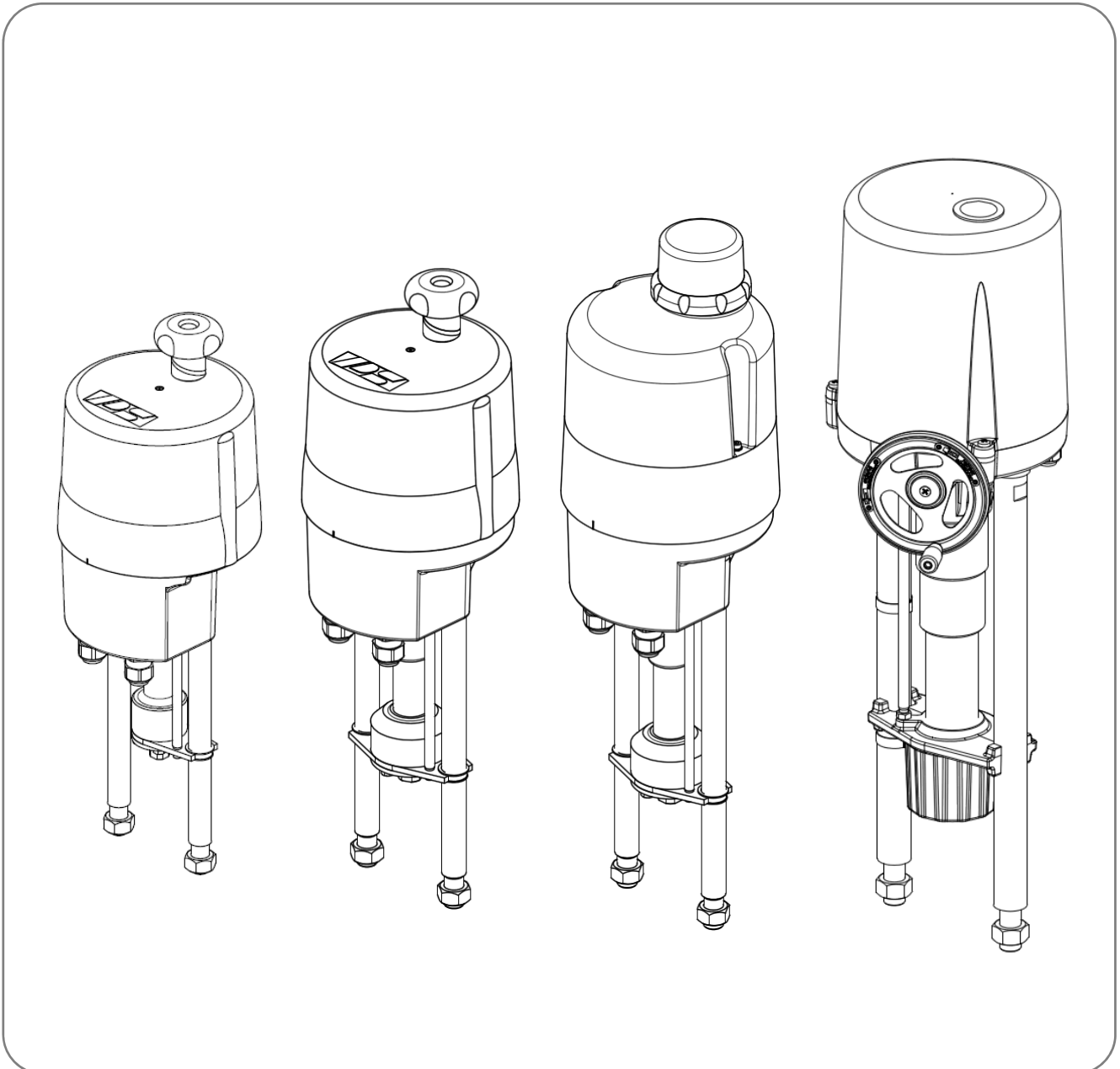


# Operating Instructions

## EC Series Electric Actuator - PSL 204



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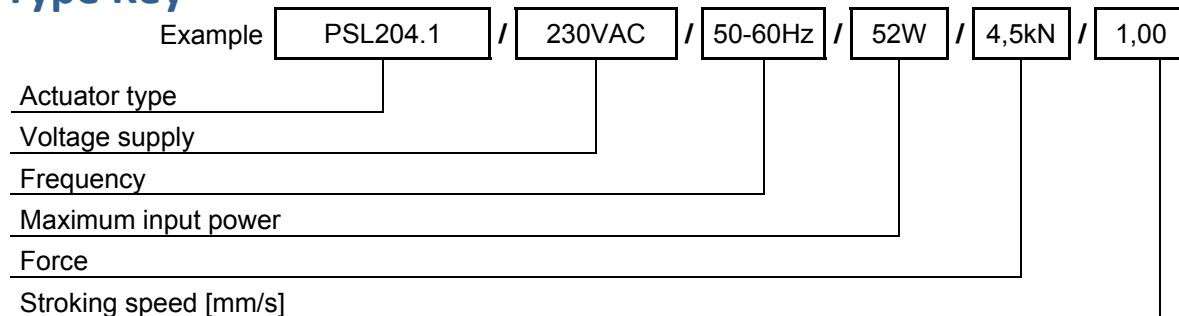
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Type Key



Watson McDaniel Model Code Configuration Chart

ACTUATOR					
Code	Actuator	Code	Power Supply	Code	Control Signal
ECA	Capacitors	1	115VAC	0	4-20mA
ECB	Fail-Closed Capacitors	2	24VAC/DC	1	0-10V
				2	0-20mA
				3	2-10V
	Fail-Open				

# 1. Symbols and Safety

## General Dangers of Non-compliance with Safety Regulations

PSL actuators are built at state-of the art technology and are safe to operate. Despite of this, the actuators may be hazardous if operated by personnel that has not been sufficiently trained or at least instructed, and if the actuators are handled improperly, or not used as per specification.

This may

- cause danger to life and limb of the user or a third party,
- damage the actuator and other property belonging to the owner,
- reduce safety and function of the actuator.

To prevent such problems, please ensure that these operating instructions and this chapter in particular have been read and understood by all personnel involved in the installation, commissioning, operation, maintenance and repair of the actuators.

## Basic Safety Notes

- The actuators may only be operated by skilled and authorized operating personnel.
- Make sure to follow all security advices mentioned in this manual, any national rules for accident prevention, as well as the owner's instructions for work, operation and safety.
- The isolating procedures specified in these operating instructions must be followed for all work pertaining to the installation, commissioning, operation, change of operating conditions and modes, maintenance, inspection, repair and installation of accessories.
- Before opening the actuator cover, ensure that the main supply is isolated and prevented from unintended re-connection.
- Areas that can be under voltage have to be isolated before working on them.
- Ensure that the actuators are always operated in faultless condition. Any damage or faults, and changes in the operational characteristics that may affect safety, must be reported at once.

## Danger Signs

The following danger signs are used in this operating manual:



**Caution!** There is a general risk of damage related to health and/or properties.



**Danger!** Electrical voltages are present that may lead to death. Life threatening risks may occur due to electrical voltages!



**Danger!** Electrical voltages are present that may lead to death. Life threatening risks may occur due to electrical voltages!

## Other Notes

- The motor surface temperature may rise when maintaining, inspecting and repairing the actuator immediately after the operation. There is a danger of burning the skin!
- Always consult the relevant operating instructions when mounting PS accessories or operating the actuator with PS accessories.
- Connections for signal in- and output are double isolated from circuits that can be under dangerous voltage.

## 2. Usage as per Specification

- PSL linear actuators are exclusively designed to be used as electric valve actuators. They are meant to be mounted on valves in order to run their motors.
- Any other use is considered to be non-compliant and the manufacturer cannot be held liable for any damage resulting from it.
- The actuators can only be used within the limits laid out in the data sheets, catalogues and other documents. Otherwise, the manufacturer cannot be held liable for any resulting damage.
- Usage as per specification includes the observance of the operating, service and maintenance conditions laid down by the manufacturer.
- Not to be regarded as usage as per specification are mounting and adjusting the actuator as well as servicing. Special precautions have to be taken while doing this!
- The actuators may only be used, serviced and repaired by personnel that is familiar with them and informed about potential hazards. The specific regulations for the prevention of accidents have to be observed.
- Damages caused by unauthorized modifications carried out on the actuators are excluded from the manufacturer's liability.
- Supply voltage may only be switched on after the proper closure of the main cover or terminal box.
- Electrical wiring is done to a terminal block under the actuator cover.

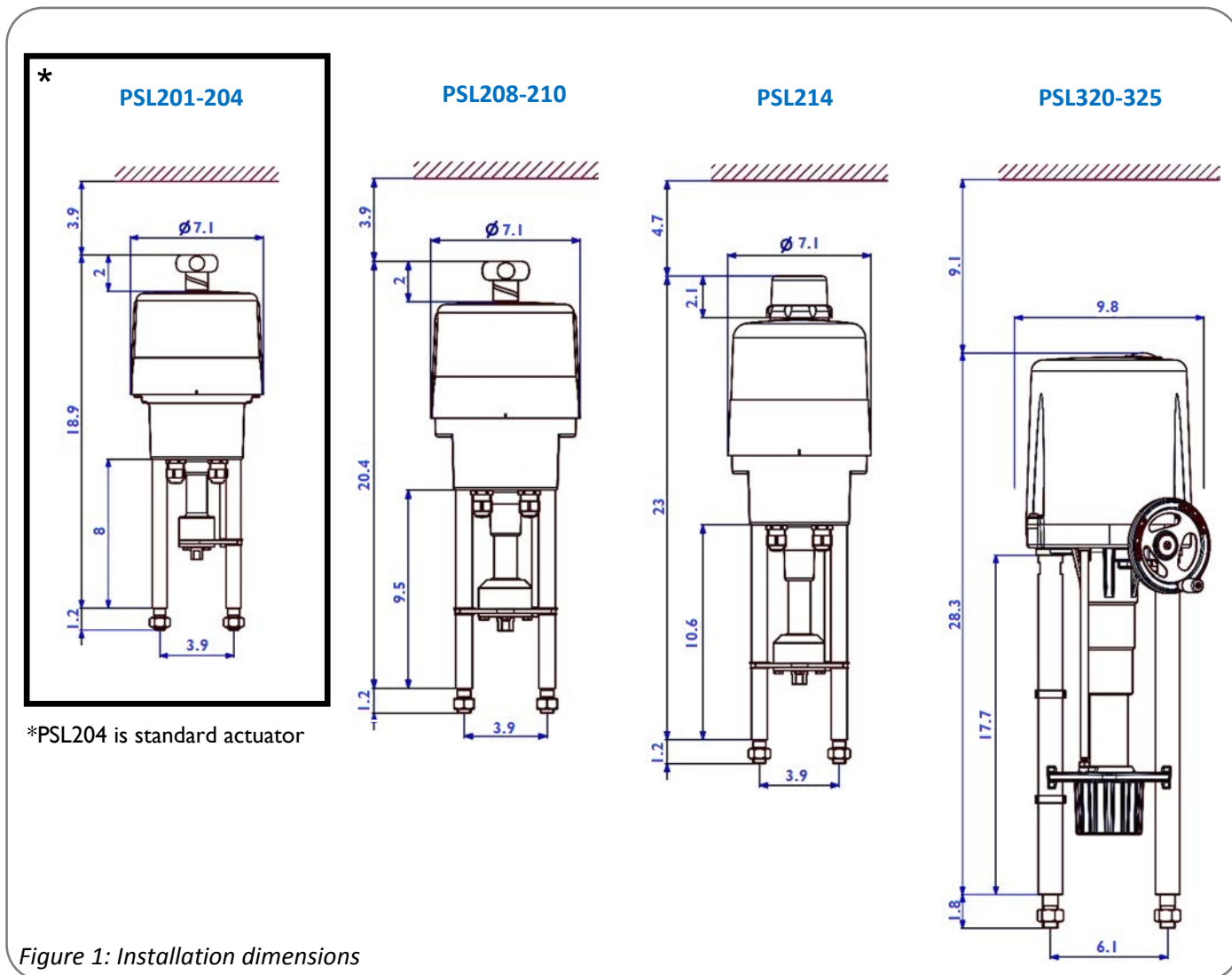
## 3. Storage

**For appropriate storage, the following instructions have to be met:**

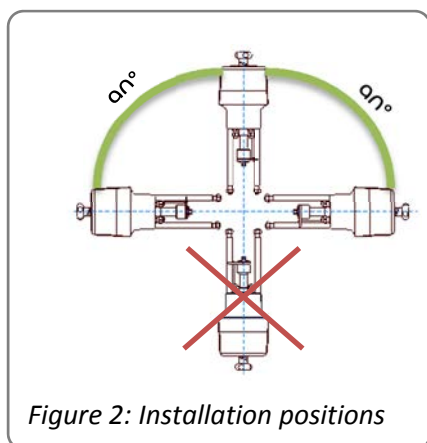
- Only store the actuators in ventilated, dry rooms.
- Store the actuators on shelves, wooden boards, etc., to protect them from floor moisture.
- Cover the actuators with plastic foil to protect them from dust and dirt.
- Protect the actuators against mechanical damage.

## 4. Operating Conditions

- Standard actuators may be operated at ambient temperatures from -4°F to +140°F (S4 operation) or from -4°F to +176°F (S2 operation).
- Operating modes correspond to DIN EN 60034-1, 8: S2 for short cycle and S4 for standard operation (for actuator specific data see the table at the end of this document or the actuator specific data sheets).
- For protection against moisture and dust, the enclosure rating is IP65 or IP67/IP68 according to EN 60529.
- When installing the actuators, leave enough space to allow cover removal (Fig.1).
- The actuator can be installed vertically or horizontally or any position in between. The actuator must not be installed with the cover pointing downwards (Fig.2).



## 4.1 Installation Position



### Outdoor Usage:



When using the actuators in environments with high temperature fluctuations or high humidity, we recommend using a heating resistor as well as a higher enclosure rating (optional accessories).

## 5. Function

The PSL actuators are designed as electric valve actuators. The valve is mounted onto the actuator via pedestals. Depending on the type of valve used, mounting pedestals or a special valve mounting plate is required.

The motor torque is transmitted via a multi-stage spur gear onto a trapezoidal threaded spindle. The spindle transmits the input torque into an axial thrust force via a stem nut. Thus the spindle stem nut which is self-locking carries out a linear stroke transmitted to the valve stem by a coupling piece. The actuating stroke is limited by two adjustable limit switches in each direction that cut off the motor current.

In case of mains power loss, a manual override of the actuator is possible using the handwheel.  
Electrical wiring is done to a terminal block under the actuator cover.

## 6. Manual Operation

A handwheel is supplied in order to operate the actuator in case of power loss or during installation work such as mounting onto a valve or setting the limit positions.

- The handwheel is permanently engaged and turns during motor operation of the device series PSL201-210 and PSL214.
- The actuators PSL320 - 325 have a handwheel which has to be engaged for manual operation. The button on the cover has to be depressed to engage the handwheel.



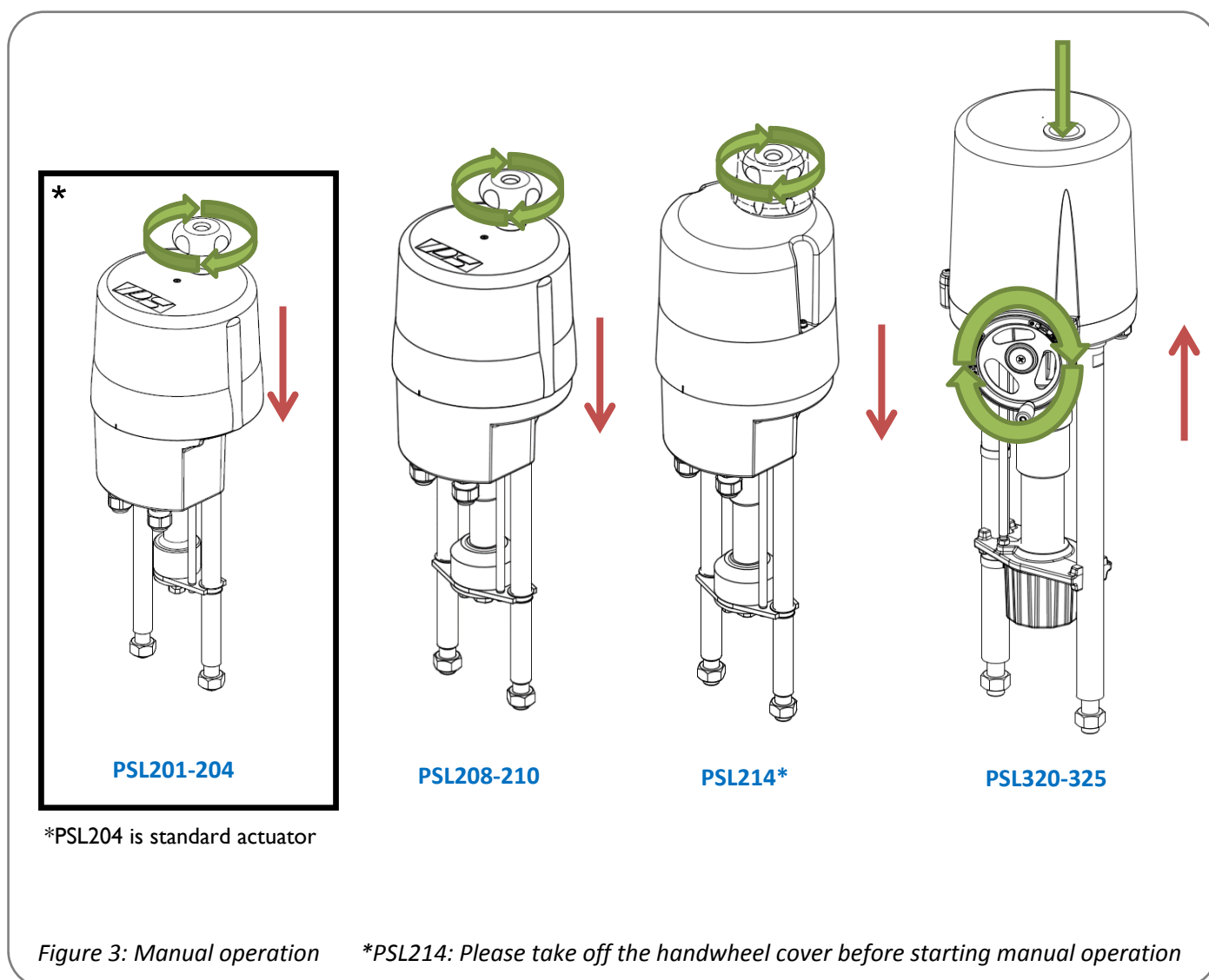
**Do not exceed the adjusted electrical stroke limits by handwheel.**

**The mechanical limits must be set accordingly.**

**If these instructions are not observed, it may result in malfunction or damage to the actuator.**



**Do not operate the handwheel using excessive force. If these instructions are not observed, it may result in malfunction or damage to the actuator.**



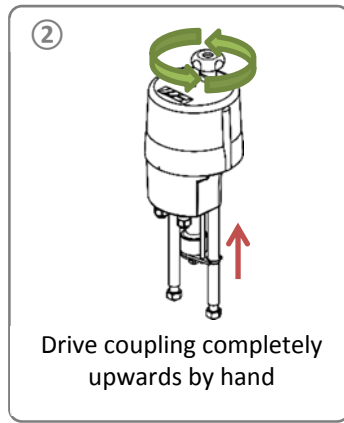
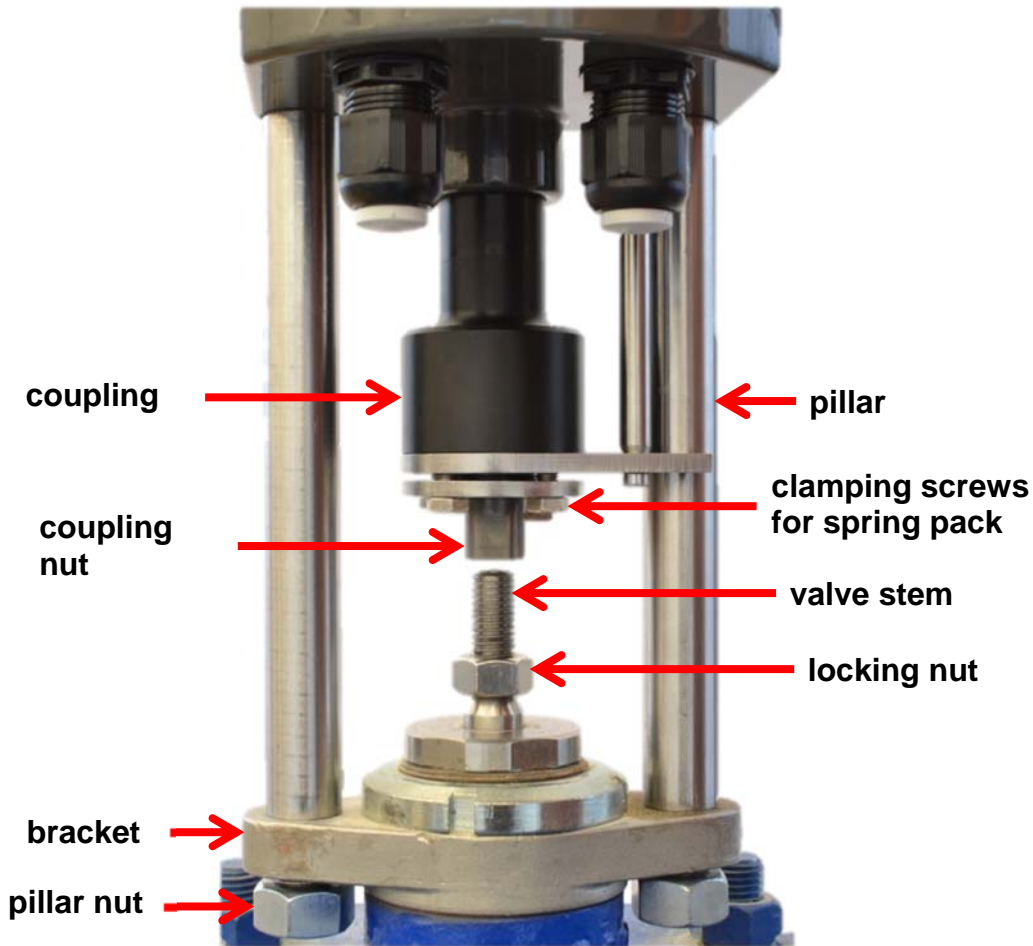
# 7. Valve Mounting

## 7.1 PSL201-214

Note: The pictures below show the mounting of a PSL204. The steps are identical for all types.



When mounting the actuator onto the valve, use the handwheel and do not drive the actuator electrically. If these instructions are not observed, it may result in personal injury or damage to the actuator and/or valve.





④

bracket  
pillar nut  $\updownarrow$  **Appr. 0.2 in**  
Leave 0.2 in. gap between bracket and pillar nut

⑤

Move the coupling down until it hits the valve stem. Continue moving until there is a 0.2 in. gap between the pillar end and the bracket.

Pillar end  $\updownarrow$  **app. 0.2 in**  
Bracket

⑥

Screw the coupling nut onto the valve stem until the pillar edges rest on the bracket.

⑦

Repeat ⑤ and ⑥ until the valve stem is screwed into the coupling nut by 0.47 in (5/16" to 1/2") resp. 0.63 in (> 9/16" and larger).

0.47 in (5/16", 1/2")  
0.63 in (> 9/16")

⑧

Lock the coupling nut

⑨

Tighten the clamping screws crosswise with 6 ft-lbs

⑩

Drive the coupling up or down, until the edges of the pillars rest on the bracket

**WRONG**      **CORRECT**

Tighten the pillar nuts



Before the pillar nuts are tightened, make sure that the pillars are sitting on the valve mounting bracket. If necessary, correct the position of the actuator by using manual operation. If these instructions are not observed, personal injury or damage to the actuator and/or valve may result.

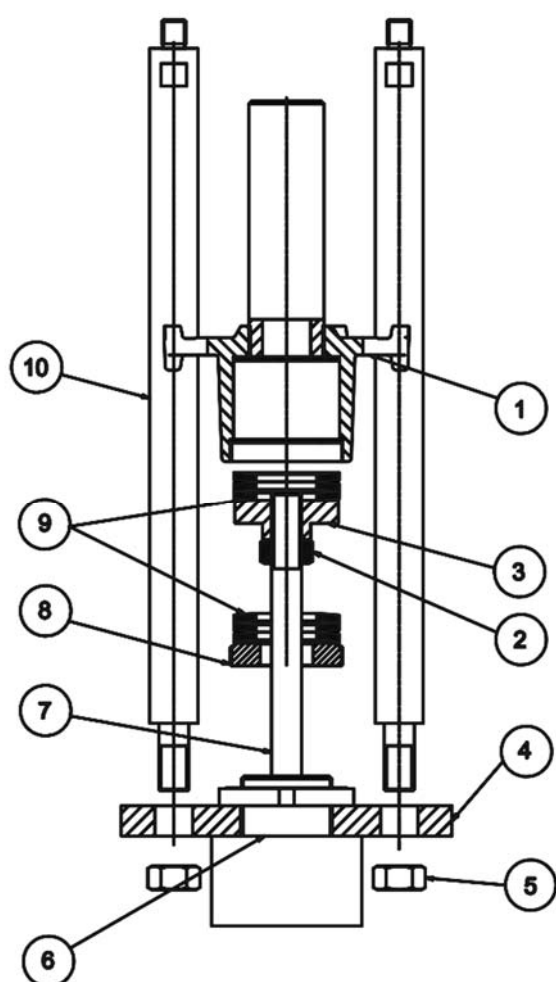


## 7.2 PSL320-325



**When mounting an actuator onto a valve, never drive the actuator electrically but use the handwheel.**

**If these instructions are not observed, it may result in personal injury or damage to the actuator and/or valve.**



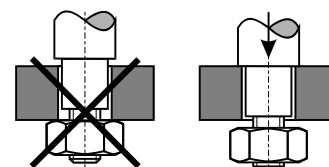
1	=	spindle nut
2	=	locking with counter nut
3	=	coupling piece
4	=	valve mounting plate
5	=	fastening nut
6	=	valve body
7	=	valve stem
8	=	swivel nut
9	=	disc springs
10	=	pillar

Figure 4: Mounting the actuator onto the valve

The valve must be suitably equipped to take the pillars. Please see the individual dimension sheets for the actuator dimensions. Observe the following steps when mounting the actuator:

- Unscrew the swivel nut (item 8) from the spindle nut (item 1) and slide it over the valve stem (item 7).
- See if the bore of the coupling piece (item 3) fits the valve stem. If necessary, rebores and/or recut the thread.
- Slide or screw the coupling piece (item 3) onto the valve stem and bore or pin to the valve stem. You may also secure the coupling piece by using a counter nut (item 2).
- Slide the valve stem with the coupling piece and disc springs (item 9) into the spindle nut, screw on the swivel nut and tighten it down using the cross slotted key supplied.
- Slide the pillars (item 10) into the bore holes of the valve mounting plate and tighten with the fastening nuts.

**Before the fastening nuts are tightened, make sure that the pedestal ends are completely inserted into the bores of the valve mounting plate. If necessary, correct the position of the actuator using the handwheel. If these instructions are not observed, it may result in damage to the actuator and/or valve.**



## 8. Removing the Cover

*Please Observe the Label on the Cover of the Actuator.*



PSL201-PSL210 (IP65)

Remove the handwheel by loosening it.  
Pull the cover upwards.

PSL214 und PSL201-210 (IP67/IP68)

Remove the handwheel by loosening the grub screw.  
Remove the fastening screws of the actuator cover.  
Pull the cover upwards.

PSL320 - PSL325 (IP65)

Remove the fastening screws of the actuator cover  
Pull the cover upwards.

Figure 5: Removing the cover

## 9. Setting of the Limit Switches

Only for deliveries without valves!

The standard limit switches switch-off the motor when the limits have been reached. Additional limit switches are free of voltage and serve to indicate the valve position. These are available as optional extras. The cover must be removed in order to set the limit switches.



**When mounting an actuator on a valve, never drive the actuator electrically but use the handwheel. If these instructions are not observed, it may result in damage to the actuator and/or valve.**

## 9.1 Type of Limit Cut-Off

The type of limit switch cut-off is dependent on the type of valve and the limit position:

- Force/stroke-dependent cut-off (cf. 9.2)
- Stroke-dependent cut-off (cf. 9.3)

### **Basic Rule:**

For a through-valve, first set the CLOSED position force/stroke-dependent, then the OPEN position stroke-dependent. For a 3-way valve set both limit positions force/stroke-dependent.

Other arrangements are possible. Please observe the data of your valve. Cutting off the limit switch incorrectly may cause damage to the valve.

## 9.2 PSL 201-214

### 9.2.1 Force/Stroke-Dependent Limit Switch Cut-Off

For force-dependant limit switch cut-off, the limit switches can be set by using the compression „s“ of the spring disc coupling (Fig. 6).

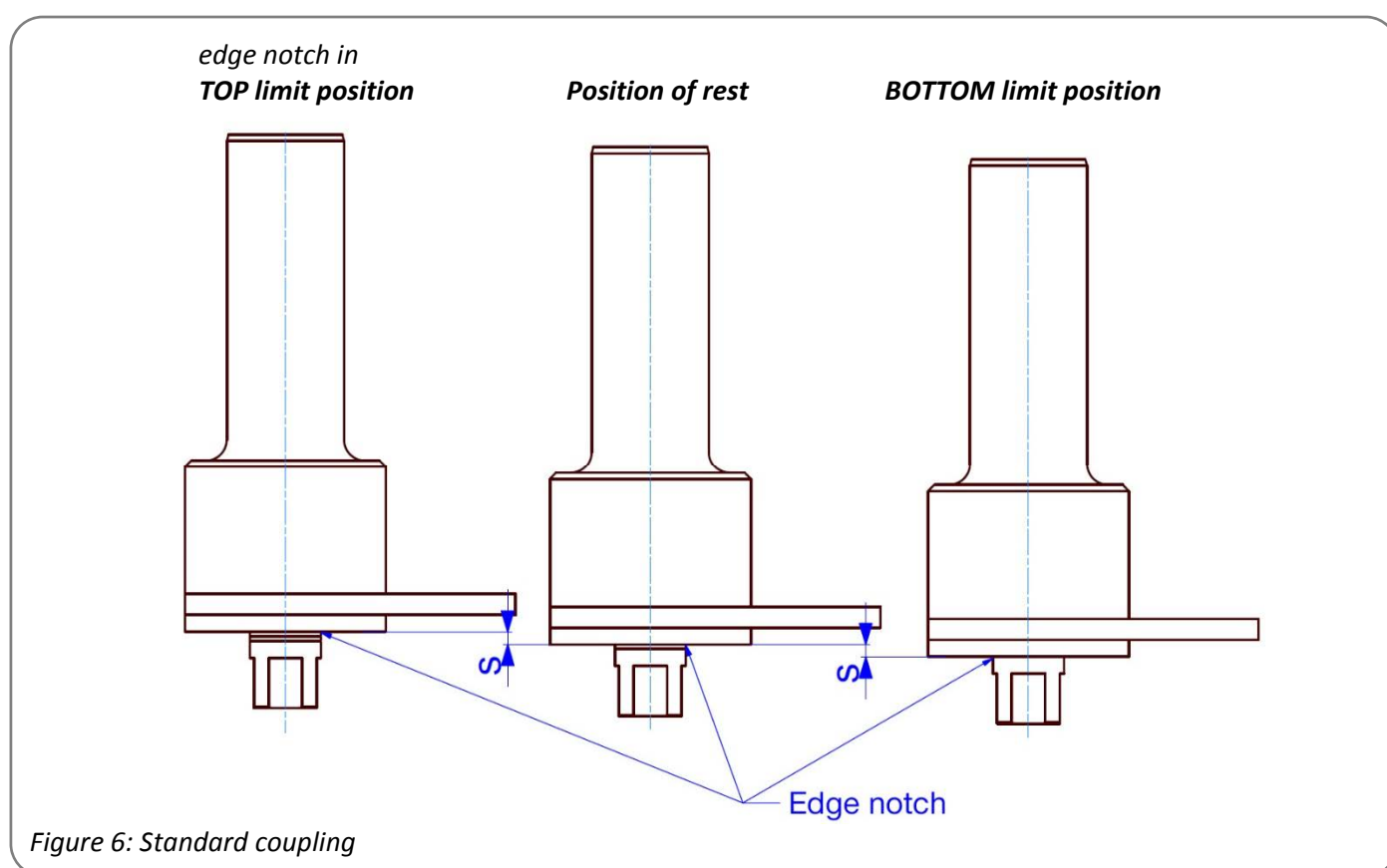


Figure 6: Standard coupling

- Using the handwheel on the actuator, drive the valve into the limit position until the valve cone touches the valve seat. This happens when the valve stem nut starts to move axially and the spindle pushes against the disc spring force.
- Mark the position on one of the drive support pedestals at the rotation protection piece.
- Continue to drive the actuator in the same direction until the disc springs are compressed to the required amount (see the specific data sheet for the drive) as denoted on the spring/force diagram.
- Slacken-off the fixing screw on the corresponding switching cam (Fig. 7), move the cam towards the limit switch until it clicks, and re-tighten the fixing screw.
- Check the setting by repeating the drive action to close the valve and check that the spring discs are compressed to the correct stroke. Re-adjust the cam if required.

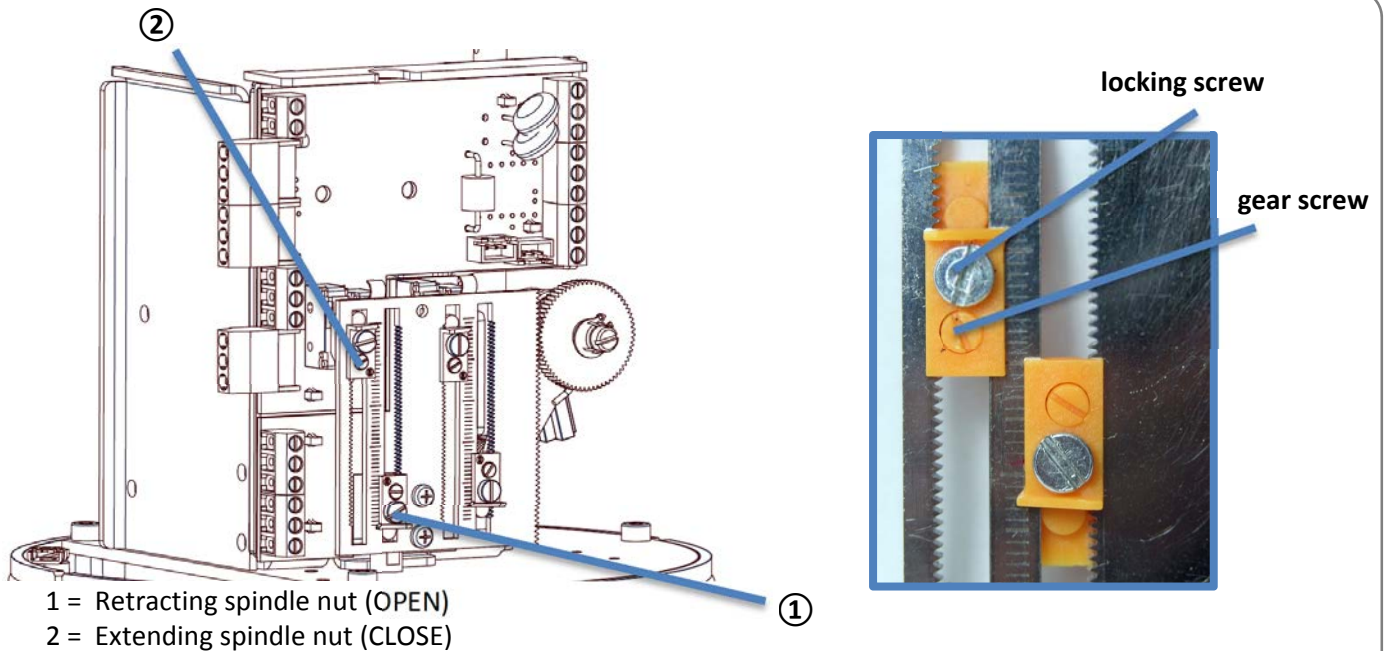


Figure 7: Adjusting switching cams

## 9.2.2 Stroke-Dependent Limit Switch Cut-Off

The spring discs are not compressed for the stroke dependent limit switch cut-off.

- Using the handwheel of the actuator, drive the valve until the required end position is reached.
- Unlock the fixing screw ① on the corresponding switching cam (Fig. 7), use the gear screw ② to move the cam towards the limit switch until it activates, and re-tighten the locking screw.
- Check the settings by driving into the end position again and measure the valve stroke.
- Re-adjust the cam if required.

## 9.3 PSL320-325

### 9.3.1 Force/Stroke-Dependent Limit Switch Cut-Off

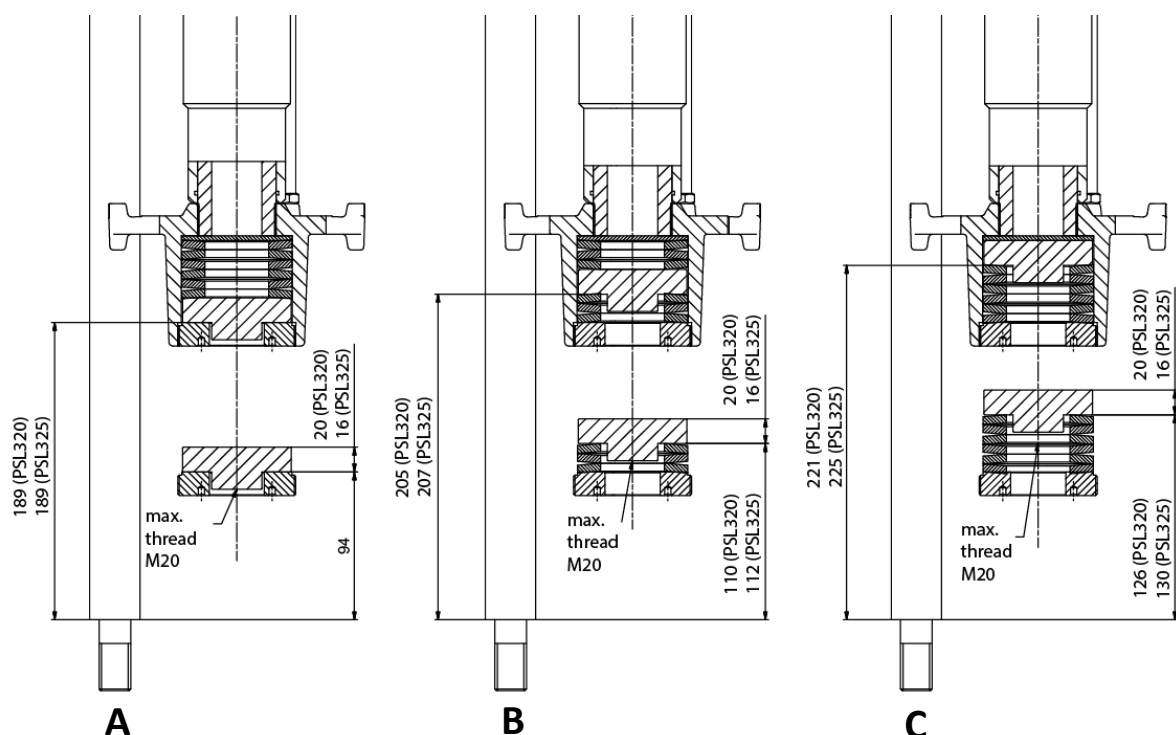


Figure 8: Standard disc spring coupling

The different methods of arranging the discs are dependent on the type of valve. Three different methods are possible:

- A: Arrangement for a through-valve with "Valve stem retracting" as direction of closing (fig. 8).
- B: Arrangement for a 3-way valve (fig. 8).
- C: Arrangement for a through valve with "Valve stem extending" as direction of closing (fig. 8).



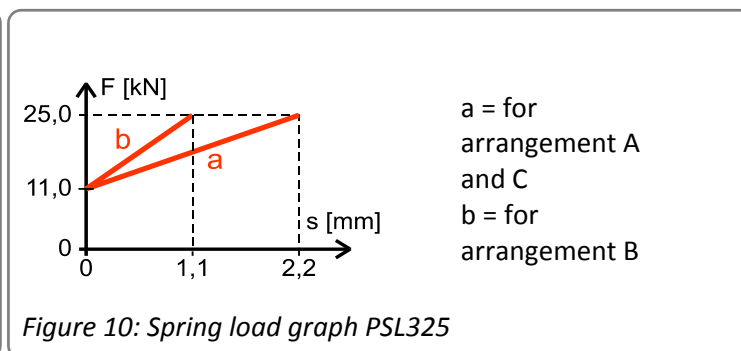
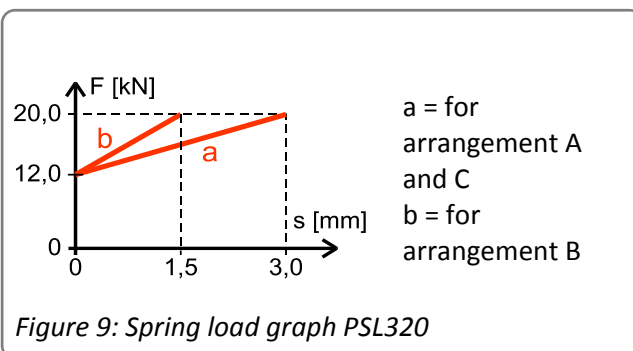
**3-way valves using the spring disc arrangement "B" require only half of the spring stroke designated in the spring pressure graph below!**

#### Basic rule:

- For a through-valve, first set the CLOSED position force/stroke-dependent, then the OPEN position stroke-dependent.
- For a 3-way valve set both limit positions force/stroke-dependent.

### 9.3.2 Force/Stroke-Dependent Limit Switch Cut-Off

- Using the handwheel on the actuator, drive the valve into the limit position until the valve cone touches the valve seat. This occurs when the valve stem nut starts to move axially and the spindle pushes against the disc spring force.
- Mark the position on one of the drive support pedestals at the rotation protection piece.
- Continue to drive the actuator in the same direction until the disc springs are compressed to the required amount (see the specific data sheet for the drive) as denoted on the spring/force diagram.
- Unlock the fixing screw on the corresponding switching cam (Fig. 7), move the cam towards the limit switch until it clicks, and re-tighten the fixing screw.
- Check the setting by repeating the drive action to close the valve and check that the spring discs are compressed to the correct stroke. Re-adjust the cam if required.



### 9.3.3 Stroke-Dependent Limit Switch Cut-Off

The spring discs are not compressed for the stroke dependent limit switch cut-off.

- Using the handwheel of the actuator, drive the valve until the required end position is reached.
- Unlock the fixing screw on the corresponding switching cam (Fig. 7), move the cam towards the limit switch until it activates, and re-tighten the fixing screw.
- Check the settings by driving into the end position again and measure the valve stroke. Re-adjust the cam if required.

## 10. Electric Supply



Before connecting to the mains, ensure that the mains supply is isolated and secured against an accidental switching-on.

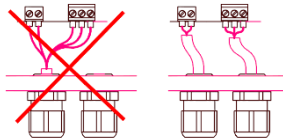
Remove the cover of the actuator in order to connect the electric supply (cf. 8, Removing the cover).

The mains connecting cables must be suitably dimensioned to accept the maximum current requirement of the actuator. The yellow-green coloured cables may only be used for connecting to earth.

When you insert the cable through the drive cable connector, ensure that the max. bending radius for the cable is observed.

The PSL electric actuators do not have an internal electrical power switch. A switch or power mains switch must be provided in the building installation. It should be positioned closely to the device and be easily accessible for the user and shall be labelled as the mains isolator switch for the actuator.

Electric installation as well as over-current and overvoltage protection devices must conform to the standard DIN DIN VDE 0100-410, protective class I resp. protection class 3 (24VAC/24VDC) and also to the standard DIN IEC 60364-4-44 according to the applied overvoltage category of the actuator.



Please protect all of the power supply and control cables in front of the terminals mechanically by using suitable measures against unintentional loosening. Never install the power supply and the control cables together in one line but instead please always use two different lines.

### 10.1 Wiring Diagram - PSL 204 Actuator

Electric terminals are provided in a terminal box at the actuator.

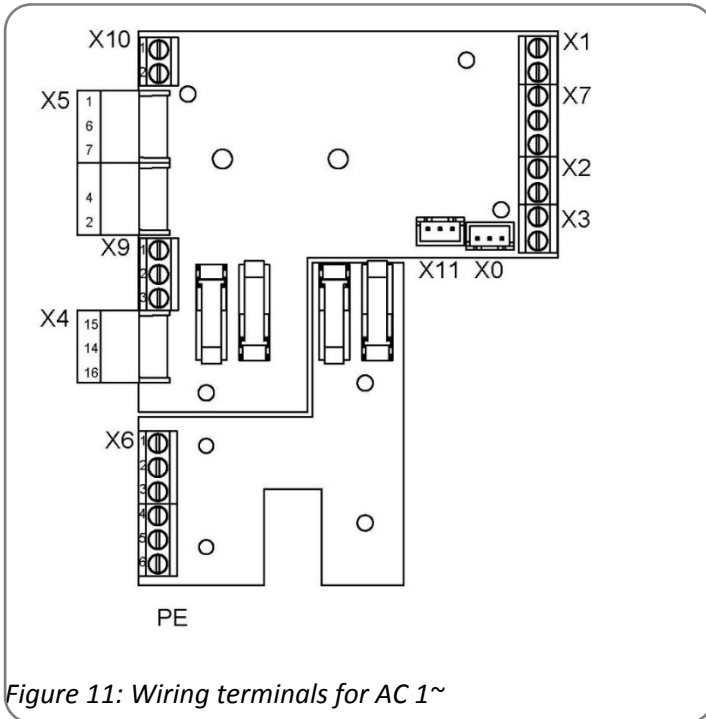
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	⊕		RJ-45 TTL	Taster Button
↑	↑	↑	↓	↓	↓	↕	↕	↑	↑	↑	↑	↑	↓	↑	↑	↑	↕	↕	↕	↕	↑	↑	⊕			
+ 0(4) - 20 mA + 0(2) - 10 V	GND	+ 0(4) - 20 mA + 0(2) - 10 V	GND	max. Last / max. Load 100 mA bei / at 24 VDC	L+ AUF/OPEN N- L+ ZU/CLOSE L+ (24V AC/DC) N- (24V AC/DC)	24 V <input type="checkbox"/> AC/DC 115 V - 230 V AC <input type="checkbox"/>	24 VDC / 100 mA	+ 0(4) - 20 mA + 0(2) - 10 V	GND	(Option)	(Option)	(Option)	(Option)	(Option)	(Option)	Zu / Closed	Auf / Open	Wegschalter potentialfreier Kontakt	Versorgungs- spannung	Feldbus- Anschluß	PC Kommuni- kation	Inbetrieb- nahme				
Set value input	Active position feedback	Monitor relay potential-free	Binary input signals	Fail safe signal	Supply	Actual value	Position switch potential-free contact	Power supply voltage	Fieldbus interface	PC commu- nication	Com- missio- ning															
Galvanisch getrennt / Galvanically isolated 1 kV													Process-Sensor													

8013770 - S-217\_E



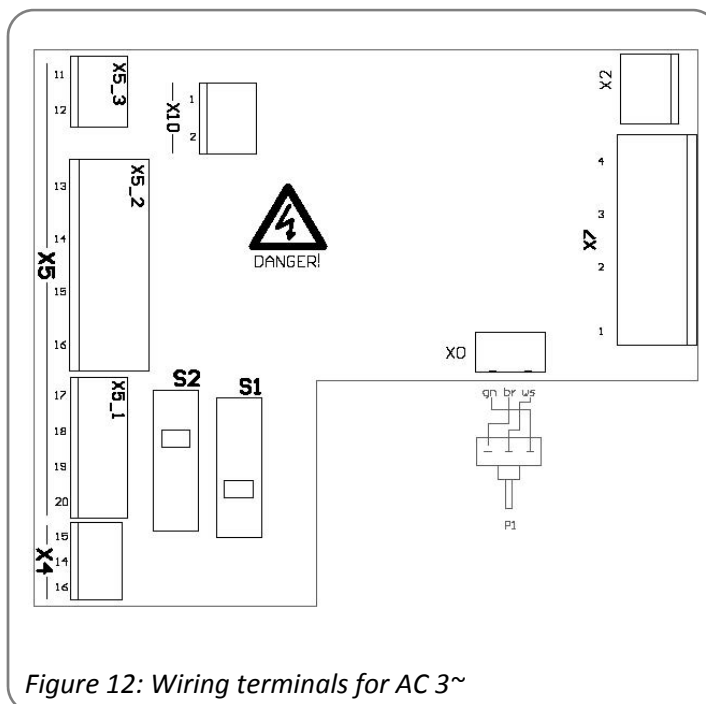
## 10.2 Wiring diagram - Accessories

2575600 Rev B



- X1 = Internal wiring
- X2 = Internal wiring
- X3 = Internal wiring
- X4 = Potentiometer 1 (optional accessories)
- X5/1 = Neutral
- X5/2 = Motor phase to open
- X5/4 = Motor phase to close
- X6 = Position signal switches (optional accessories)
- X7 = internal wiring
- X9 = Potentiometer 2 (optional accessories)
- X0 = Potentiometer 1 connection (optional accessories)
- X11 = Potentiometer 2 connection
- PE = Earth connection on housing

Figure 11: Wiring terminals for AC 1~



- X5/14-16 = 3~ supply
- X5/13 = Neutral conductor
- X5/11+12 = Terminal switch
- X5/17+18 = Position switch CLOSE
- X5/19+20 = Position switch OPEN
- X4 = Potentiometer 1 tap (optional accessories)
- X0 = Potentiometer 1 connection (optional accessories)
- X2+X7 = Internal wiring
- X10 = normal open contact option

Figure 12: Wiring terminals for AC 3~



**PE earth connection on housing plate has to be connected!**

Two adjustable limit switches are installed to limit the stroke of the actuator, and cut-off the motor current in the relative direction. (see 9.1 ff)

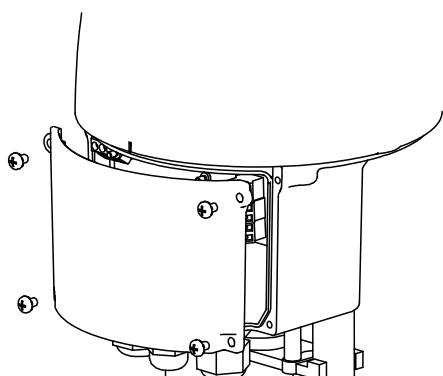
Most motors have a thermal switch, depending on the actuator type, to cut off the current in both directions when a maximum temperature is reached.



## 10.3 Mains supply

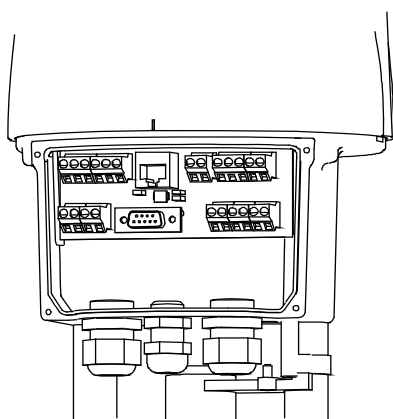


Isolate the power supply. Safeguard the line against unauthorized and unintended restarting.



Open the terminal box.

The terminal box provides terminals to accommodate rigid and flexible cables of wire widths of 0.14 mm<sup>2</sup> to 2.5 mm<sup>2</sup> as well as a PE screw on the housing.



**Caution:** Please observe the supply voltage and the maximum power consumption of the actuator as indicated on the actuator's tag plate!

Connect supply and control lines to terminals (as indicated in the wiring diagram).

## 11. Commissioning

- Put the cover on, and re-install the handwheel (fig. 11.1 Closing the cover).
- Drive the valve to the centre of the stroke using the handwheel
- Switch on the mains.
- Switch the setting signal briefly between OPEN and CLOSE and check that the drive operates in the correct direction. If necessary, reverse the setting signal for OPEN/CLOSE.
- Drive the actuator, in both directions, using the setting signal until the limit switch cuts-off. Check that the limit switch position is correct. If necessary re-adjust the limit switch.

### 11.1 Closing the Cover

#### PSL201-PSL210 (IP65)

Please observe the label on the cover of the actuator.

#### PSL201-PSL210 (IP67/IP68) and PSL214

- Put the cover on the actuator and ensure that the two fixing screws are positioned over the corresponding threaded holes.
- Slightly tighten down the fixing screws with an Allen key. If the screws don't lock, move the cover slightly.
- Push the cover downwards and ensure that it slips over the sealing ring of the actuator.
- Tighten the screws.

#### PSL320-PSL325

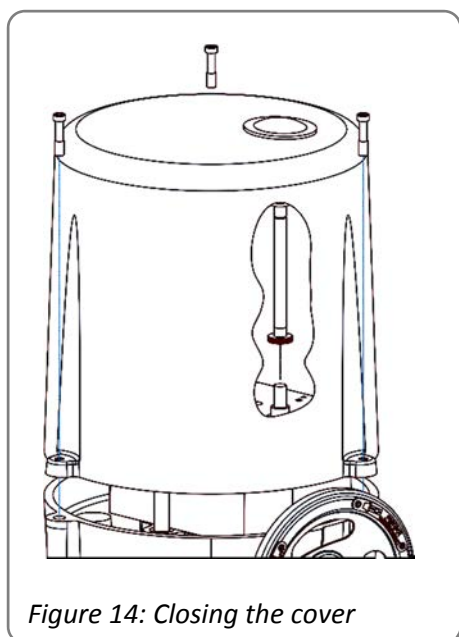


Figure 14: Closing the cover

- Check that the sealing ring on the periphery of the housing sits correctly in the groove.
- Put the cover on the actuator and ensure that the 3 fixing screws are positioned over the corresponding threaded holes and that the button is positioned over the release pin of the actuator housing.
- Tighten down the fixing screws with a corresponding screwdriver.

## 12. Service / Maintenance

The actuators are maintenance-free if used under the operating conditions as designated in the data sheet. The gearboxes are lubricated for life and do not require further lubrication.



**Caution !**  
During maintenance and repair the actuator must not be operated electrically.

## 12.1 Cleaning

The actuators should be cleaned dry. Do not operate the actuator during the cleaning process.

## 12.2 Spare Parts

Defective actuators should be returned to our factory in Pottstown, Pennsylvania, or to our representatives, to be checked for damages and their possible causes.

If you prefer repairs in-house, we can provide you our price list for spare parts.

## 13. Safety on Transportation

For transportation and storage all cable glands and connection flanges have to be closed to prevent ingress of moisture and dirt. A suitable method of packaging is required for transporting to avoid damage of coating and any external parts of the actuator.

## 14. Appendix

### 14.1 Accessoires

Various options are available in order to adapt the actuators to the various service conditions. A list of accessories for each actuator type is shown on the actuator data sheet.

		230 VAC 1~	115 VAC 1~	24 VAC 1~	400 V 3~	24 VDC	
<b>Accessories/ Options</b>	Position Signal Switches	2WE	•	•	•	•	
	Position Signal Switches Gold	2WE Gold	•	•	•	•	
	Positioner	PSAP	•	•) <sup>1</sup>	•) <sup>1</sup>	•) <sup>2</sup>	
	Position Transmitter	PSPT	•	•	•	•	
	Space Heating	HR	•	•	•	•) <sup>3</sup>	
	Potentiometer	PD	•	•	•	•	
	Reversing Starter Contactor	WSM01				•	
	IP67 Metal Cover	IP	Increase of enclosure to IP67				
	IP68 Metal Cover	IP	Increase of enclosure to IP68 (only valid for PSL201-214)				

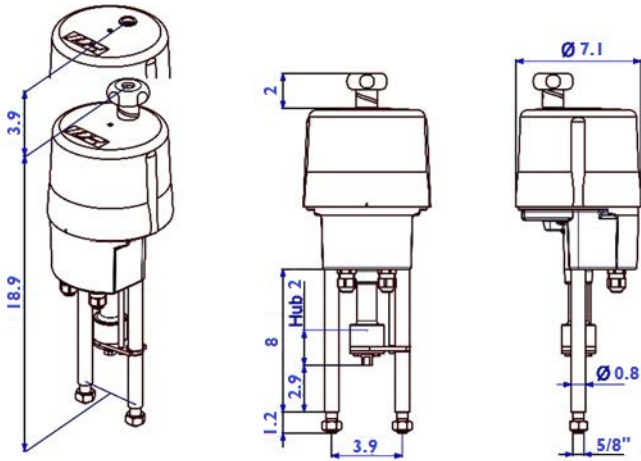
• = available, for further information see respective datasheet

)<sup>1</sup> = PSL series 204 to 320-325: PSAP with external relay required

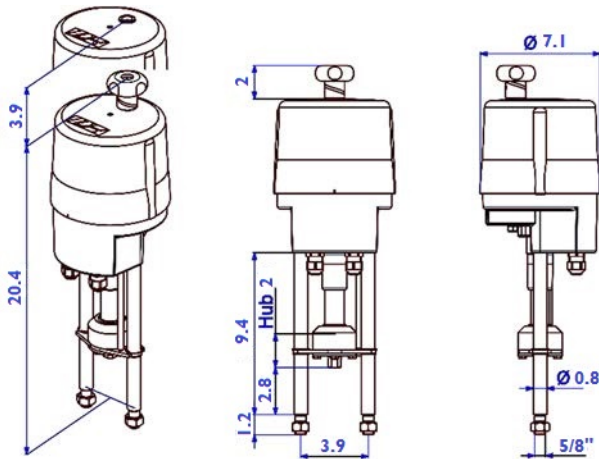
)<sup>2</sup> = only to be used with reversing starter contactor

)<sup>3</sup> = supply voltage 24 V or 115-230 V

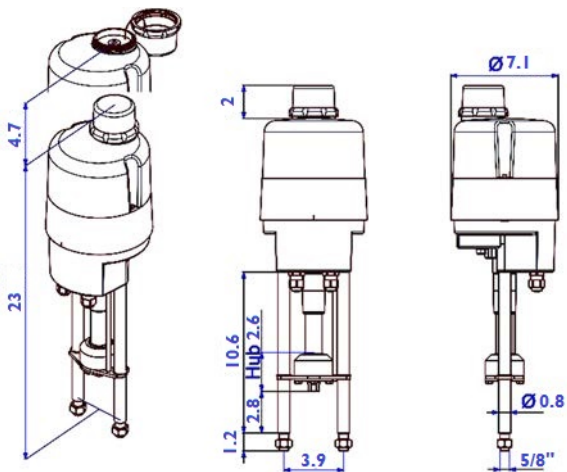
## 14.2 Actuator Overview



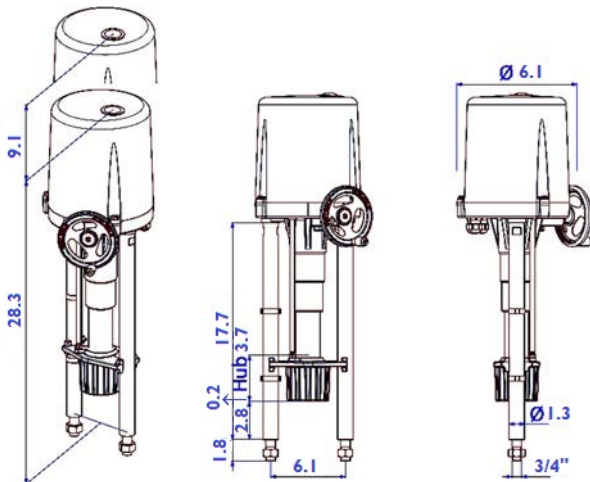
**PSL201-204**  
**225 lbf to 1012 lbf**  
 Maximum Thrust  
**0.01 to 0.06 in/s**  
 Stroking speed  
**maximum 2 in**  
 Stroke



**PSL208-210**  
**1798 lbf to 2248 lbf**  
 Maximum Thrust  
**0.014 to 0.04 in/s**  
 Stroking speed  
**maximum 2 in**  
 Stroke



**PSL214**  
**3147 lbf**  
 Maximum Thrust  
**0.018 in/s**  
 Stroking speed  
**maximum 2.56 in**  
 Stroke



**PSL320-325**  
**4496 lbf to 5620 lbf**  
 Maximum Thrust  
**0.04 in/s**  
 Stroking speed  
**maximum 3.74 in**  
 Stroke

## 15. Tracing Faults

Red LED				Green LED						
Glowing permanently	Flashing quickly	Flashing slowly	off	Glowing permanently	Flashing quickly	Flashing slowly	off			
								<b>Status</b>	<b>Probable reasons</b>	<b>Possible remedy</b>
			x				x	Actuator does not respond, both LEDs are off	1) No supply voltage applied 2) The applied voltage does not match the actuator voltage on the tag plate	1) Check mains supply 2) Apply correct supply voltage
			x	x				Actuator does not drive the full stroke	1) Actuator not correctly commissioned 2) Too small stroke programmed (in mode "one position-dependent cut-off")	1) Repeat commissioning 2) Check valve stroke parameters -> see instructions AMS-PSCS
			x	x				Actuator does not close the valve properly	1) Actuator not correctly commissioned 2) Actuator closing force/ torque too low	1) Repeat commissioning 2) Check actuator selection
			x	x				Actuator is in normal operating condition, but does not respond to set-value changes	1) Fixed digital set-value is activated 2) Actuator is configured to work with process controller	1) Check set-value parameters -> see instructions AMS-PSCS 2) Connect process sensor
			x	x				Actuator position does not correspond to set-value input	A non-linear valve curve has been parameterised	Verify parameterised characteristic -> see instructions AMS-PSCS
								<b>Operating conditions</b>	<b>Probable reasons</b>	<b>Possible remedy</b>
			x	x				Normal operating condition		
			x				X	Actuator in commissioning mode		Commissioning mode will be left automatically after completion
			x				x	Actuator not commissioned		Depending on the type of cut-offs, the actuator has to be commissioned either automatically or manually
								<b>Faults within the actuator's environment</b>	<b>Probable reasons</b>	<b>Possible remedy</b>
		x		x				Too high torque has been encountered within the valve stroke	1) Actuator not correctly commissioned to the valve 2) Mechanical block within the stroke path 3) Improper selection of the actuator	1) Repeat commissioning 2) Check valve and actuator for unobstructed running 3) Check actuator selection
		x					X	1) No proper process feedback (only in combination with PSIC) 2+3) Maximum control range exceeds (only in combination with PSIC)	1) Process feedback wrongly or not at all connected 2) Process feedback outside od adjusted range	1) Apply the correct process feedback signal and check polarity 2) Ensure the correct process feedback range 3) Check the process sensor and its supply voltage

## 15. Tracing Faults (cont.)

Red LED				Green LED						
Glowing permanently	Flashing quickly	Flashing slowly	Off	Glowing permanently	Flashing quickly	Flashing slowly	off			
								3) No process sensor signal available		
		x				x		Actuator drives into a preset position	1) Signal is applied to the binary fail-safe input 2) Supply voltage failure on actuators with optional PSEP	1) Disconnect the signal 2) Check supply voltage
		x					x	Set-value disconnected or outside the parameterized range	1) Set-value not connected 2) Wrong polarity of set-value 3) set-value signal outside parameter range, please check	1) Apply set-value 2) Check the set-value polarity 3) Check the set-value range
	x			x				Stored end position could not be reached	Loose or dirty valve seat	Check the valve seat
	x				x			Stored end position ment has been passed over	Valve seat worn or defective	Check the valve seat
	x					x		Actuator supply voltage too low	1) Improper wiring of the mains supply 2) Jitter in supply voltage 3) Too low supply voltage from PSEP (with optional PSEP)	1) Check mains wiring 2) Check supply voltage -> see datasheet 3) Contact PS service team
								<b>Faults within the actuator</b>	<b>Probable reasons</b>	<b>Possible remedy</b>
x				x				Actuator has reached lifetime limit	Wear and/ or running time	Contact PS service team
x					x			Faulty electronics or invalid parameters	1) Supply voltage interrupted during commissioning 2) Defective electronic component	1) Reload parameters (-> see manual AMS-PSCS), then repeat commissioning 2) Contact PS service team
x						x		Critical or maximum temperature reached	1) Too high numbers of starts 2) Ambient temperature too high	1) Check application and its adjustment 2) Check ambient temperature and try to reduce it -> see relevant data sheet
x							x	Mechanical fault in the actuator	Defective mechanical part	Contact PS service team



## 16. EC Declaration of Conformity

### Declaration of Incorporation of Part Completed Machinery and EC Declaration of Conformity in compliance with the Directives on EMC and Low Voltage

We,

**PS Automation GmbH  
Philipp-Krämer-Ring 13  
D-67098 Bad Dürkheim**

Declare under our sole responsibility that we manufacture electric actuator series

**PSR-E...; PSQx03...; PSQ-E...; PSQ-AMS...; PSL-Mod.4...; PSL-AMS...**

according the requirements of the

**EC Directive 2006/42/EC**

as part completed machinery. These actuators are designed to be installed on industrial valves.  
It is prohibited to take the actuator into service until it has been ensured that the complete machine conforms the applicable machinery directives.  
The technical documentation described in Annex VII, part B has been prepared.

The above actuators further comply with the requirements of the following directives.

<b>2014/30/EU</b>	Electromagnetic Compatibility (EMC)
<b>2006/95/EC</b>	Low Voltage (LVD) <i>(valid until 04/19/2016)</i>
<b>2014/35/EU</b>	Low Voltage (LVD) <i>(valid from 04/20/2016)</i>
<b>2011/65/EU</b>	Restriction of Hazardous Substances (RoHS)

and have been successfully tested in accordance with the following harmonized standards

<b>EN 61000-6-2: 2005</b>	Electromagnetic compatibility (EMC), Generic standards-Immunity for industrial environments
<b>EN 61000-6-3: 2007</b>	Electromagnetic compatibility (EMC), Generic standards-Emission standard for residential, commercial and light-industrial environments
<b>EN 61010-1: 2010</b>	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use

Bad Dürkheim, 2015



Max Schmidhuber  
(General Manager)

#### CAUTION!

To ensure compliance of these actuators with the above directives, it is the responsibility of the specifier, purchaser, installer and user to observe the relevant specifications and limitations when taking the product into service. Details are available on request, and are mentioned in the Installation and Maintenance Instructions.