FlowHuB Series

Flow, Temperature, Measure, Display, Switch, Transmit

Make it BLUE®

The FlowHUB is ideal for condition monitoring, test stands and closed loop control applications both for fluid power and lubrication systems. The FlowHUB can measure and display flow and temperature readings as well as switch and transmit flow values. This enables a system designer to trigger alarms, shutoffs and transmit real-time values to a PLC using just one component, instead of up to six which might have been required conventionally. This represents a significant cost saving in terms of reduced complexity of wiring and far fewer components.
It is available in five flow ranges and in two pressure ranges. The FlowHUB is available in three versions - 'Switch', 'Transmitter' and 'Ultimate', all three versions have built in temperature measurement and a large bright digital display.

The 'Switch' version provides two configurable switched outputs; the trigger flow rate, time delay, sense and normal mode can all be freely configured. Each switch is independent and can switch up to 500 mA. The 'Transmitter' version provides a conditioned output either 0 to 5 Volts or 4 to 20 mA - full scale is configurable to any maximum flow. The 'Ultimate' version has both the switches and transmitter and the highest pressure rating of 420 bar (6,000 psi) as well as an enhanced response time of 50 ms.

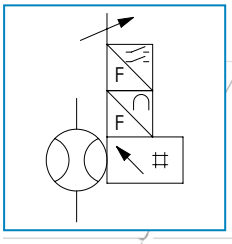
Features

- Designed for permanent installation (few wearing parts).
- Easy to operate, 4 digit LED display, 3 large keys.
- Temperature measurement built-in.
- Wide range of options: Choice of outputs. Two programmable switches. Complete with adaptors fitted. Engineering units L/min or US gpm (°C or °F).
- Easy installation. Allows reverse flow.
- Traceable calibration on request.

Specifications

Maximum Rated Pressure:		420 bar, 6000 psi
Maximum Rated Flow:		360 L/min, 95 US gpm
Ambient Temperature Range:		0 to 50°C, 32 to 122°F
Fluid Temperature Range:		5 to 90°C, 41 to 194°F
Porting:		Male BSPP, Male SAE JIC
Material:	**Body Materials:**	Aluminium
	Internal Materials:	Brass, Stainless Steel, Carbon Steel
Weight:		2.0 kg, 4.4 lb

ISO Symbol
e.g Flowhub Ultimate



Sales Order Code

Please contact our technical sales to team to discuss any special order requirements and custom configuration.

TYPICAL CODE	DESCRIPTION	SEE TABLE	YOUR CODE
HF360	Flow Range	Table 1	
TRNMA-3	Maximum Pressure and Electronic Control	Table 2	
B100V	Adaptors	Table 3	

Table 1: Flow Range

FLOW RANGE L/MIN & TEMPERATURE °C			FLOW RANGE US GPM & TEMPERATURE °F		
CODE	FLOW RANGE	STANDARD ADAPTORS	CODE	FLOW RANGE	STANDARD ADAPTORS
HF030	1 - 30	1/2" or 3/4" BSPP	HF008	0.3 - 8	1-1/16” -12UN JIC Male or 3/4” -16UN JIC Male
HF060	2 - 60	1/2" or 3/4" BSPP	HF016	0.5 - 16	1-1/16” -12UN JIC Male or 3/4” -16UN JIC Male
HF120	4 - 120	3/4" or 1 " BSPP	HF032	1 - 32	1-1/16” -12UN JIC Male or 1-5/16” -12UN JIC Male
HF240	8 - 240	1" BSPP	HF064	2 - 64	1-5/16” -12UN JIC Male
HF360	8 - 360	1" BSPP	HF100	2 - 100	1-5/16” -12UN JIC Male

Table 2: Maximum Pressure and Electronic Control

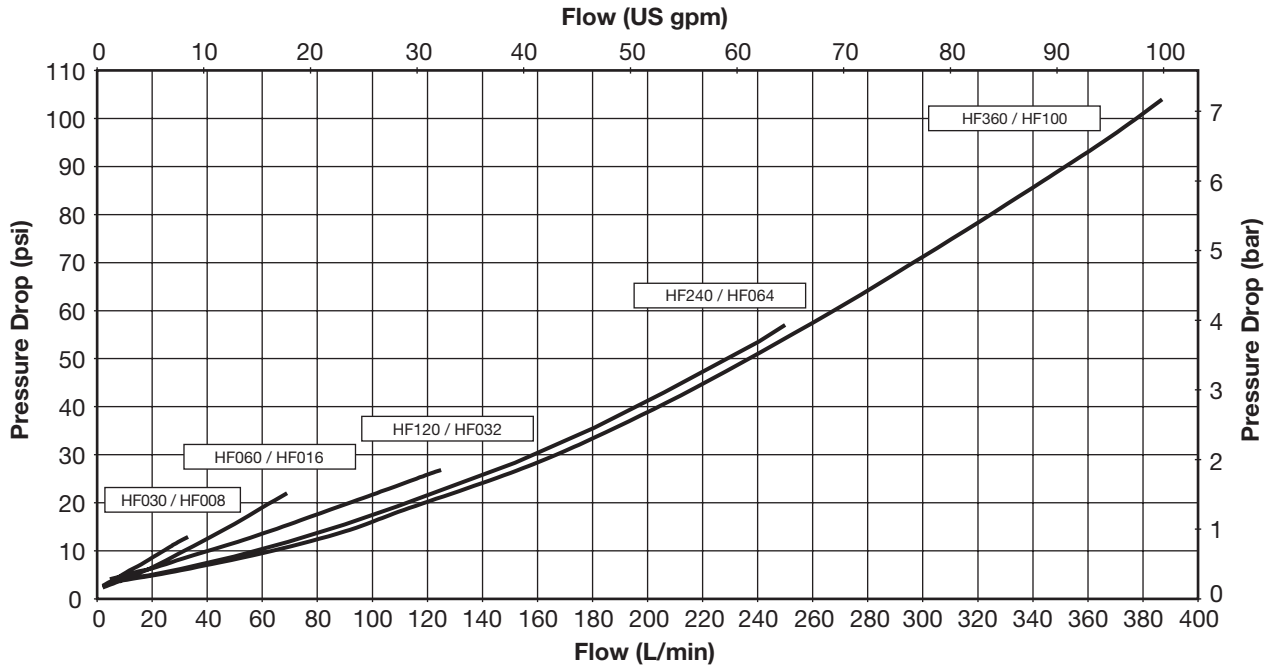
CODE	MAXIMUM WORKING PRESSURE	FUNCTION DESCRIPTION
SWTNA-3	210 bar (3,000 psi)	Two programmable switches
TRN5V-3	210 bar (3,000 psi)	Output 0 - 5 Volt
TRNMA-3	210 bar (3,000 psi)	Output 4 - 20 mA
ULT5V-6	420 bar (6,000 psi)	Two programmable switches, output 0 - 5 Volt
ULTMA-6	420 bar (6,000 psi)	Two programmable switches, output 4 - 20 mA

Table 3: Adaptors

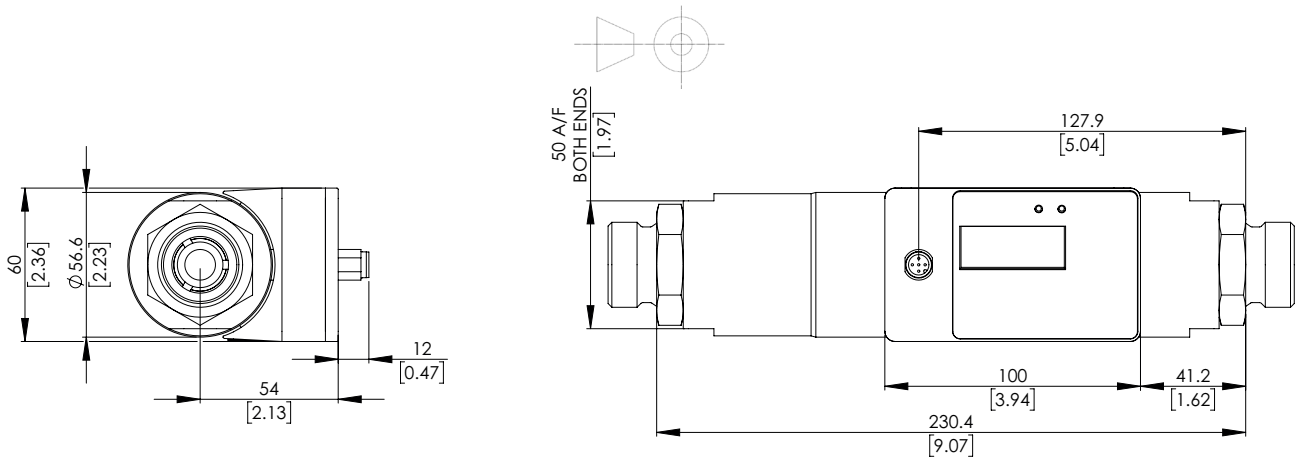
CODE	DESCRIPTION
BSPP ADAPTOR	
B050V	1/2” BSPP
B075V	3/4” BSPP
B100V	1” BSPP
SAE ADAPTORS	
S050V	3/4” -16UN JIC Male
S075V	1-1/16” -12UN JIC Male
S100V	1-5/16” -12UN JIC Male

Flow versus Pressure Drop Curve

All test completed using ISO Mineral oil at 21 cSt in forward direction



Installation Details Dimensions in millimetres (Inches)



Product Information

Functional

Accuracy:	± 3% of full scale at 21 cSt (higher accuracy on request)
Repeatability:	Better than ± 1%
Response time:	150 ms (Switch and Transmitter) 50 ms (Ultimate)
Compatible fluids:	Mineral oil to ISO 11158 category HM Other fluids consult sales office
IP Protection:	Design to meet IP64 (NEMA Type 5)

Electrical Specification

Supply voltage:	15 to 30 VDC class 2 supply only
Typical current:	35 mA
Maximum current excluding switch current:	60 mA
Switch current:	500 mA per switch max
Switch voltage:	Supply voltage - 0.5 V
Connector type:	M12 - 5 pin male
Voltage output:	minimum load = 10k Ohms
Current output:	maximum load =(supply voltage x 46) - 200 Ohms

Construction Materials

Flow Body:	High tensile aluminium 2011-T3
Internal Parts:	Brass CW614N, Stainless steel 316, Carbon Steel
Adaptors:	High pressure - Carbon Steel 212A42 zinc plated and clear trivalent passivate Standard - Carbon Steel 230M07 zinc plated and clear trivalent passivate
Electronics enclosure:	Die Cast aluminium

Filtration

The device should be protected by a maximum 40 micron filter in the hydraulic circuit. Oil cleanliness should be better than NAS 8 or ISO 19/17/14.

Calibration

FlowHUB is calibrated at a mean viscosity of 21cSt using ISO32 hydraulic mineral oil to ISO11158 category HM. Calibration certificates are available on request - this is a chargeable option.

Operation

All FlowHUBs work on the same theory - the fluid flow is used to move a magnet which is mounted within a piston, the distance moved is proportional to the flow rate. This movement is measured by a sensitive magnetic device. The piston is designed to minimise the effects of variations in temperature and viscosity and built-in flow conditioning eliminates flow swirl and allow any connection to be made at the input without the normal 10 diameters of straight pipe. The on-board electronics condition the signal and convert the linear movement to fluid flow. The FlowHUB also allows unmeasured flow in the reverse direction.

Installation

The FlowHUB can be installed in any orientation but may require special calibration (contact Sales Office). The unit has built-in flow conditioning therefore no lengths of straight tube are needed. As the unit contains a sensitive magnetic device it is recommended to mount away from strong magnetic fields and large ferrous objects, a distance of 80 mm is recommended. For this reason it is also recommended to use only the adaptors supplied as different shaped adaptors can effect the readings.

Reverse flow operation

The FlowHUB will allow reverse flow but it will not measure the flow rate. The pressure drop in reverse flow is considerably higher then that for forward flow. Please see chart below for details.

Reverse flow pressure drop

FLOW RANGE	PRESSURE DROP (1/2 FULL FLOW)	PRESSURE DROP (FULL FLOW)
HF360 / HF100	4.8 bar @ 180 L/min	17.9 bar @ 360 L/min
HF240 / HF064	2.8 bar @ 120 L/min	9.0 bar @ 240 L/min
HF120 / HF032	7.6 bar @ 60 L/min	27.6 bar @ 120 L/min
HF060 / HF016	2.1 bar @ 30 L/min	6.2 bar @ 60 L/min
HF030 / HF008	0.6 bar @ 15 L/min	1.9 bar @ 30 L/min

Note: 1 bar= 14.5 psi, 10 L/min = 2.64 US gpm

Fluid Viscosity

The performance of the FlowHUB can be affected by the viscosity of the fluid measured. FlowHUB is calibrated at a mean viscosity of 21cSt using ISO32 hydraulic mineral oil to ISO11158 category HM. The shaded area of the table shows the expected range of viscosities that can be used by the FlowHUB (models 30, 60, 120, 240 L/min & 8, 16, 32, 64 US gpm) with minimal effect on the accuracy (less than ± 3% FS). FlowHUBs can be specially calibrated at a different viscosity or we can advise on the expected
error when it is used at other viscosities. For more detailed information about viscosity changes and information on the 360 L/min or 100 US gpm models please contact Webtec.

Table Showing kinematic viscosity (cSt) of different mineral oils at specific temperatures

TEMP °C	FLUID TYPE					
	ISO15	ISO22	ISO32	ISO37	ISO46	ISO68
0	85.9	165.6	309.3	449.9	527.6	894.3
10	49.0	87.0	150.8	204.7	244.9	393.3
20	30.4	50.5	82.2	105.5	127.9	196.1
30	20.1	31.6	48.8	59.8	73.1	107.7
40	14.0	21.0	31.0	36.6	44.9	63.9
50	10.2	14.7	20.8	23.9	29.4	40.5
60	7.7	10.7	14.7	16.5	20.2	27.2
70	6.0	8.1	10.9	12.0	14.6	19.2
80	4.8	6.4	8.4	9.1	11.1	14.3
90	4.0	5.2	6.6	7.2	8.7	11.1
100	3.3	4.3	5.5	6.0	7.1	8.9