FlowCon international
A Griswold Controls LLC./FlowCon International Company

Installation and Operation Instruction

The FlowCon Energy FIT System is under the name **FlowCon FIT-G** available with PICV based on the FlowCon Green range. This FIT-G instruction is used with:

- FlowCon Green.3 DN40-50 (1 1/2”-2”)

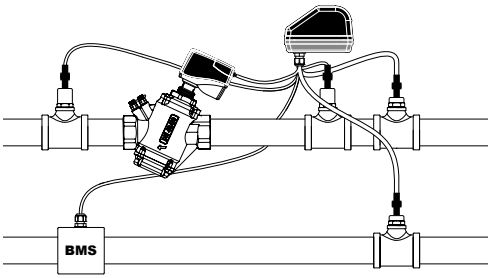


Figure 1

IMPORTANT: Do not disassemble. The FlowCon Greeen.3 is built as a complete valve and only trained FlowCon personnel can perform repair. Unauthorized disassembly may result in calibration defects or damaged part and will void warranty.

It is essential that the actuator runs linear control mode, 2-10V DC.

Setting and Installation

Prior to installing the FlowCon Green.3 (supplied from factory in setting 4.5 due to calibration), the system should be properly flushed. If it is not possible to flush the system before Green.3 installation, please make sure to adjust setting to 5.0 (clockwise turning) and then flush.

The desired flow rate is hereafter set by adjusting the valve (turn counter-clockwise to setting 1.0 and then clockwise up) with a special adjustment key (i.e. figure 2). **Range is between 1.0 and 5.0 ⚠ Do not overturn.** Scale setting is located on top of the valve numbered 1 to 5 including in-between positions indicated by dots (one dot for every 0.1 position). The specific position is defined by an indication mark on top of the housing. Once flow is set, the required actuator may be applied.

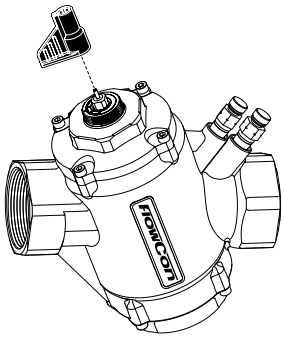


Figure 2

A micrometer setting of 3.4 as illustrated in figure 3 corresponds to a maximum flow rate of: 2.86 l/sec (45.4 GPM).

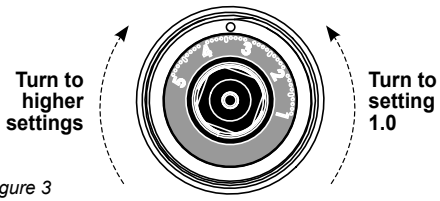


Figure 3

	FlowCon Green.3			Setting
	16-600 kPaD · 2.3-87 psid			
	l/sec	l/hr	GPM	
Nominal flow rate	0.528	1900	8.36	1.0
	0.633	2280	10.0	1.1
	0.738	2660	11.7	1.2
	0.843	3030	13.3	1.3
	0.947	3410	15.0	1.4
	1.05	3790	16.7	1.5
	1.16	4160	18.3	1.6
	1.26	4540	20.0	1.7
	1.36	4910	21.6	1.8
	1.47	5280	23.2	1.9
	1.57	5650	24.8	2.0
	1.67	6010	26.4	2.1
	1.77	6370	28.0	2.2
	1.87	6730	29.6	2.3
	1.97	7080	31.2	2.4
	2.06	7430	32.7	2.5
	2.16	7780	34.2	2.6
	2.25	8120	35.7	2.7
	2.35	8450	37.2	2.8
	2.44	8780	38.6	2.9
	2.53	9100	40.0	3.0
	2.61	9410	41.4	3.1
	2.70	9720	42.8	3.2
	2.78	10000	44.1	3.3
	2.86	10300	45.4	3.4
	2.94	10600	46.6	3.5
	3.02	10900	47.8	3.6
	3.10	11100	49.0	3.7
	3.17	11400	50.2	3.8
	3.24	11600	51.3	3.9
	3.30	11900	52.3	4.0
	3.37	12100	53.3	4.1
	3.43	12300	54.3	4.2
	3.48	12500	55.2	4.3
	3.54	12700	56.0	4.4
	3.59	12900	56.8	4.5
	3.64	13100	57.6	4.6
	3.68	13200	58.3	4.7
	3.72	13400	58.9	4.8
	3.76	13500	59.5	4.9
	3.79	13600	60.0	5.0

Accuracy: Greatest of either ±10% of controlled flow rate or ±5% of maximum flow rate.

Fitting and Re-fitting the Actuator

The suitable actuator types are FlowCon FH and and FH.1 (failsafe). These are electrical modulating actuators.

Do not connect power to the actuator unless the actuator is already fitted on the valve and NEVER install the actuator in closed position – this may damage the valve. Actuator is supplied in open position to ensure easy commissioning of the system.

Mount the actuator on the valve and finger tighten the connection union. Do not use additional tools. In case the actuator will have to be removed, it is recommended to electrically open the actuator for easier removal. Hereafter finger loosen the connection union. Again, no need for additional tools. Please make sure that the actuator is electrically opened, before re-fitting it on the valve.

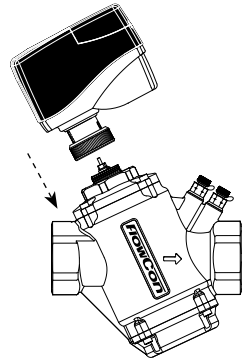
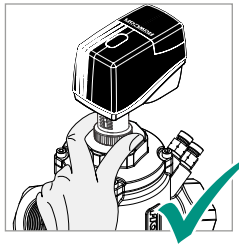
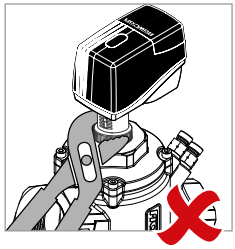


Figure 4





Orientation

Upside-down installation is allowed along with the standard horizontal and vertical installation (figure 5).

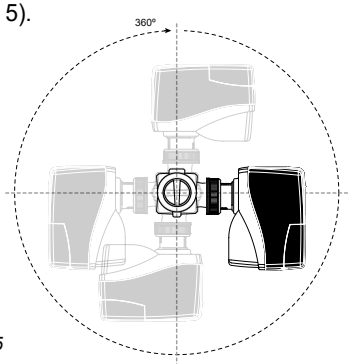


Figure 5

Intelligent Interface Connection

The FlowCon Energy FIT System includes the state-of-the-art FlowCon Intelligent Interface which is the controller of the FIT System. The Intelligent Interface is compatible with 24V AC/DC and calculates the BTU and displays the data via Bluetooth® on any Android or iPhone mobile device and includes fully integrated BACnet communication to and from the BMS.

The Intelligent Interface also includes 1 month and 1 year of accumulated BTU data stored.

The FIT System will automatically detect if it is installed in a heating or in a cooling system as it will add T1 and T2 readings and cross-check the result. If T1+T2<135°F the system is seen as a cooling system and if T1+T2≥135°F it will be considered a heating system.

Do not remove cover from Intelligent Interface. Opening cover will void warranty.

Sensor Kit Connection

The FlowCon Energy FIT System includes two temperature sensors that should be installed as close to the coil as possible, within 0.3-3 meter (1-10 ft). T1 should be installed on the inlet of the coil and T2 on the outlet of the coil. Sensors are to be installed in 1/4” ISO ports. The temperature sensors connect via quick-connectors to the grey cables from the Intelligent Interface. Cable length is different for T1 and T2. T1 connects to the longer cable (3 meter / 9 ft) and T2 to the shorter (1 meter / 3 ft).

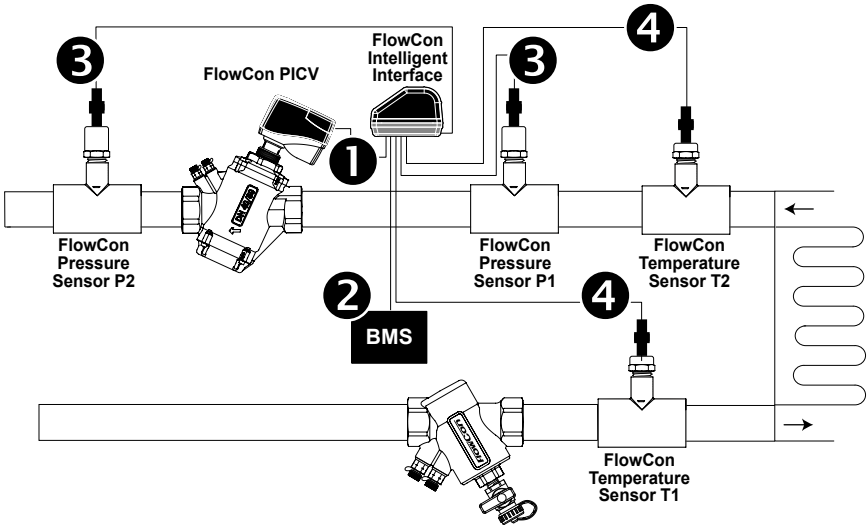
Optionally, the FIT System may include two pressure sensors that must be installed on or close to the PICV valve. P1 should be installed on the inlet of the PICV and P2 on the outlet. The pressure sensors connect via quick-connectors to the black cables from the Intelligent Interface. P1 and P2 have identical cable length (1 meter / 3 ft), but P1 cable will be marked with a white sticker.

Be aware to connect according to wiring diagrams page 4 and 5 to avoid loosing warranty.

FlowCon App

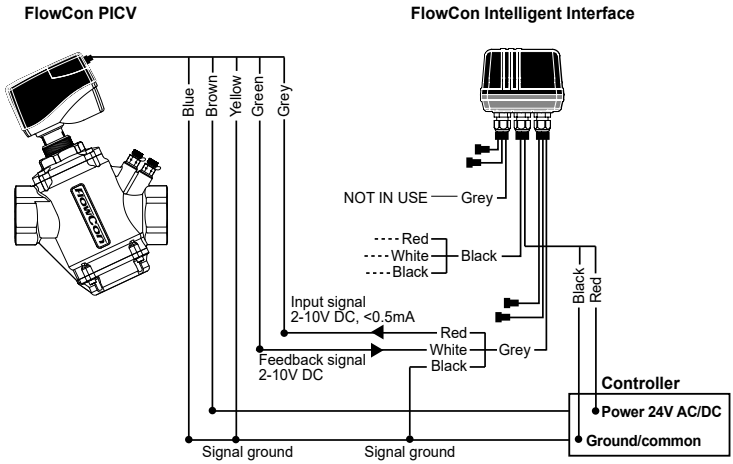
Download the FlowCon App from AppStore or GooglePlay and take full advantage of the FIT system. Information on ΔT, ΔP, flow and BTU is transferred.

Wiring Instructions

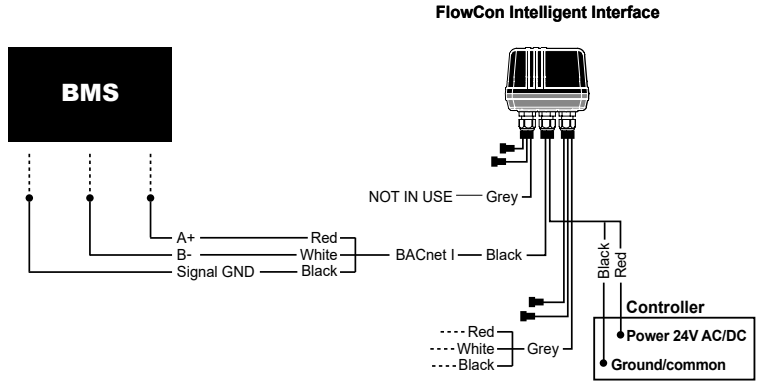


Please find the **Quick Start-Up guide** for proper set-up of Baud rate and MAC-address and FIT configuration **BEFORE connecting FlowCon FIT to BMS BACnet**

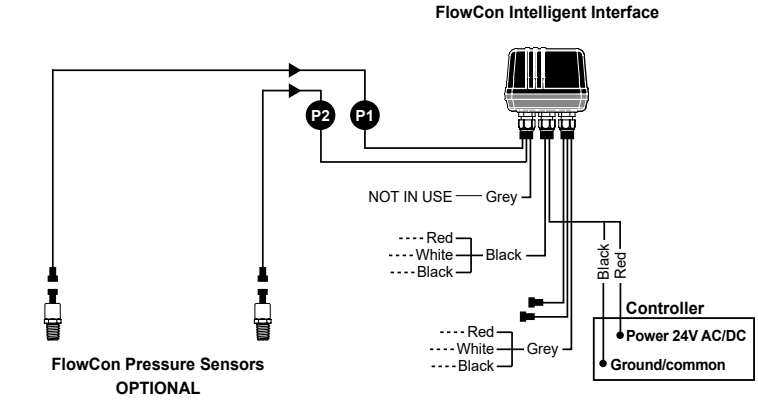
1



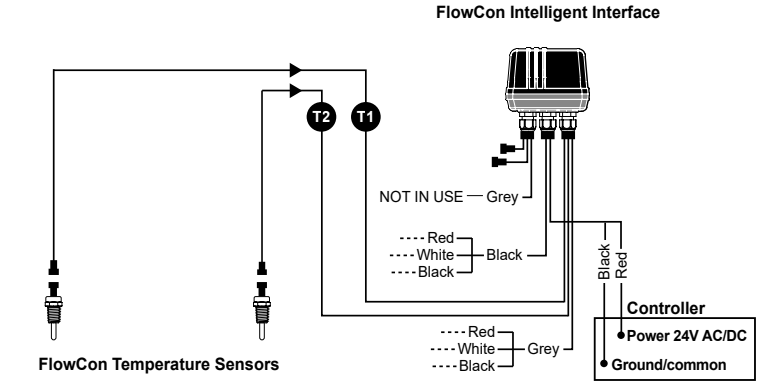
2


FlowCon Intelligent Interface
BMS
A+
B-
Signal GND
Red
White
Black
NOT IN USE
Grey
BACnet I
Black
Red
White
Black
Grey
Black
Red
Controller
Power 24V AC/DC
Ground/common

3


FlowCon Intelligent Interface
P2
P1
NOT IN USE
Grey
Red
White
Black
Black
Red
White
Black
Grey
Black
Red
Controller
Power 24V AC/DC
Ground/common
FlowCon Pressure Sensors
OPTIONAL

4


FlowCon Intelligent Interface
T2
T1
NOT IN USE
Grey
Red
White
Black
Black
Red
White
Black
Grey
Black
Red
Controller
Power 24V AC/DC
Ground/common
FlowCon Temperature Sensors

Start-up Sequence

When power to the actuator is turned on, the actuator will automatically calibrate to determine closing point. Hereafter it will proceed to normal operation mode (according to control signal).

For the failsafe version (FH.1), capacitor charging will be prioritized (max. 215 sec depending on capacitor energy level) during start-up and re-powering. After completion of charging mode followed by calibration mode, the actuator will proceed to normal operation mode.

Auto Cycle Sequence

Auto Cycle can be activated during commissioning. It prevents the valve from jamming when the valve is not moved for a longer period of inactivity. By moving DIP switch #1 from OFF to ON, Auto Cycle is activated. Actuator will then perform 50% stroke cycle every 3 weeks if no stroke movement has occurred.

Manual Override (FlowCon FH)

Before performing manual override, please turn off the power supply. Lift the silicone cap on the top of the actuator to get access to manual override. Manual override is performed by a 4 mm (~5/32”) hex key. Clockwise turning will open the valve and counter-clockwise turning will close the valve.

Electrical Override (FlowCon FH.1)

By moving DIP switch #6 from OFF to ON, electrical override is activated and the actuator will open valve fully. During electrical override the LED indicator will blink red and green. When DIP switch #6 is moved back to OFF, the actuator will re-calibrate and thereafter go into normal operation mode. Electrical override is performed with power supply on.

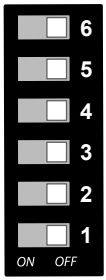
Failsafe Mode (FlowCon FH.1)

When power is lost, the actuator will go into failsafe mode after a few seconds, mandatory that capacitor charging and start-up sequence are completed. The actuator will perform failsafe action (open or close) and stay in failsafe final position until return of power. Upon power, the actuator remains in the final failsafe position until charging mode is reached (max. 215 sec). Hereafter the actuator will return to normal operation mode.

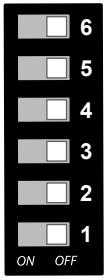
DIP Switch Settings

The valve functions are set on DIP switches found under the connection cover. PCB mounted electrical components will not be directly exposed when DIP switches are to be set. Factory setting for all switches is OFF.

FlowCon FH Actuator

DIP switch	Function ON		Function OFF
#6	Re-calibration		Re-calibration
#5	No function		No function
#4	Equal percentage		Linear
#3	Normally Open		Normally Closed
#2	2-10V Control signal 2-10V		0-10V Control signal 0-10V
#1	Auto cycle ON		Auto cycle OFF

FlowCon FH.1 Actuator

DIP switch	Function ON		Function OFF
#6	Electrical override ON		Electrical override OFF
#5	Failsafe open		Failsafe close
#4	Equal percentage		Linear
#3	Normally Open		Normally Closed
#2	2-10V Control signal 2-10V		0-10V Control signal 0-10V
#1	Auto cycle ON		Auto cycle OFF

LED Status

The LED indicator is visible through the dark colored transparent connection cover. The LED indication will give the following statuses.

	FH	FH.1
Normal operation mode	Full on green	Full on green
Charging mode (200 sec)	n/a	Blinking red
Calibration mode (closing point adjustment)	Blinking green	Blinking green
Electrical override mode	n/a	Blinking red/green
Failsafe mode	n/a	OFF
Perpetual failure mode	Full on red	Full on red

BACnet programming of FlowCon Intelligent Interface

In this instruction:
AV = Analog Value
BV = Binary Value
MSV = Multi-State Value.
Default values are underlined.
Please also see FlowCon FIT BACnet PICS.

After completing **Quick Start-up Sequence** setting Baud Rate (MSV.1), MAC Address (MSV.2) and FIT Configuration (MSV.5) and re-connecting power at specific location start by **selecti**ng your **PICV valve** in MSV.7:
1 = Green.0 2 = Green.1
3 = Green.2 4 = Green.3

Hereafter **trim the pressure sensors** (if a solution with pressure sensors is selected). To trim the pressure sensors, please check via BACnet AV.13 (Pressure1) and AV.14 (Pressure2) which show simple read-out from the two pressure sensors. Before installation in the system or withdrawn from the system, the pressure sensors should both read zero (= related to atmospheric pressure). Any deviation from zero shall be deducted in AV.16 (Press1Correct) and AV.17 (Press2Correct) respectively. If AV.13 reads 10 and should be zero, then value in AV.16 is entered to -10. It is also possible to calibrate based on another known pressure entity than ATM.

Select flow unit in MSV.39:
1 = l/sec 2 = GPM 3 = l/hr

Select pressure unit in MSV.6:
1 = kPa 2 = psi

Select temperature unit in MSV.3:
1 = °C 2 = °F

Finally **select FIT control mode** in MSV.4:
1 = ΔT Control
2 = Comfort Control
3 = Smart Control

When set to direct ΔT Control, FlowCon FIT will work as an energy valve and regulate based on ΔT target alone. When set to direct Comfort Control, FlowCon FIT will work as a PICV for room comfort control. When set to Smart Control, FlowCon FIT will prioritize room temperature setting and within designated range, optimize the ΔT.

Provide **analog control signal** in AV.141 (0% to 100%).

Condition of the FIT System through BACnet

Besides checking object values already described, the following information is available through BACnet. Please also see FlowCon FIT BACnet PICS:

Check the current flow rate (not measured) in AV.68. To know whether the valve is fully closed, please check the motor position in AV.98 (0%=fully closed). Set max.flow can be changed or confirmed in AV.62.

Check P1, P2 and ΔP in AV.13, AV.14 and AV.15. **ΔP alarm** can be seen in BV.1.
Valid output only on a solution with pressure sensors.

Check Water Temperatures T1, T2 and ΔT in AV.1, AV.2 and AV.3. **ΔT Target** is changed or confirmed in AV.4. **ΔT Target Deadband** is changed in AV.5

Check Room Temperature in AV.6 and **Room Temperature Target** in AV.7. **Room Temperature Deadband** is changed in AV.8. Control interval for all water- and room temperatures is set in AV.9

Check current BTU, accumulated BTU for the last month and accumulated BTU for the last year in AV.10, AV.11 and AV.12.