Peregrine
Instrumentation

Turbine Flowmeter
Series PI7020

GENERAL

PI7020 Turbine Flow Meters

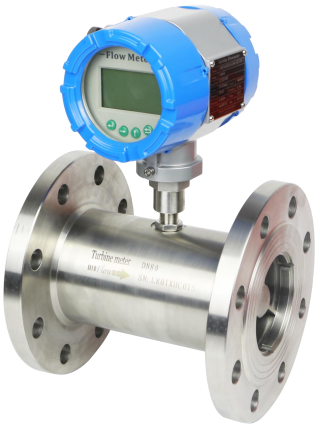
PI7020 turbine flow meters (hereinafter referred to as turbines) are used for the precise measurement of instantaneous flow of low-viscosity fluids rates and flow quantities such as; tap and demineralised water, fuels, liquefied gases, Light fuel oil, solvents, Pharmaceutical fluids, etc. Turbine Flowmeters 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.

PI7020 Display with Frequency and Analog Output

The PI7020 turbine is a programmable local display with integral carrier-frequency pickup and amplifier for PI7020 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
- Pressures up to 250 bars
- 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



SPECIFICATION

Flow body - PI7020 series

- Process Connection : flanges up to 250bar,(ANSI , JIS and DIN), diary or tri-clamp.
- Operating pressure : max. 250 bar
- Process temperature : -40 up to +120°C
- Flow rates : 0.04 to 0.4 m3/hr -smallest size (4mm)
  40 to 800 m3/hr- largest size (200mm)
- Accuracy : ±1% ; ±0.5%; 0.25%
- 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

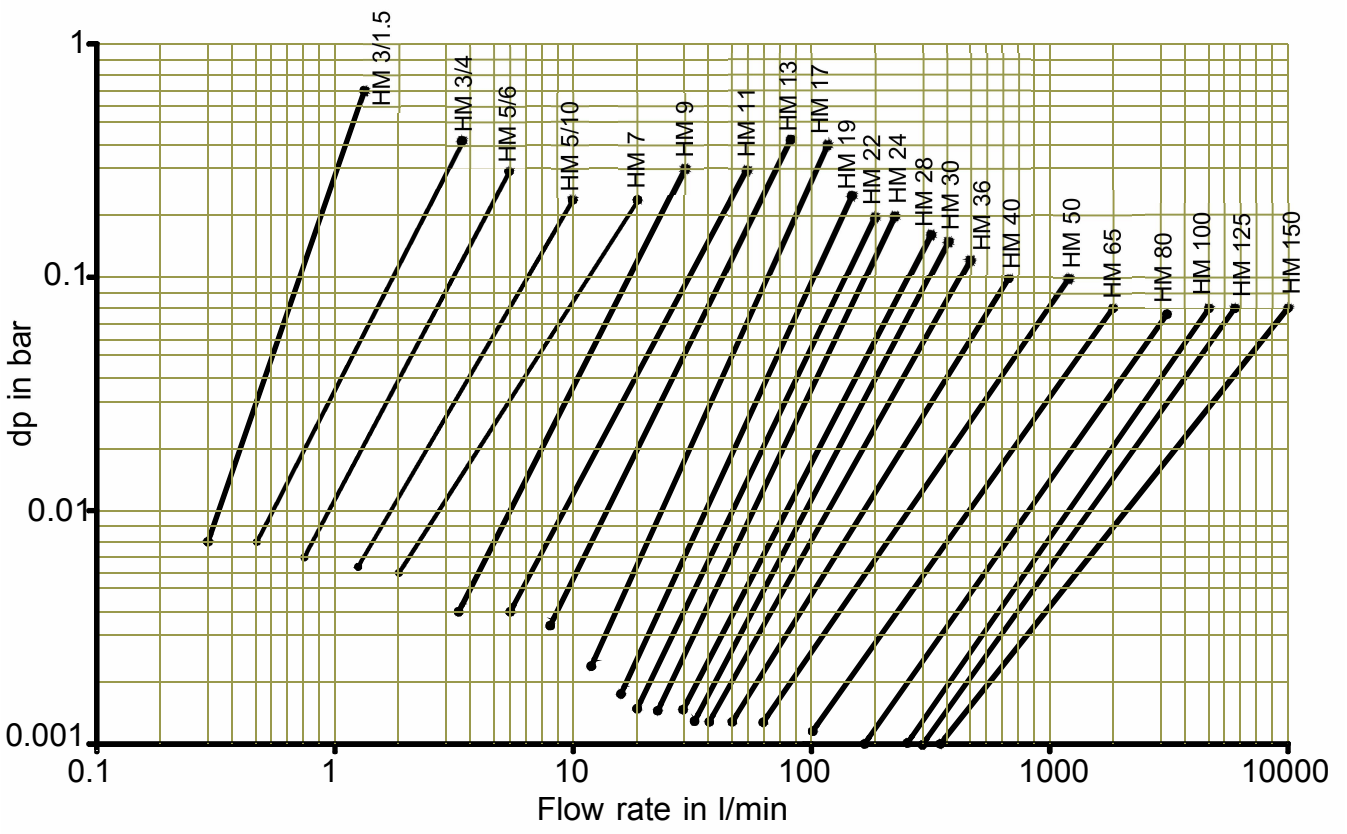
PI7020 Carrier Frequency Pulse Amplifier

- Supply Voltage UB : +8.5 up to 29 VDC, controlled
  : 3.2V 10AH battery for option
- Quiescent current : < 5 mA

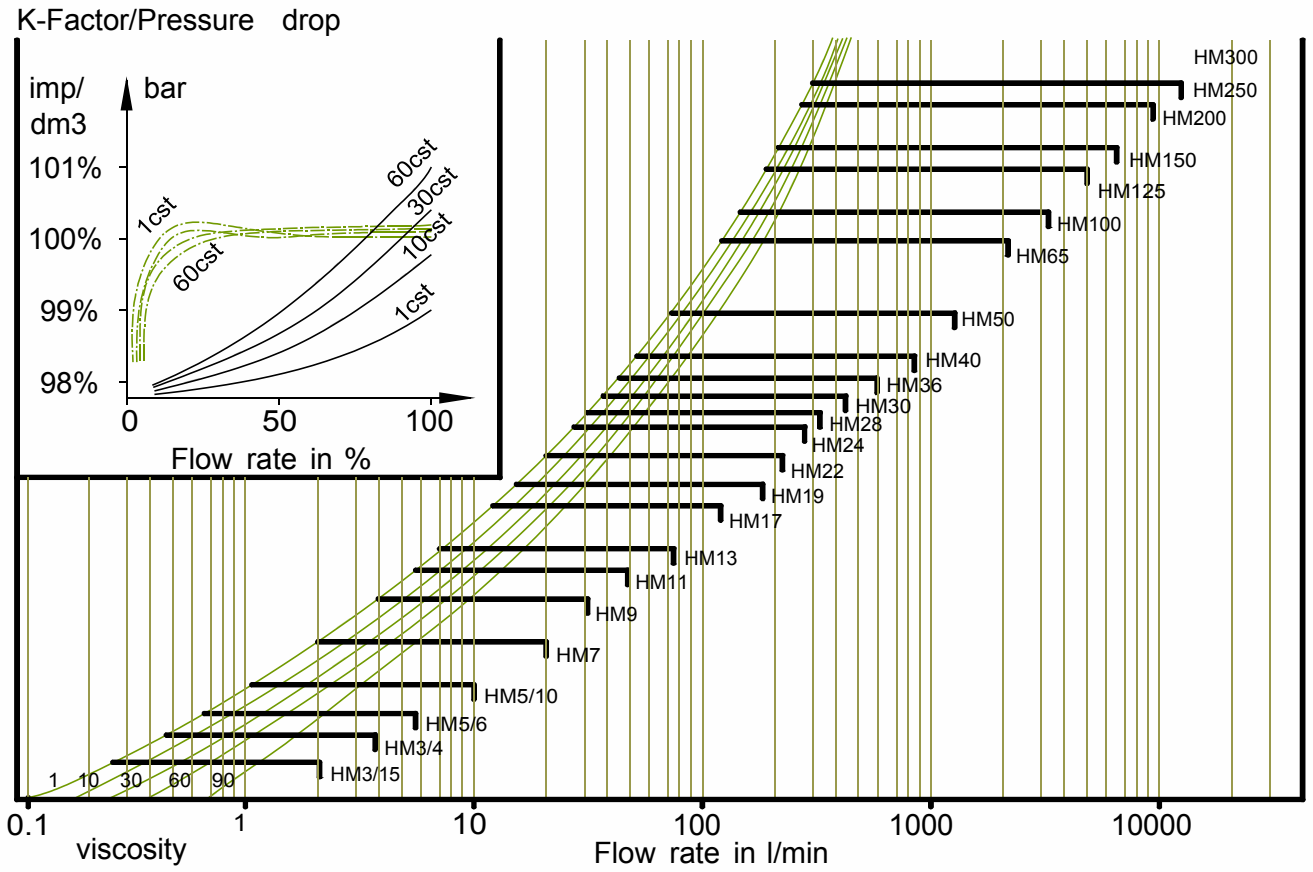
PI7020 Electronics

- 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℃ 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/ : 3-wire, 8-30 VDC controlled,
- Signal output : push, 4 to 20mA
- Frequency output, fmax: 3,000 Hz,duty cycle:approx. 1:1, pulse width: 20MS
- Analog output : 2-wire (4-20mA) for Single analog output
  3-wire(4-20mA) for analog, pulse output both
- Supply voltage : 14-30VDC controlled, UB=(250Ωx 20mA) + 14V
- Load : < 500 ohms
- Resolution : 16 bit (3,9uA)
- Housing : IP 67, aluminum AlMgSiPb, blue anodized
- Ex-protection : Exd II BT6, ExiaII CT4
- Process temperature : 120 °C with a distance of at least 25 mm between flow meter and electronic housing 150℃ at least 65mm

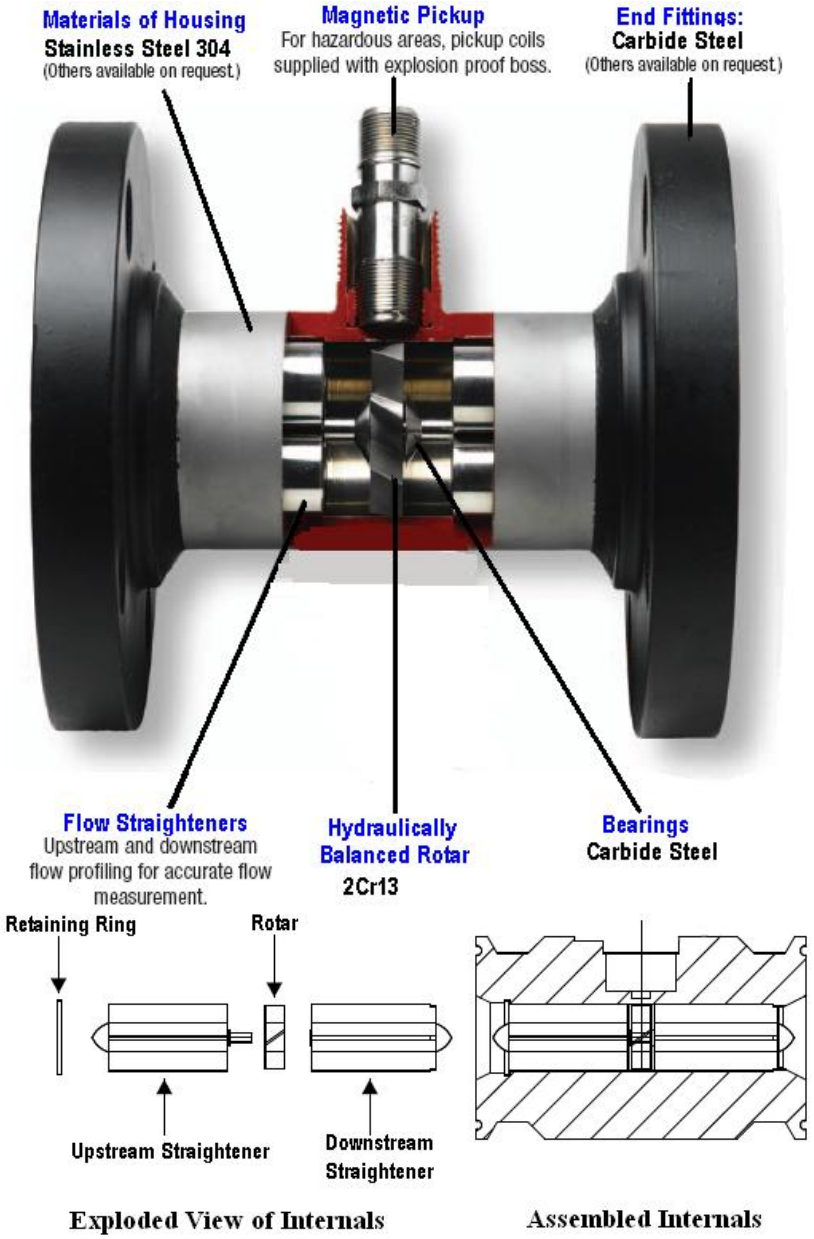
Pressure drop for turbine at different size



Measuring ranges for turbines at different viscosities



DN(mm)	Sta.Flow (m3/hr)	Full Flow (m3/hr)	Sta. Process Pressure	Max.Procss Pressure
F7002-4	0.04 to 0.25	0.04 to 0.4	63bar	250bar
F7002-6	0.1 to 0.6	0.06 to 0.6	63bar	250bar
F7002-10	0.2 to 1.2	0.15 to 1.5	63bar	250bar
F7002-15	0.6 to 6	0.4 to 8	63bar	250bar
F7002-20	0.8 to 8	0.45 to 9	63bar	250bar
F7002-25	1 to 10	0.5 to 10	63bar	250bar
F7002-32	1.5 to 15	0.75 to 15	63bar	250bar
F7002-40	2 to 20	1 to 20	63bar	250bar
F7002-50	4 to 40	2 to 40	25bar	250bar
F7002-65	7 to 70	4 to 70	25bar	250bar
F7002-80	10 to 100	5 to 100	25bar	250bar
F7002-100	20 to 200	10 to 200	25bar	250bar
F7002-125	25 to 250	13 to 250	25bar	250bar
F7002-150	30 to 300	15 to 300	16bar	160bar
F7002-200	80 to 800	40 to 800	16bar	160bar
F7002-300	250-1600	160-1600	16bar	160bar



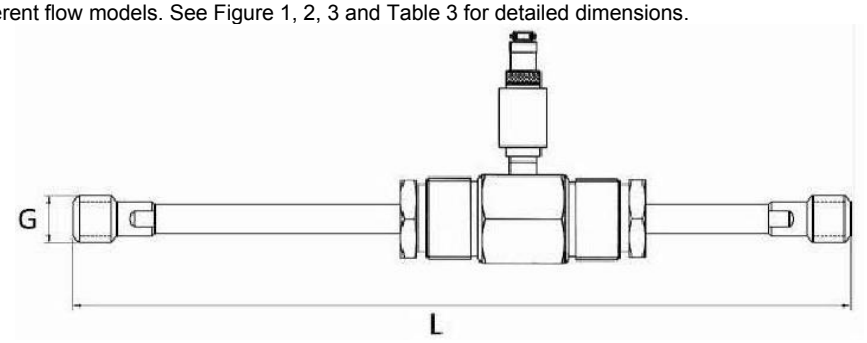
DIMENSION

Thread or flange connection is used according to different flow models. See Figure 1, 2, 3 and Table 3 for detailed dimensions.

Figure 1: DN4-DN10 sensor structure

Figure 2: DN15-DN40 sensor Structure

Figure 3: DN50-DN200 sensor structure



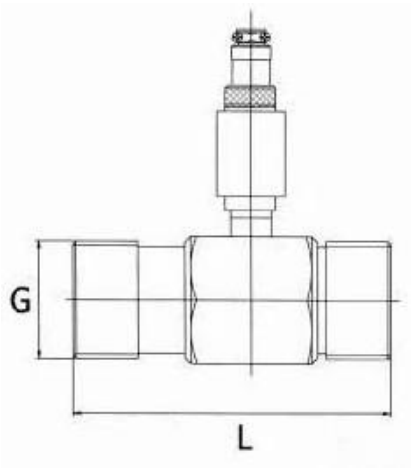


Figure 2

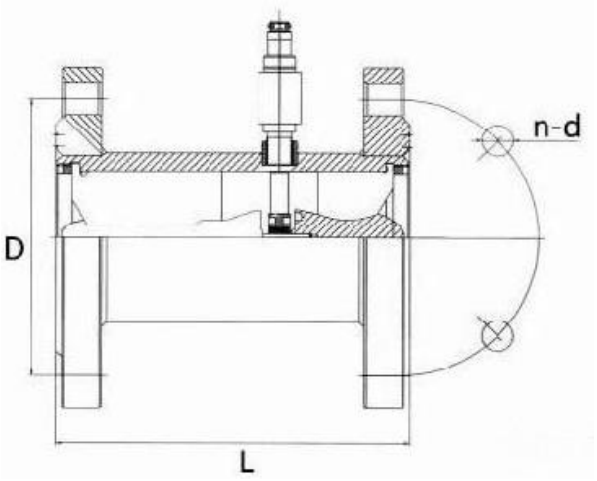


Figure 3

Diameter(mm)	L(mm)	G	D(mm)	d(mm)	N(Bolts)
4	295	G1/2			
6	330	G1/2			
10	450	G1/2			
15	75	G1	Φ65	Φ14	4
20	80	G1	Φ75	Φ14	4
25	100	G5/4	Φ85	Φ14	4
32	140	G2	Φ100	Φ14	4
40	140	G2	Φ110	Φ18	4
50	150	G5/2	Φ125	Φ18	4
65	170		Φ145	Φ18	4
80	200		Φ160	Φ18	8
100	220		Φ180	Φ18	8
125	250		Φ210	Φ28	8
150	300		Φ240	Φ22	8
200	360		Φ295	Φ22	12
300	400		Φ395	Φ26	16

MODEL SELECTION GUILD

Example PI7020-15F-N-A-EX-16-S4-C-1									
PI7020 series （Flanged Connection, other process connection available）									**Description**
Small Size (4mm to 40mm).									
DN 4 (Thread)	4T								Small Sizes (4mm to 40mm) corresponding to flow rates (water)
DN 6 (Thread)	6T								
DN 10 (Thread)	10T								
DN 15 (Thread)	15T								
DN 15 (Flange)	15F								
DN 25 (Thread)	25T								
DN 25 (Flange)	25F								
DN 40 (Thread)	40T								
DN 40 (Flange)	40F								
Large Size (50 mm to 200 mm)									
DN 50 (Flange)	50-F								Large Sizes (15mm to 40mm) corresponding to flow rates
DN 65 (Flange)	65-F								
DN 80 (Flange)	80-F								
DN 100 (Flange)	100-F								
DN 125 (Flange)	125-F								
DN 150 (Flange)	150-F								
DN 200 (Flange)	200-F								
DN300(Flanges)	300-F								
No display.3 wires pulse, 12-24VDC		N							Display and Output
2 wires 4-20mA, remote transmitter, DC24V		A							
No signal output, inner battery powered.		B							
Local display with 2 wires 4-20mA, DC24V		D1							
Local display with 2 wires 4-20mA, RS485, DC24V		D2							
Local display with 3 wires pulse, RS485, DC24V		D3							
ANSI stand. flange			A						Connection
DIN stand. flange			D						
Thread for DN4 to DN40 only			T						
Tri-clamp			C						
Explosion proof				Ex					Protection
Non Explosion proof				NX					
Max. Process pressure 16bar					16				Max. process pressure.
Max. Process pressure 40bar					40				
Max. Process pressure 6.3bar					6.3				
Max. Process Pressure 100bar					10				
Max. Process Pressure xx bar					xx				
Sensor materials SS304						S4			Sensor materials
Sensor materials SS316						S6			
Rotor materials 2Cr13							C		Rotor materials
Rotor materials duplex stainless Steel							D		
Accuracy +/-1% of R								1	Accuracy
Accuracy +/-0.5 of R								0.5	
Accuracy +/-0.2 of R								0.2	