HHR FlowPak® flow meter
For applications without straight upstream and downstream pipes
Model FLC-HHR-FP

Applications

- Power generation
- Oil extraction and refining
- Water treatment and distribution
- Gas treatment and transport, LNG processing, FLNG and FSRU
- Chemical and petrochemical

Special features

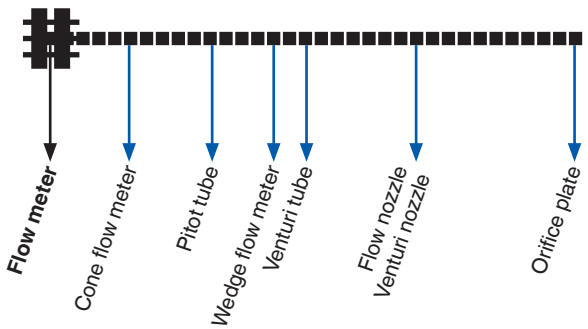
- Highest accuracy and energy efficiency
- No straight upstream and downstream pipes required
- Wide range of applications

Flow meter, model FLC-HHR-FP
Fig. top: with flange connection
Fig. bottom: with butt weld connection

Description

No straight upstream and downstream pipes required
The flow meter works independently of the flow profile and does not require straight upstream and downstream pipes. It can also be mounted immediately after two 90° pipe elbows without any problems. This makes the instrument particularly suitable for applications with very limited mounting space and complex pipeline geometries.

Maximised efficiency and measurement performance
The model FLC-HHR-FP combines integrated flow straithening with a proprietary arrangement of the pressure tapping points, thereby minimising the impact on the flow profile. Pressure loss remains extremely low, contributing to the system's high energy efficiency. As a result, this flow meter outperforms conventional flow measuring instruments in terms of pressure loss and efficiency.



Smart in sensing

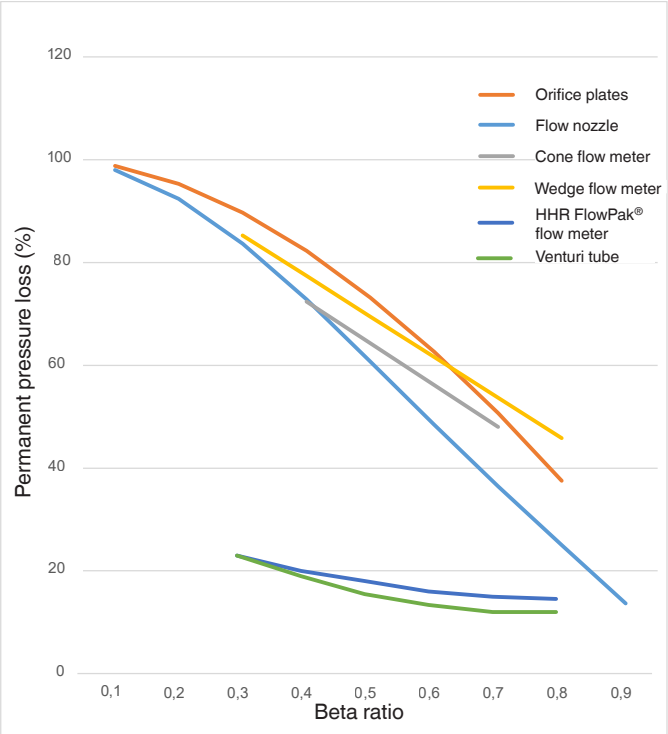
Data sheets showing similar products:
Venturi tube, model FLC-VT-BAR and model FLC-VT-WS; data sheet FL 10.04

Proven performance
The flow meter delivers proven performance, which has been confirmed by extensive laboratory and field testing. Test results of the “Alden Research Laboratory” show the flow coefficient of the HHR FlowPak® to be constant, independent of the Reynolds number and within ±0.5 % of the predicted value, even when installed directly after two pipe elbows out of plane.

This eliminates the need for calibration testing to determine the coefficient and accuracy of each individual flow meter. If a higher accuracy of ±0.25 % or better is desired, the flow meter can be calibrated in a laboratory whose data is NIST or ISO 17025 traceable.

Highest energy efficiency reduces operating costs
Each piece of component or pipe integrated into an existing piping system will result in an increase in the pressure loss. With higher pressure losses, pumps and compressors must work harder in order to keep the flow rate stable. Pressure loss is synonymous with higher energy costs that would have to be spent for normal operation.

The lowest possible pressure loss, thus, assists in reducing the operating costs to a minimum. The flow meter displays the lowest permanent pressure loss of all flow measuring systems with constrictions. The smoothest possible inlet contour and surface together with the unique design of the diffuser section ensures pressure recovery optimisation.



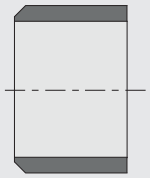
Developed for demanding applications
The unique design ensures that a flow velocity profile is well developed and clearly defined prior to measurement. Extensive tests by the “Alden Research Laboratory” showed consistently high accuracy and repeatability without the need for additional upstream and downstream pipes. In these tests, two closely coupled 90° pipe elbows out of plane were used directly before and after the flow meter. Thus, the flow meter is suitable for pipeline systems with limited mounting space (new construction or retrofit). This can result in significant cost savings in larger, more expensive pipeline systems.

Specifications

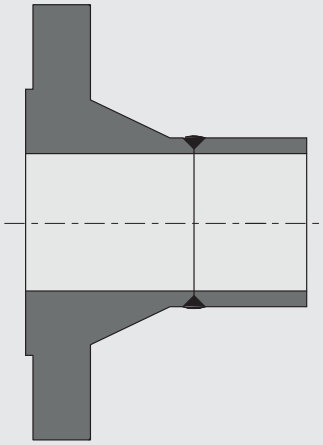
Specifications	Flow meter	Cone flow meter
Uncalibrated accuracy	Up to ±0.5 %	±5 % (calibration necessary)
Flow coefficient	0.985 ... 0.998	0.82
Repeatability	±0.1 %	±0.1 %
Adjustment ratio / Turndown	10:1	10:1
Requirements for upstream and downstream pipes	None	3 D ... 10 D
Nominal size	3" ... 48"	2" ... 20"
Beta ratio	0.4 ... 0.75	0.45 ... 0.75
Number of pressure tappings	1 ... 4 sets	1 set
	→ See „Pressure tappings“ auf Seite 4	
Permanent pressure loss	15 ... 20 %	50 ... 75 %
Pipe connections	Flange connection Butt weld seam	Flange connection Butt weld seam (can be flange-mounted for calibration in a test laboratory)
	→ See „Mounting options“ auf Seite 3	
Nominal size and pipe schedule	All nominal sizes are available in accordance with relevant standards. The pipe schedule must be specified by the customer. Standards cover diameters from 3 ... 48" [80 ... 1,200 mm]. Larger diameters are available on request.	
Nominal pressure rating	Available in accordance with all relevant standards.	
Materials	A wide range of materials is available.	

Mounting options

Butt weld seam, bevelled

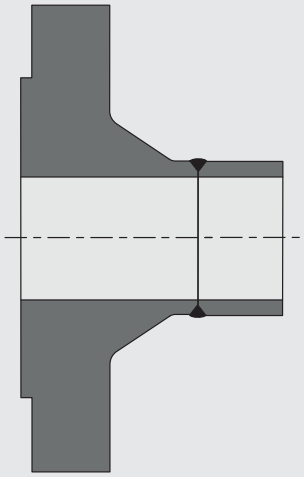


Flange connection

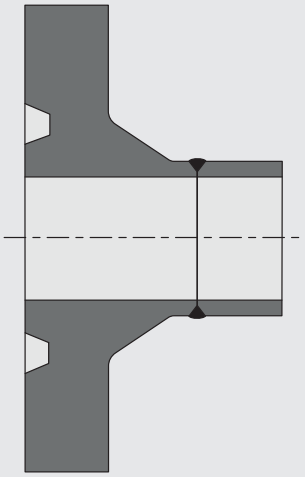


Sealing faces for flange connection

Raised face (RF)



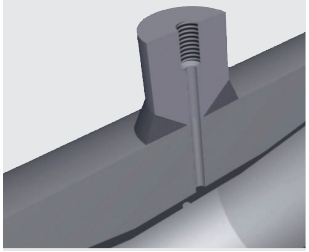
Ring joint (RJ)



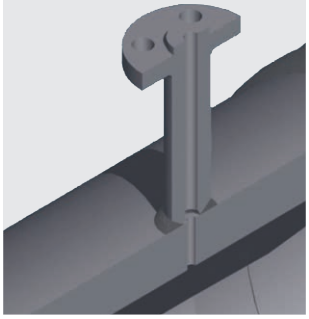
→ Other sealing faces on request

Pressure tappings

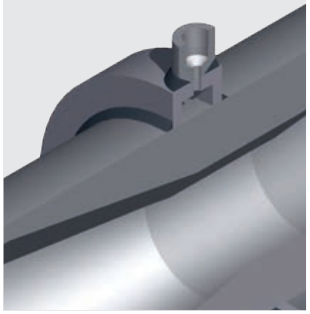
Direct tap, threaded connection NPT



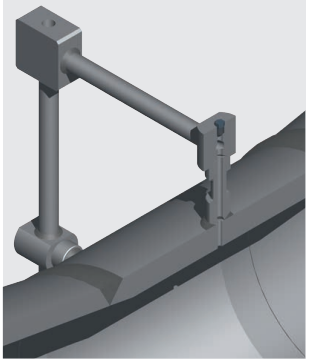
Direct tap, flange connection



Annular chamber tap



Piezometric ring



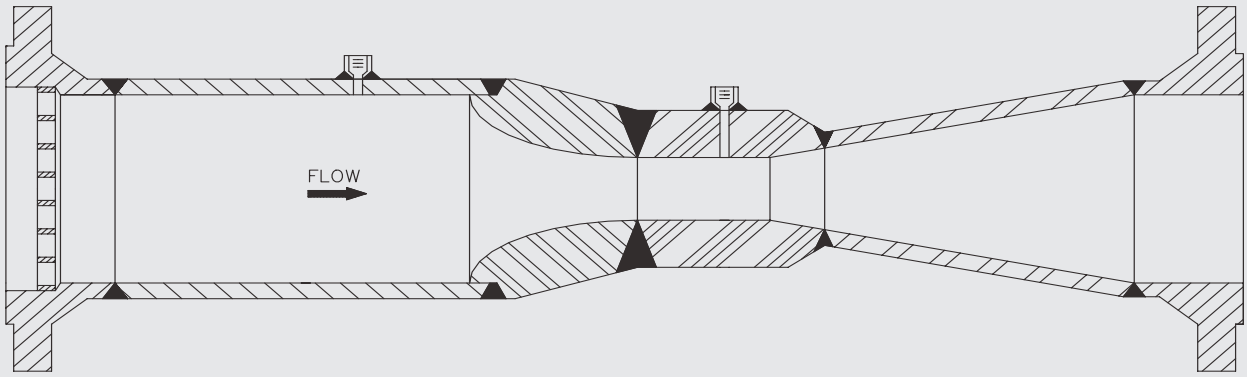
→ Other pressure tappings on request

Dimensions in inch [mm]

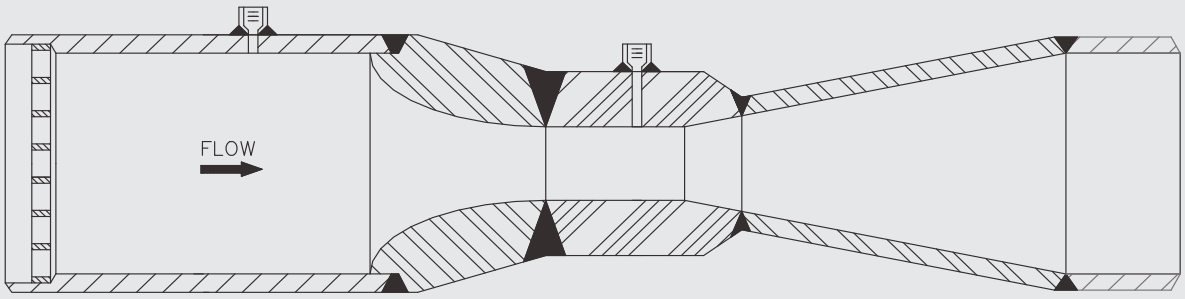
Nominal size	Inner diameter	Beta ratio	Overall length [1]	Total weight in kg [lb]	
				Butt weld seam	Flange connection
3	3.068 [78]	0.7	18 [457]	50 [110]	50 [110]
4	4.026 [102]	0.7	22 [559]	50 [110]	50 [110]
6	6.065 [154]	0.7	32 [813]	100 [220]	150 [330]
8	7.981 [203]	0.7	42 [1066]	150 [330]	200 [441]
10	10.02 [255]	0.7	52 [1320]	250 [551]	350 [772]
12	12 [305]	0.7	60 [1524]	350 [772]	500 [1102]
14	13.25 [337]	0.7	68 [1727]	450 [990]	650 [1433]
16	15.25 [387]	0.7	78 [1981]	600 [1323]	850 [1874]
18	17.25 [4.38]	0.7	86 [2184]	800 [1763]	1,050 [2315]
20	19.25 [189]	0.7	96 [2489]	1,000 [2205]	1,300 [2866]
24	23.25 [591]	0.7	114 [2896]	1,550 [3417]	2,000 [4409]

1) Shorter lengths on request

Welding neck flange



Butt weld seam



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