



## ExRun Valve actuators

Electrical, explosion proof linear actuators – 500 N to 10,000 N  
On-off / 3-pos. control mode and 3-pos.-U with feedback  
24...240 VAC/DC, 5...60 mm adjustable stroke  
ATEX tested in acc. with directive 2014/34/EU for zone 1, 2, 21, 22

**ExRun - ...****ExRun - ... - U****ExRun - ... - CTS**

Subject to change!

**Compact. Easy installation. Universal. Cost effective. Safe.**

Type	Force	Supply	Motor running time	Control mode	Feedback	Wiring diagram
ExRun- 5.10	0,5 kN / 1,0 kN	24...240 VAC/DC	2 / 3 / 6 / 9 / 12 s/mm	On-off, 3-pos.	–	SB 1.0
ExRun- 25.50	2,5 kN / 5,0 kN	24...240 VAC/DC	2 / 3 / 6 / 9 / 12 s/mm	On-off, 3-pos.	–	SB 1.0
ExRun- 75.100	7,5 kN / 10,0 kN	24...240 VAC/DC	4 / 6 / 9 / 12 / 15 s/mm	On-off, 3-pos.	–	SB 1.0
ExRun- ... - U	Types as above with additional feedback			On-off, 3-pos.	0...10 V / 4...20 mA	SB 5.0
ExRun- ... - CTS	Types as above with aluminium housing and seawater resistant coating (exterior parts in stainless steel, cable glands brass nickel-plated)					

### Product views and applications



### Description

ExRun valve actuators are the new generation of electrical, explosion proof adjustment and control valves and other motorized applications for HVAC systems in chemical, pharmaceutical, industrial and offshore/onshore plants, for use in Ex-areas zone 1, 2 (gas) and zone 21, 22 (dust).

Highest protection class and IP66 protection, compact dimensions, little weight, universal functions and technical data and 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 and forces, according to the actuator type, are selectable or adjustable on site. The integrated universal power supply is self adaptable to input voltages in the range of 24...240 VAC/DC. The actuators are 100 % overload protected and self locking. The modular concept offers the possibility to mount adjustable end switches for signalization.

...Run-...U actuators have an additional 0...10 V / 4...20 mA analogue output.

### Highlights

- For all type of gas, mists, vapours and dust for use in zone 1, 2, 21 and 22
- Universal supply unit from 24...240 VAC/DC
- Integrated junction box
- Motor running times 2–3–4–6–9–12–15 s/mm, acc. to type
- Control mode: On-off, 3-pos., 3-pos.-U (with 0...10 V / 4...20 mA feedback)
- Forces 500–1000–2500–5000–7500–10000 N, acc. to type
- Feedback gear unit, adjustable in steps 10 / 20 / 30 / 60 mm
- Mechanical stroke limitation, 5...60 mm stroke adjustable
- 100 % overload protected and self locking
- Compact design and small dimensions
- Robust aluminium housing (optional with seawater resistant coating)
- IP66 protection
- Manual override included + preparation for comfortable manual override
- Weight ~ 7 kg
- Integral safety temperature sensor
- Status indication by LED



ExRun-...

ExRun-...-U

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 EXPLOSIONPROOF

Special option

...-CTS

Technical data	ExRun- 5.10	ExRun- 25.50	ExRun- 75.100
Force (nominal)	0,5 / 1,0 kN selectable	2,5 / 5,0 kN selectable	7,5 / 10 kN selectable
Blocking force in end position *	~ 1,2 / 1,8 kN	~ 4 / 7,5 kN	~ 10 / 12,5 kN
Supply voltage / frequency	24...240 VAC/DC, $\pm 10\%$ , self adaptable, frequency 50...60 Hz $\pm 20\%$		
Power consumption	max. starting currents see ① Extra information (in acc. with voltage, $I_{start} \gg I_{rated}$ ), 2 A inrush current		
Protection class	Class I (grounded)		
Heater consumption	~ 16 W (motor is not running at this moment), turns on automatically at low ambient temperatures		
Stroke	5...60 mm (adjustable)		
Motor running times (selectable)	2 / 3 / 6 / 9 / 12 s/mm	2 / 3 / 6 / 9 / 12 s/mm	4 / 6 / 9 / 12 / 15 s/mm
Motor	Brushless DC motor		
Control mode	On-off and 3-pos. in acc. with wiring, selectable on site		
Electrical connection	Ex-e junction box incl. terminals 0,14...4 mm <sup>2</sup>		
Cable gland	M20 x 1,5 mm, II2GD Ex-e approved, cable diameter Ø 6...13 mm		
Manual override	Change from motor to hand mode with red turn-switch on the side, use Allen key's top side, max. 5 Nm		
Housing material	Aluminium die-cast housing, coated. Optional with seawater resistant coating (...-CTS)		
Dimensions (L x W x H)	~ 208 x 115 x 254 mm (types $\leq 5$ kN), ~ 208 x 115 x 298 mm (types $\geq 7,5$ kN), for diagrams see ① Extra information		
Weight	~ 7 kg (standard version without adaption)		
Ambients	Storage temperature -40...+70 °C, working temperature -20...+40 °C at T6 and -20...+50 °C at T5		
Ambient temperature -30 °C	-30...-20 °C: reduced forces approx. 60 % of rated value, e.g. 5 kN $\triangleq$ 3 kN (max.). Avoid icing!		
Humidity	0...90 % rH, non condensing		
Operation mode	S3 – 50 % ED intermittent mode (ED = duty cycle), max. 300 operating cycles / h		
Accuracy mechanically	< 1 mm stroke (hysteresis)		
Accuracy electrically	~ 200 steps acc. to stroke adjustment "Gear belt adjustment" (page 4)		
Wiring diagrams	SB 1.0	SB 1.0	SB 1.0
Scope of delivery	Actuator with integrated junction box, Allen key for manual override		
Parameter at delivery	500 N, 6 s/mm	2,5 kN, 6 s/mm	7,5 kN, 9 s/mm
ExRun- ... -U	as above and additional feedback. Adjustable by gear belt unit for max. resolution to 10–20–30–60 mm		
Feedback signal U	0...10 VDC / 4...20 mA, acc. on wiring selectable on site. $U_U$ 0...10 VDC at 1.000... $\infty$ $\Omega$ , $U_I$ 4...20 mA at 0...800 $\Omega$		
Wiring diagrams	SB 5.0	For adjusting feedback signal acc. to stroke setting please note page 4	

\* Uncertainty of measurement  $\pm 10\%$ . Note also the chapter on dimensioning!

Approbations	Special solutions and accessories
ATEX directive	2014/34/EU
EC type-approved	PTB 09 ATEX 1016 X
IECEX certified	IECEX PTB 11.0024X
Approval for gas	II 2 (1) G Ex de [ia] IIC T6, T5
Types ...-CTS	II 2 (1) G Ex de [ia] IIB T6, T5
Approval for dust	II 2 (1) D Ex tD [iaD] A21 IP66 T80, T95°C
CE identification	CE № 0158
EMC directive	2014/30/EU
Low voltage directive	2014/35/EU
Enclosure protection	IP66 in acc. with EN 60529
EAC	№ TC RU C-DE.Г508.B.01510
...-CTS	Types in aluminium housing with seawater resistant coating, parts nickel-plated
ExSwitch-R-L	External linear aux. switches, 2 separately adjustable contacts, for mounting on ...Run's spindle in zone 1, 2, 21, 22
ExBox/SW	Ex-e terminal box for aux. switches ...Switch-R-L
MKK-S	Mounting bracket, V2A, for terminal boxes ...Box-... directly on actuator
HV-R	Retrofit manual override for ...Run actuators
GMB-1	Rubber bellows, 60 mm
WS-R	Weather shield in stainless steel
Adaptions	For fittings and manufacturers on request
ExRun-...-S3	Ambient temperature up to +60 °C (T4), 110...240 VAC/DC, 25 % ED

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ExRun-...

ExRun-...-U

Special option

...-CTS

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 EXPLOSIONPROOF

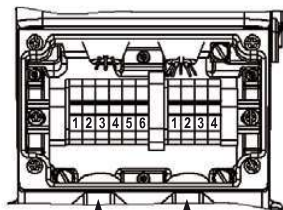
### Electrical connection

All actuators are equipped with a universal supply unit working at a voltage range from 24...240 VAC/DC. The supply unit is self adjusting to the connected voltage!  
 Device must be fuse protected max. 5 AT.  
 Note current consumption acc. to running time and applied voltage (min. 2 A).

**Attention**

At initial operation a self adjustment has to be executed.

### Integrated junction box



Feedback (3-6) Supply  
 IN/OUT control (1-2) (3-4)

1. Switch off the power
2. Open cover of junction box
3. Put cable through cable gland into junction box
4. Strip wires approx. 7 mm
5. Connect wires acc. to wiring diagram and type. Note: Wrong wiring expires guarantee and warranty
6. Connect protection earth PE
7. Fix wires, screw terminals
8. Close cable entries tighten (IP66)
9. Close cover junction box (regard gasket)

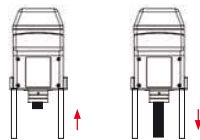
### On-off and 3-pos.

SB 1.0



Function:

- a closed – rod goes in
- b closed – rod goes out



24...240 VAC/DC

### Wiring feedback signals

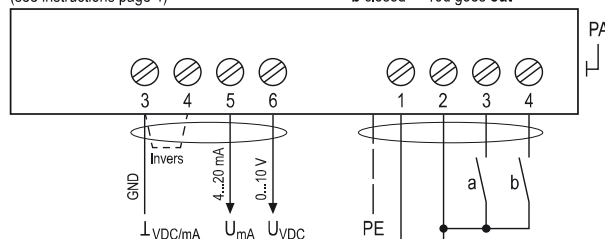
(...Run-...-U)

SB 5.0

Note gear belt setting 0-10-20-30-60 mm  
 (see instructions page 4)

Function:

- a closed – rod goes in
- b closed – rod goes out



Self adjustment:

To adjust the signal input/output to the stroke of the valve the button (T) must be pushed for min. 3 sec.

24...240 VAC/DC

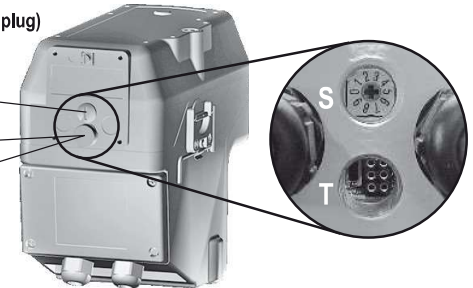
### Parameters, adjustments and failure indication

Switch – Push button – Lamp  
 for adjustment  
 (behind the blanking plug)

10-position switch (S)

Push button (T)

3-colour LED



### Parameter selection

Example:

ExRun-25.50

Type	Forces		Forces		
ExRun- 5.10 ▶	500 N	1.000 N			
ExRun-25.50 ▶	2.500 N	5.000 N			
ExRun- 75.100 ▶			7.500 N	10.000 N	
	▼	▼		▼	
Running times	Position of switch S	Running times	Position of switch		
2 s/mm ▶	00	05	4 s/mm ▶	00	05
3 s/mm ▶	01	06	6 s/mm ▶	01	06
6 s/mm ▶	02	07	9 s/mm ▶	02	07
9 s/mm ▶	03	08	12 s/mm ▶	03	08
12 s/mm ▶	04	09	15 s/mm ▶	04	09

Requested parameter:

Force 5.000 N

Running time 6 s/mm

Result:

Switch position 07

### Functions, adjustments and parameters

#### A) Self adjustment of stroke:

Push button (T) for minimum 3 seconds. The actuator will drive into both end positions to be adjusted. LED indicates GREEN.

Adjustment drive can be applied in any switch (S) position.

#### B) Selection of running time and force:

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, b open = rod goes in
- b closed, a open = rod goes out
- a and b closed = motor doesn't work, no function
- a and b opened = motor doesn't work, no function

### Dimensioning

#### Force in blocking position after adjustment drive

The force in the end positions could be much more than the nominal force.  
 Generally the valve is to check together with actuator and construed accordingly.  
 Note the values in the "Technical Data".

#### Force during travel

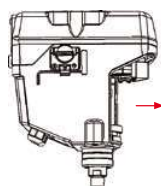
The force during travel could be much more than the nominal force.

#### Self adjustment

To protect the valve/armature and the actuator in the end positions a self adjustment has to be performed before each commissioning or after any changes.  
 Regard the gear belt adjustment according to the stroke!



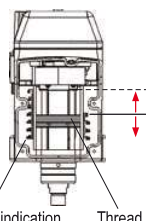
## Stroke and gear belt adjustment



### ⚠ Switch off power

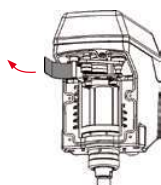
1. Demount cover:  
Loosen 5 screws,  
remove cover.

## Stroke adjustment



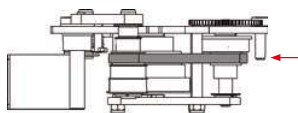
2. Adjust/limitate stroke:  
Stroke can be adjusted by thread nut  
from min. 5 mm to 60 mm.

## Open feedback gear's cover bracket



3. Open cover bracket of feedback gear,  
thereby gear belt's tension is removed –  
not till then slide belt by hand to the right  
setting acc. to stroke. Do not use any  
tools.  
Due to repeated movements of the red  
bar the setting of the gear belt gear can  
be changed. The position is corrected by  
closing the cover and starting a re-adjust-  
ment drive.

## Gear belt adjustment (for feedback/return signal)



4. Position gear belt acc. to set stroke.  
Do not use any sharp tools, manual  
operation only. Mind positioning.  
Set acc. to stroke.

### Feedback signal

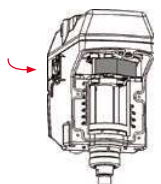
By gear belt setting the feedback signal  
0...10 V / 4...20 mA (...Run-...-U)  
is adjusted to stroke.

Gear belt setting



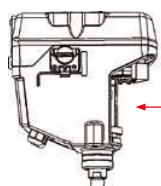
Stroke  
10 mm  
20 mm  
30 mm  
60 mm

## Close cover bracket of feedback gear



5. Note right position of gear belt!  
Close bracket, thereby the gear belt is  
automatically tensioned.

## Remount cover



6. Note: cover gasket must be fit  
in the groove while mounting!  
Tighten 5 screws.

Switch on power

## Important information for installation and operation

Ex area –  
zone 1, 2, 21, 22



Safe area



Supply \*  
24...240 VAC/DC ± 10 %

...Run-...-U \*  
Feedback 0...10 V / 4...20 mA

\* electrical wiring see diagrams

- All national and international standards, rules and regulations for hazardous Ex-areas must be complied.
- Certified apparatus must be installed in accordance with manufacturer instructions. If the equipment is used in a manner not specified by the manufacturer, the safety protection provided by the equipment may be impaired.
- For electrical installations design, selection and erection, EN/IEC 60079-14 can be used.
- Supply cables must be installed in a fixed position and protected against mechanical damage
- For electrical connection use the integrated junction box
- Do not open the cover when circuits are live
- Connect potential earth
- Avoid temperature transfer from valve to actuator (note ambient temperature T<sub>a</sub>!)
- Close all openings with min. IP66
- Flameproof enclosure is protected against mechanical damages acc. to EN 60079-ff
- For outdoor installation a protective weather shield against sun, rain and snow should be applied
- Actuators are maintenance free, an annual function test is recommended
- Clean only with damp cloth, avoid dust accumulation
- For electrical installations inspection and maintenance, EN/IEC 60079-17 can be used.

## ⓘ Extra information (see additional data sheet)

Additional technical information, dimensions, installation instruction, illustration and failure indication

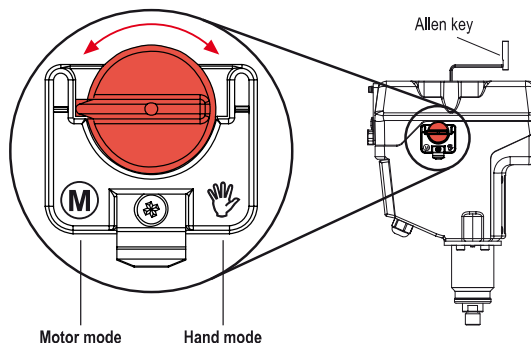
## Manual override



### Attention

Turn hand feed crank slowly! When approaching the end positions  
overturning is possible and could damage the valve or actuator.

1. Actuator must be in stop position
2. Turn red switch to change from motor to hand mode
3. Turn to required stroke with Allen key (top side):
  - clockwise = rod out
  - counterclockwise = rod in
4. Upon completion turn back to motor mode



Motor mode

Hand mode

When operating the manual override in case of failure it is possible that the gear decouples. It can be seen that the selector switch is turned on "motor", but when controlled the actuator does not execute any stroke movement. The blockade is resolved by simultaneously rotating the motor-hand switch and turning the Allen key in the hexagon shaft. The gear engages.





## Extra information for ...Run Valve actuators

for optimization of planning, installation and initial startup for safe operation



### Assembly

- Dimensions, drill plate
- Control elements: switch – push buttons – LED
- Outdoor installation
- Mounting and adaptations

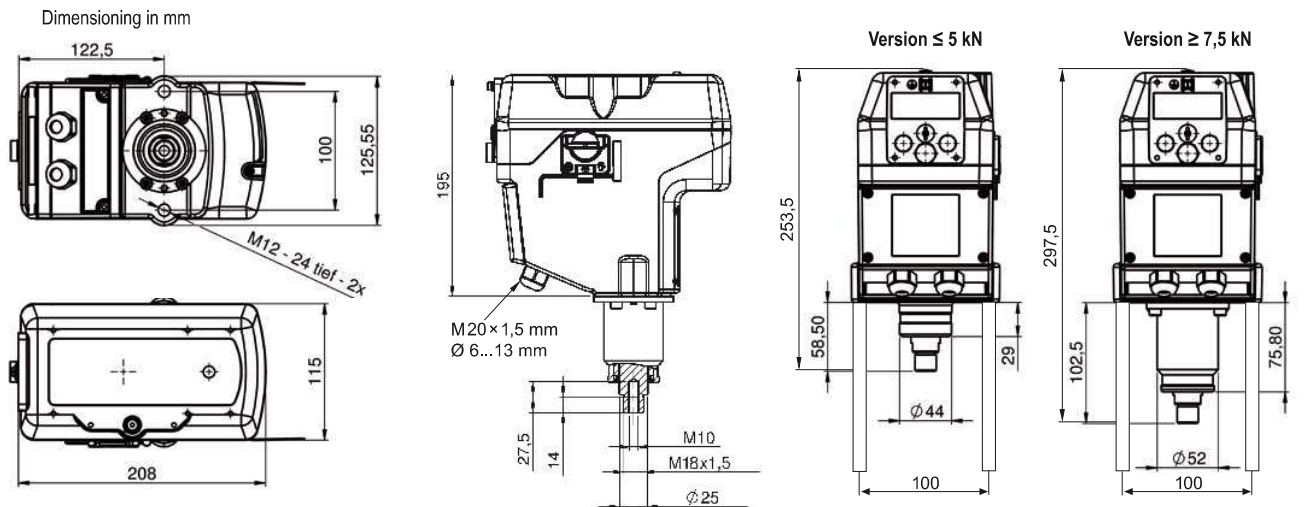


### Electric

- Power supply design
- Cross sections and line lengths
- Commissioning, requirements for controller, maintenance
- Problem treatment/error indication

Subject to change!

#### ► Dimensions

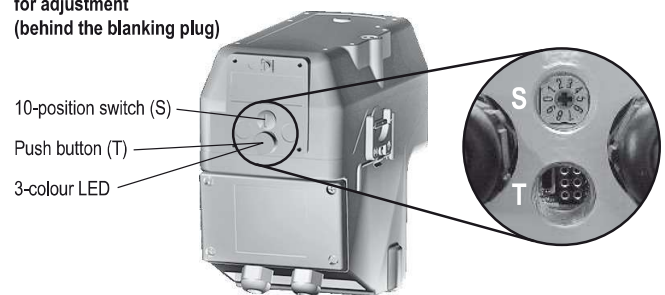


#### ► Control elements: switch – push button – LED

All actuators are equipped with a 10-position switch, a push button and a multicolour LED for 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 despite lining up power supply at the actuator. The explosion prevention is not impaired thereby. However, 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. Adjustments of force and running time can be achieved also before mounting. The self adjustment of stroke can be started only with an outside load and accurate mounting.

Switch – Push button – Lamp  
for adjustment  
(behind the blanking plug)



#### ► Outdoor installation or at high dust exposure

When mounting actuator outdoors 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 to a too high temperature, neither at storage nor during operation. Otherwise the limiters could respond and switch off the actuator irreversibly.

At high dust exposure appropriate counteraction has to be taken, e.g. mounting a rubber bellow on rod.



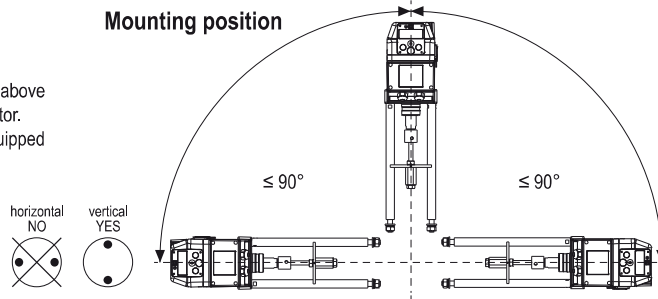


### ► Mounting of ...Run actuators



When mounting particularly observe the following:

- The linkage spacer columns for the actuators should only be mounted vertically.
- Valve actuators should only be mounted as shown, never suspended.
- When mounting on a steam valve, the actuator should not be mounted vertically above the valve as the rising heat and steam could cause damage at parts of the actuator.
- If mounted outside or in areas with a high level of humidity, the drive must be equipped with a heater.
- Vibration should be avoided, they shorten the serviceable life of the actuators. Suitable shock absorption should be incorporated.
- Pressure fluctuations in steam systems must be avoided to protect the actuator.



### Valve adaption

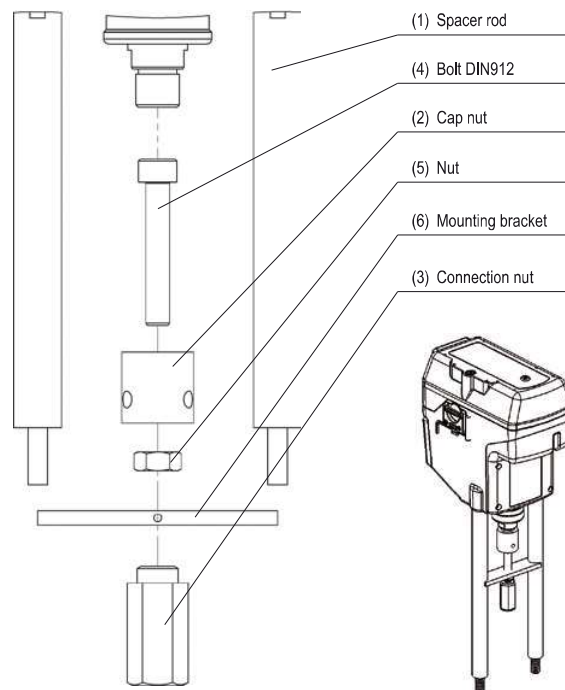
For mounting and adjustment act as follows:

- The actuator needs a specific linkage to match the selected valve
- The construction of the valve linkage is determined by the used valve
- Check the stroke of actuator and compare with valve if necessary adjust stroke
- Check adaption
- Mount actuator to valve

#### Stroke setting

The max. stroke is 60 mm. To reduce this turn the adjusting screw. Open the lateral cover of actuator. Remove the 5 screws of the cover and set the adjusting screw of needed stroke. (see ...Run data sheet page 4).

1. The actuator will be delivered with retracted stroke!
2. Place the actuator on the valve body and attach with the nuts and washers provided.
3. Remove the cap nut (2) and screw the connecting parts with the connecting nut (3), taking care not to damage the valve spindle. The spindle should be retracted as far as possible into the valve body.
4. Allow enough distance between the threaded bolt head (4) and the rod of the actuator, **noting the travel of the valve spindle**. Any adjustment can be done by screwing the bolt (4) into the connection nut (3).
5. Screw the nut (5) hand tight. Draw out the valve spindle with the connecting parts until contact is made to the threaded actuator rod and join with the cap nut (2). **Do not overtighten (max. 4 Nm) otherwise damage will be caused to the mounting bracket.**
6. Connect the actuator to the supply in accordance with the wiring diagram.
7. Operate the actuator electrically to fully extend the actuators rod. For modulated controlled actuator with a 4 mA or 0 VDC positioning signal or by connecting to load via terminal 4 (if no positioning signal available). Visual check that the valve is closed. Minor adjustment to the travel can be achieved by turning the threaded bolt (4).
8. Connections: take care not to operate the actuator against the stroke otherwise damage to mounting bracket may occur.
9. Start adjustment drive.
10. The actuator is ready to operate.



### Commissioning on a 2- or 3-way valve

#### 2-way valve

- Use only adaptations suitable for the drive
- Mount adaption to actuator
- Set stroke considering internal and external end positions
- Push button (T) for 3 sek. (necessary for "modulation" Y-types)
- Actuator drives in the adjusted end position and scales the stroke automatically

#### 3-way valve

An adaption on a 3-way valve is checked as above. You only need to take into account that the lift rod must move to both of the valve closures. This can necessitate a repeated check or adjustment.

#### Fixing the valve stroke into position

With 3-way valves the valve stroke must be less than the actuator's stroke. The valve stroke must be measured exactly so as to eliminate  $\pm$ tolerances. The actuator's stroke must be slightly greater than the valve stroke (3-way valves close in two directions). For 2-way valves it is possible to use the value stated in the written information. However, many valve manufacturers do not allow travel beyond its fully opened/closed position (2-way valves only close in one direction).



### ► Power input depending of supply voltage

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 at approx. 5 W. The power consumption for the heater is approx. 16 W. The heater switches on only when motor is in idle position!

The initial starting supply voltage required by the actuators power supply unit is approx. 2.0 A. The starting pulse takes about 1 sec. (Please consider this while concepting the cross section of the supply line). The power factor is between 0.8 and 0.5 in dependence of motor running time. A line protection should be with min. 2 AT.

- Power connection must be made with switched off circuits, always!
- Do not open the junction box when circuits are live
- Note supply voltage!  
Wrong connection or over voltage are not covered by warranty
- The cable of the actuator must be installed in a fixed position and protected against mechanical and thermal damage
- Electrical connection with integral terminals only
- Electrical connection with integrated junction box. After this close all openings and thighten screws
- Inrush current is approx. 2 A up to 1 sec. (please note for dimensioning)
- The cross section of the wiring please choose according the length of the wiring and the necessary power consumption of the actuator. Too small cross sections are very often the reason for malfunctions

Load		Rated current in acc. with motor running time									
		500 N					1000 N				
		2 s	3 s	6 s	9 s	12 s	2 s	3 s	6 s	9 s	12 s
24 VDC	I <sub>Nominal</sub> [A]	0,5	0,4	0,3	0,4	0,3	1,0	0,8	0,6	0,5	0,5
120 VAC	I <sub>Nominal</sub> [A]	0,4	0,3	0,2	0,1	0,1	0,4	0,3	0,2	0,1	0,1
240 VAC	I <sub>Nominal</sub> [A]	0,3	0,2	0,1	0,1	0,1	0,3	0,2	0,1	0,1	0,1

Load		Rated current in acc. with motor running time									
		2500 N					5000 N				
		2 s	3 s	6 s	9 s	12 s	2 s	3 s	6 s	9 s	12 s
24 VDC	I <sub>Nominal</sub> [A]	0,6	0,5	0,3	0,3	0,3	1,1	0,75	0,4	0,3	0,3
120 VAC	I <sub>Nominal</sub> [A]	0,4	0,3	0,2	0,1	0,1	0,5	0,4	0,4	0,3	0,3
240 VAC	I <sub>Nominal</sub> [A]	0,3	0,2	0,1	0,1	0,1	0,3	0,2	0,1	0,1	0,1

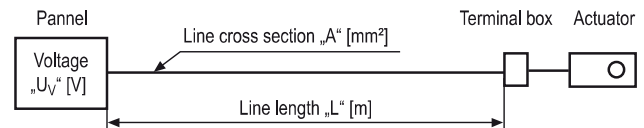
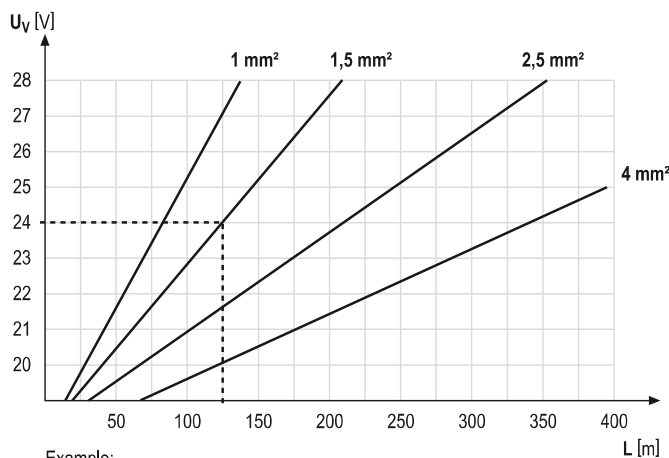
Load		Rated current in acc. with motor running time									
		7500 N					10.000 N				
		4 s	6 s	9 s	12 s	15 s	4 s	6 s	9 s	12 s	15 s
24 VDC	I <sub>Nominal</sub> [A]	1,2	1,0	0,8	0,6	0,4	1,5	1,2	1,0	0,7	0,5
120 VAC	I <sub>Nominal</sub> [A]	0,5	0,5	0,4	0,3	0,3	0,5	0,4	0,4	0,4	0,3
240 VAC	I <sub>Nominal</sub> [A]	0,5	0,5	0,4	0,4	0,3	0,6	0,5	0,4	0,4	0,2

### ► Dimensioning cross sections and line lengths

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 dimensioned accordingly.

The accompanying formulas allow the calculation of the necessary line cross section respectively maximal permitted conduit length respectively utilizing the existing line cross section.

Alternatively the secondary voltage can be increased by selecting a transformer.



Required cable cross section A at existing cable length L

$$A = 0,0714 \times L : (U_V - 18 \text{ V})$$

Example: L = 250 m,  $U_V = 30 \text{ V}$   
Cross section A = 1,5 mm²

Maximum cable length L at existing cross section A

$$L = A \times (U_V - 18 \text{ V}) : 0,0714$$

Example: A = 1,5 mm²,  $U_V = 24 \text{ V}$   
Length of cable L = 126 m

For calculation following characteristics are essential:

$U_V$  = supply voltage [V]  
A = line cross section [mm²]  
L = conduit length [m]

Factor 0,0714 = drive specific factor [Vmm²/m]  
(based on the electrical conductivity of electrolytic copper with a coefficient of 56 m/Ωmm²)



### ► Commissioning / Operation

#### Check before turning on

- Ensure that the supply voltage is in accordance with the specifications
- Connect protection earth and potential equalisation
- The actuator must not display any type of mechanical damage

#### Commissioning and function control

- Check the wiring and control function
- Rod goes in – with contact 2 to 3
- Rod goes out – with contact 2 to 4
- Check manual override  
With manual override the rod has to be moved very carefully in the end positions. Actuator and valve could be damaged.

#### Check options

- Check internal aux. switches regarding end position
- Check feedback potentiometer
- Adjust external switches

#### Further checks

- Check valve and actuator linkage to confirm correct connection
- Check the terminal box for damage

Before switching off, consider the effects on the system and on other devices. Disconnect the mains before starting mechanical dismantling. The junction box must be free of voltage. Loosen the linkage and remove the actuator.

### ► Requirements for controller

The controller must ensure that the following conditions are fulfilled:

To ensure a high accuracy and long life actuators are equipped with "protective mechanisms". They protect all electric motors against early wear.

For 2- and 3-position actuators, a minimum control time of 0.5 second must be attained. If the controller pulses in shorter steps (< 0.5 s), the actuator will not respond. The time between the impulses must be min. 0.5 s.

Note: At small control deviations the actuator is permanently active. This can arise over-temperature and the actuator goes in STOP position. This self protection is evidence that the control loop is incorrect.

Schischek recommends using Y-actuators for control applications.

### ► Maintenance

Relating to operation actuators are maintenance free. Nevertheless maintenance must comply with regional standards, rules and regulations. The actuator should be opened for adjustments only. After setting all covers must be closed.

Damaged junction boxes, cable glands or gaskets must be exchanged for original parts or sent for repair to Schischek GmbH.

### ► Problem handling / Error indication

Problem	Possible cause	Course of action
01 Actuator does not work LED does not light	<ul style="list-style-type: none"> <li>• No power supply attached</li> <li>• The actuator is operated at ambient temperature beyond specifications and the internal temperature sensor shut down irreversibly</li> </ul>	<ul style="list-style-type: none"> <li>• Attach power supply and turn on</li> <li>• Caused by inadmissible operation and for safety relevant reasons the actuator drove into an irreversible condition and must be exchanged. Accompanying new installation the ambient temperature has to be reduced accordingly</li> </ul>
02 Actuator does not work LED lights RED	<ul style="list-style-type: none"> <li>• The actuator is operated at a too high ambient temperature and the internal temperature sensor responded</li> </ul>	<ul style="list-style-type: none"> <li>• Shut off actuator and let temperature decrease, reduce ambient temperature by suitable measures e.g. ventilation or other mounting position of the actuator</li> </ul>
03 Actuator does not work LED lights GREEN	<ul style="list-style-type: none"> <li>• 3-pos. control signal is wired on both entrances</li> <li>• Required torque is greater than actuators torque</li> <li>• Control signals are not attached or attached on a wrong conductor</li> <li>• Actuator is incorrectly mounted and is blocked by an external stop unit</li> <li>• Actuator is clocked with impulses &lt; 0,5 s and therefore ignored the signals</li> <li>• Interchanged supply lines</li> </ul>	<ul style="list-style-type: none"> <li>• Readjust / correct circuit</li> <li>• Adjust a higher torque at the actuator if possible otherwise exchange for a type with higher torque</li> <li>• Examine rule and adjusting signals and connect in accordance with diagram</li> <li>• Dismount actuator and testdrive without load for operability. Then install actuator accordingly so that the power transmission of the actuator runs the armature/damper without external blockade or torsion</li> <li>• Switch off supply voltage for at least 2 s. Thereby a reset is conducted. Readjust the controller in order to extend control pulses</li> <li>• Switch wires: 1 must be connected to (-, N) and wire 2 to (+, L)</li> </ul>
04 Actuator does not work LED is blinking RED	<ul style="list-style-type: none"> <li>• The actuator has been mounted at temperatures &lt; -20 °C and did not reach its operating temperature of at least -20 °C</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that a constant voltage supply is applied on conductor 1–2</li> <li>• Wait until the required operating temperature is achieved by the actuators internal heating system. The actuator will start operating independently</li> </ul>
05 LED flashes irregularly, actuator does not work	<ul style="list-style-type: none"> <li>• Actuator does not receive sufficient supply voltage</li> <li>• Cable too long, voltage drop in the supply line too large</li> </ul>	<ul style="list-style-type: none"> <li>• Increase line cross section or power supply at output of the transformer</li> <li>• Increase line cross section or power supply</li> </ul>
06 LED briefly flashes RED, end position is not reached	<ul style="list-style-type: none"> <li>• Actuator is in blocking position 1 × blinking: block position, rod goes in 2 × blinking: block position, rod goes out</li> </ul>	<ul style="list-style-type: none"> <li>• External load is higher than actuator's max. force. Check mechanic for easy movement and tensioning, eventually for test purposes without valve</li> </ul>