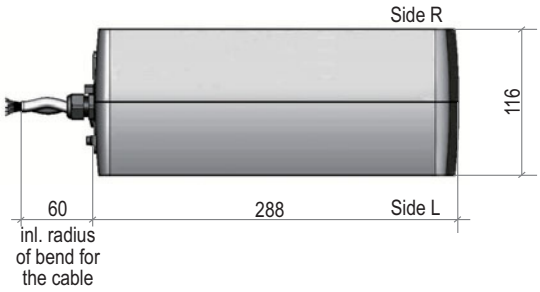
- Dimension, drill template
- Control elements: switch - push button - LED
- Outdoor installation
- Mounting using form-fitting shaft connection (square shaft)
- Mounting on butterfly valves and ball valves
- Mounting InBox, InSwitch

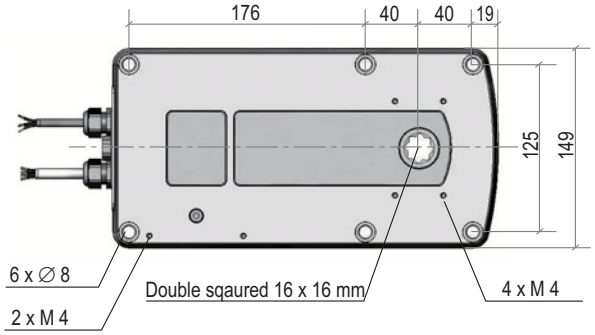
For additional electrical data have a look at "extra information EL"

Dimensions - drill template

Dimension size M

Dimension in mm



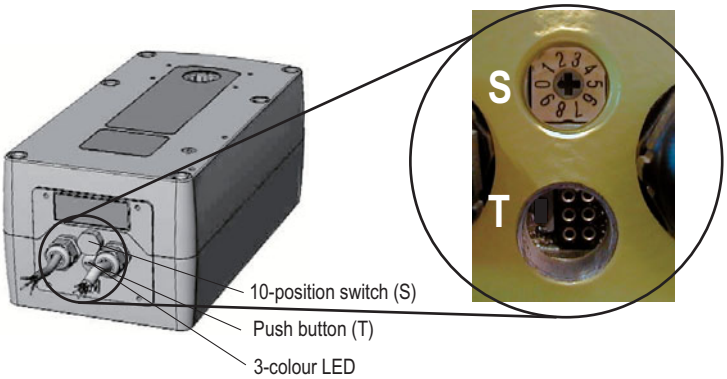


Control elements: switch - push button - LED

Specification

All InMax actuators are equipped with a 10 position switch a push button and a multicolor LED calibration. These control elements are to be found cable-laterally behind the two middle sectioned dummy plugs. For operation these must be removed. The calibration can be achieved despide lining up tension at the actuator. It has to be of great concern that the dummy plugs must be rescrewed in order to comply with the IP-protection class. The operation of the switch and button has to be done by means of a small screwdriver. Force with strong pressure and /or rotation is to be avoided in any case, since otherwise control electronics can be damaged irreparably. By bad visibilities a flashlight should be used. Attitudes of torque and running time can be achieved also before mounting. The adjustment of angle of rotation can be started only with an outside load and accurate mounting.

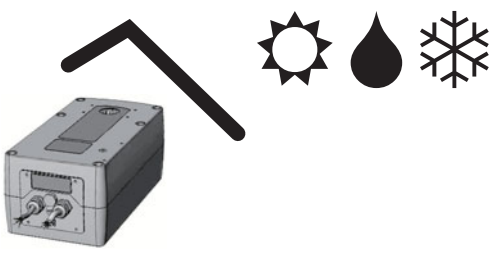
Switch - push button - LED for programming, behind dummy plug



Outdoor installation

Specification

For outdoor installation it has to be certain that the actuator is protected against direct sun exposure (heat and UV), rain and snow by employing an enclosure roof. Supply voltage is to be applied immediately after mounting in order to assure integrated heating at start. Since explosion proof actuators must have internal safety temperature limiters, these may not be exposed neither at storage nor during operation to a too high temperature. Otherwise the limiters could respond and switch of the actuator irreversibly.



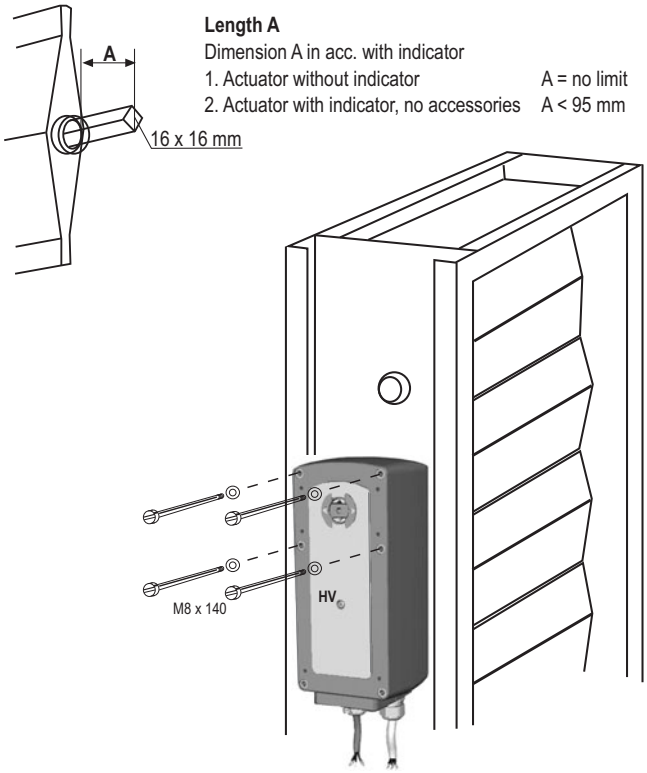
Mounting instruction for InMax actuators size M on air dampers

Specification

InMax actuators size M are equipped with a 16 x 16 mm (double square) shaft connection. The form-fitting shaft connection is the securest connection between damper shaft . The actuator will be connected firmly by means of four screws M 8 x 140 (scope of supply) to the damper.

Form fitting mounting on square damper shaft

Dimension damper shaft



Length A

Dimension A in acc. with indicator

1. Actuator without indicator	A = no limit
2. Actuator with indicator, no accessories	A < 95 mm

4 screws M8 x 140, as well as a socket wrench, are part of delivery for InMax actuators size "M".
For damper shafts 14 x 14 or 12 x 12 mm reducing bush are optional available.

Mounting instructions form-fitting shaft connection

It is to be considered that the actuators have a total angle movement of approx. 95° in order to realize a pre-tention on the damper. Therefore the actuator sits tilted on the damper shaft. In order to prevent this and to assure pre-tention to the damper the driving shaft has to be adjusted mechanically before connecting to the damper shaft.
The provided socket wrench serves for the mechanical adjustment over the hand-operated control socket HV. The actuators are axially symmetrically developed. In case of spring return function the safety postion must be selected by turning the actuator 180°.

Mounting:

1. Affix tap hole M8 (in accordance with drill template) on the damper or to a mounting bracket.
2. Adjust drive shaft of the actuator with the socket wrench that the drive stands perpendicular to the damper before pluging actuator on to the damper shaft.
3. Plug actuator onto damper shaft and fix diagonally with 2 screws.
4. Remove the socket wrench.
5. Pivot and tighten the remaining screws.

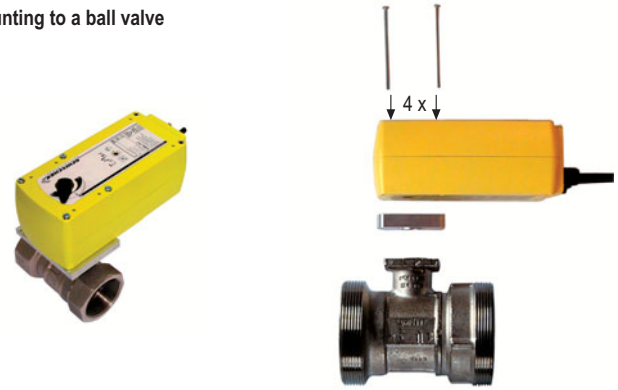
Note: the drive shaft is selflockingly produced and may only be mechanically adjusted either with the provided socket wrench or the optional accessory "HV-M" manual override. External applied force to the shaft can lead to mechanical damage of the actuator.

Mounting instructions for InMax actuators size M on butterfly valve and ball valve

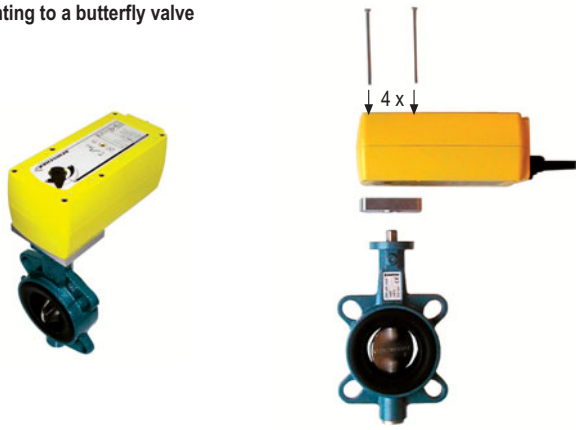
Specification

InMax actuators of the size M are equiped with a 16x16 mm (double square) form-fitting shaft connection. For mounting to butterfly valves or ball valve a special mounting bracket in acc. with DIN EN ISIO 5211 is required. Since this standard provides only certain basic conditions there can be substantial geometrical differences between armatures which require a special adaption.

Mounting to a ball valve



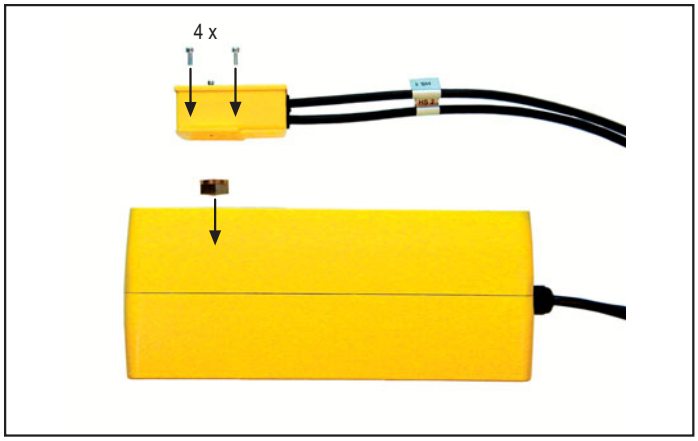
Mounting to a butterfly valve



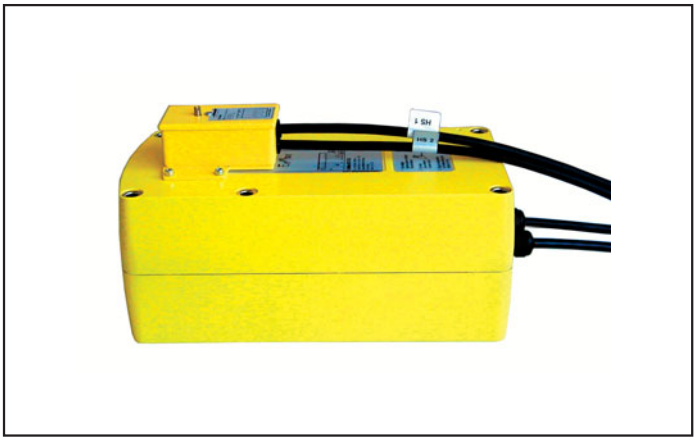
Mounting of InSwitch accessory to the actuator

Specification

1. Put the squared connection part to the actuator, then mount InSwitch and fix it with 4 screws



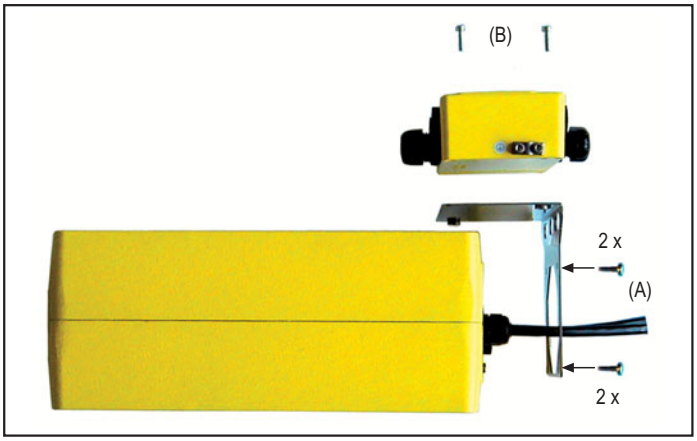
2. InMax with mounted InSwitch



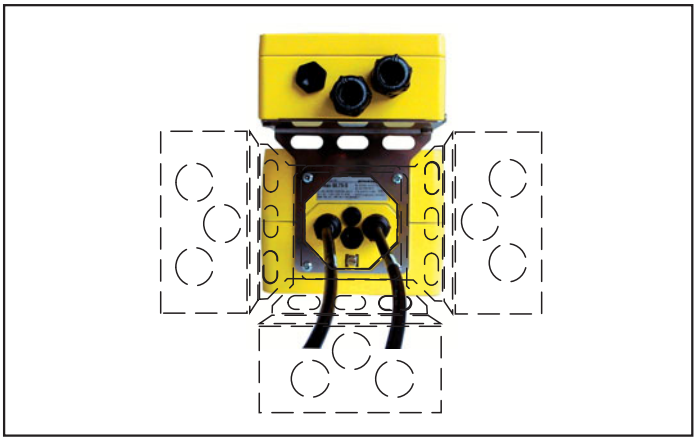
Mounting of terminal boxes type InBox via mounting bracket type MKK-M to the actuator (accessory)

Specification

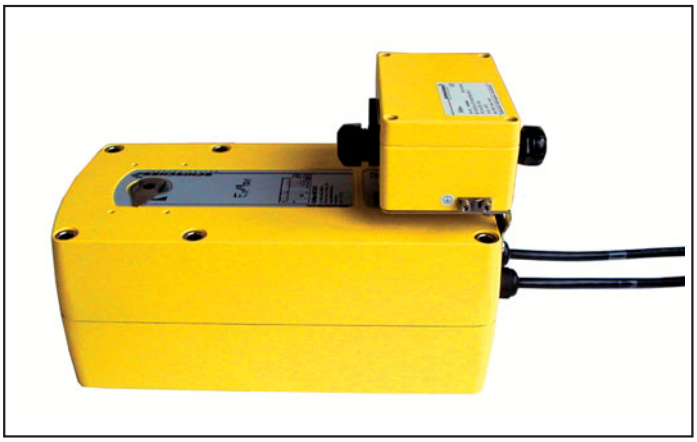
1. Screw mounting bracket MKK-S to the actuator (A)
then terminal box to the mounting bracket (B) screws



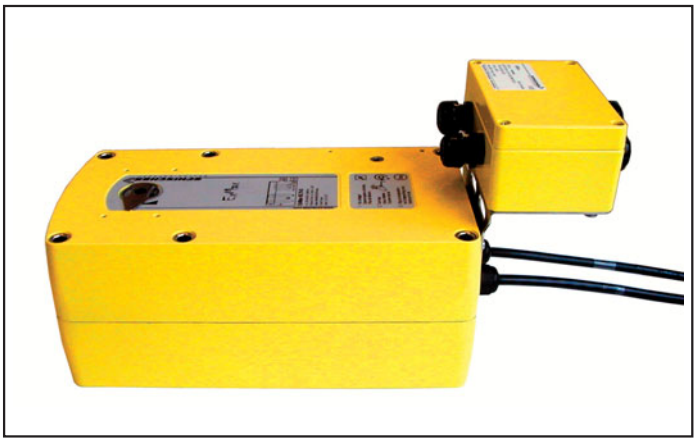
Mounting bracket MKK-M can be mounted every 90°



Terminal box mounted above the actuator



Terminal box mounted beside the actuator



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