

# RABO® Rotary Gas Meter



Elster Instromet has combined tried and tested product features of their RVG and IRM rotary meter product lines with new developments into a single product. The new RABO offers a feature set that meets virtually all market applications in one simple design. Rotary-All-By-One, simply, all-in-one!

### Features

- 4 meter sizes
- 3,500 to 14,000 acfh Maximum Capacity
- 2", 3" and 4" ANSI 125/150 flanged connections
- High rangeability across the flow range
- Low pressure drop
- Differential pressure taps on inlet and outlet with Pete's Plugs®
- Non-lubricated and non-resettable index
- End view, rotatable index
- Heavy duty, compact design
- High impact-resistant, ultraviolet stabilized index cover
- Anodized extruded aluminum body and impellers
- Anodized forged aluminum case covers
- Permanently lubricated bearings
- 10ft<sup>3</sup> output on all meter sizes

### General Information

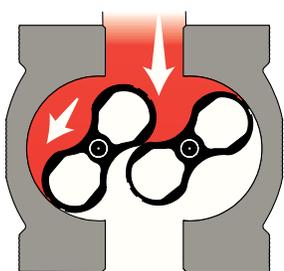
- MAOP 290 psig
- Temperature range  
-40 F to +140 F
- Meets ANSI B109.3 (pending)
- Approvals pursuant to MID/PED/ATEX directives
- Media: dry natural gas, noncorrosive industrial gases

### Options

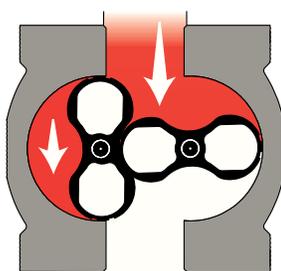
- Pulse outputs
- Thermowell
- Index masking
- Gasket strainers
- Flange bolts and gaskets
- AMR mounting
- Differential pressure gauge kit

## Operating Principle

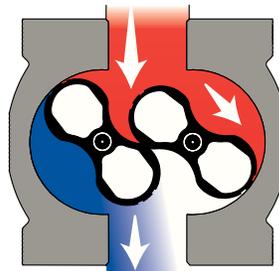
The RABO meter utilizes the rotary-type positive displacement principle of operation which makes volumetric measurements by displacing finite volumes of gas. The positive displacement occurs within a cavity formed between the meter's internal housing and its rotating impellers. The counter-rotating "figure-8" impellers turn as a result of pressure drop across the meter's inlet and outlet created as downstream gas is consumed. The rotating impellers separate the flowing gas into small, finite, volumes and are counted using a mechanical index.



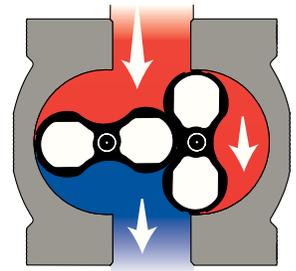
As the left impeller rotates toward the vertical position, gas enters the cavity created between the impeller and the housing.



When the left impeller reaches the vertical position, a finite volume of gas is captured in the left cavity.

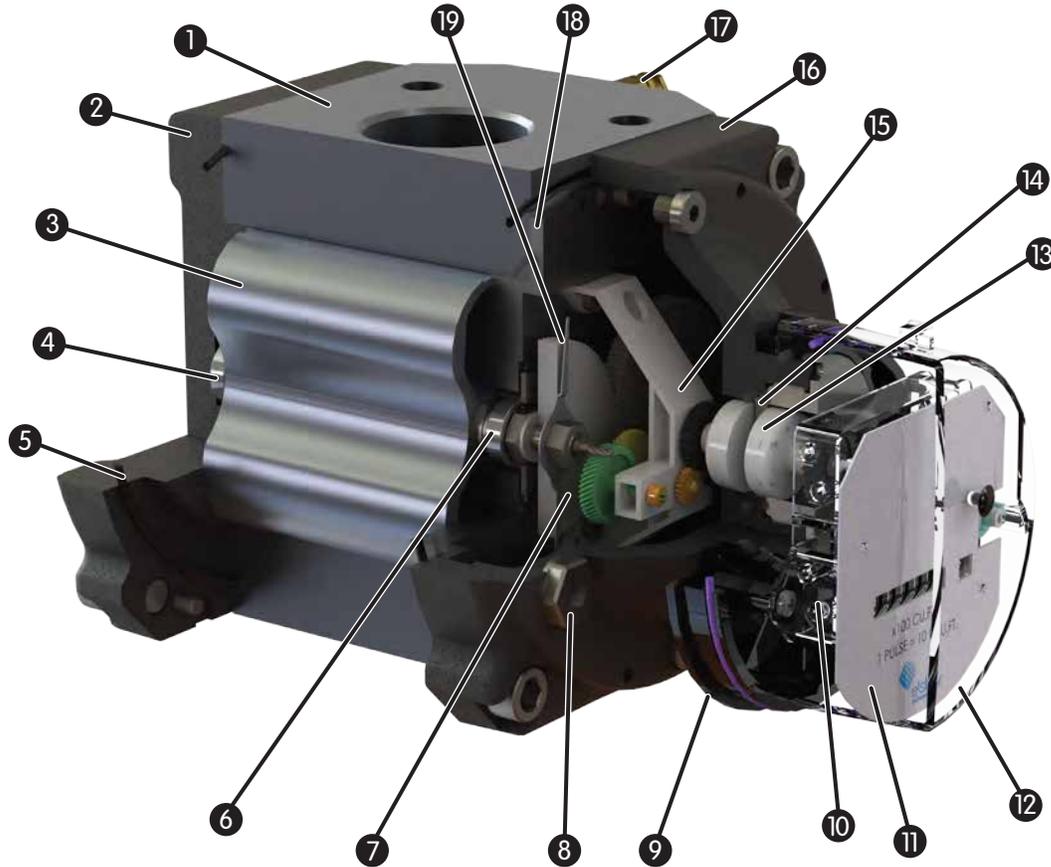


As the impellers continue to turn, the volume of gas in the left cavity is discharged. Simultaneously, gas is entering the space between the right impeller and housing.



After further rotation, the right impeller becomes vertical and a finite volume of gas is captured in the right cavity.

## RABO Rotary Meter Construction



Part Name	Material
1 Case	Extruded Aluminum, Hard-coat Anodized
2 Back Case Cover	Forged Aluminum, Hard-coat Anodized
3 Impellers	Extruded Aluminum, Hard-coat Anodized
4 Back Bearing	Stainless Steel, Permanently Lubricated, Shielded
5 O-Ring	Buna-N
6 Front Bearing	Stainless Steel, Lubricated, Shielded
7 Timing Gears	Carbon Steel
8 Oil Sight Glasses	Aluminum Housing
9 Index Base	High Performance Polyamide (Nylon)
10 Index	Polycarbonate
11 Index Masking Plate	Aluminum
12 Index Cover	Polycarbonate, UV Resistant
13 Index Drive	Magnet
14 Pressure Plate	Stainless Steel
15 Gear Box	Polyoxymethylene
16 Front Case Cover	Forged Aluminum, Hard-coat Anodized
17 Pete's Plugs	Brass Housing
18 Front Bearing Plate	Aluminum, Hard-coat Anodized
19 Oil Slinger	Steel

## Pulse Outputs

Elster RABO flow meters come equipped with a drive magnet as standard equipment for easy adaptability of a low frequency pulse generator. The pulse generators are attachable to the exterior of the index cover, and can be retrofitted or changed without opening the index. They also have sealing capability to visually detect tampering.

Model	Description
IN-S10	8' cable
IN-S11	1 connector
IN-S12	2 connectors

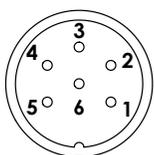
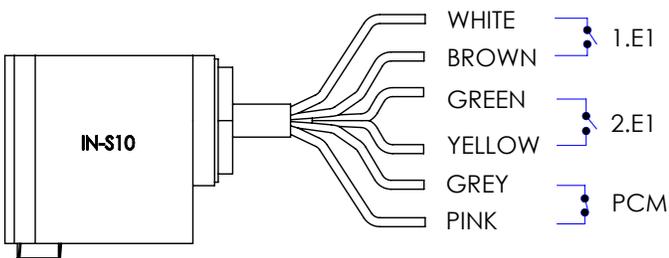
All models include 2 independent switches and a tamper circuit.  
 Pulse value is 10 acf (0.28 x am<sup>3</sup>) for all meter sizes.  
 IN-S11 and IN-S12 come with mating connector, no cable included.



### Technical Specifications

Description	Min.	Typ.	Max.	Unit
Voltage (U)			24	V
Current (I)			76	mA
Power (P)			1,1	mW
Static Contact Resistance			200	mΩ
Insulation Resistance	10 <sup>9</sup>			Ω
Breakdown Voltage	100		100	VDC
Switching Time Including Bounce		0.5		ms
Release Time		0.1		ms

Temperature range: -40°C ... +70°C  
 IP-Class: IP67  
 Explosion protection: Ex II 2 G EEx ia 2C T4



Pulsers Pin-Out Connections			
Connector	1.E1	2.E1	PCM
IN-S11	1 + 2	5 + 6	3 + 4
IN-S12	1 + 2 (Back)	1 + 2 (Front)	3 + 4 (Front)



## Thermowell

316 SS, 0.25" Bore

[Model](#)

¼" NPT with gland



## Index Masking

[Mask](#)

4 X 1,000 CF

5 X 100 CF (Std)

5 X 1,000 CF

6 X 10 CF

6 X 100 CF

Blank



## Gaskets, Strainers, Bolts

Gaskets and bolts are necessary for mounting a meter in the gas line. Gaskets and strainers are high quality Garlock® BLUE-GARD® Style 3000, and Grade 5 bolts are Xylan® coated for increased corrosion resistance and reduced friction. Gasket strainers are an effective way to protect the meter and downstream equipment from weld slag and other debris in the gas system.



Description	Size	Type	Mesh
Gasket Strainer	2" ANSI 125/150	Full Face *	80
Gasket Strainer	3" ANSI 125/150	Full Face *	80
Gasket Strainer	4" ANSI 125/150	Full Face *	80
Gasket Strainer	2" ANSI 125/150	Ring	40
Gasket Strainer	3" ANSI 125/150	Ring	40
Gasket Strainer	4" ANSI 125/150	Ring	40
Gasket Strainer	2" ANSI 125/150	Ring	20
Gasket Strainer	3" ANSI 125/150	Ring	20
Gasket Strainer	4" ANSI 125/150	Ring	20
Gasket Strainer	2" ANSI 125/150	Full Face *	20
Gasket Strainer	3" ANSI 125/150	Full Face *	20
Gasket Strainer	4" ANSI 125/150	Full Face *	20
Gasket & Bolts	2" ANSI 125/150	Ring	N/A
Gasket & Bolts	3" ANSI 125/150	Ring	N/A
Gasket & Bolts	4" ANSI 125/150	Ring	N/A

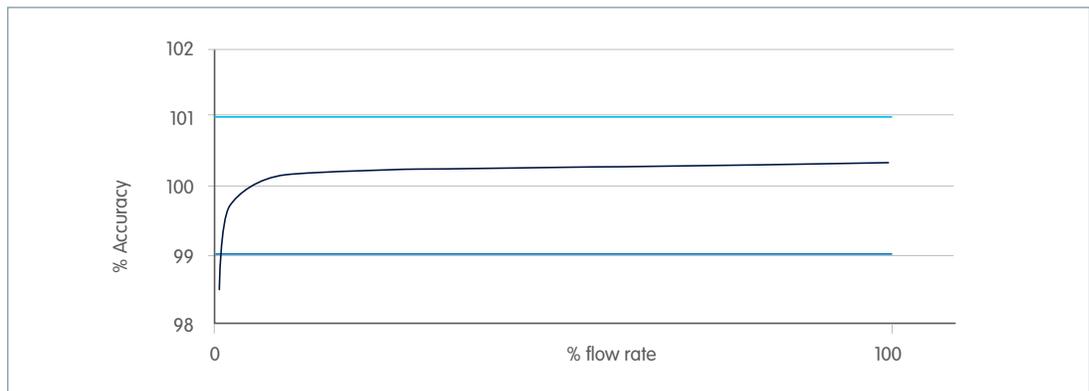


\*Not rated for full MAOP of the meter.

## Performance

	Units	3.5M/G65		5.5M/G100		9M/G160		14M/G250	
Rangeability		90:1		160:1		160:1		160:1	
Start Rate	acfh [am <sup>3</sup> /h]	1.3	[0.04]	0.9	[0.03]	2.5	[0.07]	2.5	[0.07]
Stop Rate	acfh [am <sup>3</sup> /h]	1.1	[0.03]	0.8	[0.02]	1.9	[0.05]	2.3	[0.07]
Flow Rate at ½" w.c. DP	acfh [am <sup>3</sup> /h]	2,715	[77]	4,074	[115]	5,722	[162]	6,740	[191]
Differential Pressure at 100% Flow Rate	in. w.c. [mBar]	1.46	[3.64]	1.23	[3.06]	1.70	[4.23]	2.65	[6.60]

### Accuracy Curve



### Sizing Chart

Using the chart below, select the appropriate meter by using the Maximum Instantaneous Flow Rate (scfh) and the Minimum Operating Pressure (psig) at any given point in time.

Example: A flow rate of 25,000 scfh and an operating pressure range of 75–100 psig would require a 5.5M meter based on a 75 psig minimum inlet pressure.

Model	3.5M/G65		5.5M/G100		9M/G160		14M/G250	
psig [Barg]	Corrected Capacity in scfh [sm <sup>3</sup> /h]							
0.25 [0.0]	3,500	[100]	5,500	[160]	9,000	[250]	14,000	[400]
2 [0.1]	3,900	[110]	6,100	[170]	10,000	[280]	15,600	[440]
5 [0.3]	4,600	[130]	7,200	[200]	11,900	[340]	18,400	[520]
10 [0.7]	5,800	[160]	9,100	[260]	14,900	[420]	23,200	[660]
20 [1.4]	8,200	[230]	12,800	[360]	21,000	[590]	32,700	[930]
30 [2.1]	10,500	[300]	16,600	[470]	27,100	[770]	42,200	[1,190]
40 [2.8]	12,900	[370]	20,300	[570]	33,200	[940]	51,700	[1,460]
50 [3.4]	15,300	[430]	24,000	[680]	39,300	[1,110]	61,200	[1,730]
60 [4.1]	17,700	[500]	27,800	[790]	45,500	[1,290]	70,700	[2,000]
75 [5.2]	21,200	[600]	33,400	[950]	54,600	[1,550]	85,000	[2,410]
100 [6.9]	27,200	[770]	42,700	[1,210]	69,900	[1,980]	108,700	[3,080]
150 [10.3]	39,100	[1,110]	61,400	[1,740]	100,400	[2,840]	156,300	[4,430]
175 [12.1]	45,000	[1,270]	70,700	[2,000]	115,700	[3,280]	180,000	[5,100]
250 [17.2]	62,800	[1,780]	98,700	[2,790]	161,500	[4,570]	251,300	[7,120]
290 [20.0]	72,300	[2,050]	113,700	[3,220]	186,000	[5,270]	289,300	[8,190]

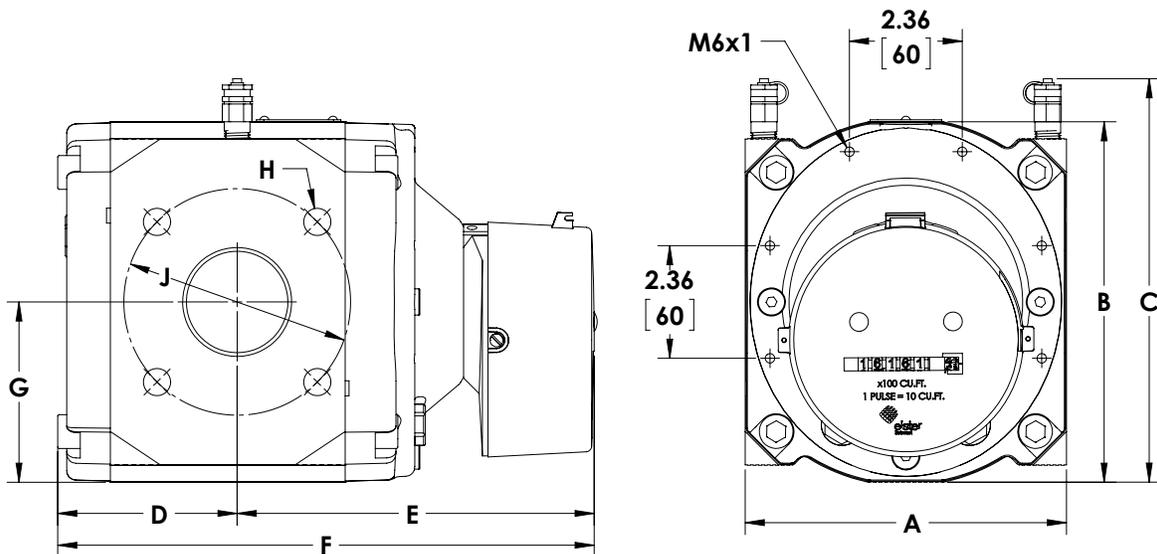
Note: All capacities are based on 14.4 |

ase temperature.

## Dimensions and Weights

	Units	3.5M/G65		5.5M/G100		9M/G160		14M/G250	
A	in. [mm]	6.75	[171]	6.75	[171]	9.5	[241]	9.5	[241]
B	in. [mm]	7.56	[192]	7.56	[192]	10.08	[256]	10.08	[256]
C	in. [mm]	8.63	[219]	8.63	[219]	10.75	[273]	10.75	[273]
D	in. [mm]	3.78	[96]	5.43	[138]	5.16	[131]	6.14	[156]
E	in. [mm]	7.52	[191]	9.17	[233]	10.67	[271]	11.65	[296]
F	in. [mm]	11.26	[286]	14.61	[371]	15.83	[402]	17.76	[451]
G	in. [mm]	3.78	[96]	3.78	[96]	5.04	[128]	5.04	[128]
Nom. Pipe Size*	in. [mm]	2		3		3		4	
Bolt Size, H		5/8" - 11		5/8" - 11		5/8" - 11		5/8" - 11	
# Bolts / Flange		4		4		4		8	
Bolt Circle, J	in. [mm]	4.75	[121]	6.00	[152]	6.00	[152]	7.50	[191]
Shipping Weight	lbs. [kg]	29.8	[14]	37.7	[17]	73.9	[34]	82.3	[37]
Carton Size	in.	18.3L x 1.6W x 12.6H				23.6L x 13.0W x 13.4H			
	[mm]	465L x 270W x 320H				600L x 330W x 340H			

\*ANSI Class 125/150 flat face flange connection



## Ordering Information

- Meter Model
- Index Masking
- AMR Mounting
  - Horizontal or Vertical Flow
- Special Badge
- Options
  - Thermowell
  - Pulser
  - Gasket Strainer
  - Gasket and Bolt Installation Kit