



# ALTURBINE

Turbine Flowmeter  
Series ALTM HM

## GENERAL

### ALTM Turbine Flow Meters

ALTM turbine flow meters (hereinafter referred to as turbines) are used for the precise measurement of instantaneous flow of low-viscosity fluids rates and flow quantities such as; tap and demineralised water, fuels, liquefied gases, Light fuel oil, solvents, Pharmaceutical fluids, etc. Turbine Flowmeters measure volumetric flow, where flow passing through the tube is measured by the mean velocity of the streaming fluid. Flow rectifiers ensure a laminar flow in the axial direction of the wheel. A light-weight turbine wheel carried concentrically in the tube body is rotated by the fluid. The RPM of the turbine wheel is directly proportional to the mean flow velocity within the tube diameter and corresponds to the volume flow over a wide range.

### ALVTM Display with Frequency and Analog Output

The ALVTM is a programmable local display with integral carrier-frequency pickup and amplifier for Alia turbine meters. Flow rate is indicated in an 8 digit LCD display with 14 segments. A 10 point linearization is included to optimize the accuracy. The pulse output provides a flow-proportional frequency signal or scaled volume pulse in accordance with programming. For electrical connection a 6-pin plug or a junction box with 6 internal terminals is provided

## FEATURES

- Fast response time and high resolution within 5 to 50 msec
- Wide temperature range from -273 up to +350°C
- Pressures up to 630 bars and up to 4,000 bar (using high-pressure adapters or flanges)
- Easily cleaned and designed to flushed particulates through the turbine with the medium
- For food applications with dairy connections as per DIN 11851
- For Pharmaceutical fluids with Tri-Clamp« connections
- For very low flows designed with sapphire bearings
- Factory calibrated



## SPECIFICATION

### Flow body - ALTM - HM series

- Process Connection : BASF flanges up to 4,000bar,(ANSI and DIN), dairy or tri-clamp, ermeto threads, FNPT, etc.
- Operating pressure : max. 4,000 bar
- Process temperature : -273 up to +350°C
- Flow rates : 0.03 to 0.8 LPM -smallest size (15mm)  
430-25,000 LPM- largest size (250mm)
- Accuracy : ±0.15%
- Viscosities : 1 to 60 cSt
- Material : Stainless steel as per DIN (AISI)
  - Body : 1.4305 (1.4571 with flange)-(316 Ti)-specia
  - Internal parts : 1.4305 (303)-standard, 1.4571 (316 Ti)
  - Wheel : 1.4122 (303)-standard, 1.4460 (329) special
  - Bearing : Tungsten carbide or teflon
- Weight : Small sizes : 2 to 16 kg  
Large sizes : 11 to 155 kg  
Electronics : 0.25 to 2.5 kg

### ALVTE Carrier Frequency Pulse Amplifier

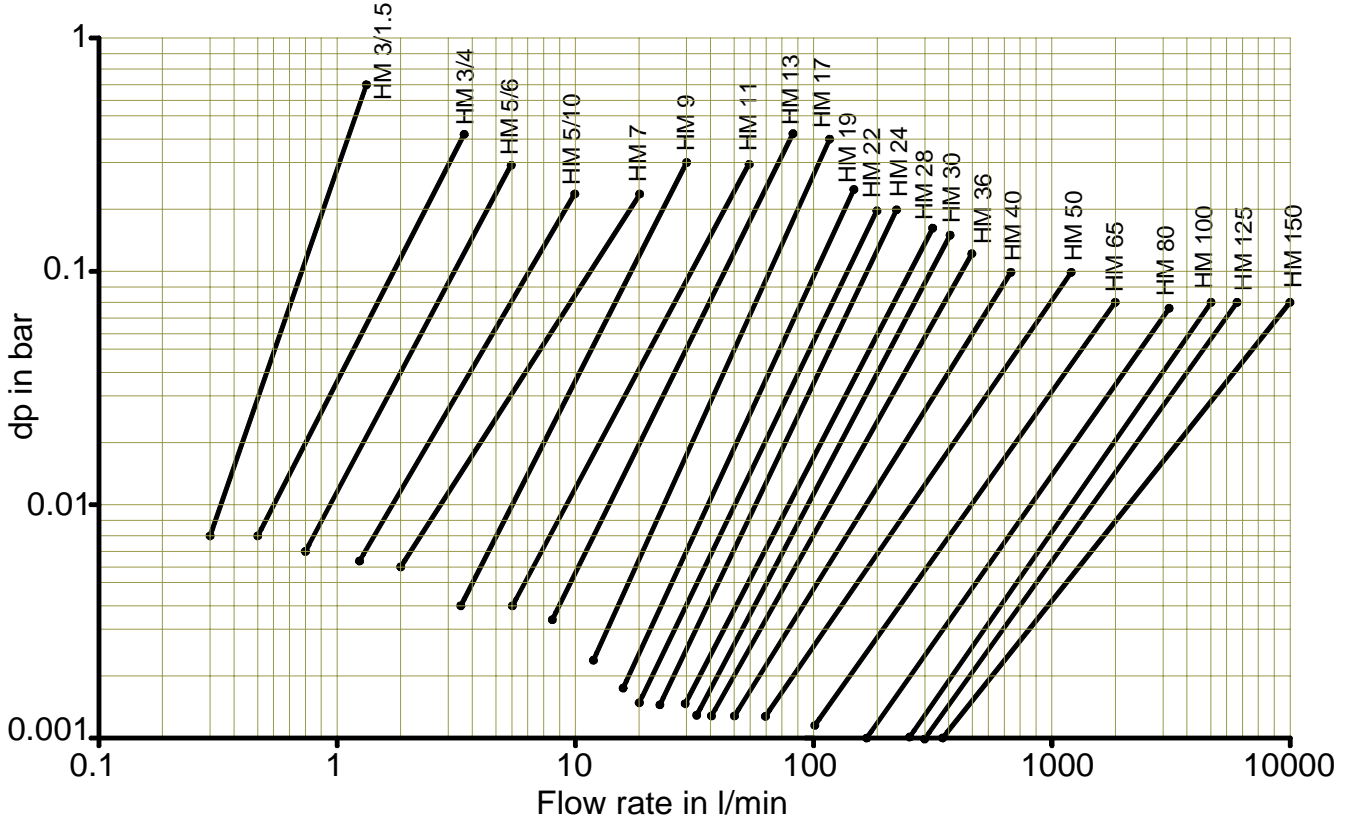
- Supply Voltage UB : +8.5 up to 29 VDC, controlled (incl. reverse-battery protection)
- Quiescent current : < 5 mA
- Frequency range : 2 up to 4,000 Hz

### ALVTM Electronics

- LCD display : 8 digits(14 segments), digit height 7mm for real-time value, totals and programmable
- Linearization : with 10 points
- Process temperature : -40 up to +120°C with a distance of at least 25 mm between flow meter and electronic housing
- Ambient temperature : -40 up to +70 °C
- Weight : 700 g
- Frequency output/divider : 3-wire, 8-30 VDC controlled, Ex-versions : 12-30 VDC,< 25 mA
- Signal output : push/pull, I<sub>max</sub>: 20 mA,
- Frequency output, f<sub>max</sub>: 3,000 Hz,duty cycle:approx. 1:1,2.divider, pulse width: 1 ms, 20 ms, 50 ms, f<sub>max</sub>: 500 Hz.
- Analog output : 2-wire (4-20mA)
- Supply voltage : 14-30VDC controlled, UB=(Rload x 20mA) + 14V
- Load : < 800 ohms
- Time constant : < 0.2-3 s (programmable)
- Resolution : 12 bit (3,9uA)
- Housing : IP 65, aluminum AlMgSiPb, blue anodized
- Ex-protection : II 2 G EEx ia IIC T4, BVS 03 ATEX E 205
- Process temperature : 120 °C with a distance of at least 25 mm between flow meter and electronic housing 150°C at least 65mm

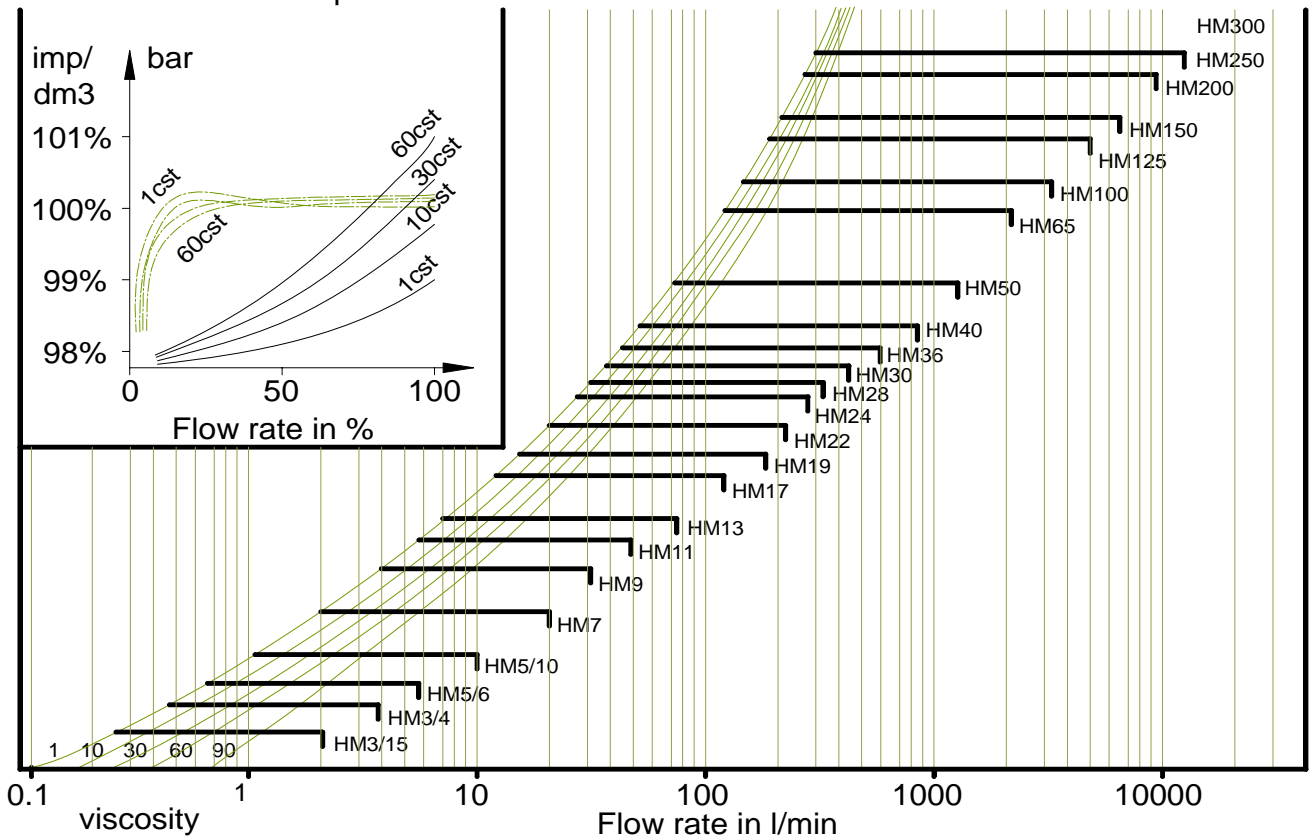


Pressure drop for turbine at different size



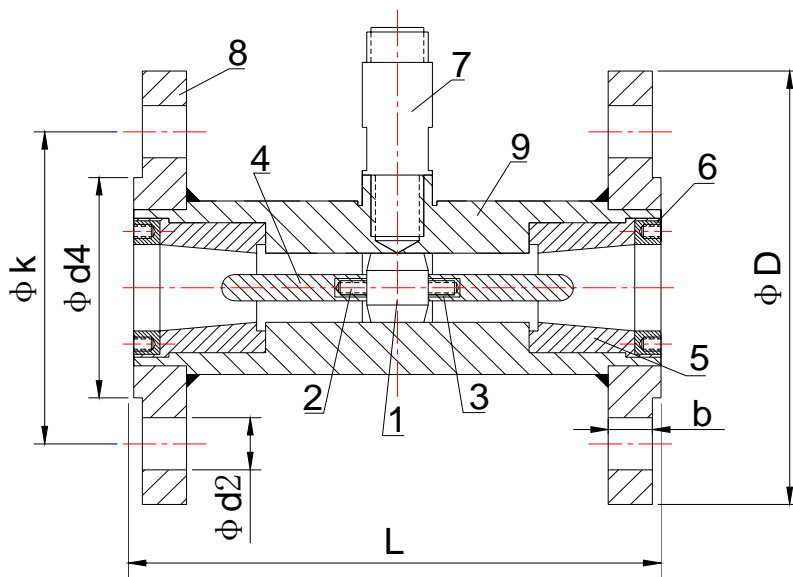
Measuring ranges for turbines at different viscosities

K-Factor/Pressure drop



Type dia	Flow (LPM)	K-factor* pulses/ltr.		Frequency range in Hz. 0 to max		Output signal mV
HM 9 EP	0.03 to 0.8	139000		1970		0.5 to 5
HM 3/1.5	0.3 to 1.3	32000	32500	1000	1000	0.5 to 5
HM 3/4	0.5 to 4	24000	19000	1250	1250	0.5 to 5
HM 5/6	0.8 to 6	17800	17800	1740	1780	1.0 to 10
HM 5/10	1.2 to 10	11000	11000	1750	1750	1.0 to 10
HM 7	2 to 20	5200	5200	1800	1800	1.5 to 15
HM 9	3.3 to 33	1900	4200	1080	2200	1.7 to 17
HM 11	6 to 60	1300	2730	1350	2700	2.0 to 20
HM 13	8.5 to 85	900	1900	1300	2600	2.5 to 25
HM 17	12 to 120	380	840	800	1650	2.7 to 27
HM 19	15 to 150	310	650	925	1600	2.9 to 30
HM 22	20 to 200	217	450	800	1600	3.1 to 31
HM 24	25 to 250	170	362	800	2000	3.8 to 40
HM 28	30 to 360	155	320	960	2000	4.0 to 42
HM 30	35 to 400	130	270	860	1850	4.1 to 45
HM 36	40 to 500	60	135	600	1200	4.3 to 48
HM 40	50 to 750	105	110	1320	1400	4.5 to 52
HM 50	70 to 1200	65		1400		6.0 to 64
HM 65	100 to 2000	25		850		10 to 80
HM 80	160 to 3200	11		615		15 to 100
HM 100	250 to 500	7		560		20 to 120
<b>pulses/m<sup>3</sup></b>						
HM 125	300 to 6600	4500		495		30 to 125
HM 150	350 to 10000	3400		420		35 to 140
HM 200	430 to 13400	415		134		40 to 150

Cut off drawing HM...F



1 to 4=measuring kit

1 = turbine wheel

2 = shaft

3 = bearing bush

4 = flow rectifier

5 = inlet cone

6 = ring nut

7 = pick up

8 = flange

9 = body



**\*\* Please contact your local SMC application engineer**

**You also need to provide the following information:**

Type of liquid	We need the name of your liquid, including operating density and viscosity
Full Scale Flow	Maximum and minimum flow rates, units must be volumetric flow such as LPM or gpm, etc..
Line Size	we need to know your pipe size as well connection type (flange, threaded, etc..)
Process Pressure and Temperature	We calibration your Flowmeter as close to your application as possible
Pressure drop	Please indicated the maximum pressure drop (see graph) that your process can withstand
Type of Electronics	Indicate if you want integral, remote panel or remote wall mounted
Power Requirements	Specify your power requirements such as 24 VDC or 115 VAC or 230 VAC

**➤ Model Selection Guide**

ALTM Series			
Example ALTM-HM17/25-F-ALVTM-F-EX			
ALTM-HM Series (Flanged Connection, other process connection available)			<b>Description</b>
Small Size (15mm to 40mm).			
DN 15 PN 40 (1/2" ANSI 150)	3/1.5-15F	0.3-1.5 LPM	Small Sizes (15 mm to 40 mm) corresponding to flow rates (water)
DN 15 PN 40 (1/2" ANSI 150)	3/4.0-15F	0.5-4 LPM	
DN 15 PN 40 (1/2" ANSI 150)	5/6.0-15F	0.8-6 LPM	
DN 15 PN 40 (1/2" ANSI 150)	5/10-15F	1.2-10 LPM	
DN 15 PN 40 (1/2" ANSI 150)	7/15-F	2-20 LPM	
DN 15 PN 40 (1/2" ANSI 150)	9/15-F	3.3-33 LPM	
DN 25 PN 40 (1" ANSI 150)	11/25-F	6-60 LPM	
DN 25 PN 40 (1" ANSI 150)	13/25-F	8.5-85 LPM	
DN 25 PN 40 (1" ANSI 150)	17/25-F	12-120 LPM	
DN 25 PN 40 (1" ANSI 150)	19/25-F	15-150 LPM	
DN 25 PN 40 (1" ANSI 150)	22/25-F	20-200 LPM	
DN 25 PN 40 (1" ANSI 150)	24/25-F	25-250 LPM	
DN 40 PN 40 (1 1/2" ANSI 150)	22/40-F	20-200 LPM	
DN 40 PN 40 (1 1/2" ANSI 150)	24/40-F	25-250 LPM	
DN 40 PN 40 (1 1/2" ANSI 150)	28/40-F	30-360 LPM	
DN 40 PN 40 (1 1/2" ANSI 150)	30/40-F	35-400 LPM	
DN 40 PN 40 (1 1/2" ANSI 150)	36/40-F	40-500 LPM	
Large Size (40 mm to 250 mm)			
DN 40 PN 40 (1 1/2" ANSI 150)	40-F	50-750 LPM	Large Sizes (15 mm to 40 mm) corresponding to flow rates (water)
DN 50 PN 40 (2" ANSI 150)	50-F	70-1200 LPM	
DN 65 PN 40 (2 1/2" ANSI 150)	65-F	100-2000 LPM	
DN 80 PN 40 (3" ANSI 150)	80-F	160-3200 LPM	
DN 100 PN 40 (4" ANSI 150)	100-F	250-5000 LPM	
DN 125 PN 40 (5" ANSI 150)	125-F	300-6600 LPM	
DN 150 PN 40 (6" ANSI 150)	150-F	350-10000 LPM	
DN 200 PN 40 (8" ANSI 150)	200-F	430-13400 LPM	
DN 250 PN 40 (10" ANSI 150)	250-F	830-25000 LPM	
Electronics - ALVTM (programmable display)			
Frequency/divider and analog	ALVTM		Analog outputs
Top View		D	display arrangement
Standard with window		NX	Protection
Ex proof with window		EX	
Electronics - ALVTE Carrier Frequency Pulse Amplifier			
Carrier-Frequency pickup	ALVTE		frequency range 2-4000 Hz
Standard		NX	Protection
Ex proof		EX	
Short thread 110 mm		EK	Thread size
Long thread 149 mm		EL	
Electronics - ALIF-Inductive Pickups and Pulse Amplifiers (for -12 to 350C)			
Frequency pulse amplifier(-12-235C)	ALIF		
Standard		NX	Protection (II 2 G EEx ia IIC T6)
Ex proof		EX	
High temperature (350C)		HTK	Higher temperature (with NX only)

