

CPT-01

TURBINE GAS METER
FOR NOT FISCAL USE

CPT-01

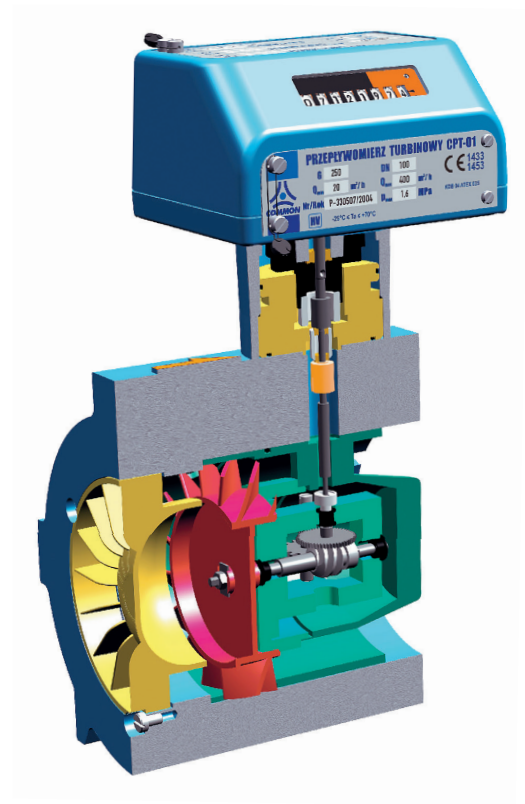
Description

The turbine meter uses the principle of proportionality between the quantity of gas passing through the meter itself and the number of revolutions of the rotor. A mechanical / magnetic transmission system actuates the counting unit, installed in the upper part of a meter, which shows the volume of flowed gas to the operating conditions.

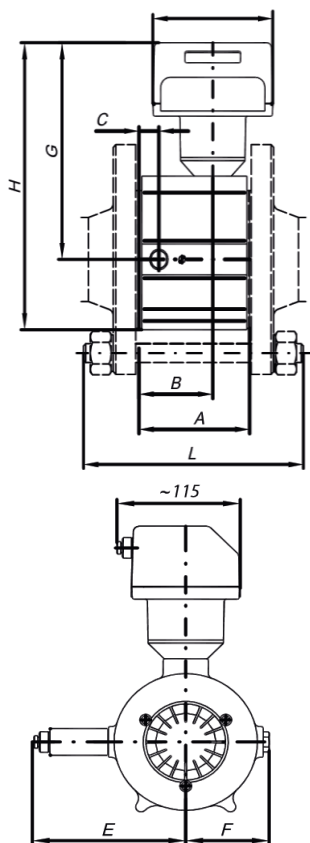
The high precision of the bearings, precise tolerances of all the parts of measurement and the application of a flow straightener with specific characteristics, reduce the pressure losses to minimum values.

The measuring cartridge is separate from the external body and is therefore extraneous to any mechanical stress due to non-perfect alignment of the flange and completely replaceable.

- Body with threaded connections or wafer (installed between flanges)
- ATEX - PED approved
- In accordance with ISO 9001 to comply ISO 9951 DIN 33800
- Flow straightener installed
- Size from G 40 DN 40 to G1600 DN 200
- Flow: $6 \div 2500 \text{ m}^3/\text{h}$
- Rangeability: 1:20 Standard; different value on request
- Pressure range PN 16, PN 20 and ANSI 150
- Minimum pressure loss
- High measurement precision for a long time
- Steel main body or GGG40, compact and robust construction. Aluminum impeller.
- Suitable for outdoor installation IP66 / 67
- Horizontal or vertical position
- The counters are standard equipped with 2 low frequency pulse generators (reed contact)
- A HF high-frequency pulse generators (NAMUR) can also be installed on request
- Temperature range:
 - Gas temperature $-20 \text{ }^\circ\text{C} / + 60 \text{ }^\circ\text{C}$
 - Room temperature $-25 \text{ }^\circ\text{C} / + 70 \text{ }^\circ\text{C}$
- Measurement Accuracy:
 - $Q_t \div Q_{\text{max}} < \pm 1.5\%$
 - $Q_{\text{min}} \div Q_t < \pm 3.0\%$



Quantometer CPT-01 Wafer Type



Dimension E and F valid for all types

Technical Data

DN	G	Max flow Qmax	Pressure loss at Qmax*	Flow min Qmin			Impulse LF	Impulse HF1, HF2	Impulse HF
				1:10	1:20	1:230			
-	-	m ³ /h	mBar	m ³ /h	m ³ /h	m ³ /h	imp/m ³	imp/m ³	imp/m ³
40	40	65	2,5	6	-	-	10	2610	94830
	65	100	5,0	10	-	-		2610	94830
50	40	65	2,5	6	-	-	10	2610	94830
	65	100	5,0	10	-	-		2610	94830
65	65	100	1,6	10	8	-	10	1081	42560
	100	160	3,8	16	8	-		1081	42560
80	100	160	3,7	16	8	-	1	1081	42560
	160	250	5,4	25	13	8		844	30650
100	250	400	11,4	40	20	13	1	470	17060
	160	250	3,7	-	13	8		692	16780
	250	400	4,2	-	20	13		692	16780
150	400	650	8,8	-	32	20	1	401	9720
	400	650	2,4	-	32	20		227	6870
200**	650	1000	6,4	-	50	32	0,1	227	6870
	1000	1600	16,0	-	80	50		129	3910
200**	650	1000	2,0	-	50	32	1	114	3110
	1600	2500	15,0	-	130	80		67	2025

*Air pressure loss at atmospheric conditions

**Steel body for DN200, others models aluminium body

Table 2: dimension and weight of Quantometer CPT-01

DN	A	B	C	D	E	F	G	H	J	k*	L	Weight
	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	Kg
50	100	65	18	32	158	74	199	252	78	4xM16	200	3,6
65	120	80	21	38	170	86	211	278	90	4xM16	220	5,1
80	120	80	21	38	170	86	211	278	90	8xM16	220	5,3
100	150	100	29	53	185	100	225	305	105	8xM16	250	7,4
150	180	127	50	76	210	125	243	351	130	8xM20	300	11,6
200	200	146	56	83	225	140	272	407	145	12xM20	320	48,5

K*: Number of studs needed to fit wafer type quantometer

Quantometer CPT-01 with threaded connections

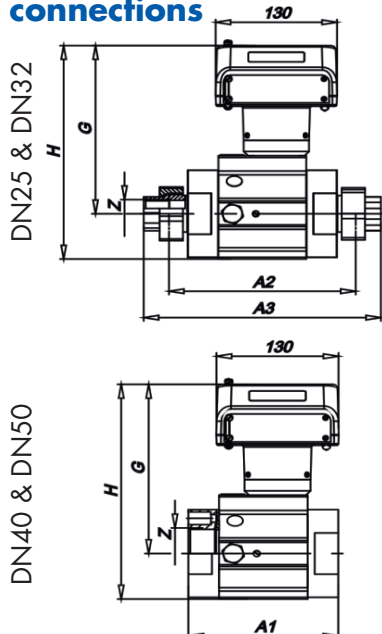


Table 3: Quantometers CPT-01 specifications with threaded connections

DN	G	Internal thread	Max flow Qmax	Pressure loss*		Pressure min Qmin 1:10	Impulse frequency LF	Impulse frequency HF1, HF2	Impulse frequency HF
				Qnom	Qmax				
		inch	m ³ /h	mBar		m ³ /h	impulse/m ³	impulse/m ³	impulse/m ³
25	16	1; 1¼	25	1,5	4	2,5	10	9770	113585
	25	1	40	1,5	4	4		8710	101275
32	25	1¼	40	1,4	3,2	4	10	8925	103755
40	40	G 1½	65	1	2,5	6	10	2610	94830
	65		100	2	5	10		2610	94830
50	40	G 2	65	1	2,5	6	10	2610	94830
	65		100	2	5	10		2610	94830

**Air pressure loss at atmospheric conditions

All models type made in aluminium body

Table 4: Dimension and weight of threaded Quantometers

DN	A1	A2	A3	G	H	Z	Weight
	mm	mm	mm	mm	mm	inch	Kg
25	-	200	250	199	252	1; 1¼	4,6
32	-	200	250	199	252	1¼	4,6
40	160	-	-	199	252	G 1½	4,6
50	160	-	-	199	252	G 2	4,6

Thread G in accordance with DIN / ISO 228-1 standard, others in accordance with ISO 7-1 / EN 10226-1

Pressure Loss

Pressure losses are calculated with air in atmospheric conditions. The maximum value of the loss ΔP_{max} is given in Tables 1 and 3. Tests were performed at Q_{max} with air ($\rho = 1,2 \text{ kg / m}^3$)
In real conditions the value of the loss ΔP_{rz} can be calculated by the formula:

$$\Delta p_{rz} = \frac{\rho}{\rho_0} \cdot \frac{p_a + p}{p_a} \cdot \left(\frac{Q_{rz}}{Q_{max}} \right) \cdot \Delta p_{max} [\text{mbar}]$$

ρ = Gas density according to the table below (Kg / m^3)

ρ_0 = air density ($1,2 \text{ Kg/m}^3$)

P_0 = pressure base ($1013,25 \text{ mBar}$)

P = transducer pressure detected

ΔP_{max} = maximum loss pressure [mbar]

Q_{max} = max flow by tables 1 and 3 [m^3/h]

Q_{rz} = flow in real conditions [m^3/h]

Types of gas that can be measured by the Quantometer:

Gas	Symbol	Density ρ : [kg/m3]	Relative Density
Carbon Dioxide	CO ₂	1,84	1,53
Argon	Ar	1,66	1,38
Nitrogen	N ₂	1,16	0,97
Butane	C ₄ H ₁₀	2,53	2,10
Helium	He	0,17	0,14
Ethane	C ₂ H ₆	1,27	1,06
Ethylene	C ₂ H ₄	1,17	0,98
Natural gas		~0,75	~0,63
Methane	CH ₄	0,67	0,55
Carbon Monoxide	CO	1,16	0,97
Propane	C ₂ H ₈	1,87	1,56
Air		1,20	1

Density values refer to: $p = 1,01325 \text{ bar}$ $T = 20 \text{ }^\circ\text{C}$

Recommendations for installation and operation

- Meters must be transported to the place of installation in their original packaging.
- The meters must be handled with care and protected against falling, direct flow of rain, snow and high humidity.
- The measured gas must be clean, dry and must not contain impurities. It is recommended to use a 10 micron filter on input.
- In the new installations it is recommended to use a temporary conic filter.
- Seals must be positioned so as not to disturb the gas flow.
- The gas flow must flow in the direction of the arrow on the meter body.
- Inlet and outlet piping should not cause stress to the meter.
- If used outdoors, the meter must be protected against weather.
- The opening valve must be operated slowly to ensure a gradual increase in pressure not to exceed 350 mbar / s
- Straight input $\geq 2\text{DN}$

The CPT-01 series Quantometer can have up to 7 pulse generators:

Standard

- 2 LFK - reed contact LF

Optionals

- 2 LFI - inductive sensor LF (NAMUR)
- 2 HF - inductive sensor into index (NAMUR) - HF1, HF2
- 1 HF - inductive sensor into meter main body (NAMUR) HF3

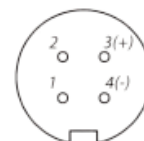
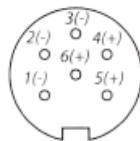
Input/Output

- High pressure plug
- Connectors Amphenol TOUCHEL

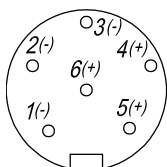
Impulsive output connectors description

PIN nr.	Connector 1	Connector 2
1 - 4	LFK 1 (standard)	LFK 2
2 - 5	LFI 1	LFI 2
3 - 6	HF1 o AFK	HF2

PIN nr	Connector AF
1 - 2	---
3 - 4	HF3



Pinout of connectors installed on index meter. Connectors are in order TUCHEL plug No C091 31H006 100 2 and No C091 31D004 100 2



Mechanical index can be rotated by 350° to facilitate the reading and insertion of the connectors

Product range



Rotary piston gas meters



Turbine gas meters



Gas pressure regulators



Electronic volume correctors



Diaphragm gas meters



Smart meters

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