ELSTER®
SM-RI-X

Turbine Gas Meter. Sizes from DN200 to 600 (8” to 24”)

Honeywell Elster SM-RI-X turbine gas meters are robust meters for operation under the most demanding conditions (offshore and onshore). Over decades the SM-RI-X has proven to be highly accurate from first calibration to the end of its lifetime many years later.

SM-RI-X turbine meter (20") with Oil lubiraction system and MI-2 Index

The longterm measurement stability and highest reliability of the SM-RI have made it become a standard in high volume gas measurement. These are also reasons why SM-RIs are used by recognizable calibration labs around the world as reference meters of choice.

The SM-RI-X is used for custody transfer applications along the complete gas value chain high from production, to pipeline transmission stations, down to local distribution and city gate stations. SM-RI-X turbine meters are also applied at larger industrial and commercial gas consumers where accurate gas measurement is key. For sizes smaller than DN200 (8”) Honeywell offers the TRZ2 turbine gas meter which is available in sizes DN50 to DN150 (2” to 6”).

The SM-RI-X turbine gas meter is designed and manufactured according to:

- The European Standard for turbine meters EN 12261.:2018
- OIML Provision R137-1&2
- EC directive 2014/34/EU(ATEX) / IECEx
- EC directive 2014/68/EU (PED)

APPLICATIONS

The SM-RI-X is designed to measure flows of natural gas and various other non-corrosive gases like propane, butane, air, nitrogen and hydrogen. The SM- RI-X is optimized for use in the most demanding applications in the transport and distribution of gas. Special versions are available for high temperatures and for other challenging operating conditions. Modified versions of the SM-RI-X without meter index are used as master meter in Various calibration facilities.

FEATURES AND BENEFITS

Used as reference meter in major calibration facilities

Suitable for 30% H2 for custody transfer- and 100% H2 for non-custody transfer applications

Conformity to EN12261 OIML R137, PED, ATEX and IECEx

Lowest measurement uncertainty, typically
+/- 1% for Q_{min} - $0.2Q_{max}$
+/- 0.5% for $0.2Q_{max}$ to Q_{max}

Honeywell

OPERATING PRINCIPLE

The gas flowing through the meter sets the turbine wheel in motion. The number of revolutions of the wheel is proportional to the volume passing through the meter. To optimize measurement performance the patented X4X flow conditioner eliminates flow disturbances such as swirl or asymmetric flow that are created by bends or T-pieces upstream of the meter for example. The shaft on which the turbine wheel is fixed is held in place by robust high quality ball bearings that help to maintain high performance for a long time with minimized maintenance needs. Via gears and a magnetic coupling the revolutions of the turbine wheel are transmitted to the 8-digit mechanical counter in the index head. The outlet of the meter has been optimized to decrease pressure loss and create optimal flow conditions after the meter.

Honeywell SM-RI-X meters are used in several calibration facilites around the world, underlining the long term stability and high accuracy.

Facilities using the SM-RI-X as reference meters are:

- **Euroloop Netherlands**
- **Pigsar Germany**
- **various others...**

METROLOGICAL PERFORMANCE

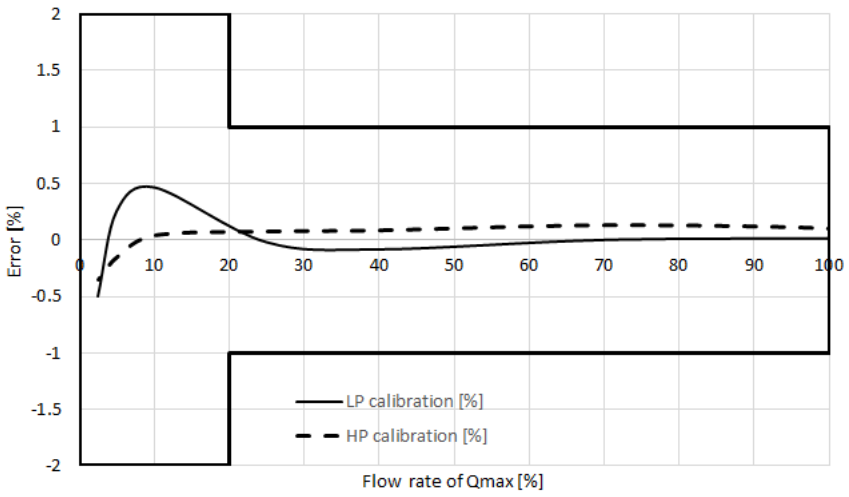
The SM-RI-X turbine gas meter is designed and manufactured according to the European Standard for turbine meters EN 12261.

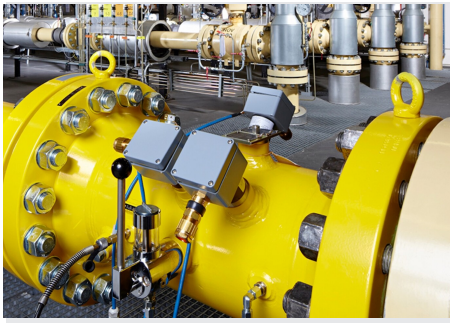
SM-RI-X fulfills the maximum permissible error allowed by MID:

- ± 1.0 % for 0.2 Qmax to Qmax
- ± 2.0 % for Qmin to 0.2 Qmax

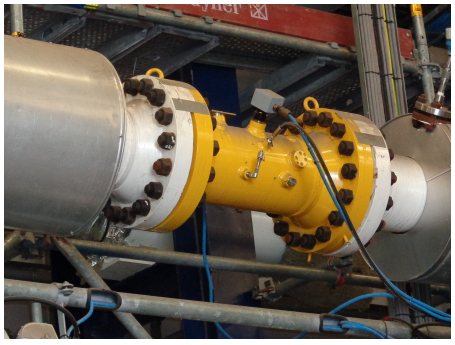
Typically the error of the Honeywell turbine meters is approx. half of these limits+/- 1% for Qmin - 0.2Qmax and 0.5% for 0.2Qmax to Qmax.Smaller errors are available on request.

Repeatability: <0.1%





SM-RI-X at Pigsar HP calibration facility



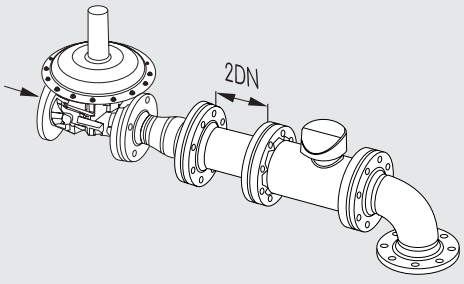
SM-RI-X at Euroloop Calibration Facility

INSTALLATION AND MOUNTING

Installation tips/Mounting position:
According to EN12261 turbine gas meters can be operated in horizontal and vertical position.

Inlet pipe:
Apply ≥2 DN straight pipe in case of up-stream flow disturbances.
With the X4X flow straightener installed no straight pipe is required.

Outlet pipe:
Fitting to nominal diameter of the meter



In case of upstream flow disturbances ≥2DN straight pipe should be used in front of the meter.

A flow conditioner is not required.

Installation Instructions

SM-RI-X METER INDEX AND PULSE OPTIONS

Multi-Index MI-2: The rugged design of the meter index (including the metal cover) has proven itself in the harshest environments and is IP67 certified. The MI-2 is equipped with an 8-digit mechanical index for continuous meter reading. A low frequency output (reed contact) is included as a standard and can be connected to any Flow Computer or Electronic Volume Corrector. The pulse output is equipped with inbuilt anti-tampering protection.

Pulse outputs: The SM-RI-X can be equipped with low, medium and high frequency outputs depending on customer requirements.

Low frequency (standard):
- 2x LF outputs (type E1) with maximum frequency of 0.5 Hz
- 1x manipulation contact

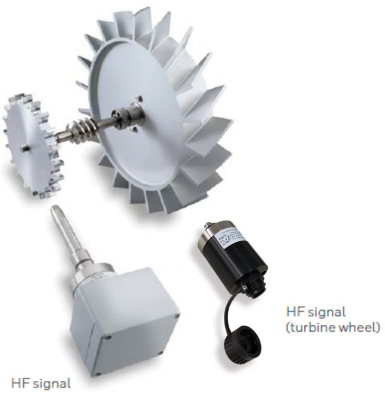
Medium Frequency (optional)
- 1x MF output (type MI-2) built into the meter

High frequency (optional)
- Up to 2x HF outputs (one on the turbine wheel and one on the reference

Options available for the MI-2:
- Medium Frequency Output
- Absolute ENCODER for digital data transfer between the meter and Flow Computer / EVC

IN-S10 IN-S12 IN-S11

The standard IN-S10 pulse output is delivered with 2.5m open-ended 6-wire cable to be connected directly to an EVC or junction box. Optionally the IN-S11 and IN-S12 offer a 6-pin fl ange plug and one/two connector sockets.



SM-RI-X - PULSE VALUES						
Size		Measuring data		Output pulse values		
Diameter	Meter size	Measuring range (1:20)		LF [1/m³]	MI-2 [Hz at Qmax]	HF * [Hz at Q_{max}]
DN	G	Q_{min}	Q_{max}			
DN200/ 8"	G650	50	1000	0,1	30	770
	G1000	80	1600	0,1	47	1180
	G1600	130	2500	0,1	46	1060
DN250 /10"	G1000	80	1600	0,1	49	825
	G1600	130	2500	0,1	77	1320
	G2500	200	4000	0,1	69	1200
DN300 /12"	G1600	130	2500	0,1	26	810
	G2500	200	4000	0,1	42	1270
	G4000	320	6500	0,1	39	1175
DN400 /16"	G2500	200	4000	0,1	88	660
	G4000	320	6500	0,1	141	1055
	G6500	500	10000	0,1	121	890
DN500 /20"	G4000	320	6500	0,1	72	530
	G6500	500	10000	0,1	116	865
	G10000	800	16000	0,1	105	770
DN600 /24"	G6500	500	10000	0,01	26	470
	G10000	800	16000	0,01	41	720
	G16000	1250	25000	0,01	38	650

* Small deviations are possible

SM-RI-X MATERIALS AND LUBRICATION OPTIONS

Material:
Meter body: Spheroidal graphite cast iron (EN-GJS-400-18-LT) or forged steel.
Turbine wheel: Aluminum

Lubrication
The SMRI-X is equipped with a lubrication system that will increase the lifetime of the bearings and thus ensure a long lasting optimal performance of the meter. The system is operated manually with a lever and the specially for this purpose selected oil will be delivered with the meter.

Lubrication pump

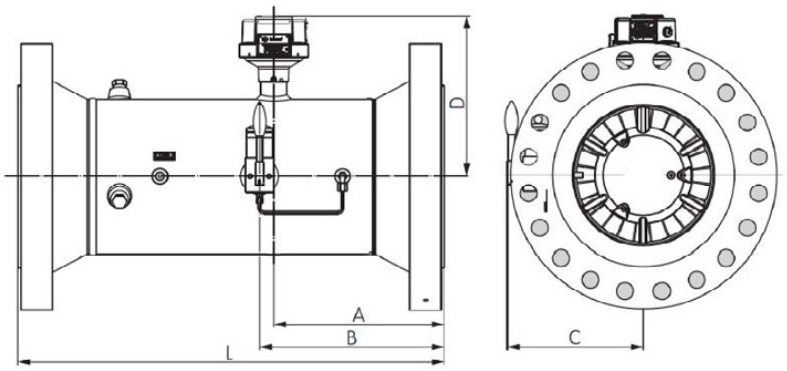
SM-RI-X TECHNICAL DATA

The standard measuring range for the SM-RI-X meters is 1:20. Extended measuring ranges are possible provided the meter is operated at a certain minimum pressure. The extended measuring ranges will result in a lower Q_{min}. In the table below the Q_{min} and the minimum required pressure for the different measuring ranges are listed, as well as the pressure drop for each meter size.

MEASURING RANGES, REQUIRED PMIN AND PRESSURE LOSS									
Size		Measuring Range							Pressure loss in [mbar]*
		Q_{max} [m³/h]	1:20		1:30		1:50		
Diameter	Meter Size		Q_{min} [m³/h]	P_{min} [bar]	Q_{min} [m³/h]	P_{min} [bar]	Q_{min} [m³/h]	P_{min} [bar]	
DN200/ 8"	G650	1000	50	0 (atm)	32	4	20	11	1.5
	G1000	1600	80	0 (atm)	50	0 (atm)	32	11	3
	G1600	2500	130	0 (atm)	8	7	50	11	8
DN250 /10"	G1000	1600	80	0 (atm)	50	8	32	11	1.5
	G1600	2500	130	0 (atm)	80	0 (atm)	50	11	4.5
	G2500	4000	200	0 (atm)	130	7	80	11	10
DN300 /12"	G1600	2500	130	0 (atm)	80	4	50	11	1.5
	G2500	4000	200	0 (atm)	130	0 (atm)	80	11	5
	G4000	6500	320	0 (atm)	200	7	130	11	14
DN400 /16"	G2500	4000	200	0 (atm)	130	4	80	11	1.5
	G4000	6500	320	0 (atm)	200	0 (atm)	130	11	5
	G6500	10000	500	0 (atm)	320	7	200	11	13
DN500 /20"	G4000	6500	320	0 (atm)	200	4	130	11	1.5
	G6500	10000	500	0 (atm)	320	0 (atm)	200	11	6.5
	G10000	16000	800	0 (atm)	500	7	320	11	15
DN600 /24"	G6500	10000	500	0 (atm)	320	4	200	11	1.5
	G10000	16000	800	0 (atm)	500	0 (atm)	320	11	5
	G16000	25000	1250	0 (atm)	800	7	500	11	10.5

* Δp for natural gas at at 1 bar abs.

SM-RI-X: TURBINE GAS METER TECHNICAL DATA



DIMENSIONS, WEIGHTS AND PRESSURE DROP														
Size		Dimensions [Inch]					Weight [kg]**							
							PN Pressure rating					ANSI Pressure rating		
Diameter	Meter size	A	B	C	D	L	PN 10	PN 16	PN 25	PN 40	PN 63	Class 150	Class 300	Class 600
							Steel / (ductile iron)	Steel / (ductile iron)	Steel	steel	Steel	Steel / (ductile iron)	Steel	Steel
DN200 /8"	G650	240	240	273	298	600	99/(70)	99/(70)	109	117	134	106/(70)	126	160
	G1000													
	G1600													
DN250 /10"	G1000	300	360	327	314	750	189	189	227	240	247	187	236	304
	G1600													
	G2500													
DN300 /12"	G1600	360	390	352	338	900	267	267	293	314	344	299	339	404
	G2500													
	G4000													
DN400 /16"	G2500	480	510	395	380	1200	430	447	462	502	552	469	563	652
	G4000													
	G6500													
DN500 /20"	G4000	600	630	445	431	1500	719	749	809	879	919	782	923	1092
	G6500													
	G10000													
DN600 /24"	G6500	720	750	495	482	1800	1213	1263	1463	1513	1612	1379	1598	1818
	G10000													
	G16000													

* Small deviations are possible.

For more information

To learn more about Honeywell Elster's Gas Solutions, visit automation.honeywell.com or contact your Honeywell account manager.

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DTS-24-13-EN | 09/24

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