INSTALLATION AND OPERATION INSTRUCTION

FlowCon SM 15-40mm, 1/2”-1 1/2”

Install the **FlowCon SM** valve either in the supply or return pipe work for the unit. It is recommended that a strainer be installed prior to the valve body to prevent damage or blockage due to debris. INSTALL THE VALVE HOUSING WITH THE FLOW DIRECTIONAL ARROW POINTING IN THE CORRECT DIRECTION.

The valve body is available with double union end connections. Two types of end connections are available for use with the union nut:

Threaded (male or female)

The threads on both the connection and piping should be cleaned carefully.
As these models are union end connected, the union nuts and the end connections should be removed for installation.

O-rings are supplied with the valve body and are used to seal the connections. It is recommended to grease the o-rings with a silicone grease before installation. **IMPORTANT:** Never use mineral oil or petrol based grease or oil on the o-rings. Please make sure these are in place in the o-ring grooves in the inlet and outlet of the valve body, when installing the housing and REMEMBER TO TIGHTEN THE UNION NUTS TO ENSURE SEALING.

For all threaded connections pls. clear threads on both valve and piping of debris. Sealant such as pipe dope or teflon tape is recommended. WHEN USING HEMP AS PIPE SEALANT, ENSURE NO STRANDS ARE LEFT IN THE VALVE OR PIPING.

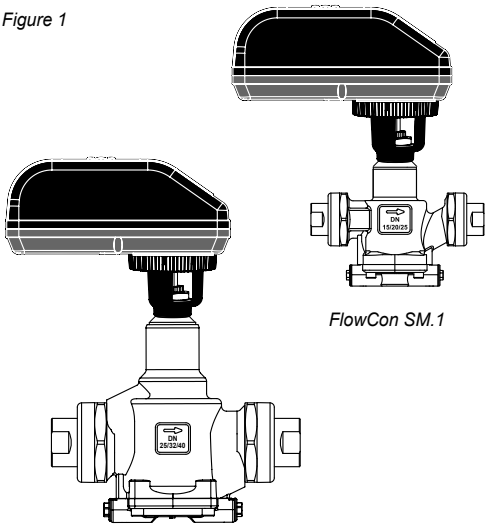
Soldered end (sweat)

REMOVE THE END CONNECTIONS FROM THE HOUSING BEFORE SOLDERING. THIS ENSURES THAT THE O-RINGS AND INTERNAL PARTS ARE NOT DAMAGED BY HEAT.

Valve bodies are as standard supplied with body tappings **plugged**, each plug sealed with a gasket.

Alternatively, **pressure/temperature fittings** (p/t plugs) are available. Before finger mounting the p/t plugs in the body tappings, pls. seal the threads of the p/t plugs (DO NOT OVER TIGHTEN).

Figure 1



FlowCon SM.1

FlowCon SM.2

Fitting and orientation of the actuator

To fit the actuator on the valve body, please grease the o-ring on the spindle adaptor and place the spindle adaptor on the valve spindle. Place the actuator on the spindle adaptor and place the three actuator “legs” into the three holes in the mounting bracket. Make sure that the snap ring is clicked onto the mounting bracket, so that the snap ring is locked at the top of the mounting bracket, but is able to rotate. Then turn the snap ring counter clockwise (upside view) approximately 1/6 of a turn until its stop points touch the actuator “legs” and the mounting is locked with a (small) click (please see figure 2 and 3).

To remove the actuator, please reverse the procedure, i.e. turn the snap ring clockwise until the actuator is loosened and lift the ac-tuator up (fig. 4). To ease removal of actuator, make sure that the valve is not fully closed.

Symbols at the bottom side of the actuator also indicate how to lock and unlock the actuator with the snap ring.

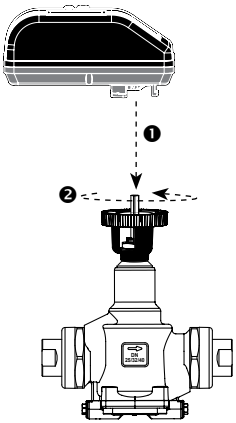


Figure 2

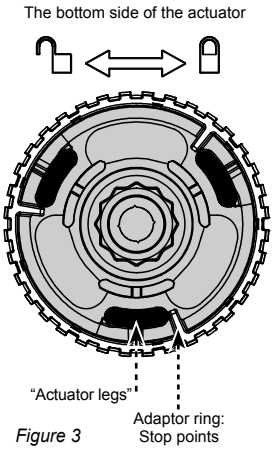


Figure 3

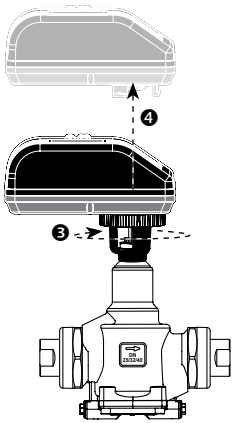


Figure 4

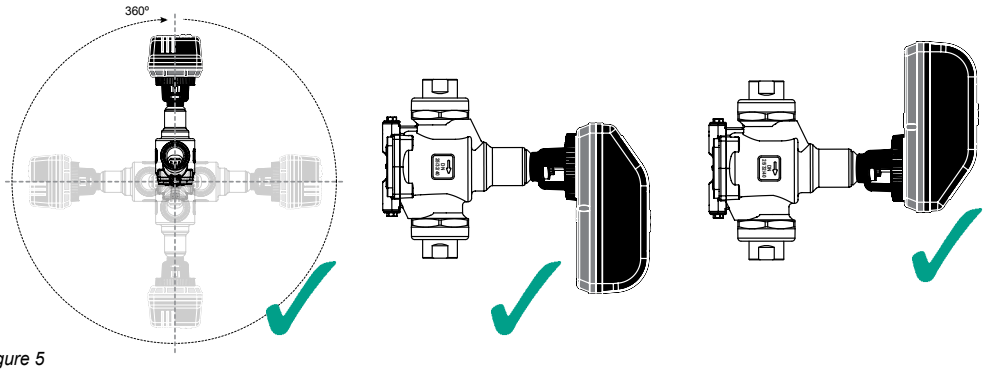
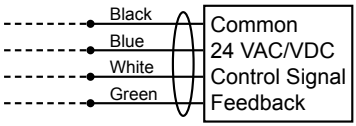


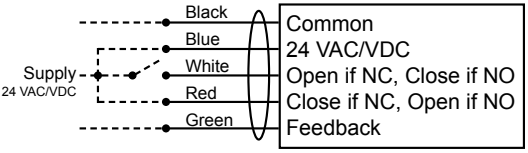
Figure 5

Wiring instructions

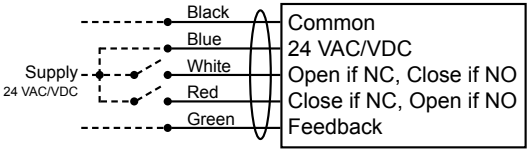
Analog



Digital - 2 position



Digital - 3 point floating



If feedback signal is not required, leave green wire detached.

Start-Up sequence

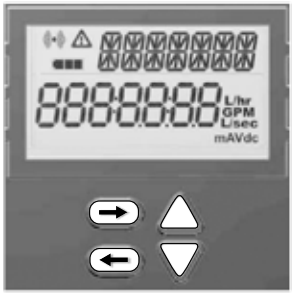
When power to the actuator is turned on, the actuator will automatically calibrate:

- Valve is calibrating to determine closing point. This calibration can take up to 10 minutes depending on the valve's position at start-up. During calibration lower part of display will show "CAL".

- If no control signal is detected, flush is started if enabled in programming menu (enabled by default), opening valve to 5/6 of fully open. Lower part of display will show "FLUSH" until control signal is detected.

- When control signal is present, actuator will adjust to current control signal and proceed with normal operation.

At first start-up please enter programming menu to adjust actuator settings.



Programming Menu

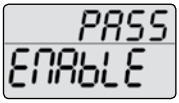
The programming menu is always accesible. To enter the programming menu, please **simultaneously press ⇦ and ⇨ for 6 seconds**, until bottom line blinks.

Generally, press ⇨ to accept value and go to next step and press ⇦ button to go to previous step. To change the value, pls. press △ or ▽ keys, for quick scroll through values hold down the button.

Press ⇦ and ⇨ simultaneously for 6 sec. to exit programming menu. Actuator will automatically return to operation mode if no action is detected on arrow keys during 1 minute.

All values selected in the programming menu are stored in non-volatile memory.

Step		Display	Description	Values
0	*	ENTER 0000000	Password. **scrolling top:* *ENTER PASS WORD*	**Disabled by default** Password: 3569266. *Only if Enabled (in step 11).* Change one digit at a time, press ⇨ and ⇦ to move between digits. At last digit, press ⇨ to go to next step.
1	*	LANG EnGLI S	Select language. **scrolling top:* *SELECT LANGUAG*	Default: English. Possibility to choose other languages later on (not currently an option).
2	*	VALVE SM 0.0	Select valve model onto which the actuator is installed. **scrolling top:* *SELECT VALVE MODEL*	Default: SM.0.0 Select from the 10 available valve models. Options: SM.1.1, SM.2.1...
3	*	UNIT L/sec	Choose unit scale for flow rate. **scrolling top:* *SELECT UNIT SCALE*	Default: l/sec. Options: l/sec or l/hr or GPM.
4	*	FLUSH EnAbLE	Activate Flush mode at start-up. **scrolling top:* *SELECT FLUSH MODE*	Default: Enable. Options: Enable or Disable. *When no control signal (analog) is detected at start up, flush mode is started (5/6 of fully opened). It will be dismissed when control signal is detected.*
5	*	SIGNAL 2- 10 Vdc	Select type of control signal. **scrolling top:* *SELECT CONTROL SIGNAL*	Default: 2-10VDC. Options: 2-10VDC or 4-20mA or digital. Choose: • 2-10VDC for VDC • 4-20mA for mA • Digital for 2 position or 3 point floating.

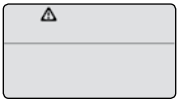
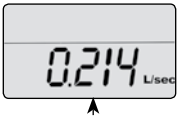
Step	Display	Description	Values
6	* 	Select minimum control value. **scrolling top:* *SET MINIMUM LIMIT*	Volt default: 2. Options: from 0-7. Increment: 0.1. mA default: 4. Options: from 0-14. Increment: 0.2. *NA if Digital (in step 5).*
7	* 	Select maximum control value. **scrolling top:* *SET MAXIMUM LIMIT*	Volt default: 10. Options: from 3-10 and at least 3 VDC greater than the selected minimum limit. Increment: 0.1. mA default: 20. Options: from 6-20 and at least 6 mA greater than the selected minimum limit. Increment: 0.2. *NA if Digital (in step 5).*
8	* 	Select feedback signal. **scrolling top:* *SELECT FEEDBAC SIGNAL*	Default: AU; Automatic match of control signal if analog. Options: 0-10 VDC, 2-10 VDC or 4-20 mA or AU. *If Digital (in step 5) AU is not an option.*
9	* 	Set the designed maximum flow. *Accuracy: Greatest of either ±5% of designed max. flow or ±2% of max. valve flow.* **scrolling top:* *SELECT MAXIMUM FLOW*	Default: Maximum setting. Values depend on valve model and unit scale chosen in step 2 and 3. Stepping increments as per tech note.
10	* 	Select direction of rotation. **scrolling top:* *SELECT ROTAT DIRECT*	Default: Normally Closed (NC). Options: Normally Open (NO) or Normally Closed (NC).
11	* 	Activation of password. **scrolling top:* *ACTIVAT PASS WORD*	Default: Disable. Options: Enable or Disable. If Enabled password is required to access alarm and programming menu.
12	* 	Select direction of rotation when Failsafe. **scrolling top:* *SELECT FAIL SAFE DIRECT*	Default: Closed. Options: Open or Closed. *Only valid for SM.0.0.0.4 (failsafe model). Failsafe direction open means opening to max. flow chosen in step 9.*

Failsafe mode (only SM.0.0.0.4)

If power supply is out of range or lost, failsafe mode will be activated:
1. Approx. 80 sec. delay.
2. Actuator opens/closes valve (according to failsafe direction chosen in programming menu).
3. Actuator shuts off.

If power supply is restored during action 1. or 2., failsafe mode is deactivated.

In Operation

Display	Description	Values
	Indicates unit scale system.	l/sec or l/min or GPM. mA or VDC.
	Indicates battery level.	Basic version with no battery (SM.0.0.0.3) Failsafe version with battery (SM.0.0.0.4) Battery level low, charging needed. Medium battery level. Battery charged.
	Alarm indicator.	*Blinking if actuator is still functional (warning).* *Fully on if actuator is not working (critical).*
	Information	CONTROL SIGNAL 2.0 VDC FEEDBAC SIGNAL 2.0 VDC VALVE SM. 3.1 PRESSUR RANGE 35-400 KPAD MAXIMUM FLOW RATE 6.580 L/SEC OPERAT DIRECT NC FAIL SAFE DIRECT CLOSE ERROR CODE 01
	Current flow rate[1]. Indicates current flow rate in l/sec, l/hr or GPM.	

Use ⇨ to go to next information line and ⇦ to go to the previous.

Information

Control signal	Indicates value of control signal.	0-10 VDC or 0-20 mA or Open/Stop/Close
Feedback signal	Indicates value of feedback signal.	0-10 VDC or 0-20 mA.
Valve	Indicates valve model.	SM.1.1, SM.2.1...
Pressure range	Indicates pressure range.	32-320 kPaD, 40-320 kPaD.....
Maximum flow rate	Indicates selected maximum designed flow rate.	Depends on valve etc. l/sec, l/hr or GPM.
Operational direction	Indicates direction of rotation.	NO or NC.
Failsafe direction	Indicates failsafe direction.	Open or Closed *Only valid for SM.0.0.0.4*
Critical Alarm	Indicates alarm error code.	01, 03, 05 (without failsafe) or 06. *Only if critical alarm is present.*

Note 1: Note that the flow rate displayed on the actuator is a calculated value based upon differential pressure being within control range. If display shows “NA” instead of current flow rate, it indicates that the flow rate is below minimum defined flow rate according to tech note, or that valve model has not been chosen in programming menu step 2.

Alarm Menu

To enter the alarm menu, please **simultaneously press △ and ▽ for 6 seconds.**
You can access the alarm menu only if an alarm is present (i.e when icon ⚠ is displayed).
Press ⇨ to go to the next alarm display, press ⇦ to return to previous step.
Press △ and ▽ simultaneously for 6 seconds to exit alarm menu.
Actuator will automatically return to operation mode if no action is detected on arrow keys during 1 minute.

Display	Description	Action
	Alarm.	
	Enter password.	If enabled in programming menu step 11 Disabled by default. Password: 3569266.

Code	Icon	Description	Details
01	⚠ **FULL ON**	Valve/actuator is overtorqued.	Operation is stopped. Actuator will retry operation every 4 minutes. If over torque condition disappear, error will convert to error code 02.
02	⚠ **BLINKING**	Actuator has reached its torque limit in the past.	Actuator is functioning. To reset the alarm simultaneously press △ and ⇦ for 6 seconds.
03	⚠ **FULL ON**	Critical - over temperature.	Critical: Temperature in actuator is at least 70ºC, motor operation is stopped. If temperature is decreasing, operation will resume.
04	⚠ **BLINKING**	High temperature.	Actuator is still functioning. Temperature in actuator is at least 50ºC as limited according to tech note. If temperature is decreasing, operation will resume.
05	⚠ **FULL ON**	No Failsafe: Power supply not in range.	Operation is stopped. Alarm will automatically reset when voltage is back in range.
	⚠ **BLINKING**	With Failsafe: Power supply not detected / not in range.	Failsafe is activated. Alarm will automatically reset when voltage is back in range.
06	⚠ **FULL ON**	Control signal not detected.	Operation is stopped. Alarm will automatically reset when control signal is back in range.
07	⚠ **BLINKING**	Battery error.	Battery is not properly connected. Alarm will reset when battery is properly connected. *Only valid for SM.0.0.0.4.*

In case of ERRORS or ALARM

If actuator is still functioning (error 02, 04, 05 with failsafe and 07 with failsafe) the ALARM icon ⚠ will flash.
Error codes can be found in the alarm menu.

If actuator is not functioning (error 01, 03, 05 without failsafe and 06) the ALARM icon ⚠ is turned on.
The error code will be available in the information in the upper part of the display and the alarm menu.

Auto-stroke - re-calibration

In case the valve does not operate as expected, start the auto-stroke sequence to re-calibrate the closing point of the valve and to make sure that the actuator is able to open the valve fully. Press buttons ⇨ and △ simultaneously for 6 seconds to start the auto-
stroke.

Auto-stroke sequence

(display shows: “AUTO STROKE CYCLES”):

1. Valve is closed to determine closing point.
2. Valve is opened fully (independent of max. flow chosen).
3. System returns to normal operation.

If actuator is not able to open valve fully, an error will be displayed. An auto-stroke cannot be cancelled.

Manual override

Manual override is used to temporarily set the position of the valve regardless of the settings and control signal for the actuator.

1. Turn off power to the actuator.
2. Remove actuator from valve as described.
3. Turn spindle to the relevant position (Clockwise to close valve, counter clockwise to open valve). Be sure not to use more than 10 Nm torque. Please protect actuator from water while not on valve.
4. Re-mount actuator on valve as described.
5. Turn on power to the actuator when normal operation is needed.

General

Water must always be suitable treated, clean and free of debris. It is recommended that a strainer be installed prior to the valve body to prevent damage or blockage due to debris. Ensure that the valve is not in the fully closed position when filling the system with water. Further, it is recommended not to exceed maximum differential pressure control range.

Warranty obligation

Failure to abide by all recommendations as per this installation and operation instruction will void warranty.

Do not remove cover from actuator. Opening cover will void warranty.

When manually operating the valve (actuator disconnected) do not use more than 10 Nm torgue. Using more than 10 Nm torgue will void warranty.

For latest updates pls. see www.flowcon.com