

VAF



AQ-RATE Mass Flowmeter

Series 6000 HP & 7000 UHP

122

Product Bulletin

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**TO BE
REALLY
SURE**

Introduction

VAF Instruments is the most preferred supplier of the top 100 shipyards and market leader in maritime measurement systems today because we continuously strive to improve our products and service in order to serve you better.

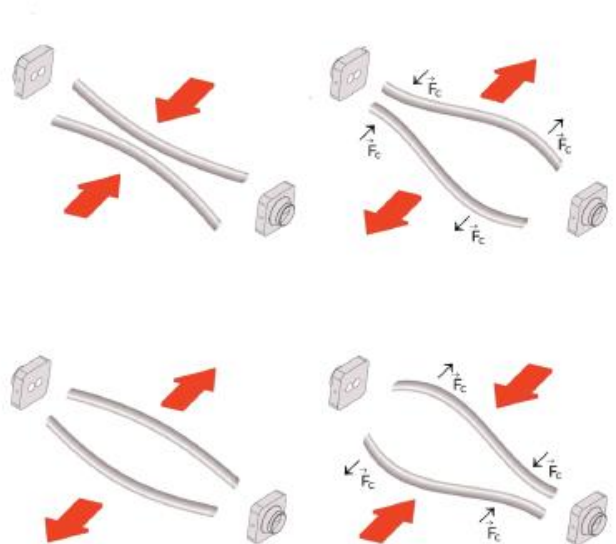
For one, VAF Instruments offers her customers the best, longest and most comprehensive guarantee in the maritime industry. Secondly, with a global service organisation, VAF Instruments offers a unique level of customer service. When you look for reliability and service, VAF Instruments is the logical choice.

VAF Instruments is the leading specialist for the development, manufacturing and world-wide sales of measurement and control systems. We supply both the marine- and process industry.

Having more than 80 years of experience with flow measuring in both high demanding marine and industrial applications, the product range is expanded with a Coriolis Mass Flowmeter.

Principle of operation

A VAF AQ-RATE Mass Flowmeter is operating on the Coriolis principle. The process connection of the Flowmeter is split internally into two identical v-shaped tubes, which are actuated at resonance frequency in opposite direction. When fluid flows through the tubes, the input legs of the v-shape will vibrate with the same frequency as the output legs, but they are behind in time. This difference in time, called phase shift, is a measure of the mass flow through the tubes. The magnitude of this phase shift is a measure of the mass flow rate, whilst the frequency of the complete system is a measure of the density of the fluid. The mass flow rate is the mass of the fluid per unit of time. When the mass flow rate is divided by the measured density, a volumetric flow rate can be obtained.



Features & benefits

Features	Benefits
Obstruction-free measurement	No liquid filtering needed
Optional remote design	Electronics can be separated from a hot or aggressive environment
Intuitive operation	No training needed
Few moving parts	Maintenance free design
Insensitive for system lay-out	Flexible piping design
Design simplicity	Only few spare parts
Constructed to CE standards	Proven design
From ISO 9001 registered company	Guaranteed product reliability
Wetted parts from stainless steel	Applicable for a wide range of fluids
Ex transmitter available	Suitable for hazardous areas

Configurations

The AQ-RATE Mass Flowmeter is available in different configurations and connection sizes. The AQ-RATE Mass flowmeters are available in the 6000 HP and the 7000 UHP series.

The 6000 HP (High Precision) versions are primarily suitable for accurate fuel consumption monitoring. They offer good accuracy and repeatability and are available in the most common connection sizes in fuel systems on vessels. For even higher accuracy and repeatability and additional applications like bunkering and fuel transfer measurement we advise the 7000 UHP (Ultra High Precision) series.

The AQ-RATE Mass Flowmeters have a digital signal processor based transmitter, enabling high precision measurements. Fast signal processing in combination with intuitive self-diagnostics makes the sensor suitable for a large variety of applications. Various input and output options make the AQ-RATE Mass Flowmeters versatile in interfacing with other systems.

AQ-RATE Mass Flowmeters are standard equipped with a built-on totaliser/transmitter (Integral). For applications at elevated temperatures or in heavy vibrating environments, it is recommended to have a separate remote totaliser/transmitter.

The AQ-RATE Mass flowmeters are also available in special version for use in hazardous areas.

Technical specification

AQ-RATE	Series 6000 HP		Series 7000 UHP	
Transmitter position	Integral	Remote	Integral	Remote
Meter sizes	DN15 – DN50		DN15 – DN200	
Flange type	DIN / JIS			
Measuring accuracy ¹⁾ for liquids on rate				
Mass flow	0,4 %		0,15 %	
Volumetric flow rate	0,4 %		0,15 %	
Reproducibility	0,2 %		0,12 %	
Density	10 g/l		2 g/l	
Temperature	1 °C		0,5 °C	
Wetted materials	stainless steel			
Liquid temperature range	-50 to 160°C		-50 to 205°C	
Transmitter design	Integral / remote / Ex d (optional)			
Connections	M20 x 1,5			
Display	LCD backlit, 2 configurable lines			
Power supply	100 - 230 VAC			
Power consumption	max. 25 VA			
Cable length remote transmitter		5 m standard		5 m standard
Pulse output	scalable and passive			
Analogue output	4-20 mA active			
Communication	Modbus RTU (RS485)			
Protection class	IP 65 / 67			
Ambient temperature	-20 to 60 °C			

Notes: ¹⁾ on measuring range of 20:1 based on water

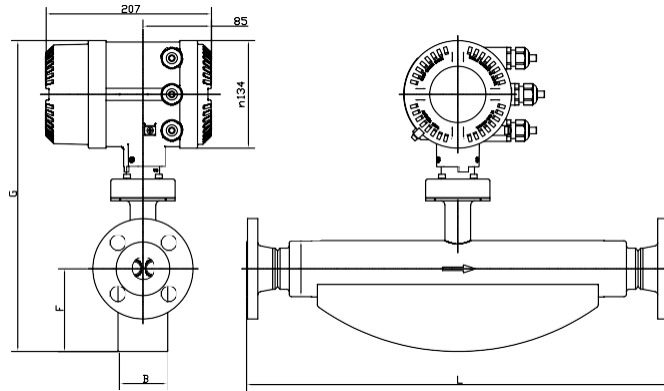
AQ-RATE series 6000 HP / 7000 UHP

Basic model number	6015 / 7015	6020 / 7020	6025 / 7025	6040 / 7040	6050 / 7050	7080	7090	7100	7150	7200
Flange connections [DN]	15	20	25	40	50	80	100	100	150	200
Flange types	DIN / JIS									
Maximum flow [kg/h] ²⁾	8000	8000	35000	35000	90000	250000	250000	520000	860000	860000
Measuring range	5 to 100%									
Weight [kg] Remote version ³⁾	5	5	10	10	25	69	69	125	205	205
Weight [kg] Integral version	7	7	12	12	27	71	71	128	207	207

Notes: ²⁾ Based on water. ³⁾ Excluding remote transmitter

Dimensions

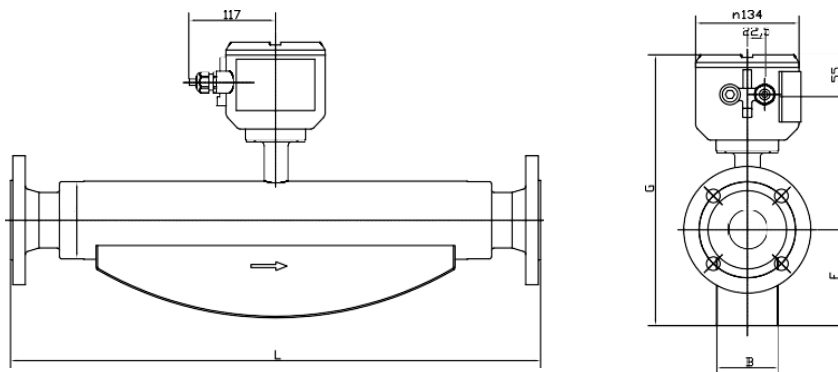
Integral design



Model number	Connection size	L (mm) ¹⁾	G (mm)	F (mm)	B (mm)	Weight (kg)
6015-I / 7015-I	DN 15	385	340	77	65	7
6020-I / 7020-I	DN 20	421	340	77	85	7
6025-I / 7025-I	DN 25	525	379	103	62	12
6040-I / 7040-I	DN 40	576	379	103	62	12
6050-I / 7050-I	DN 50	715	416	125	80	27
7080-I	DN 80	870	505	183	123	71
7090-I	DN 100	875	505	183	123	71
7100-I	DN 100	1122	603	260	168	128
7150-I	DN 150	1421	691	320	205	207
7200-I	DN 200	1637	691	320	205	207

Notes: ¹⁾ DIN PN16-40 / JIS10-16K

Remote design



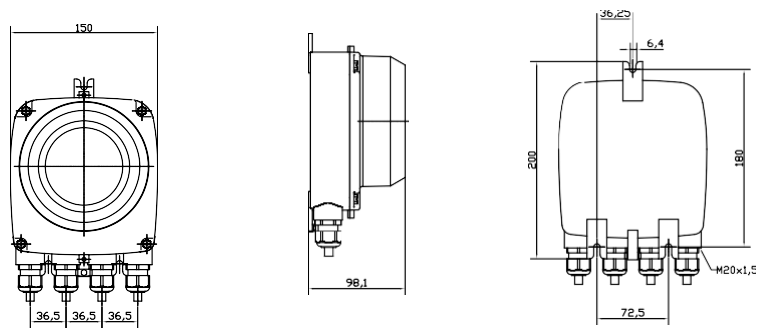
Dimensions

Remote design

Model number	Connection size	L (mm) ²⁾	G (mm)	F (mm)	B (mm)	Weight (kg)
6015-R / 7015-R	DN 15	385	278	77	46	5
6020-R / 7020-R	DN 20	421	340	77	46	5
6025-R / 7025-R	DN 25	525	317	103	62	10
6040-R / 7040-R	DN 40	576	317	103	62	10
6050-R / 7050-R	DN 50	715	354	125	80	25
7080-R	DN 80	870	445	183	123	69
7090-R	DN 100	875	445	183	123	69
7100-R	DN 100	1122	541	260	163	125
7150-R	DN 150	1421	630	320	205	205
7200-R	DN 200	1637	630	320	205	205

Notes: ²⁾ DIN PN16-40 / JIS10 -16K

Transmitter



Quotation and ordering information

For proper selection of the suitable AQ-Rate mass Flowmeter the following data should be determined:

Liquid data:

1. **Process liquid** (trade name or chemical composition):

2. **Flowrate** [l/min] minimum: continuous: maximum:

3. **Operating pressure range** [bar]: allowable pressure drop [bar]:

4. **Operating temperature range** [°C] process liquid: ambient:

5. **Specific gravity at operating conditions** [kg/l]: viscosity [m/Pas]:

Flowmeter data:

6. **Series:** 6000 HP 7000 UHP

7. **Diameter liquid piping:**

8. **Connection flanges:** DIN PN16 DIN PN40

JIS 10K JIS 16K

JIS 20K

9. **Hazardous Area classification:**

10. **Inspection:** material certificate acc. EN 10204 3.1

inspection by classification authority;

Other

Name:

Place and date:

Please fill out this form and send it to sales@vaf.nl. We will reply with a quotation and ordering information for the requested product or solution a.s.a.p.

For further information see relevant Product Bulletins or www.vaf.nl



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VAF Instruments B.V.
Vierlinghstraat 24, 3316 EL Dordrecht, The Netherlands
P.O. Box 40, 3300 AA Dordrecht, The Netherlands
T+31 78 618 3100 | info@vaf.nl | www.vaf.nl

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