ARMSTRONG

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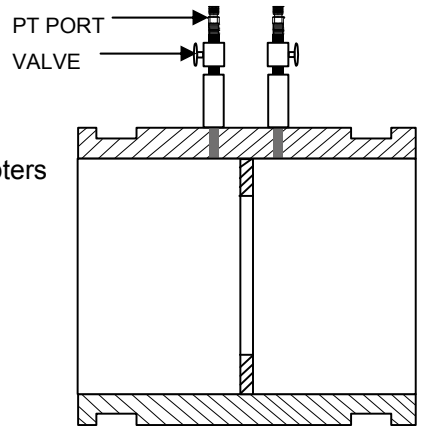
INSTALLATION AND OPERATING INSTRUCTIONS

ARMflo Fixed Orifice Flowmeters - DN65 to DN300



TYPICAL APPLICATIONS:

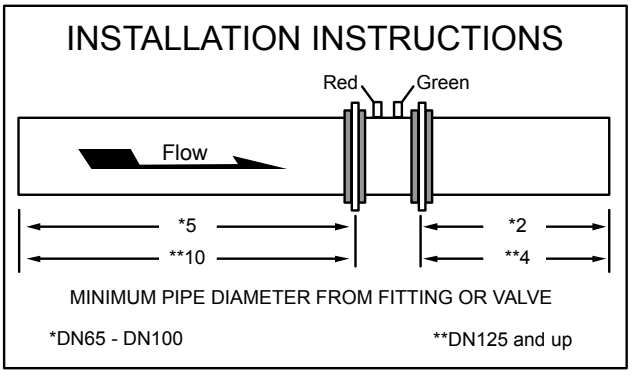
ARMflo AFO-G flowmeters are used to accurately determine hydronic fluid flow in HVAC heating and chiller systems. System connections are made with industry standard grooved couplings for lowest installed cost, or with ARMgrip flange adapters for PN16 or PN25 flange connection requirements.

The AFO-G may be close-coupled to an Armstrong grooved CBV, or mounted elsewhere in the system piping where flow measurement may be desired.

INSTALLATION:

Armstrong AFO-G flowmeters are precision measurement instruments

1. To achieve optimum accuracy (to +/-1%), locate the flowmeter at least the distance prescribed from any fitting or valve, and at least 10 pipe diameters from any pump. Alternatively, the flowmeter may be close-coupled to an Armstrong CBV, enabling flowrate feedback during valve adjustment, with a typical accuracy of +/- 5%. Accuracy is not significantly affected by throttling the ARMflo CBV within the recommended operating limits of both the CBV and flowmeter.
2. Connect the AFO-G to the system using standard grooved pipe couplings or ARMgrip flange adapters. Ensure the flow direction markings match the system fluid flow direction.
3. Mount the meter connection hardware kits (included) in the pressure tappings provided.
4. Always perform a liquid pressure test after installation, before putting the system into operation.



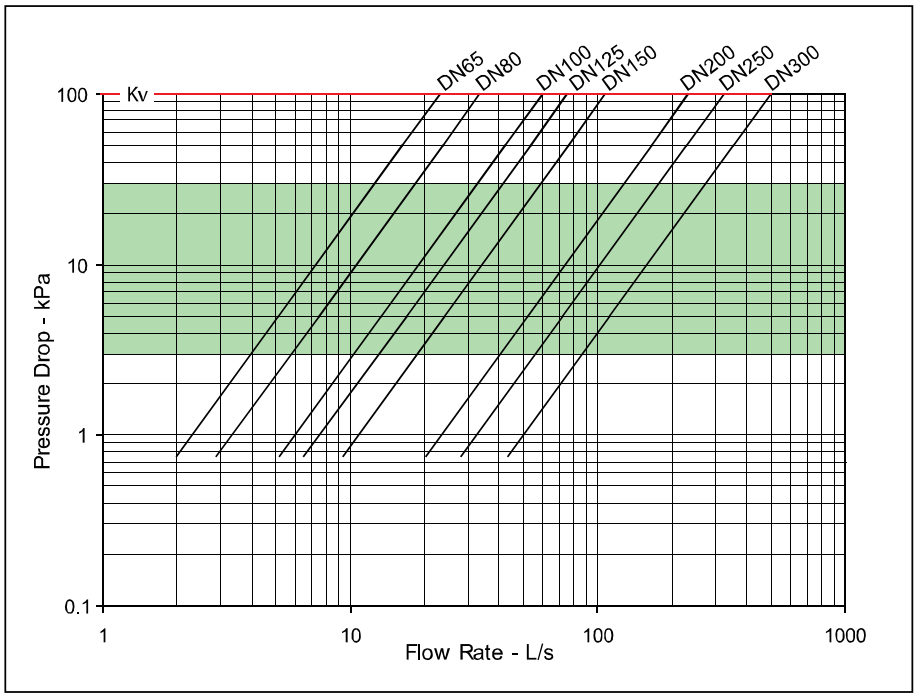
OPERATION:

1. Remove the PT Port caps, using caution to avoid contact with the hydronic fluid.
2. Insert the manometer high pressure probe into the red meter connection.
3. Insert the manometer low pressure probe into the green meter connection.
4. Ensure there are no leaks at the meter probe connections.
5. Open the pressure tapping shut-off valves and take the differential pressure measurement.
6. If the value is negative, ensure the meter connections are not reversed. Otherwise, check the fluid flow direction in that piping section.
7. Use the AFO-G performance charts or flow calculations to convert the differential pressure reading to the corresponding flowrate.
8. When finished, close the pressure tapping valves, carefully remove the meter probes to avoid contact with the hydronic fluid, and replace the PT Port caps.

MAINTENANCE:

AFO-G flowmeters are generally maintenance-free. A schedule of periodic inspection for damage or leaks is recommended. After repeated use, should a PT port leak with or without the probe inserted, de-pressurize the system to remove and replace the PT Port.

PERFORMANCE CHARTS:



Note: Min and Max flowrates are based on operation between 3 and 30 kPa. Operating beyond these recommendations may affect the performance of the AFO and other HVAC equipment. For optimum performance, select the flowmeter to operate as close to 3 kPa as possible, without going under. Kv = L/s @ 100 kPa * 3.6 .

FLOW CALCULATION:

Flow Rate = $0.028\ Kv\sqrt{\Delta P/d}$	Flow Rate = $0.01\ Kv\sqrt{\Delta P/d}$
Flow Rate Units = L/s 0.028 = Conversion Constant Kv = Flow Co-efficient ΔP = Differential Pressure [kPa] d = Density of Liquid d = 1 for Water at 16°C (60°F)	Flow Rate Units = m^3/h 0.01 = Conversion Constant Kv = Flow Co-efficient ΔP = Differential Pressure [mm] d = Density of Liquid d = 1 for Water at 16°C (60°F)

Refer to density charts for water at other temperatures, or other hydronic fluid solutions.

FLOWRATE RANGES:

Flowrate Ranges							
Flowmeter	Size	Flow Coefficient		Min Flowrate		Max Flowrate	
Model		Kv	Cv	L/s	US GPM	L/s	US GPM
AFO2.5-G	DN65	82	96	4.0	63	13	206
AFO3-G	DN80	119	140	5.8	92	21	333
AFO4-G	DN100	213	250	11	174	33	523
AFO5-G	DN125	269	315	13	206	40	634
AFO6-G	DN150	384	450	19	301	60	951
AFO8-G	DN200	832	975	40	634	130	2061
AFO10-G	DN250	1152	1350	55	872	180	2853
AFO12-G	DN300	1791	2100	88	1395	280	4438

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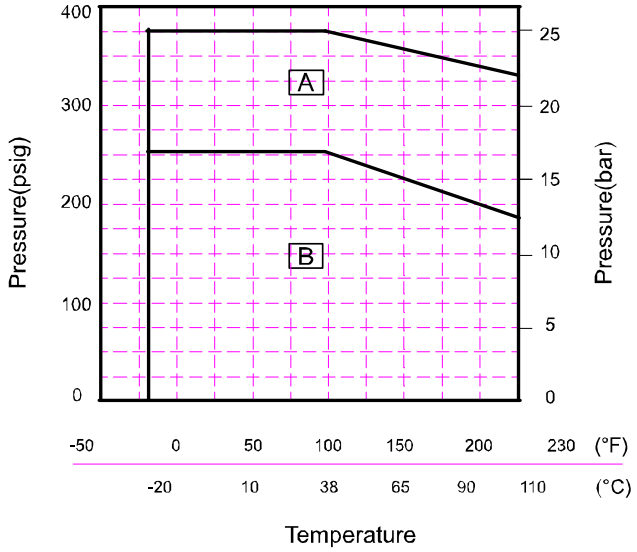
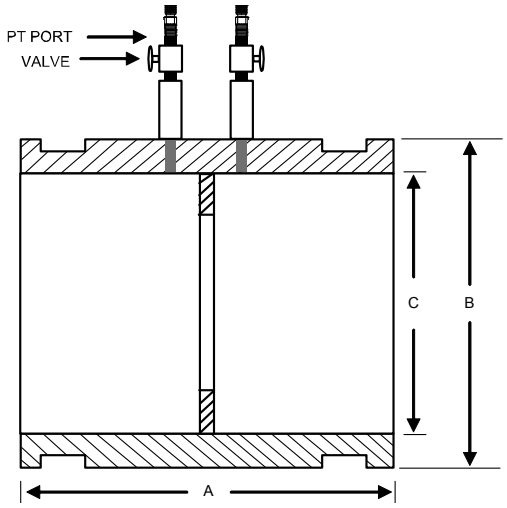
MATERIALS OF CONSTRUCTION	
Body / Orifice Plate	Carbon steel – ANSI B36.10, Zinc plated
Meter Ports	Qty 2 – Brass PT ports with caps, Nordel check and gasket
PT Port Extensions / Valves	Brass – ASTM B-16

PRESSURE / TEMPERATURE:



LEGEND:	
A	AFO-G alone or with PN-25 flange
B	AFO-G with PN-16 flange adapter.

DIMENSIONS:



AFO- G mm (“)								
Model	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300
A	89 (3.5)	89 (3.5)	92 (3.6)	109 (4.3)	109 (4.3)	121(4.8)	127 (5.0)	127 (5.0)
B	73 (2.9)	89 (3.5)	114 (4.5)	142 (5.6)	168 (6.6)	219 (8.6)	273 (10.8)	324 (12.8)
C	63 (2.5)	78 (3.0)	102 (4.0)	127 (5.0)	154 (6.0)	203 (8.0)	254 (10.0)	303 (12.0)
Weight kg (lbs)	0.8 (1.7)	1.0 (2.2)	1.4 (3.1)	2.2 (4.8)	3.0 (6.7)	4.7 (10.4)	7.3 (16.1)	8.9 (19.7)

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