ILEA-G_IOM

Installation Instructions for ILEA electric actuators
ILEA-Gx

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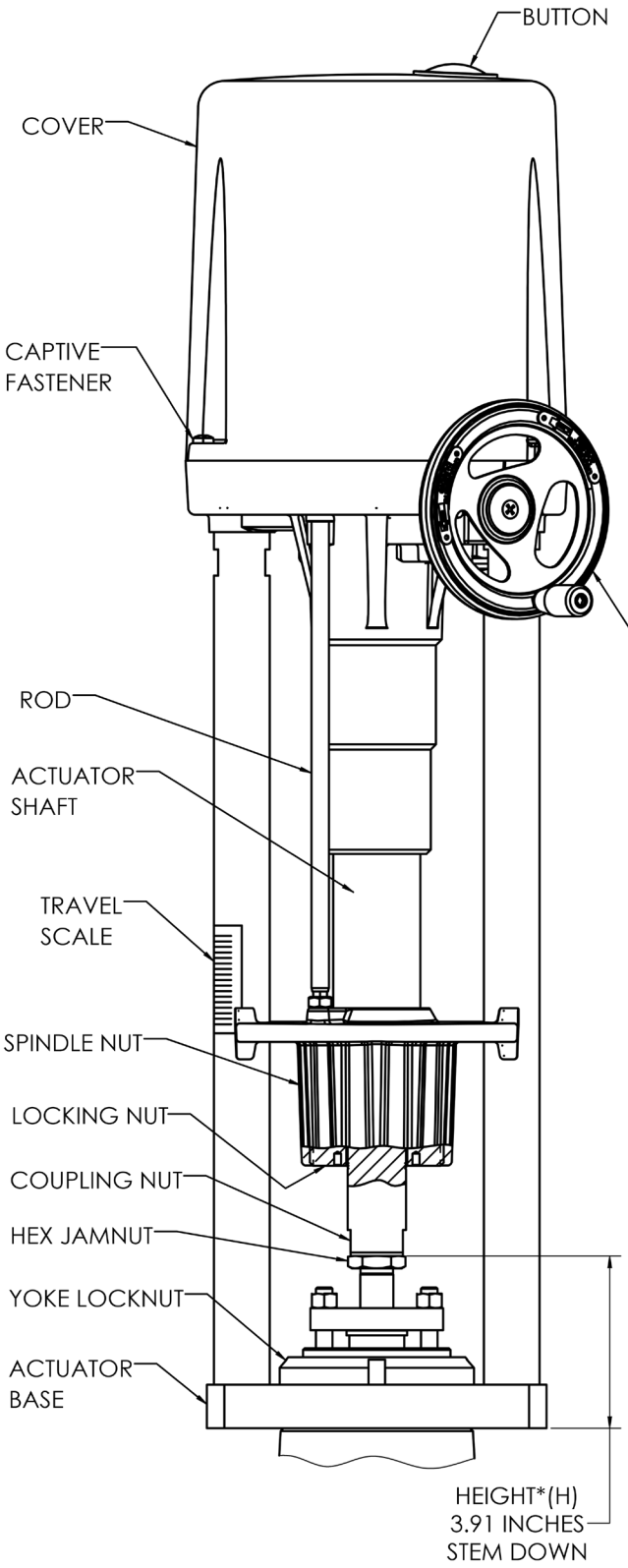
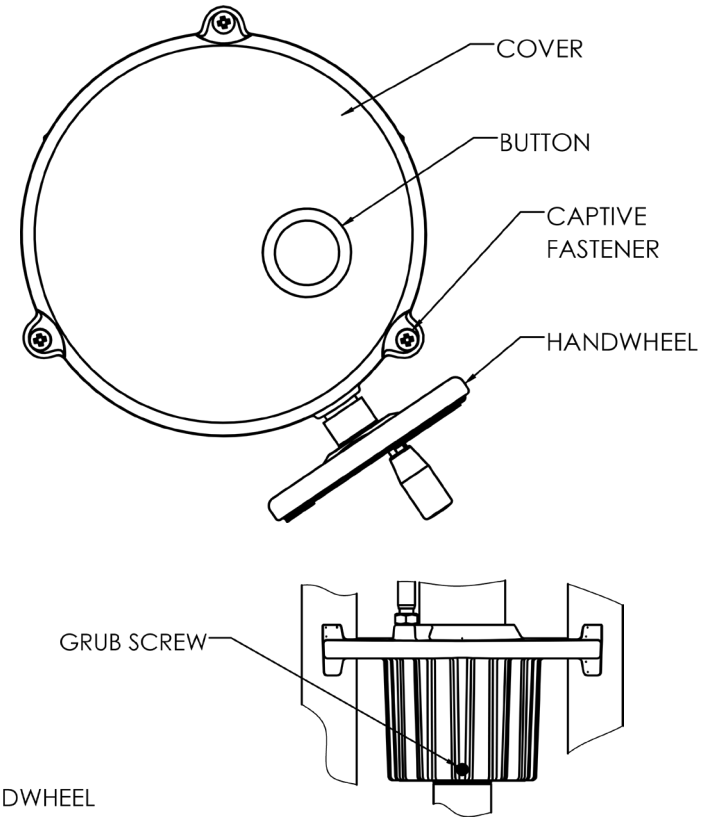
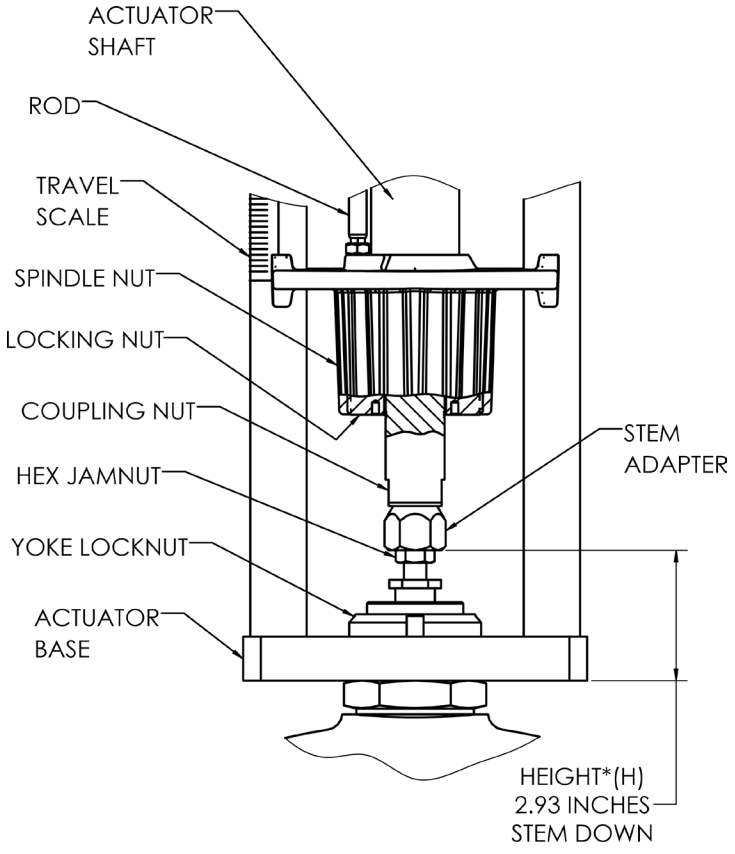
ACTUATOR PART DESIGNATIONS



MODEL 18N VALVE
HD5 INTERFACE MOUNTING





MODEL 29S VALVE
115 INTERFACE MOUNTING

Please ensure that the detailed operating instructions and the chapter on "Safety" in particular have been read and understood by all personnel involved in the installation, start-up, operation, maintenance and repair of the actuators.

Beware of mechanical hazards due to electrically powered actuator components! With the actuator powered electrically, operating the unit holds the danger of crushing your finger!

Caution! During the installation of the actuator on the valve, the unit must not be powered electrically. Disconnect voltage from the actuator before maintenance and adjustment work.

During adjustment work, the actuator must be operated by means of the handwheel only. Do not operate electrically!

DO NOT FULLY EXTEND.

BEFORE START WORKING:
SAFETY REGULATIONS:

- Disconnect mains!
- Prevent reconnection!
- Test for absence of harmful voltages!
- Cover or close nearby live parts!

ACTUATOR REMOVAL OF AN ILEA G7 OR G8

From a Model 18N (HD5 Interface) Valve or a 29S (115 Interface) Valve

Read all instructions carefully before beginning

1) Remove line pressure and isolate the valve in the piping.

2) Remove the power and signal from the actuator. Remove the wiring connections from the actuator. The cover must be removed to access the wiring connections, green and red LED lights, and commissioning button. Loosen the 3 captive fasteners then pull the cover up to remove. After the wiring connections are removed, replace the cover to avoid damage to the actuator. To replace the cover, check that the o-ring sits correctly in the groove around the base of the cover. Orient the button on the top of the cover over the release pin of the actuator. Install the cover on the actuator. Tighten the 3 captive fasteners.

3) Operate the actuator with the handwheel so the plug is not in contact with the seat(s) or travel stop in the valve. Depress the button on the top of the actuator cover to engage the handwheel. Facing the handwheel, turn the handwheel clockwise to extend the valve stem and retract the actuator shaft. Facing the handwheel, turn the handwheel counterclockwise to retract the valve stem and extend the actuator shaft.

4) Loosen the jamnut on the valve stem. Thread the jamnut to the bottom of the threads on the valve stem.

5) Loosen the yoke locknut until it is free of the valve. A hammer or mallet and a chisel may be used to loosen the yoke locknut. Insert the end of the chisel into one of the slots around the circumference of the yoke locknut.

6) Hold the jamnut on the valve stem with a wrench to keep the valve stem from turning. The valve stem should never be turned while the plug is in contact with the seat otherwise the seating surfaces will be damaged. Looking down on the actuator, turn the actuator counterclockwise to disengage the actuator shaft from the valve stem.

7) Remove the actuator and yoke locknut from the valve.

ACTUATOR INSTALLATION OF AN ILEA G7 OR G8

On a Model 18N (HD5 Interface) Valve or a 29S (115 Interface) Valve

Read all instructions carefully before beginning

1) Push the valve stem down until the plug is seated. Note the stem location.

2) With the valve stem down and the plug seated install the hex jamnut on the valve stem. Thread the jamnut onto the stem so the Height *(H) measured from the actuator mounting surface on the valve to the top of the jamnut is correct. For a Model 18N valve, Height *(H) is 3.91 inch. For a Model 29S valve, Height *(H) is 2.93 inch.

3) Place the actuator and yoke locknut over the valve stem and onto the valve. Watch the orientation of the yoke locknut. Looking down on the valve stem, when the yoke locknut is installed the tapered edge of the yoke locknut must be up. The actuator must rest firmly on the actuator mounting surface on the valve. If necessary, use the actuator handwheel to reposition the actuator shaft. Depress the button on the top of the actuator cover to engage the handwheel. Facing the handwheel, turn the handwheel clockwise to retract the actuator shaft. Thread the yoke locknut onto the valve. Do not tighten the yoke locknut at this time. The actuator must rest firmly on the actuator mounting surface on the valve and be free to turn on the valve to engage the valve stem in Step 5.

4) With the valve stem down, the plug seated, and the actuator resting firmly on the actuator mounting surface on the valve, use the actuator handwheel to bring the actuator shaft into contact with the valve stem. Depress the button on the top of the actuator cover to engage the handwheel. Facing the handwheel, turn the handwheel counterclockwise to extend the actuator shaft.

5) Looking down on the actuator, turn the actuator clockwise to engage the actuator shaft with the valve stem. For a Model 18N valve, engage the coupling nut on the actuator shaft with the valve stem. For a Model 29S valve, engage the stem adapter on the actuator shaft with the valve stem. The valve stem should never be turned while the plug is in contact with the seat otherwise the seating surfaces will be damaged. For a Model 18N valve, turn the actuator clockwise until the jamnut on the valve stem contacts the coupling nut. Tighten the jamnut to the coupling nut. For a Model 29S valve, turn the actuator clockwise until the jamnut on the valve stem contacts the stem adapter. Tighten the jamnut to the stem adapter.

6) Depress the button on the top of the actuator cover to engage the handwheel. Facing the handwheel, turn the handwheel clockwise 3 turns to retract the actuator shaft. Rotate the actuator to the desired orientation. For the factory default actuator position on a 2-way valve, orient the actuator with the travel scale downstream. For the factory default actuator position on a 3-way diverting valve, orient the actuator with the travel scale on the lower port side of the valve. For the factory default actuator position on a 3-way mixing valve, orient the actuator with the travel scale on the common port side of the valve. There is a rod alongside the actuator shaft. The rod extends from the spindle nut into the actuator housing. The travel scale is attached to the actuator leg closest to the rod. Securely tighten the yoke locknut to the valve. A hammer or mallet and a chisel may be used to tighten the yoke locknut. Insert the end of the chisel into one of the slots around the circumference of the yoke locknut.

7) Observe the orientation of the actuator locking nut in the spindle nut. The actuator locking nut must be flush with the lower edge of the spindle nut and not protrude. If the actuator locking nut is flush with the lower edge of the spindle nut and does not protrude, go on to the next step. If the actuator locking nut protrudes from the lower edge of the spindle nut, remove the grub screw if it is installed in the spindle nut. Depress the button on the top of the actuator cover to engage the handwheel. Facing the handwheel, turn the handwheel counterclockwise to extend the actuator shaft until the actuator locking nut can be threaded further into the spindle nut. Use the supplied face (pin) wrench in the holes on the actuator locking screw to turn the actuator locking screw until it is flush with the lower edge of the spindle nut and does not protrude.

8) Install the grub screw in the spindle nut and tighten to secure the actuator locking nut.

9) Restore the wiring connections to the actuator. The cover must be removed to access the wiring connections, green and red LED lights, and commissioning button. Loosen the 3 captive fasteners then pull the cover up to remove.

10) Return power to the actuator.

11) Perform the automatic commissioning procedure.

12) Return the signal to the actuator.

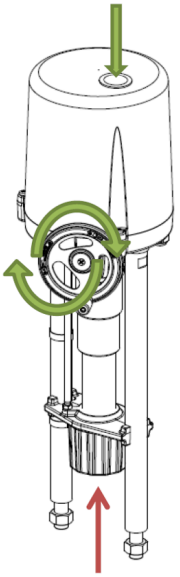
13) Return the line pressure to valve.

14) Stroke the valve several times to check the operation.

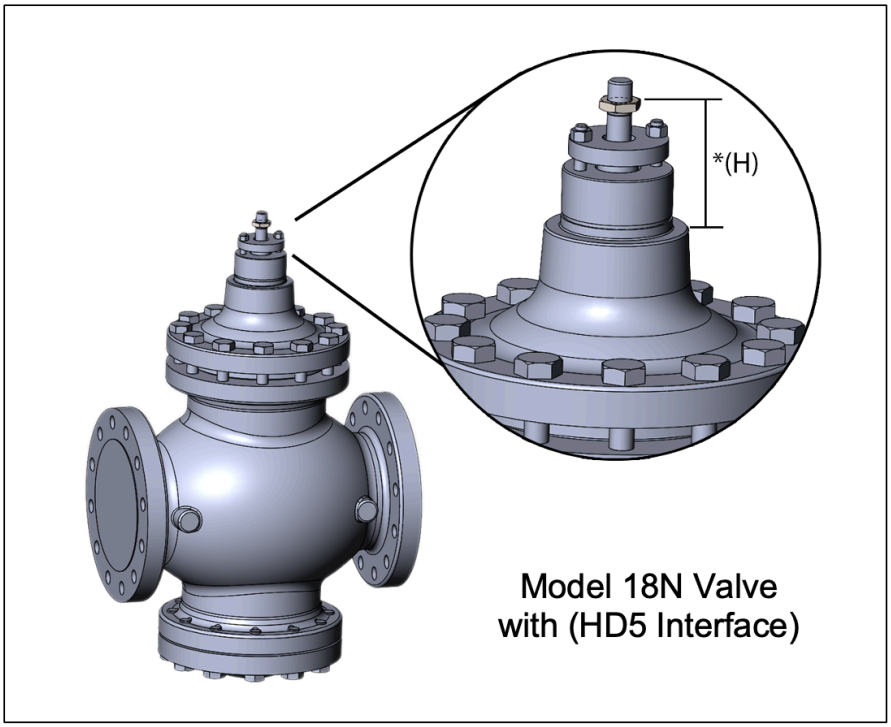
15) Install the travel scale.

16) Replace the cover. Check that the o-ring sits correctly in the groove around the base of the cover. Orient the button on the top of the cover over the release pin of the actuator. Install the cover on the actuator. Tighten the 3 captive fasteners.

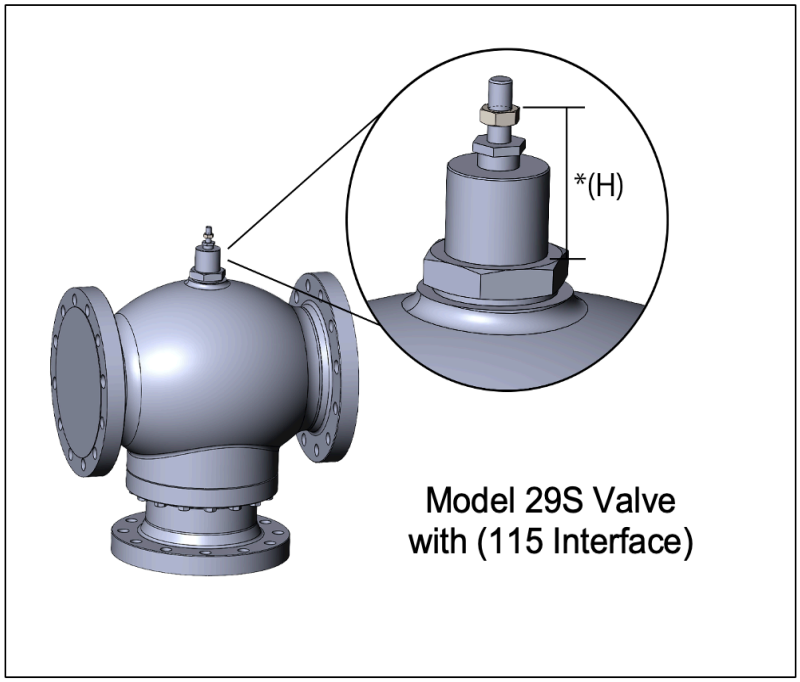
Depress the button then turn handwheel clockwise to retract the actuator shaft.



Face (Pin) Wrench



ILEA-G7 or G8 Height *(H) to top of jamnut with valve stem down and plug seated		
Valve	Height *(H) Inches	Number Of Jam Nuts
18N	3.91	1
29S	2.93	1



GENERAL SAFETY

ILEA actuators are built with state of the art technology and are safe to operate with commonly accepted electrical safety precautions. ILEA Actuators can also produce significant linear forces and should only be operated when connected to a control valve unless otherwise instructed. Fingers should not be anywhere near the moving parts of the valve and actuator assembly while power is connected.

Operators should be trained, read the user manual and have a good understand of the actuator's function and operating capabilities. The wiring termination should be verified before commissioning commences.

If the actuator was purchased together with a control valve the actuator will be precalibrated to the valve's stroke and there will be no other requirement than applying the correct power supply and control signal.

The standard control signal is 4 – 20 mA where a 2-way valve is closed at 4mA and fully open at 20 mA. This standard configuration would be depicted on the product label for 'Signal' as 20-4 CL, to indicate it is a 4 – 20 mA signal and CLOSED at 4 ma. The actuator should be preprogrammed for control action and which signal is designated. Switching from a milliamp signal to a voltage signal is simply a matter of wiring termination. Switching whether the control signal is ZERO based or not, or the control action must be done in the software set up. This can be done on the job site as necessary with the programming umbilical cord option along with a laptop computer that has a USB connection. If this is required, contact the Warren Controls factory.

SET UP

CONTROL SIGNAL AND POSITION FEEDBACK CHOICES AND LABEL DESIGNATIONS.

SIGNAL	2-WAY VALVE CLOSED	LABEL DESIGNATION	3-WAY VALVE LOWER PORT CLOSED	LABEL DESIGNATION
4 – 20 mA	@ 4 mA	20 – 4 mA CL	@ 4 mA	20 – 4 mA DN
4 – 20 mA	@ 20 mA	4 – 20 mA CL	@ 20 mA	4 – 20 mA DN
0 – 20 mA	@ 0 mA	20 – 0 mA CL	@ 0 mA	20 – 0 mA DN
0 – 20 mA	@ 20 mA	0 – 20 mA CL	@ 20 mA	0 – 20 mA DN
2 – 10 Vdc	@ 2 Vdc	10 – 2 Vdc CL	@ 2 Vdc	10 – 2 Vdc DN
2 – 10 Vdc	@ 10 Vdc	2 – 10 Vdc CL	@ 10 Vdc	2 – 10 Vdc DN
0 – 10 Vdc	@ 0 Vdc	10 – 0 Vdc CL	@ 0 Vdc	10 – 0 Vdc DN
0 – 10 Vdc	@ 10 Vdc	0 – 10 Vdc CL	@ 10 Vdc	0 – 10 Vdc DN

With power applied, preferably, use a signal calibrator to verify that the valve is fully stroking from one end to the other as depicted by the travel indicator on the side of the actuator mounting Pillar and with the proper control action. Alternately the process controller could be directly connected to test if it has a 'Manual-Mode' of operation where the controllers output can be manually adjusted from 0% - 100%.

IF THE ACTUATOR IS ONE WITH A DEFINED 'FAIL-SAFE' DIRECTION ,THAT CAN BE VERIFIED BY:

1. Using the signal calibrator to move the actuator position to mid-stroke.
2. Safely disconnecting power at the power breaker switch and observing the actuator going to its fail-safe position.

Once these steps are verified you may proceed to commissioning the control valve. If either of these tests did not perform as expected, then contact the Warren Controls factory for further troubleshooting steps.

Removing the cover

The cover must be removed to access the wiring connections, green and red LED lights, and commissioning button. Loosen the 3 captive fasteners then pull the cover up to remove.

Replacing the cover

To replace the cover, check that the o-ring sits correctly in the groove around the base of the cover. Orient the button on the top of the cover over the release pin of the actuator. Install the cover on the actuator. Tighten the 3 captive fasteners.

BASIC SAFETY NOTES:

• Before removing the actuator cover, ensure that the electrical mains supply voltage is disconnected.

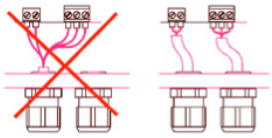
• If operating the actuator with the cover removed for troubleshooting reasons make sure the wiring terminations are clearly understood. Contract the Warren Controls factory for further troubleshooting steps as may be necessary.

• Do NOT attempt to auto-stroke the actuator when the actuator is not connected to a control valve as it will not function.

• Do NOT adjust the Manual Override handwheel completely downward when the actuator is not connected to a control valve as this could permanently damage the actuator.

•If the actuator is removed from the control valve, upon reinstallation the auto-calibration procedure must be performed.

Electric installation as well as over-current and over-voltage protection devices must be conform to the standard DIN IEC 60364-4-41, protection class I resp. protection class III (24VAC/24VDC) and also to the standard DIN IEC 60364-4-44 according to the applied over-voltage 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 conduit but instead please always use two different conduit.

Green Wire Earth Ground Connection:

Attach the green wire earth ground to the chassis, shown here.

WIRING TERMINATION

Electric supply for 1-phase AC/DC

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	⏚		TTL	Button
↑	↑	↑	↓	↓	↓	↕	↕	↑	↑	↑	↑	↑	↓	↑	↑	↑	↕	↕	↕	↕	↑	↑				
+0(2) - 10 V	+ 0(4) - 20 mA	GND	+ 0(2) - 10 V	+ 0(4) - 20 mA	GND	max. Last/max. Load 100 mA/at 24 VD (Option)		L/ + Open	N/-	L/ + Close	N/- (24V AC/DC) L/+ (24V AC/DC) (Option)		21-40 VDC/ 100 mA (OPTION)	+ 0(2) - 10 V	+ 0(4) - 20 mA	GND	(Option)	(Option)	(Option)	(Option)	L/+(see tag plate)	N/-(see tag plate)	PE	(Option)		
								24 V AC/DC																		
								115V- 230V AC																		
Control Signal Input			Position Feedback Output			Monitor relay potential-free		Binary Input signals			Fail safe signal		Supply	Actual value			Closed		Open		Supply Voltage			Fieldbus Interface	PC Communication	Commissioning
Galvanically isolated 1 kV													Process-Sensor (Option)				Position switch potential-free contact									

COMMISSIONING

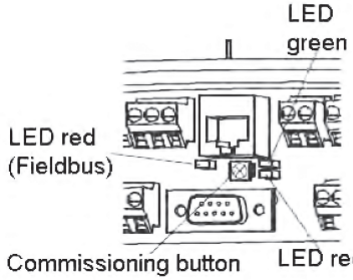
ILEA actuators are commissioned at the factory when mounted to a control Valve.

It must be commissioned if provided separately from a valve or has been dismounted.

The actuator can only be commissioned when correctly mounted to a valve and with at least one cut off set to "force/torque.
Actuator cover must be removed to access commissioning button and red and green LED's.

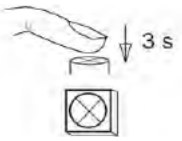
CAUTION! ELECTRICAL OPERATION OF THE ACTUATOR IS ALLOWED ONLY AFTER MOUNTING TO A VALVE!

OPERATING DISPLAY – CONTROLS

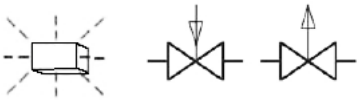


AUTOMATIC COMMISSIONING

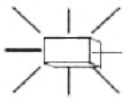
(Only available if at least one of the cut-offs is set to be "by force/torque" or "by position automatically".)



1 ***Press the commissioning button for 3 sec***



2 ***Commissioning in progress (Green LED is flashing, actuator drives in both positions).***



3 ***Green LED lights – Actuator successfully commissioned and ready to be used.***

Red LED				Green LED						
Glowing permanently	Flashing quickly	Flashing slowly	Off	Glowing permanently	Flashing quickly	Flashing slowly	Off			
								Status	**Probable reasons**	**Possible remedy**
			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 instrucions 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
								Operating conditions	**Probable reasons**	**Possible remedy**
			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
								Faults within the actuator's environment	**Probable reasons**	**Possible remedy**
		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 3) No process sensor signal available	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

TRACING FAULTS CHARTS

Red LED				Green LED						
Glowing permanently	Flashing quickly	Flashing slowly	Off	Glowing permanently	Flashing quickly	Flashing slowly	Off			
								Faults within the actuator's environment	**Probable reasons**	**Possible remedy**
		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 PSCP	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 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
								Faults within the actuator	**Probable reasons**	**Possible remedy**
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

NOTES

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