

FA-1000 Spring Return Valve Actuator

Introduction

The FA-1000 series electro-hydraulic actuators are available for 3-point (floating) or with electronic positioner for 0...10 V or 0...20 mA control. It provides a fully variable valve aperture and features: calibrated pressure switches (specified close-off values), a power failure safety mechanism and a hand crank for manual override.

This actuator has a minimum force of 700 N; it can be used with VG8000, VBD and VG7000 series valves in accordance with the maximum close-off pressure settings specified.

The FA-1000 when delivered as a single unit is pre-set to facilitate installation with minimum adjustment. It is also available with a variety of options such as auxiliary switches and feedback potentiometers.



**FA-1000 Actuator with VG8000 (left)
and VG7000 valve**

Features and Benefits

<p><input type="checkbox"/> Power failure safety mechanism (spring return).</p>	<p>Fast valve shut-off time after power failure.</p>
<p><input type="checkbox"/> Uses hydraulic system with calibrated pressure switches.</p>	<p>Fixed close-off force.</p>
<p><input type="checkbox"/> Models for 3-point and proportional 0...10 V or 0...20 mA control.</p>	<p>Allows optimum choice of electrical signal.</p>
<p><input type="checkbox"/> Positioner with adjustable starting point, span, and direct / reverse action.</p>	<p>Provides flexibility in application. Allows easy sequencing from only one controller output.</p>
<p><input type="checkbox"/> Active 0...10 V feedback on proportional models.</p>	<p>Provides active signal for independent position monitoring and command function.</p>
<p><input type="checkbox"/> Hand crank.</p>	<p>Provides manual positioning of the valve.</p>
<p><input type="checkbox"/> Special coupling clamp.</p>	<p>Provides easy mounting of the actuator on flanged valves with slotted stem.</p>
<p><input type="checkbox"/> Optional auxiliary switches and feedback potentiometers available.</p>	<p>Provides potential free contacts for independent monitoring of the actuators position.</p>

Ordering data

FA-10	□	-	□	10	□
Supply voltage type					
1 230VAC, 50/60 Hz					
6 24 VAC, 50/60 Hz					
Valve type					
1 VG7000					
2 VG8000 and VBD					
Accessories, factory mounted					
00 None					
03 Two auxiliary switches and 2 kΩ feedback potentiometer					
05 Two auxiliary switches and 130 Ω feedback potentiometer					
40 Built-in electronic Positioner 0...10 V / 0...20 mA (only 24 VAC models)					

Ordering Procedure

The actuator can be ordered as a separate unit or a factory fitted valve-actuator combination. Should the latter be requested, please just add "+M" to the end of the actuator ordering code.

For example:

Item 1 **VG82G1S1N** (valve body)
 Item 2 **FA-1040-2101** (actuator)

Alternatively, to order a factory fitted combination.

Item 1 **VG82G1S1N** (valve body)
 Item 2 **FA-1040-2101+M** (actuator)

Accessory Kits for in-situ installation

Order No.	Description	Comments
111 6133 010	2 signal switches	Not available for 0...10V models
111 6134 010	Feedback potentiometer 2 kΩ	Not available for 0...10V models
111 6135 010	Feedback potentiometer 130Ω	Not available for 0...10V models
282 3501 113	PG 11 x 7...9mm Screw fitting	Accessory
111 6142 010	*24V hydraulic unit	Spare part
111 6142 020	*230V hydraulic unit	Spare part

* Actuator hydraulic pump and motor.

Actuator - Valve combinations

The FA-1000 can be combined with the following range of valves:

● VG8000 series (PN16 flanged valves)

VG82□S1N	2-way PDTC (NO)	DN 15...40
VG84□S1N	2-way PDTO (NC)	DN 15...40
VG88□S1N	3-way mixing	DN 15...40
VG89□S1N	3-way diverting	DN 15...40

● VG7000 series (Threaded valves)

Only valves with a stainless steel trim can be combined with the FA-1000.

FA-1003, -1005, and -1040 models

VG72□3□T	2-way PDTC (NO)	DN 25+32
VG74□3□T	2-way PDTO (NC)	DN 25+32
VG78□4□T	3-way mixing	DN 25+32

FA-1000 models (3-point)

VG72□3□T	2-way PDTC (NO)	DN 15...32
VG74□3□T	2-way PDTO (NC)	DN 15...32
VG78□4□T	3-way mixing	DN 15...32

● VBD series (PN25 flanged valves)

VBD- 4□□ 4-520□	2-way PDTO (NC)	DN 15...40
VBD- 4□□ 8-520□	3-way mixing	DN 15+25

Please refer to the product bulletins "VG8000 Series Flanged Valves", "VG7000 Series Bronze Valves" and "VBD Series Flanged Valves" for complete ordering information.

Operation

3-Point control models

Connections	Actuator Stem	Power failure
1-2	extends	retracts
1-3	retracts	retracts

Proportional models

Jumper function	Input control signal	Actuator Stem	Power failure
Direct action	increases decreases	retracts extends	retracts retracts
Reverse action	increases decreases	extends retracts	retracts retracts



WARNING

In a "power failure" situation, the stem retracts.

Safety function

On power failure, the actuator stem is retracted by the return spring, thus closing a PDT0 (NC) valve or, respectively opening a PDTc (NO) valve.

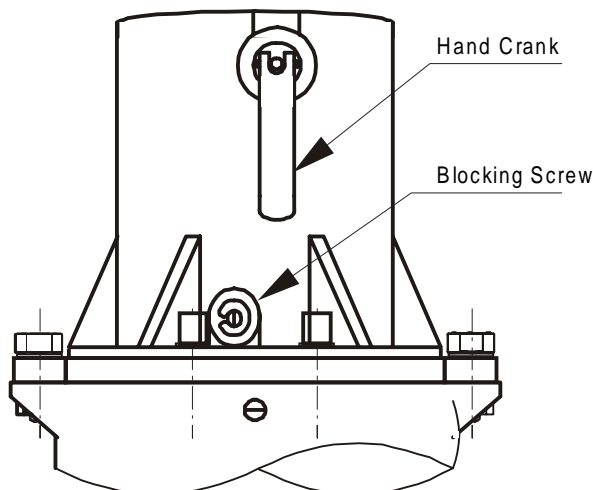
Hydraulic unit

The stem is extended by hydraulic fluid being pumped into a piston-cylinder system. The increasing pressure in the cylinder overcomes the return spring force. The stem is retracted by gradually releasing the hydraulic fluid.

No power on terminal "B" (0...10V models) or terminal 18 (3-point models), as in a power failure, allows operation of a second electrical control. Hydraulic fluid is released and spring return force (safety function) regains control, quickly retracting the stem.

Manual override

To operate the manual override the blocking screw must be pushed in and turned clockwise to lock. The blocking screw is situated below and left of the hand crank (see drawing below).



The hand crank operates the hydraulic pump that in turn extends the actuator stem. The manual override can only be operated with power off or when jumper "S1" is set to position "H".

WARNING

The blocking screw, when in operation also blocks the safety function.

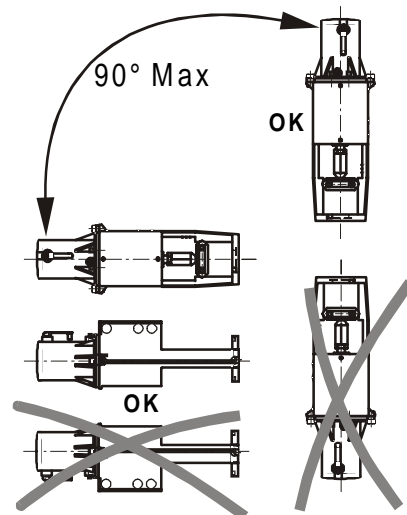
If the actuator is electrically operated while the blocking screw is engaged, then the actuator will malfunction.

Please ensure that the blocking screw is returned to the "disengaged" position before reactivating the actuator.

Mounting instructions

When mounting the actuator on a valve, please use the following instructions:

- It is recommended that the valves be mounted within 90° of the upright position, in an easily accessible location. When mounting in an *inclined to horizontal* position, please ensure that the yoke is fitted such that the black electrical access panel does not face downward (please note illustration below).



- Protect the actuator from dripping water, which could enter the housing and damage the mechanism or motor.
- Do not cover the actuator with insulating material.
- Allow sufficient clearance for removal or servicing (please refer to the dimension drawings).
- Install the valve so that the plug seats against the direction of flow as indicated by the arrow(s) on the valve.

Wiring instructions

- All wiring must be in accordance with local regulations and national electrical codes and should be carried out by authorised personnel only.
- Make sure that the line power supply is in accordance with the power supply specified on the device.
- See also the instructions in paragraph "Application".

! WARNING

Shock Hazard

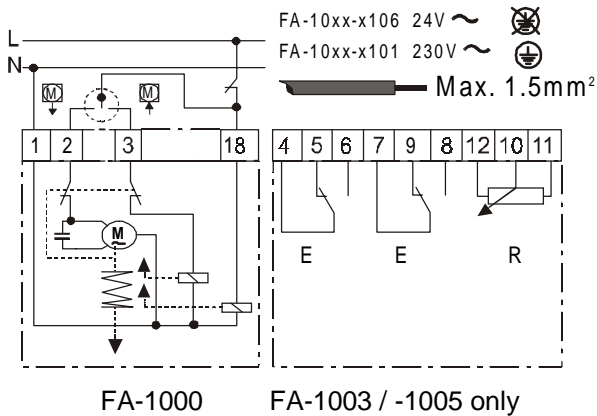
Disconnect the power supply before wiring connections are made to prevent personal injury.

Equipment Damage Hazard

Make and check all wiring connections before applying power to the system. Short circuited or improperly connected wires may result in permanent damage to the unit.

Wiring Diagrams:

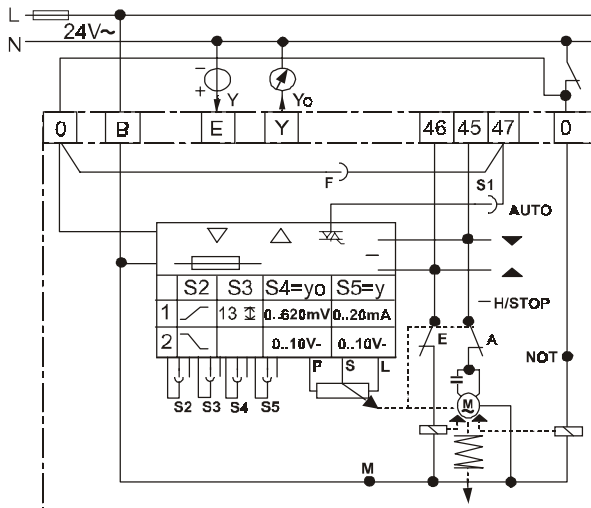
3-Point Models



FA-1000

FA-1003 / -1005 only

Proportional Models



FA-1040

A djustments

! WARNING

Shock Hazard

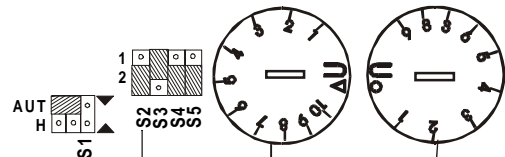
Great care must be taken when the cover is removed (by authorised personnel only) for adjustment or inspection.

In all other cases when the cover is removed the power must be switched off.

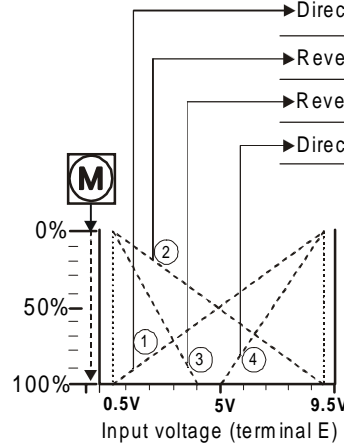
Do not touch or attempt to connect or disconnect wires when the electrical power is on.

Actuators with 0...10 V or 0...20 mA positioner (example 0...10 V).

The starting point (U_0), working span (ΔU), direct or reverse action (DA or RA) can be adjusted on the PCB (see illustration below).



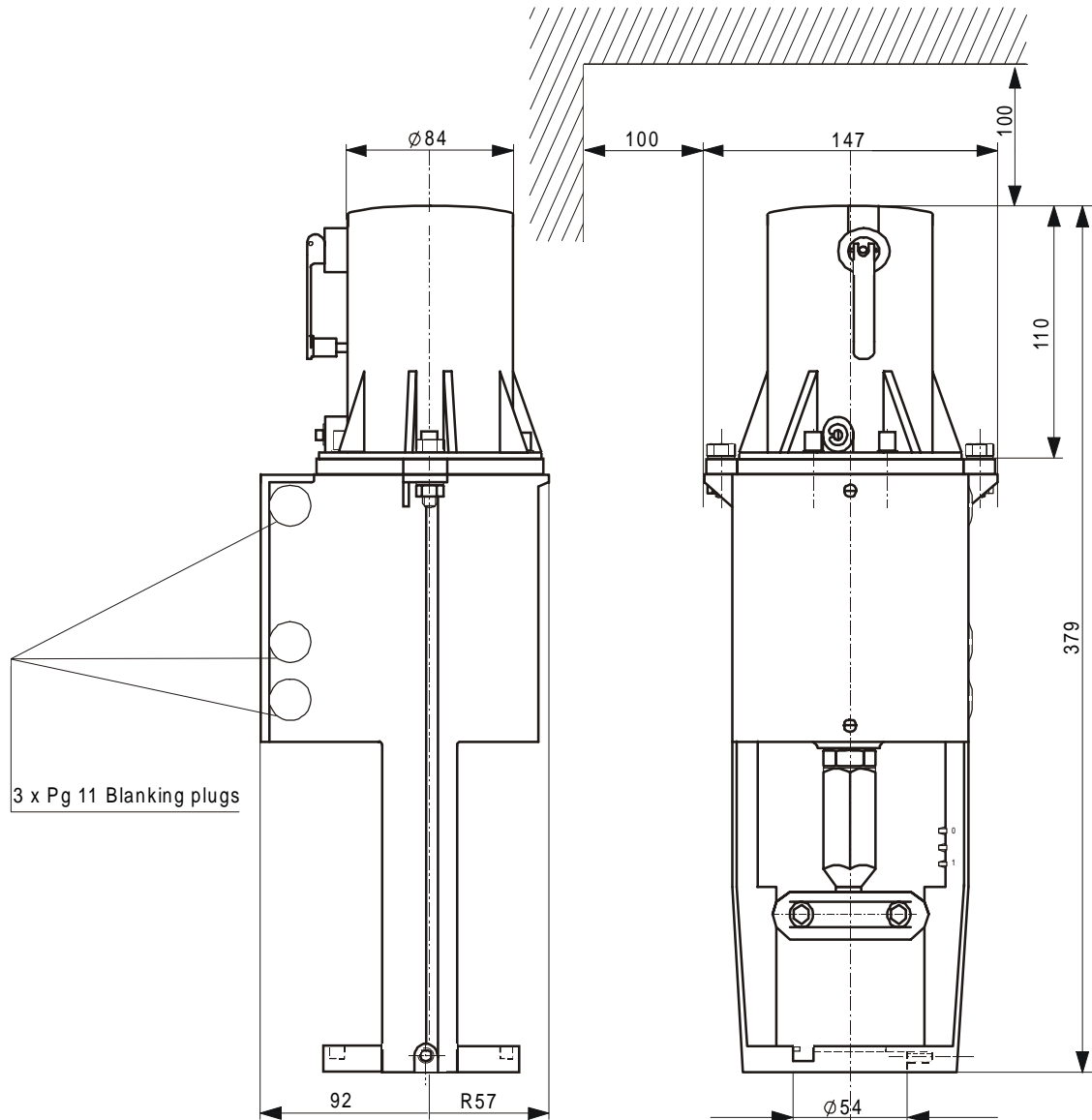
Positioner Action	Span ΔU	Starting point U_0
→ Direct (DA)	9V	0.5V
→ Reverse (RA)	9V	0.5V
→ Reverse (RA)	3.5V	0.5V
→ Direct (DA)	4.5V	5V



Description of jumper operation:

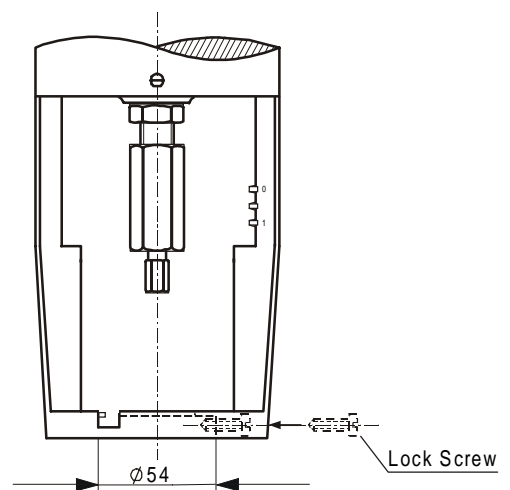
- "S1" set to position "H" enables manual override with power on.
- "S2" Direct action (DA) jumper setting: "2"
Reverse action (RA) jumper setting: "1"
- "S3" must always be placed at setting "1"
- "S4" must always be placed at setting "2"
- "S5" input signal: 0...10V: setting 2
0...20mA: setting 1

Dimensions in mm



3 x Pg 11 Blanking plugs

FA-10xx-210x for VG8000 and VBD valve series



FA-10xx-110x for VG7000 valve series (section)

Specifications

Actuator model	FA-1000	
Associated valve series and body sizes	<ul style="list-style-type: none"> • VG8000 PN16 DN 15,25 and 40 • VBD PN25 DN 15,25 and 40 • VG7000 PN16 (ANSI class 250) DN 15, 20, 25 and 32 	
Type of motor	Electro-hydraulic	
Action / Control	<ul style="list-style-type: none"> • 3-point (floating) • 3-point with 5(3) A / 250 VAC auxiliary switches and 2 kΩ or 130 Ω feedback potentiometer • Proportional with built-in 0...10 V / 0...20 mA electronic positioner (input impedance 30 kΩ). 	
Manual override	Hand crank	
Supply voltage and frequency*)	24 VAC \pm 15%, 50/60 Hz	230 VAC \pm 15%, 50/60 Hz
Power consumption running (with positioner)	20 VA (23 VA)	20 VA -
Power consumption idle (with positioner)	7 VA (10 VA)	8 VA -
Minimal force	700N	
Nominal stroke	13mm	
Nominal running speed at 50 Hz	13mm/120s	
Emergency shut-off speed	13mm/20 \pm 10s	
Enclosure Protection	IP 54 (with cable tension relief only)	
Materials:		
Stem	Bronzed steel DIN W. Nr. 1.0718	
Support base, Yoke	Die cast aluminium	
Mechanism housing cover	PC Lexan 500R	
Operating Conditions (Storage Conditions)	-5...+50 $^{\circ}$ C (-10...+50 $^{\circ}$ C) R.H. 10...95 %, non condensing	
Electrical Connection	screwed connectors 2.5 mm ²	
Cable entry	3 blanking plugs for PG11. 1 PG11 screwed fitting is part of delivery.	
Net weight	3.5 kg	
Approvals	European Directives: EMC (89 / 336 / EEC) LVD (73 / 23 / EEC)	

*) For other supply voltage and frequency, please contact your Johnson Controls supplier.

All specific values refer to 23 $^{\circ}$ C ambient temperature.

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

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Electric Valve Actuator with Spring Return FA-10xx-210x (FA13/700) for VG8000N and VBD Valves

These service and data instructions are applicable to Electric Valve Actuators FA-10xx-210x (FA13/700) in conjunction with VG8000N and VBD valves.

The actuator can be ordered as a separate unit or a factory fitted valve-actuator combination.



WARNING

Shock Hazard

Electrical wiring to be in accordance with local ordinances and codes of practice for high voltage installations.

Supply voltage and frequency must conform to data on product nameplate.

Line voltage wiring:

Nominal wires gauge min. 1 mm².

Installation protective fuse:

Max. 6A, 2A at 24 V, Observe DIN/VDE 116.

Electrical isolation:

Before removing the actuator cover, e.g. for mechanical service or adjustment, voltage supply must be disconnected by means of an isolation switch, which is safeguarded against inadvertent operation.

Electrical connection:

- Select DIN 46320 PG conduit adapter to match cable diameter.
- Lead cable through the conduit adapter to the respective terminal. Then remove cable insulation from tips of wire strands and connect to terminals. Ensure that wiring is secured against damage through moving parts and removal or replacement of the actuator cover.
- Connect ground wire to ground terminal (For 230V installations only.)
- Tighten PG conduit adapter to achieve reliable protection against tension.



WARNING

DANGER

This electrical device is designed for operation in high voltage installations. It comprises moving or rotating machinery and bare voltage carrying parts. Unauthorised removal of protective covers, improper application or operation or insufficient servicing may cause severe damage to health or property.

Those responsible for the safety of this installation must ensure that:

- Only qualified personnel will be authorised to work on this device.
- These persons will be in possession of operating instructions and all other relevant product documentation and will be charged with strict compliance to these records.
- Unqualified personnel are prohibited to work on this device or in its immediate vicinity within the system.

Technical data:

Electrical connection:	to terminal strip, through 3 PG11 conduit adapters, max. wire gauge 1.5 mm ²
Voltage supply ±15%:	230 V, 50/60 Hz 24 V, 50/60 Hz
Nominal stroke:	13 mm
Nominal force:	700 N
Manual operation:	with side-mounted crank
Standard stroke timing:	120 s, for 13 mm stroke
Emergency stroke timing:	20 ± 10s at 13 mm stroke
Power consumption:	

	230 V ~	24 V ~	24 V ~ EPOS
In operation	20 VA	20 VA	23 VA
Idle	8 VA	7 VA	10 VA

Limit switching:	pressure
Permitted ambient temperature:	5 to 50°C
Permitted humidity:	less than 95% R.H.
Mounting orientation:	not greater than 90° from the upright position.
Weight:	4.1 kg
Enclosure to DIN 40050:	IP 54 with cable fitting.
Accessories (additional):	E = 2 auxiliary limit switches, max. 250 V AC For resistive load: max. 5 A For inductive load: max. 3 A For light bulb: max. 1 A R 2 = Feedback potentiometer 2 KΩ R 130 = Feedback potentiometer 130 Ω
Positioner:	0 - 10V / 0 - 20mA input (relative to nominal stroke) Ri = 30 kΩ / Ri = 50 Ω Position feedback, reverse acting (RA) 0...10V or 0...620mV adjustable (S4) Load ≥ 2.5 kΩ

All technical data related to ambient temperature of 23 °C

Close-off pressures

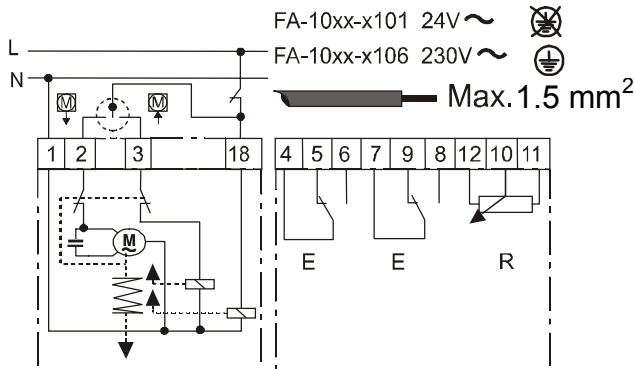
Valve series	Stroke	Nominal size/k _{vs} coefficient	Close-off pressures (kPa)
VG8000N, PN16, DN15, 25, 40 PDTO (N.C.)	13mm	15, 0.63 to 4.0	1600
		25, 6.3 and 10	1600
		40, 16 and 25	550
VG8000N, PN16, DN15-40 PDTC (N.O., mixing and diverting)	13mm	15, 0.1 to 4.0	1600
		25, 6.3 and 10	1270
		32, 16 and 32, 10	610
		40, 16 and 25	340
VBD, PN25, DN15, 25, 40 PDTO (N.C.)	13mm	15, 0.63 to 4.0	2500
		25, 6.3 and 10	1360
		40, 16 and 25	380
VBD, PN25, DN15, 25, 40 (Mixing)	13mm	15, 0.63 to 4.0	2500
		25, 6.3 and 10	270
		40, 16 and 25	--

Hydraulic actuator with safety function

For 3-Point controllers, to operate two-way and three-way valves and as a safety device with defined "off" position in the event of a power failure or a signal from a limiting device.

Wiring diagram:

Auxiliary switch (E) and feedback potentiometer (R) model



The following conditions are established:

Electrical connection to terminals 1 and 2:

Actuator stem extends.

Electrical connection to terminals 1 and 3:

Actuator stem retracts.

Feedback potentiometer models:

If the actuator stem is extended to its limit (with electrical connection to terminals 1 and 2), the nominal potentiometer resistance can be measured between terminals 10 and 12.

Function

The valve can be driven to any intermediate position by the hydraulic actuator when the electrical circuit between terminals 1 and 2 or 1 and 3 is closed. Voltage on terminal 2 extends the stem. The hydraulic unit is switched off by pressure switch at the stroke end position or if there should be a jam.

Safety function: No power to the solenoid coil in the actuator (Terminal 18) causes the actuator stem to retract very quickly and spring force moves the valve plug to the fail safe position.

Hydraulic unit: The pump injects hydraulic fluid into a piston - cylinder system. The resultant stroke extends the actuator stem. The stem is retracted when hydraulic fluid is slowly passed through an electrically operated bleed valve, allowing the extended spring to retract. Nominal force is determined by the retraction spring. Interrupting electrical power to terminal 18 activates a second electrical bleed valve, which allows hydraulic fluid to escape more speedily (Safety function).

Manual operation: The hand-crank operates the hydraulic pump, extending the actuator stem. It is necessary for the actuator to have voltage supply, as otherwise the safety function will be activated automatically.

When there is no power, the safety function must be mechanically blocked. (Depress brass screw with screwdriver and turn approx. 90° until it locks down) On TÜV approved models the mechanical blocking feature is not accessible.

To retract the actuator stem by spring force, apply voltage to terminal 3 (Close-off function) or unlock mechanical blocking screw on safety function (Terminal must be 18 de-energised).

Hydraulic valve actuator with safety function and positioner (EPOS)

Proportional control (0...10V DC or 0...20mA): To control two-way and three-way valves and also as a safety device, with defined "off" position in event of a power failure, or a signal from a limiting device.

Adjustable positioner with position feedback 0...10V DC or 0 ...620mV.

Adjustable Ranges:	Starting point U_0	0.5...9.0V DC	Factory setting: 0.5V DC
	Control span ΔU :	0.5...9.5V DC	Factory setting: 9.0V DC
	Switch span X_{sh} :	4 % of ΔU	

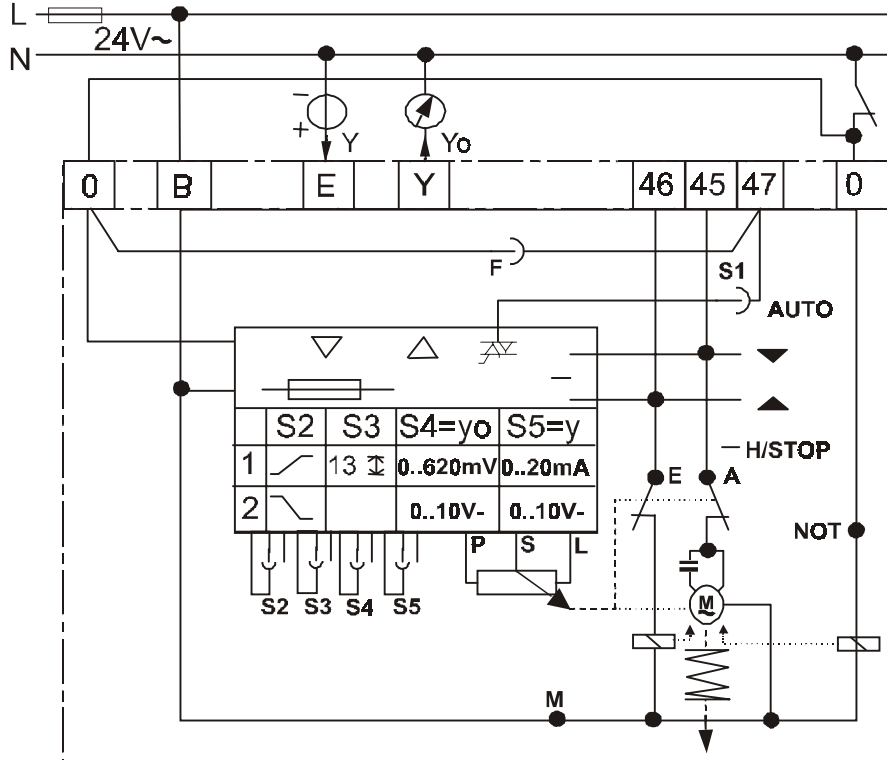
Wiring diagram :

Model with positioner

The following condition is established

for:

- Voltage supply 24V AC
- Voltage 0V on terminal E
- Action : Direct acting (DA), Code switch S2, action mode 2

Actuator stem extends**Function**

The built-in positioner operates the hydraulic unit in dependency upon the controller signal E. Action mode 1 and 2 are selectable through switch S2. Action mode 2 (Factory setting): With a decrease in signal E, the actuator stem extends. Starting point U_0 and operating range ΔU are adjustable. The feedback signal can be switched from 0...10V DC to 0...620mV with switch S4. A pressure switch switches off the hydraulic unit when the stroke limit is achieved or when there is a blockage.

Safety function: No power to the solenoid coil in the actuator (Terminal 0) causes the actuator stem to be quickly retracted and spring force moves the valve plug to the safety position.

Hydraulic unit: The pump injects hydraulic fluid into a piston - cylinder system. The resultant stroke extends the actuator stem. The stem is retracted when hydraulic fluid is slowly passed through an electrically operated bleed valve, allowing the extended spring to retract. Nominal force is determined by the retraction spring. Interrupting electrical power to terminal 0 activates a second electrical bleed valve, which allows hydraulic fluid to escape more speedily (Safety function).

Manual operation: The hand-crank operates the hydraulic pump, extending the actuator stem. It is necessary for the actuator to have voltage supply, as otherwise the safety function will be activated automatically. When there is no power, the safety function must be mechanically blocked. (Depress brass screw with screwdriver and turn approx. 90° until it locks down) On TÜV approved models the mechanical blocking feature is not accessible. To retract the actuator stem by spring force, unlock the mechanical blocking screw on safety function (Terminal 0 must be de-energised).

Single unit delivery:

FA - 10xx - 210x (FA13/700...) Actuators are factory-adjusted to permit mounting of the actuator on a valve with a minimum of time and energy.

Mounting actuator on valve

Actuator stem is retracted by spring force.

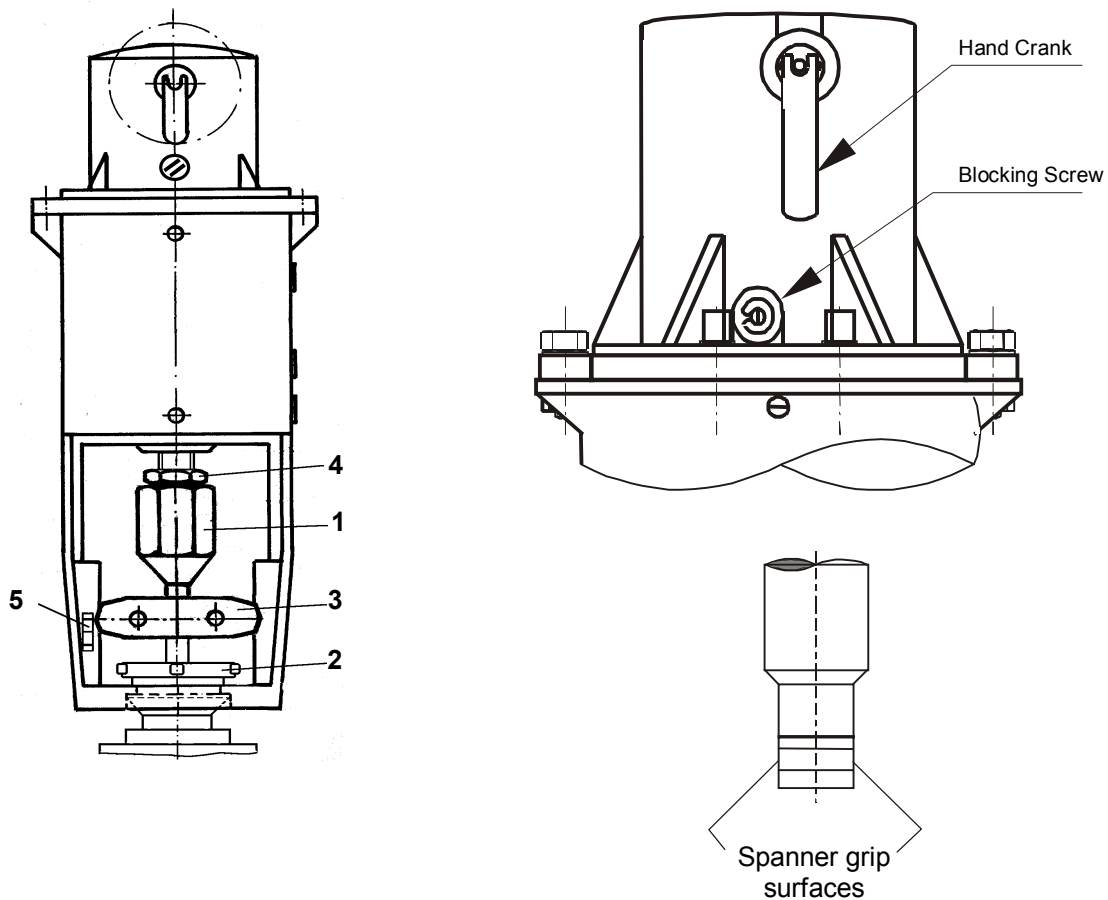
Valve:

- Valve stem must be fully extended.

Caution! Rotation of valve stem can damage valve seat!

A) Actuator without positioner:

- Screw stem extension (1) as far as possible onto actuator stem. Valves stem in upper most position!
- Place actuator with ring-nut (2) on valve, align and fasten ring-nut tightly.
- Unscrew stem extension (1) until it abuts valve stem and spanner grip surfaces have attained the position as depicted.



- Fit stem coupling (3)
- Connect actuator electrically and drive stem downward by approx. 2 mm. Lock M16 counter lock nut (4) against stem extension (1).
- Interrupt voltage supply (simulating power failure)
- Fix stroke indication scale (5)

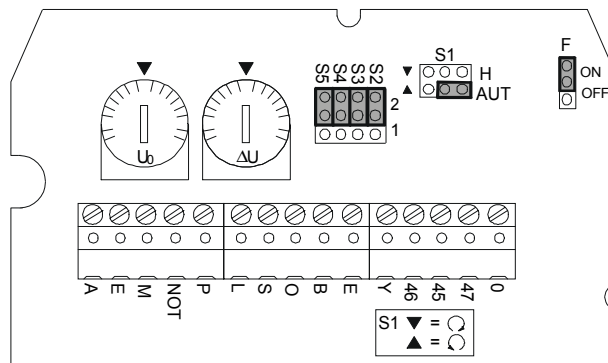
In order to check the complete function, extend actuator stem to stop position. The actuator has a pressure limit switch. Further adjustments are not required.

B) Actuator with positioner:

- Screw stem extension (1) onto actuator stem as far as possible. Valve stem in upper most position!
- Place actuator with ring-nut (2) on valve, align fasten ring-nut on (2) tightly.
- Turn adjustment screw (1) fully onto valve stem, until spanner grip surfaces have attained the position as depicted on page 5.
- Fit stem coupling (3)
- Connect actuator electrically and adjust input signal to 9V DC. Actuator stem extends approx. 2mm.
- Lock M16 counter lock nut (4) against stem extension (1).
- Interrupt voltage supply (simulating power failure)
- Fix stroke indication scale (5).

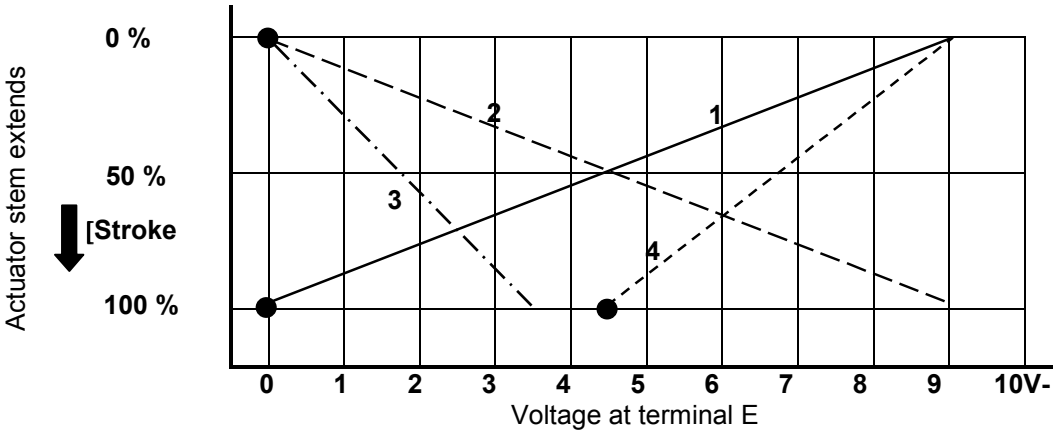
Description of jumper operation:

- **S1** Operating mode factory setting: "AUT"
 AUT automatic mode
 ▼ Actuator stem extends
 ▲ Actuator stem retracts
 H manual mode: positioner and motor without power
- **S2** Positioner's direction of operation (1 or 2) factory setting: "2"
- **S3** For FA13/700 always be placed at position "2" factory setting: "2"
- **S4** Output signal y_0 : 1 = 0 ... 620mV; 2 = 0 ... 10V factory setting: "2"
- **S5** Input signal y : 1 = 0 ... 20mA; 2 = 0...10V factory setting: "2"
- **F** If an external operation-mode switch is used, then change from ON to OFF

**Characteristic-Adjuster:**

- | | | |
|-------------------------|-----------------|--------------------------|
| U_0 Starting point: | 0.5 ... 9.0V DC | factory setting: 0.5V DC |
| ΔU Control span | 0.5 ... 9.5V DC | factory setting: 9.0V DC |

- **Curve 1** Action mode DA, jumper: S2, direction of operation: 2
 Starting point $U_0 = 0.5V$ DC Control span $\Delta U = 9.0V$ DC
- **Curve 2** Action mode RA, jumper: S2, direction of operation: 1
 Starting point $U_0 = 0.5V$ DC Control span $\Delta U = 9.0V$ DC
- **Curve 3** Action mode RA, jumper: S2, direction of operation: 1
 Starting point $U_0 = 0.5V$ DC Control span $\Delta U = 3.5V$ DC
- **Curve 4** Action mode DA, jumper: S2, direction of operation: 2
 Starting point $U_0 = 5.0V$ DC Control span $\Delta U = 4.5V$ D



Adjustment procedure (Factory setting):

Input voltage 0V DC, action mode switch (S2) in position 2 (DA), control span (ΔU) at 10V DC, Starting point (U_0) at 0V DC, action mode switch (S1) in position Automatic. Actuator stem extends. Connect voltmeter to terminal Y. Voltmeter reading indicates 10 V to 10.7 V.

Adjust input voltage to 0.5V DC. Adjust start-point (U_0) in the end position, slowly towards 0.5 V until the “Y” output shows no change. Display registers 10 V to 10.7 V.

Adjust input voltage to 9.5V (final setting can be expedited by brief interruption of voltage supply). Slowly adjust the operating range (ΔU) in the end position, towards 9 V until the “Y” output shows no change. Display registers 0 V to 0.6 V.

Correct actuator function is assured when the actuator stem is fully extended at an input signal of $0.5\text{ V} \pm 0.2\text{ V}$ and the actuator stem is fully retracted at an input signal of $9.5\text{ V} \pm 0.2\text{ V}$.

Valve position at delivery

For two-way, mixing and diverting valves, the end position is determined by the by the spring-return action.

Aux. switch models

Auxiliary switches (E) may be adjusted to any stroke position with a screwdriver.

Position feedback potentiometer models

The feedback potentiometer serves position indication and can be adjusted with a screwdriver at the friction clutch axle.

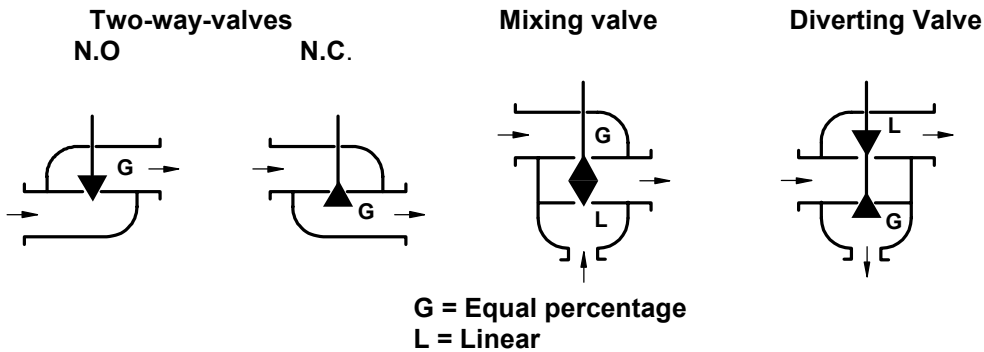
Mounting orientation

Ensure that the actuator is not mounted at angles greater than 90° from the upright position. The cover must be freely removable.

Wiring: It may be necessary to rotate the actuator to gain access (e.g. EPOS adjustment)

For the flow direction is valid:

Valve plug close-off movement must always be against flow direction. This requirement is fulfilled, when flow direction is identical to arrows on valve. (See symbols or marks on valve body)

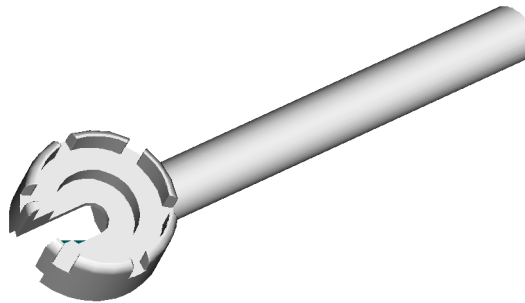
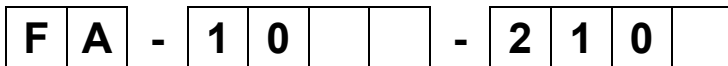


Retrofit Accessory Kits:

Prefix	Order No.	Description	Note
E	111 6133 010	2 auxiliary switches	Not for models with positioner
R2	111 6134 010	2 k Ω feedback potentiometer	Not for models with positioner
R130	111 6135 010	130 Ω feedback potentiometer	Not for models with positioner
PG 11	282 3501 113	PG 11 x 7-9 FS conduit adapter	Accessory
HE 24V	111 6142 010	Hydraulic Unit 24V	spare
HE 230V	111 6142 020	Hydraulic Unit 230V	spare
EPOS	111 6236 010	FA-10xx-210x (FA13/700) Positioner	spare

Accessory kits have installation instructions as by-pack.

Wrench to tighten and loosen the ring nut (order No. 111 6235 010)

**Device codes****Voltage / Frequency**

1 = 230V, 50/60Hz
6 = 24V, 50/60Hz

Accessories

00 = None
01 = Limit switch
02 = 2k Ω Feedback potentiometer
03 = Limit switch and 2k Ω Feedback potentiometer
04 = 130 Ω Feedback potentiometer
05 = Limit switch and 130 Ω Feedback potentiometer
40 = Electronics 0-10V (0-20mA)

Dimensions (in mm)