

A large industrial refinery or chemical plant at night, illuminated by numerous lights. The scene features tall distillation columns, complex piping, and storage tanks. The sky is a deep blue, and the overall atmosphere is industrial and high-tech.

HONEYWELL ELSTER-RABO COMPACT SERIES ROTARY GAS METER

High Accuracy In A Compact Unit

Honeywell



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INTRODUCTION TO RABO® COMPACT SERIES GAS METERS

Honeywell Elster's RABO® Compact gas meter series, including RABO®-CT (Compact Thread) and RABO®-CF (Compact Flange), are designed to accurately measure natural gas and various filtered, non-corrosive gases.

Honeywell Elster RABO® Compact gas meters offer extensive measuring ranges and compact dimensions. They ensure high accuracy, even if the gas flow is low or irregular. The new series of natural gas meters combines proven rotary mechanics from Honeywell Elster, with an added range of innovative features.

The RABO® Compact series was created to develop a compact rotary gas meter as a successor to RVG-ST and an alternative to RABO® G40 - G400.



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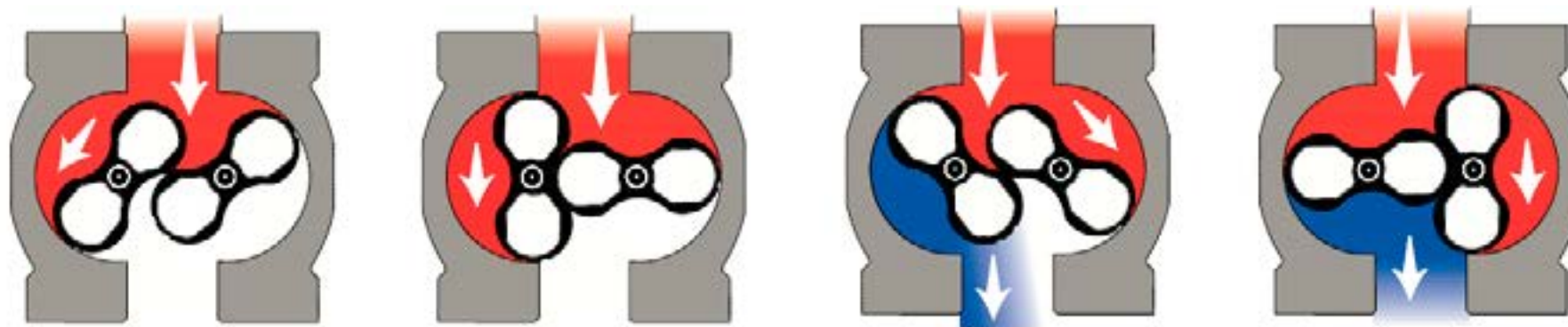


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WHAT IS A ROTARY GAS METER?

Rotary gas meters are volume-measuring devices for gaseous media which operate according to the positive displacement principle.

Due to their volumetric measuring principle, their functioning is not influenced by installation, and they are therefore ideal for compact measuring systems without an inlet section. This design allows for greater flexibility and high accuracy from a smaller device.



Metering by basics of positive displacement principle



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HOW RABO[®] COMPACT CAN HELP SOLVE OPERATIONAL CHALLENGES



The new technology offered by RABO[®] Compact gas meters can tackle many of the issues caused by standard meter systems:

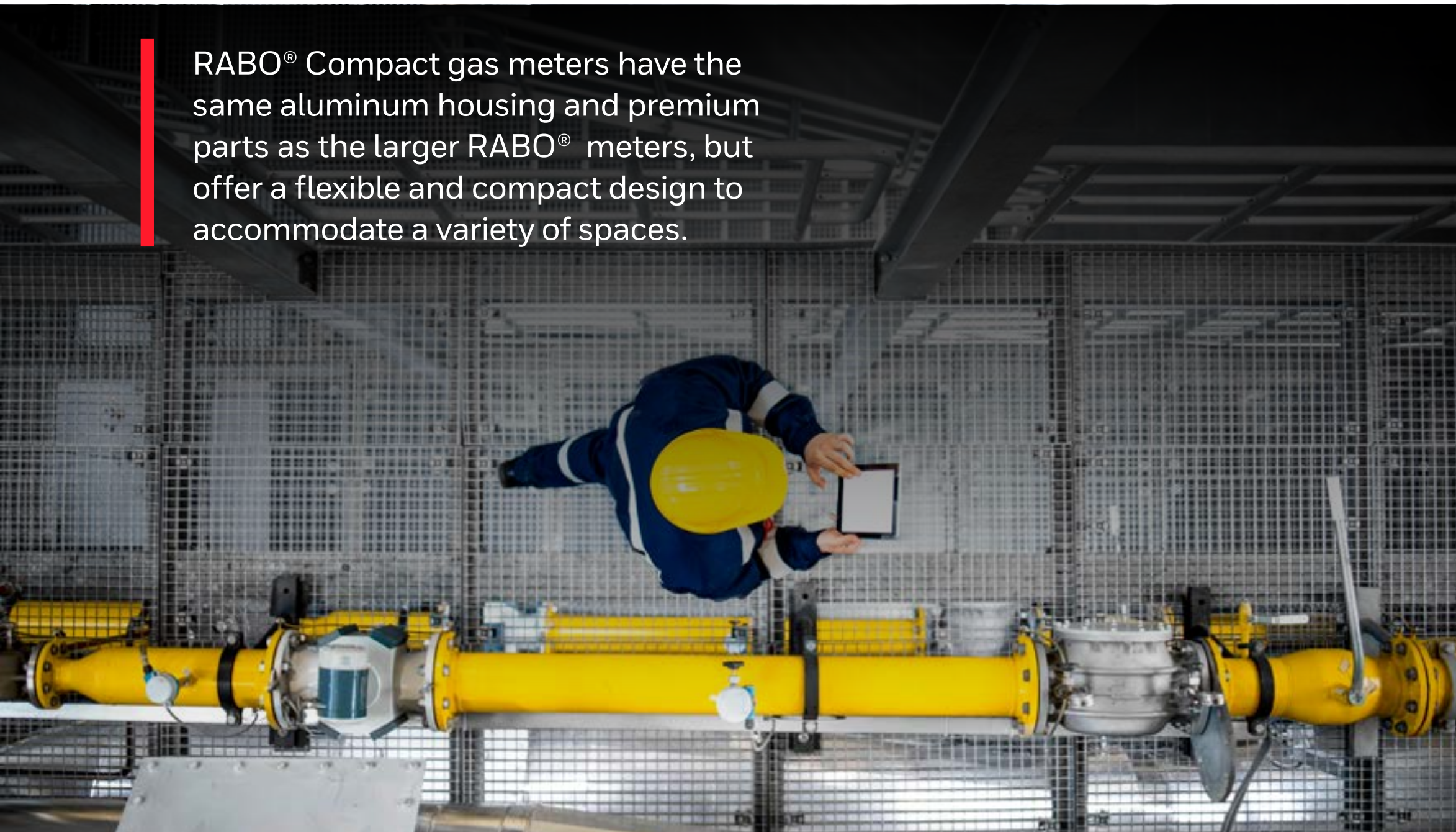
PROBLEM	SOLUTION
Regular maintenance issues Many meters require oil for initial installation and periodic filling, which increases costs for human resources, materials and time. In addition, to fill with oil, a meter must be depressurized, and a rotary meter containing oil cannot be transported.	RABO [®] Compact offers a maintenance-free option
Difficult installation Many types of meters, including diaphragm meters, cannot be installed in small spaces	RABO [®] Compact is designed for mounting in a cabinet to build a smaller station.
Low accuracy and no T/P compensation Low accuracy and no T/P compensation from commercial and industrial diaphragm meters increase financials risks for your operation.	RABO [®] Compact improves accuracy with EVC installed even-precise calculation, plus T/P compensation.
No flexibility Standard meters can only be installed for one flow direction and without an encoder ready.	RABO [®] Compact can be used for any flow direction and can be installed in the horizontal or vertical position. It has a rotatable index with different index variants and an encoder ready to eliminate discrepancies between the mechanical index and the EVC.

FEATURES AND BENEFITS OF RABO® COMPACT METERS

RABO® Compact gas meters have the same aluminum housing and premium parts as the larger RABO® meters, but offer a flexible and compact design to accommodate a variety of spaces.

In addition, RABO® Compact gas meters are packed with a range of modern features:

- Meter sizes G10 to G40
- Flow rates from 0.25 to 65 m³/h
- Nominal sizes DN 25 to DN 50
- Pressure ratings PN 10/16 and Class 150 in accordance with ASME B 16.5
- Temperature range -25°C to +70°C
- Measuring ranges up to 1:200
- Aluminum housing as Flange or Thread version
- Compact dimensions
- Maintenance-free option
- Index can be rotated for horizontal and vertical installation
- Optional index solutions (e.g. Absolute ENCODER S1D)
- Approvals pursuant to MID/PED/ATEX Directives
- MID approved hydrogen metering



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RABO® COMPACT

STRUCTURE AND FUNCTION

RABO® Compact gas meters operate according to the positive displacement principle. Two rotating impellers, which look like a figure of eight when viewed in cross-section, are mounted in a single housing with one inlet and one outlet (see Fig. 1a). The two impellers are coupled together using synchronizing gears.

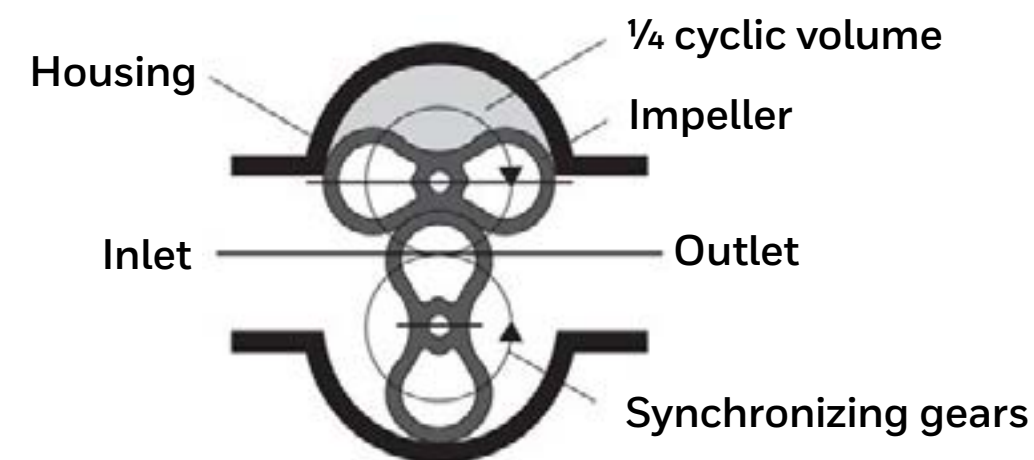


Fig. 1a | Working principle of rotary gas meters

When gas flows, the impellers rotate without touching one another and propel a gas volume to the outlet which is defined by the cyclic volume (see Fig. 1b). One rotation of the system thus corresponds to a defined gas volume.

The revolutions of the impellers are transferred to the mechanical index via a reducing gear and a magnetic coupler. The rotary gas meter is adjusted using a pair of gears in the index.

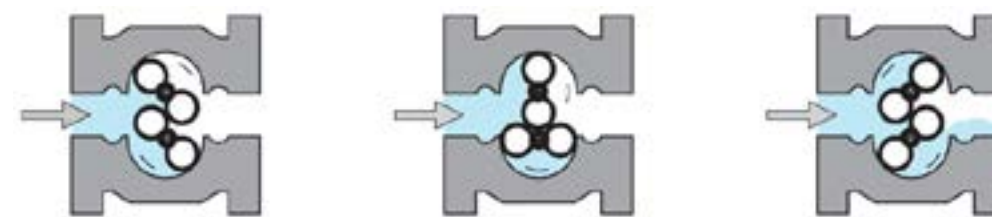
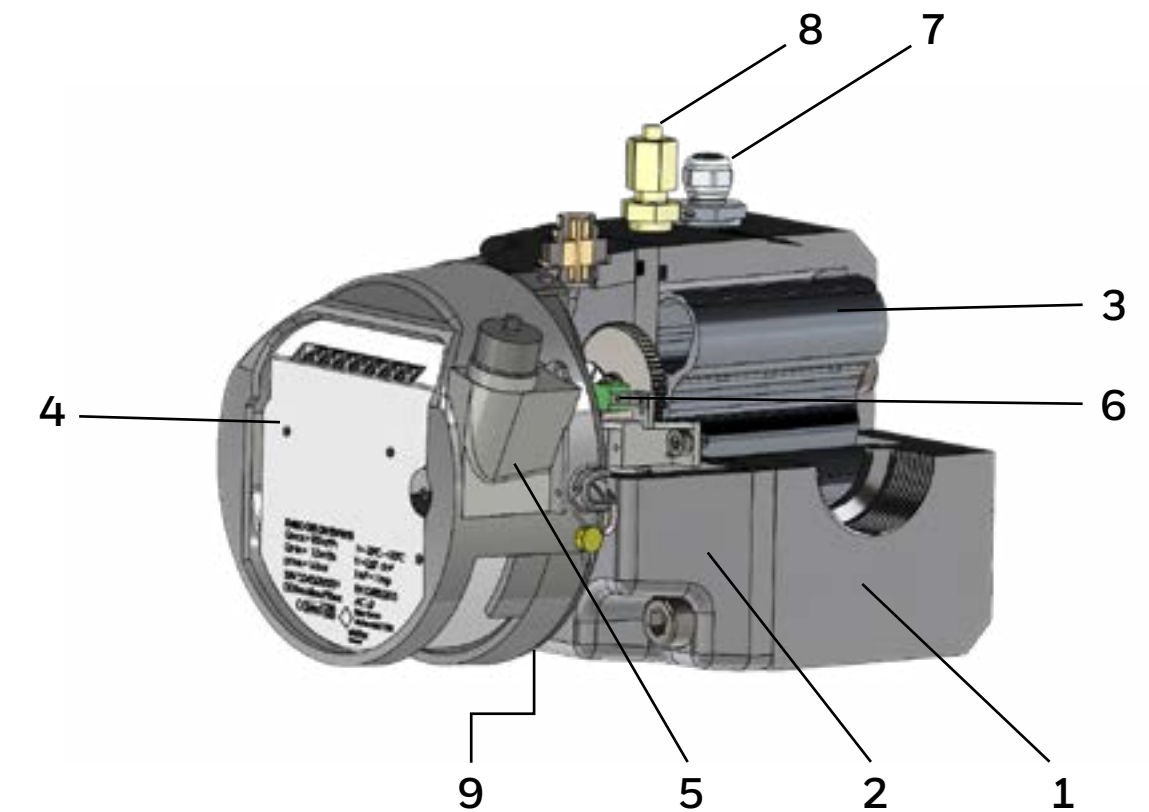


Fig. 1b | Working principle of rotary gas meters



1. Meter housing
2. Housing cover (front)
3. Pistons
4. Index
5. LF pulse generator (optional)
6. HF pulse generator (optional)
7. Temperature test point(s)
8. Pressure test point
9. Oil-level gauge glass (optional)

INDEX VERSIONS

The meter can be equipped with various index versions:



PULSE GENERATORS/ENCODERS

The meter may be fitted with the following pulse generators or encoders:

DEVICE TYPE	MANUFACTURER	DEVICE DESIGNATION
Low-frequency pulse generator (LF)	Elster GmbH	IN-Sxx
Low-frequency pulse generator (LF)	Elster GmbH	IN-Wxx
Low-frequency pulse generator (LF)	Elster GmbH	S1xRx
High-frequency pulse generator (HF)	Pepperl & Fuchs	SJ2-N
Encoder	Elster GmbH	ENCODER S1

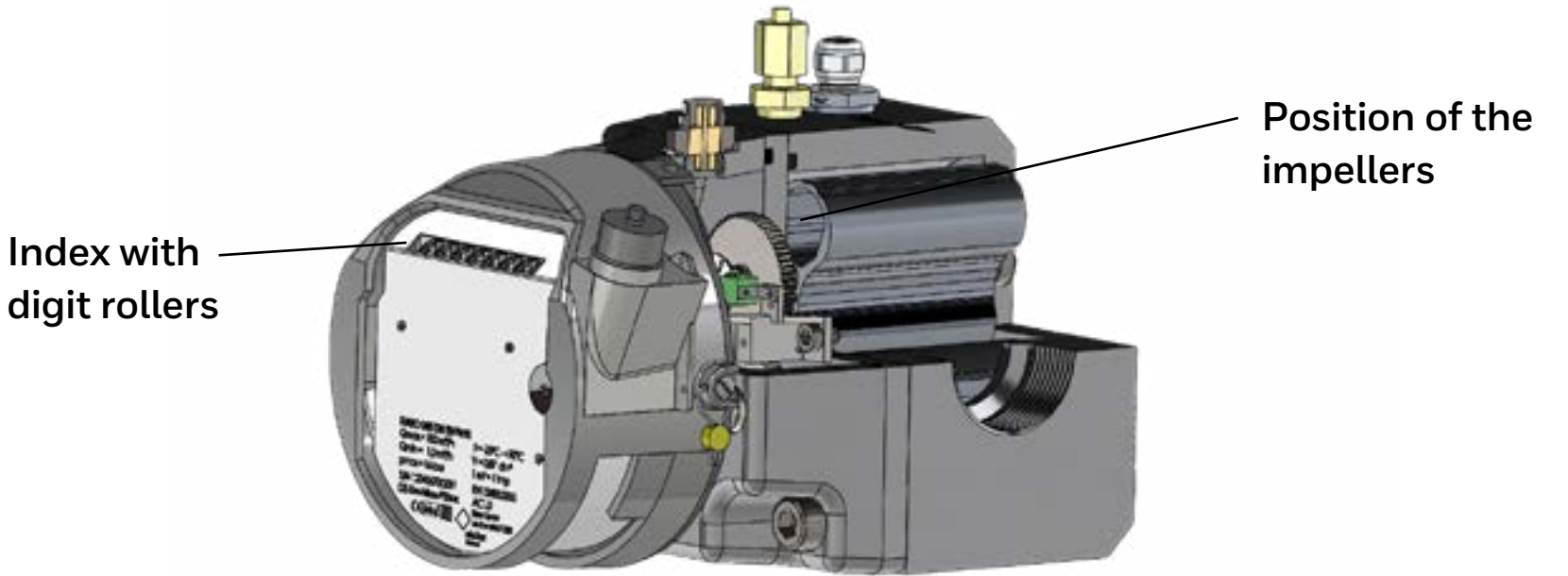
Table 2 | Overview of pulse generators

Further information on the pulse generators and encoders is provided in the separate instruction manuals.

INSTALLATION POSITION AND FLOW DIRECTION

Gas can be fed through the RABO rotary gas meter both horizontally and vertically. The impeller shafts and digit rollers on the index must always be aligned horizontally (see Fig. 8). The index can be turned through up to 355° for optimum ease of reading in different installation/operating positions.

If you have specified the installation or operating position when ordering, all attachments will have been fitted at the factory to suit the installation position.



RABO-COMPACT (CT/CF) Technical Specifications

RABO-COMPACT(CT/CF) - OIL LUBRICATED VERSION

PERFORMANCE DATA RABO OIL LUBRICATED (MEASURING RANGES, PRESSURE LOSS, PULSE VALUE)																
DN (mm)	Type	Q _{max} (m³/h)	Q _{min} *									V (dm³)	NF (Imp/m³)	HF (Imp/m³)	Δp (air)** (mbar) at Q _{max}	Δp (natural gas)**(mbar) at Q _{max}
			1:200	1:160	1:130	1:100	1:80	1:65	1:50	1:30	1:20					
25	G10	16						0.25	0.3	0.5	0.8	0.26	10	38770	1,5	1
25	G16	25				0.25	0.3	0.4	0.5	0.8	1.3	0.26	10	38770	3,8	2,5
25	G25	40		0.25	0.3	0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	10	6,6
32	G10	16						0.25	0.3	0.5	0.8	0.26	10	38770	0.7	0.4
32	G16	25				0.25	0.3	0.4	0.5	0.8	1.3	0.26	10	38770	1.8	1,2
32	G25	40		0.25	0.3	0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	4,6	3,2
32	G40	65	0.3	0.4	0.5	0.6	0.8	1	1.3	2	3	0.26	10	38770	10	6,6
40	G10	16						0.25	0.3	0.5	0.8	0.26	10	38770	0.6	0.4
40	G16	25				0.25	0.3	0.4	0.5	0.8	1.3	0.26	10	38770	1.8	1,2
40	G25	40		0.25	0.3	0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	4	2,6
40	G40	65	0.3	0.4	0.5	0.6	0.8	1	1.3	2	3	0.26	10	38770	8.4	5,5
50	G10	16						0.25	0.3	0.5	0.8	0.26	10	38770	0.6	0.4
50	G16	25				0.25	0.3	0.4	0.5	0.8	1.3	0.26	10	38770	1.8	1,2
50	G25	40		0.25	0.3	0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	4	2,6
50	G40	65	0.3	0.4	0.5	0.6	0.8	1	1.3	2	3	0.26	10	38770	8.4	5,5

* Q_{min} ≈0,3m³/h valid for temperature range from -10°C to +70°C

**Typical values, depending on test rig conditions



RABO-COMPACT(CT/CF) - MAINTENANCE FREE VERSION

PERFORMANCE DATA RABO OIL LUBRICATED (MEASURING RANGES, PRESSURE LOSS, PULSE VALUE)																
DN (mm)	Type	Q _{max} (m³/h)	Q _{min} *									V (dm³)	NF (Imp/m³)	HF (Imp/m³)	Δ p(air)** (mbar) at Q _{max}	Δp (natural gas)**(mbar) at Q _{max}
			1:200	1:160	1:130	1:100	1:80	1:65	1:50	1:30	1:20					
25	G10	16								0.5	0.8	0.26	10	38770	1,5	1
25	G16	25						0.4	0.5	0.8	1.3	0.26	10	38770	3,8	2,5
25	G25	40				0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	10	6,6
32	G10	16								0.5	0.8	0.26	10	38770	0.7	0.4
32	G16	25						0.4	0.5	0.8	1.3	0.26	10	38770	1.8	1,2
32	G25	40				0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	4,6	3,2
32	G40	65		0.4	0.5	0.6	0.8	1	1.3	2	3	0.26	10	38770	10	6,6
40	G10	16								0.5	0.8	0.26	10	38770	0.6	0.4
40	G16	25						0.4	0.5	0.8	1.3	0.26	10	38770	1.8	1,2
40	G25	40				0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	4	2,6
40	G40	65		0.4	0.5	0.6	0.8	1	1.3	2	3	0.26	10	38770	8.4	5,5
50	G10	16								0.5	0.8	0.26	10	38770	0.6	0.4
50	G16	25						0.4	0.5	0.8	1.3	0.26	10	38770	1.8	1,2
50	G25	40				0.4	0.5	0.6	0.8	1.3	2	0.26	10	38770	4	2,6
50	G40	65		0.4	0.5	0.6	0.8	1	1.3	2	3	0.26	10	38770	8.4	5,5

TECHNICAL DATA	
Gas Temperature	-25°C to +70°C
Ambient Temperature	-25°C to +70°C
Storage Temperature	-45°C to +70°C
Operating Pressure	Max. 20 bar
Protection Class	IP 67 (suitable for outdoor installation)
Housing CF	Aluminum DN25-DN50
Housing CT	Aluminum G1 ½"
MID Approval	DE-12-MI002-PTB001 (PTB)
PED Approval	CE-0085CN0022 (DVGW Cert GmbH)
ATEX / IECEx Approval	Ex-Zone 1 in accordance EC directive 2014/34/EU (ATEX) and IECEx type-examination certificate: IECEx TUR 16.0042 X / II 2G Ex h IIC T4 Gb
Medium	Natural gas and various filtered, non-corrosive gases and 100% H2
Metrological Accuracy Class	AC 1,0
Reproducibility	< 0.1%
Indexes	S1V (standard), S2 (optional, no extra cost)
Pulse Outputs	• LF pulser IN-Sx (reed contact, standard) in accordance with EC type-examination certificate TUV 16 ATEX 7729 X and IECEx TUR 16.0032 X II 2G Ex ia IIC T4 Gb • LF pulser IN-W11 (Wiegand sensor, optional) in accordance with EC type-examination certificate FTZÚ 04 ATEX 0277 / II 2G Ex ia IIC T6/T4 Gb • HF pulser A1K (Namur sensor, optional) in accordance with EC type-examination certificate PTB 99 ATEX 2219X and IECEx PTB 11.0091 X II 2G Ex ia IIC T4 Gb

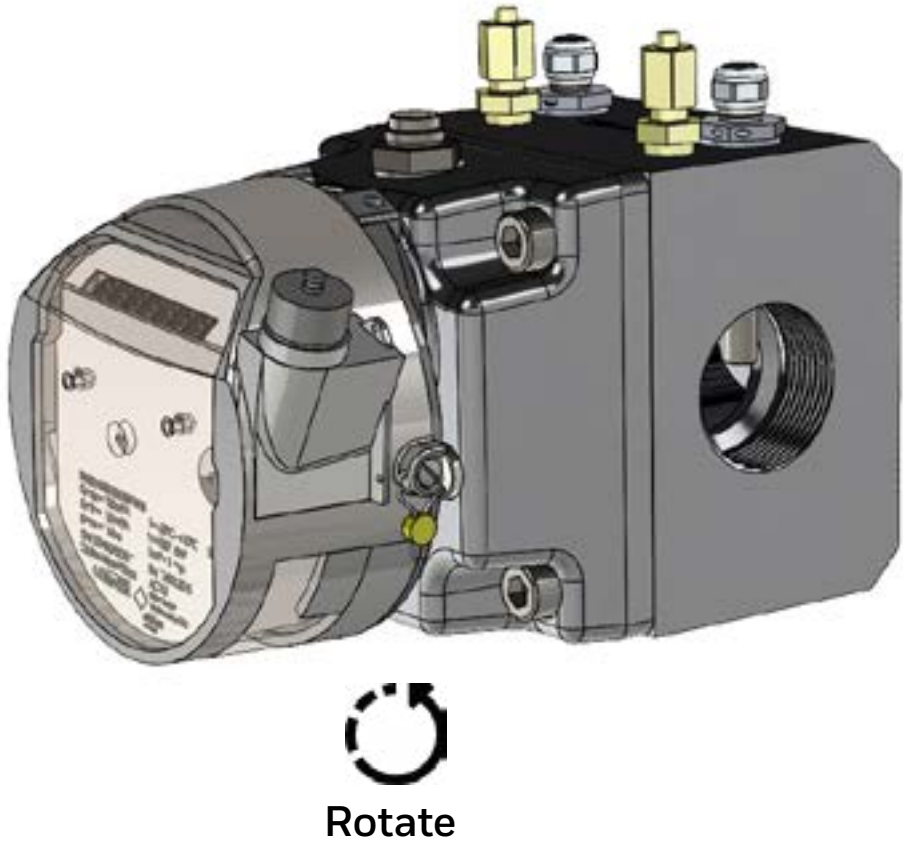


LUBRICATION AND MAINTENANCE

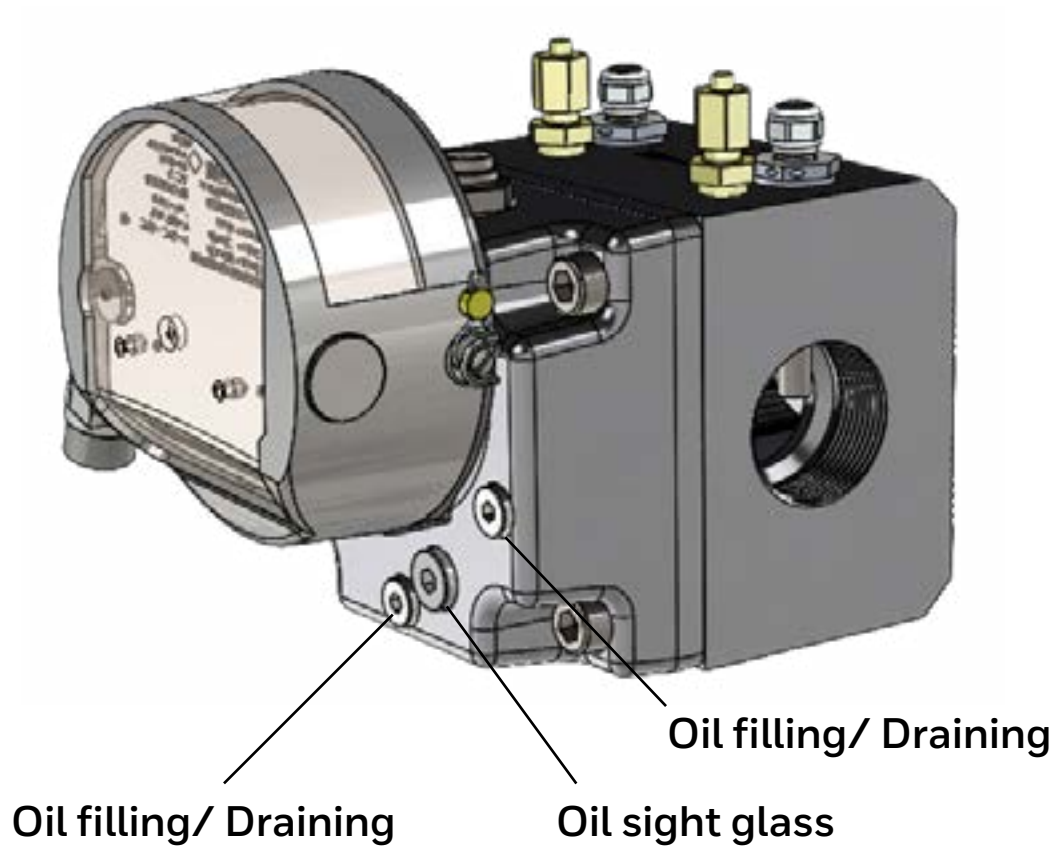
- Only use original spare parts supplied by Elster-Instromet.
- Fill with oil before commissioning.
- To fill with oil, depressurise the meter
- The quantity of oil required for operation, as well as a syringe for filling, are included in the delivery
- Use Shell Morlina S2 BL 10 oil. (Inspection kit !dent.No. 73016605 or 73014893).
- There are two oil filling and draining openings (M10) and one oil level inspection opening (M12) or 1 - 2 oil sight glass (optional) on the front of the meter.
- Unscrew the filler neck (M10) and the oil level inspection nozzle (M12) in the front housing cover.
- Fill with oil slowly, using the syringe. The oil quantity is correct when the oil is visible in the threads of the oil level inspection borehole or in the centre of oil sight glass.
- The required quantity of oil depends on the installation position; for guidance, see table below.

Flow Direction	G 16 to G 100	G 160 to G 400
Horizontal	25	25
Vertical	100	100

Guide values for O11q uantity on commlsslomng and for O11c hanges (In ml)



- Reseal the oil filling and oil level inspection openings (seal with O-ring).
- Once it has been commissioned, the measuring instrument does not require any special servicing or oil level inspections. Generally the oil must be replaced at least every 5 years.



- Never transport a rotary gas meter containing oil.
- Make sure that the oil is drained out before transporting the meter (e.g. when sending the meter for repairs), otherwise the oil will penetrate the measuring chamber and damage the meter.

INDEX VERSIONS

The meter can be equipped with various index versions:

INDEX HEAD S1V

- This is the standard version with an 8-digit mechanical roller index
- The mechanical roller index can be read-off from the front
- Can be rotated up to 355° about its axis
- Suitable for outdoor installation
- Designed for LF pulse generators which can be plugged on from the outside and which can be exchanged on site

INDEX HEAD S1D

- This has the same features as index head S1V
- It has two 8-digit mechanical roller indexes (depending on the flow direction, one index will be covered)
- Meter with S 1 D can be used in all installation positions

INDEX HEAD S2

- This has the same features as index head S1
- Provides 45° reading from the top

INDEX HEAD MI-2

- Provides universal read-off
- Can be rotated up to 355° about its axis
- Can be optionally fitted with a mechanical index drive pointing upwards or backwards in accordance with EN 12480
- Equipped with dry cartridge, lifetime of cartridge depends on installation conditions (minimum life 12 months), replace dry cartridge when colour has changed from blue to pink



ABSOLUTE ENCODER S1D

- This has the same features as index head S1D.
- Can be used as main index on gas meters.
- Available as a top-mounted unit (transmitter unit) on meters with mechanical index drive (index head version ML-2).
- The encoder is suitable for connection to a series-connected additional device (volume corrector, data logger or bus system) in potentially explosive atmospheres (see table Technical Data). A device connected to the terminal box must feature at least the following approval as a related equipment for this:

[**Ex ia IIC**] for version with Namur interface,

[**Ex ib IIC**] for version with SCR and SCR Plus interface.

The version with M-BUS interface is not AT&T-approved!

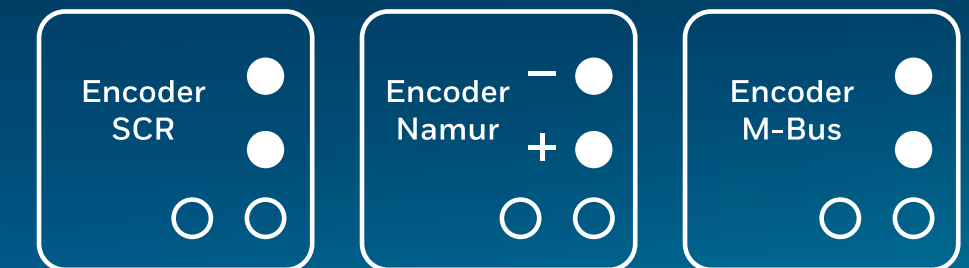


CONNECTION OF THE ABSOLUTE ENCODER S1D UNIT TO THE MECHANICAL INDEX DRIVE OF THE METER

- Connect the connector of the top-mounted unit to the mechanical index drive of the driving unit (e.g. M1-2, ensure the steel disc is removed from the connector).
- Use a locking screw to secure the encoder top-mounted unit against pulling out.
- The locking screw must be lead-sealed for applications requiring mandatory calibration.

CONNECTION OF THE ENCODER

- Use only a screened cable (DIN EN 60079-14) to connect the encoder and ensure that the pin assignment is correct (see sticker next to the cover of the terminal box).
- When connecting the Namur interface, ensure that the 2-wire connection has the correct polarity. The M-Bus, SCR and SCR Plus interfaces are independent of the polarity.



THE FUTURE IS WHAT WE MAKE IT.

Not only does the RABO® Compact meter extend our RABO® portfolio, but it's also the first of its kind in the market. Compared to traditional designed meters, it features a maintenance-free, compact design as well as temperature/pressure compensation and horizontal and vertical installation.

Launched in 2013, Honeywell's RABO® portfolio has sold more than 150,000 units and installed in more than 50 countries. It offers a feature set that meets virtually all market applications in one simple design.

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