Quantometer Q/Q75

Short Pattern
Turbine Gas Flow Meters

Applications

Media: Natural gas, methane, city gas, oxygen (up to 10 bar*) **
Branches: Gas industry, chemicals, food-stuffs, industry, ***
Functions: Controlling, regulation, registration, analysis, ****

Brief information

The Q/Q75 series of quantometers are well known in the field of industry and commerce as robust and accurate turbine meters. They have a low price and are particularly suitable for highly-accurate and reliable metering, also in higher flow and pressure ranges. The Q/Q75 quantometers meet the highest industrial standards in terms of quality. Depending on the size of the meter and the conditions of application, the quantometer has self lubricating, maintenance-free bearings or is lubricated by pressure oil (oil pump). It is possible to equip the quantometer with additional devices such as volume correctors or external pulsers. The Q/Q75 quantometers can be used in hazardous areas up to zone 1. They are easy to install in a pipeline and are capable of registering, monitoring and transferring measurement data. With a Q/Q75 quantometer, volume (m^3) in production processes can be measured exactly. By constantly controlling and monitoring the gas flow, the use of energy in a production process, for example, can be optimized. The flow meters can be combined with an Elster DS-/DL-data storage device or EK series volume correctors if required.

Operation: Elster-Instromet Q/Q75 quantometers are flow meters for gaseous media which display actual volume. The measurement is made with the help of a turbine wheel, whose revolutions are proportional to the actual volume flowing through the meter (or the volume at actual operating conditions). The revolutions of the turbine wheel are reduced by a gear. The volume is then displayed on an 8-digit mechanical roller counter.

Installation tips: Up to a diameter of DN 150, the quantometer can be installed in any position. From a diameter of DN 200 upwards we recommend a horizontal installation. The flow direction in the quantometer is marked by an arrow on the housing.

Main features

- Economic gas flow meter
- Meter Q/Q75, sizes 65 to 16 000
- Flow ranges 6 - 25000 m^3/h
- Rangeability up to 1:20
- Nominal width DN 50 - DN 600
- Pressure rates up to 100 bar
- Temperature range -10 °C to +60 °C (further temperatures on request)
- Flange connections according to EN or ASME
- Short pattern design
- Housing made of spheroidal graphite cast iron, steel or welded steel
- Suitable for outdoor installation (IP67)
- Two low frequency pulsers standard

* Special version
** Non-aggressive gases and further gases on request
*** District heating, power plants, petrochemicals
**** Monitoring, examining, evaluation

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Q/Q75: Short Pattern Turbine Gas Flow Meters

Index variants

S1 (Q ≤ DN150)
MI-2 (Q75 ≥ DN200)

- 8-digit mechanical counter
- Index head can be rotated 355°
- Protection class IP67
- Absolute-ENCODER S1 or MI-2 (optional) useable as main meter index

Pulsers

Low frequency: Elster-Instromet Q/Q75 turbine gas meters are fitted with two low-frequency pulsers and one switch for monitoring any attempts at manipulation (PCM). The low-frequency pulses, which are generated by Reed switches in the plug-in pulser IN-S1x, are used to transmit the actual volume in m³ to a volume corrector, for example. The maximum frequency is 0.5 Hz.
Standard version:
- **IN-S10** with a 2.5 m open-ended 6-wire cable

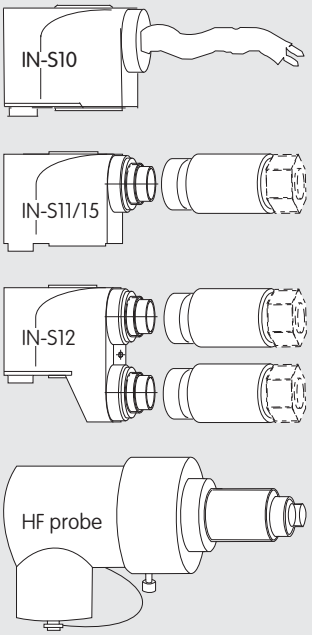
Options:
- **IN-S11/15** with a 6-pin flange plug and a connector socket (Binder 423 system)
- **IN-S12** with two 6-pin flange plugs and two connector sockets (Binder 423 system)

High frequency (optional): If higher pulse rates or a higher resolution is required for control or regulation purposes, the turbine meter can be equipped with high-frequency pulsers:

- **A1R (Q model)** picks up reference markings on the turbine wheel
- **BI-ISM-Y1 (Q75 model)** picks up the blades of the turbine wheel

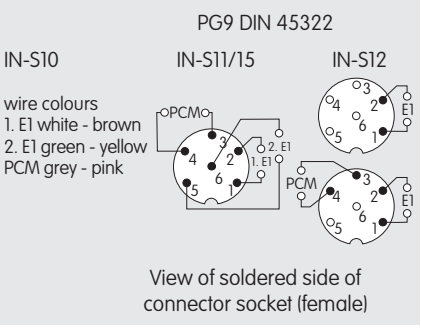
Up to 4 high-frequency pulsers can be ordered for the individual meter models

The plugs for the high-frequency pulsers are designed to save space



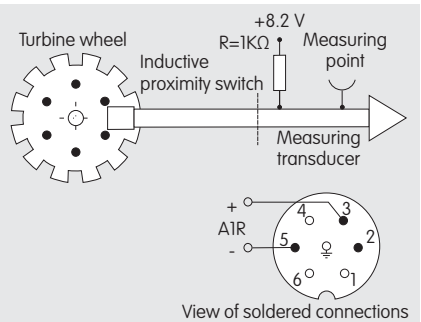
Pin assignment

Low frequency pulser (Q/Q75 model)

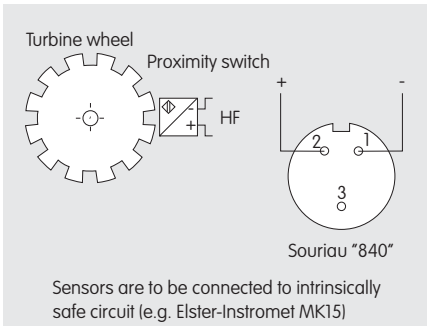


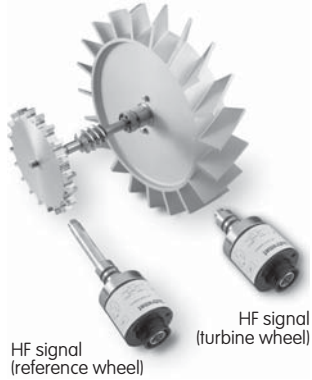
LF type		Terminal connection pins		
		Reed 1	Reed 2	PCM
IN-S10	incl. 2.5 m cable (with open ends)	white - brown	green - yellow	grey - pink
IN-S11	incl. 1x sealed 6-pinBINDER - plug (male), plus 1x clutch socket acc. DIN 45322	1 + 2	5 + 6	3 + 4
IN-S11F	incl. 1x sealed 6-pinBINDER - plug (male), plus 1x clutch socket acc. DIN 45322	4 + 6	3 + 5	1 + 2
IN-S12	incl. 2x sealed 6-pinBINDER - plug (male), plus 2x clutch socket acc. DIN 45322	1 + 2 (plug 1)	1 + 2 (plug 2)	3 + 4 (plug 2)
IN-S12F	incl. 2x sealed 6-pinBINDER - plug (male), plus 2x clutch socket acc. DIN 45322	4 + 6 (plug 1)	3 + 5 (plug 2)	1 + 2 (plug 1)
IN-S15	incl. 1x sealed 6-pinBINDER - plug (female), plus 1x clutch plug acc. DIN 45322	1 + 4	2 + 5	3 + 6

High frequency pulser A1R (Q model)



High frequency pulser BI-ISM-Y1 (Q75 model)

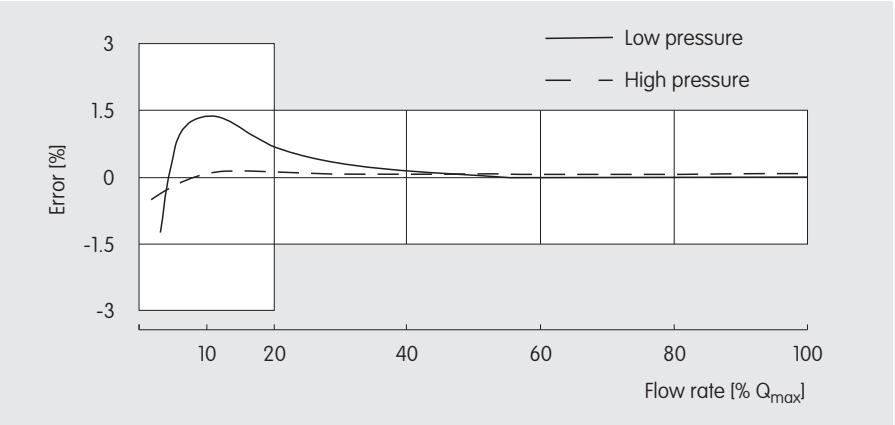




Accuracy

Limits

± 1.5% for $0.2Q_{max}$ to Q_{max}
± 3.0% for Q_{min} to $0.2Q_{max}$



Pressure loss

The average pressure loss of the Q/Q75 flow meters, using atmospheric natural gas with a density of 0.8 kg/m³, is measured on a straight pipe of the same size as the meter.

Measuring range

The Q/Q75 turbine gas meter has a typical measuring range of 1:20 with air at atmospheric conditions. At higher operating densities, the range of the turbine meter will increase since more kinetic energy is available to overcome mechanical friction of bearings.

The following equation may be used for a rough estimate of the minimum flow rate of the meter for various operating conditions. The equation assumes ambient temperature and ideal gas behaviour (Z = 1)

$$Q = Q_m \sqrt{\frac{1.013}{p} \cdot \frac{1.29}{\rho}}$$

Q = Minimum capacity under operating conditions
Q_m = Minimum capacity for meter accuracy
p = Operating pressure of the meter in bar absolute
ρ = Density of gas at atmospheric pressure

Diameter	Model	Meter size		Q_{min}-Q_{max}	Pressure loss*	LF**	MF***	HF ****	MF***	HF ****
		G-rate	type	[m³/h]	[mbar]	[Imp/m³]	[Imp/m³]	[Imp/m³]	[Hz at Q_{max}]	[Hz at Q_{max}]
DN50 2"	Q	65	100	6 - 100	12	10	-	28500	-	792
DN80 3"	Q	100	160	10 - 160	2	1	-	10500	-	467
		160	250	13 - 250	5.3	1	-	10500	-	729
		250	400	20 - 400	13.6	1	-	10500	-	1167
DN100 4"	Q	250	400	20 - 400	5.8	1	-	6630	-	733
		400	650	32 - 650	13.1	1	-	6630	-	1192
DN150 6"	Q	400	650	32 - 650	2.6	1	-	2560	-	451
		650	1000	50 - 1000	6.5	1	-	2560	-	694
		1000	1600	80 - 1600	16.8	1	-	2560	-	1111
DN200 8"	Q75	650	1000	100 - 1000	1.5	0.1	109	770	30	214
		1000	1600	80 - 1600	2.5	0.1	106	1180	47	524
		1600	2500	130 - 2500	5.5	0.1	66	1060	46	736
DN250 10"	Q75	1000	1600	80 - 1600	1.5	0.1	109	825	49	367
		1600	2500	130 - 2500	3.5	0.1	111	1320	77	917
		2500	4000	200 - 4000	8.5	0.1	62	1200	69	1333
DN300 12"	Q75	1600	2500	130 - 2500	1.5	0.1	38	810	26	563
		2500	4000	200 - 4000	4	0.1	38	1270	42	1411
		4000	6500	320 - 6500	9	0.1	21	1175	39	2122
DN400 16"	Q75	2500	4000	200 - 4000	1.5	0.1	79	660	88	733
		4000	6500	320 - 6500	4	0.1	78	1055	141	1905
		6500	10000	500 - 10000	9	0.1	44	890	121	2472
DN500 20"	Q75	4000	6500	320 - 6500	1.5	0.1	40	530	72	957
		6500	10000	500 - 10000	4	0.1	42	865	116	2403
		10000	16000	800 - 16000	9	0.1	24	770	105	3422
DN600 24"	Q75	6500	10000	500 - 10000	1.5	0.01	10	470	26	1306
		10000	16000	800 - 16000	4	0.01	9	720	41	3200
		16000	25000	1300 - 25000	9	0.01	5	650	38	4514

* at Q_{max} natural gas = 0.8 kg/m³
** LF from IN-S pulser
*** MF from MI-2 Slot disc
**** ≤DN150 from Reference (A1R); ≥DN200 from turbine wheel

Q/Q75: Short Pattern Turbine Gas Flow Meters

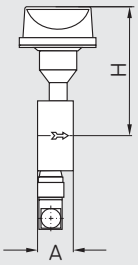
Dimensions and weights Q/Q75

Diameter	Model	Body material	Dimensions							Pressure rate [ASME class]	Weight [kg]
			A	B	C	D	E	F	H		
50 (2")	Q	Cast iron*/** Steel	60 / 150 150	As per flange class dimension	75 75	- 75	- 198	143 134	170 165	150 / - / - 150 / 300 / 600	4 / - / - 14 / 15 / 16
80 (3")	Q	Cast iron** Steel*	120 120		52 52	- 74	- 185	158 180	190 193	150 / - / - 150 / 300 / 600	13 / - / - 24 / 27 / 26
100 (4")	Q	Cast iron** Steel*	150 150		57 57	- 104	- 217	170 211	200 230	150 / - / - 150 / 300 / 600	15 / - / - 38 / 48 / 53
150 (6")	Q	Cast iron** Steel*	175 / 180 175 / 180		76 73	- 138	- 260	195 253	225 272	150 / - / - 150 / 300 / 600	28 / - / - 56 / 77 / 96
200 (8")	Q75	Cast iron Steel*	200 200		69 69	100 100	338 338	-	353 353	150 / - / - 150 / 300 / 600	42 / - / - 90 / 120 / 152
250 (10")	Q75	Steel	375		140	167	327	-	315	150 / 300 / 600	74 / 110 / 200
300 (12")	Q75	Steel	450		172	224	352	-	338	150 / 300 / 600	136 / 182 / 264
400 (16")	Q75	Steel	600		221	280	394	-	380	150 / 300 / 600	250 / 310 /430
500 (20")	Q75	Steel	750		335	365	445	-	431	150 / 300 / 600	412 / 562 /742
600 (24")	Q75	Steel	900		350	380	495	-	482	150 / 300 / 600	657 / 907 / 1107

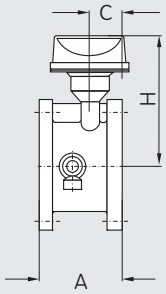
* Sandwich design

** No oil lubrication possible

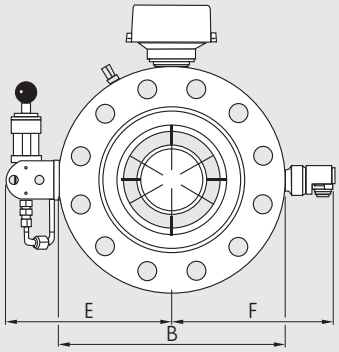
Model Q

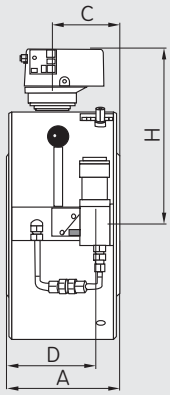


DN 50 (Cast iron)



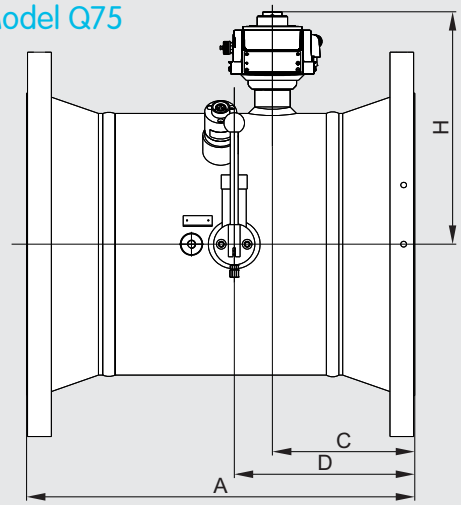
DN 80 - 150 (Cast iron)

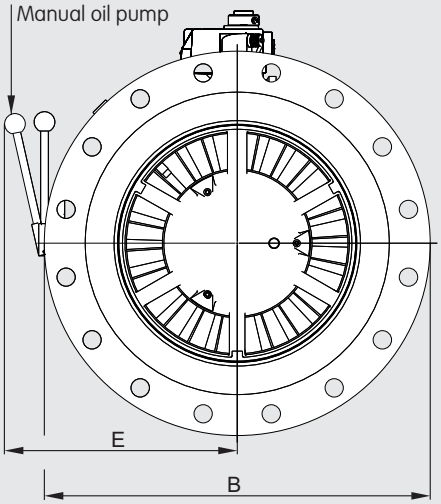


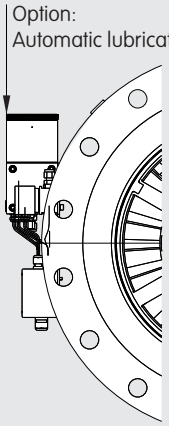


DN 50 - 150 (steel)

Model Q75







Attention: Q75 DN 200, steel in sandwich design (see Model Q DN 50 – 150, steel)

Your contacts

Germany
Elster GmbH
Steinern Str. 19 - 21
55252 Mainz-Kastel
T +49 6134 605 0
F +49 6134 605 223
www.elster-instromet.com
info@elster-instromet.com

Belgium
Elster-Instromet N.V.
Rijkmakerlaan 9
2910 Essen
T +32 3 670 0700
F +32 3 667 6940
www.elster-instromet.com
info@elster-instromet.com

Singapore
Elster-Instromet Sdn. Bhd. (Singapore Branch)
160 Paya Lebar Road
#04-01 Orion@Paya Lebar
Singapore 409022
T +65 6247 7728
F +65 6247 7729
sales@elster-instromet.com.sg

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