

# Elster® RABO®

## Highly Accurate Rotary Gas Meter

### Applications

Honeywell Elster has combined tried and tested product features of their RPM and IRM rotary meter product lines with new developments into a single product. The new Honeywell Elster Rotary.

**Rotary-All-By-One, simple, all-in-one!**

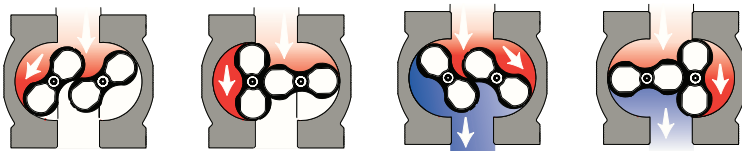
### Brief information

#### General

- MAOP 290 psig
- Temperature range -40 F to +140 F
- Meets ANSI B109.3 and EN12480:2015
- Approvals pursuant to MID/PED/ATEX directives
- Media: dry natural gas, noncorrosive industrial
- Suitable for Indoor or Outdoor installation

### Operating Principle

The Elster Rotary Gas 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.



## PRODUCT FEATURES

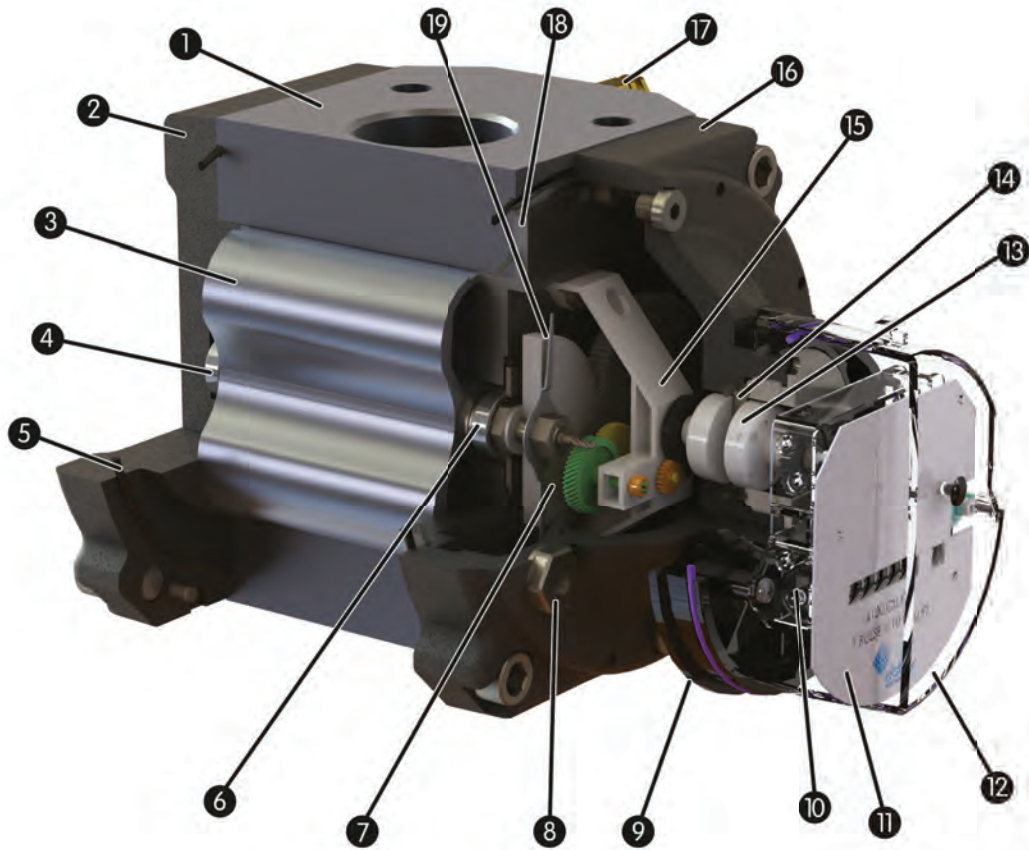
### Main Features

- 4 meter sizes
- 3,500 to 14,000acfh Maximum Capacity (23,000 acfh pending)
- 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 pressure test ports
- 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

### Options

- Pulse outputs
- Thermowell
- Index masking
- Gasket strainers
- Flange bolts and gaskets
- AMR mounting
- Differential pressure gauge kit
- Instrument Drive
- Bracketed or ID-mounted P&T correction (EC 350)
- Direct mount TCI or EC350As

# Elster® Rotary Gas Meter Construction



## METER CONSTRUCTION

No.	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	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	Pressure Test Ports	Brass Housing
18	Front Bearing Plate	Aluminum, Hard-coat Anodized
19	Oil Slinger	Steel
	Lubricating Oil	Shell Morlina

## Pulse Outputs

Elster Rotary Gas 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-S10A	14' length cable for Itron AMR connection
IN-S11	1 connector
IN-S12	2 connectors
IN-S11P	Pulsar cable for Dresser roots model 5 prover

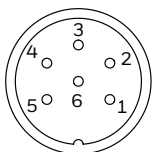
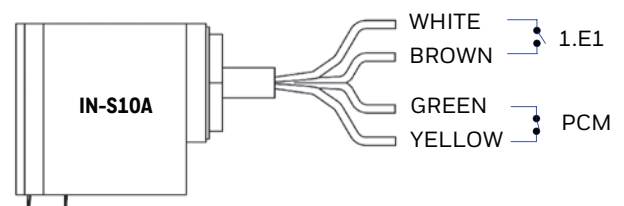
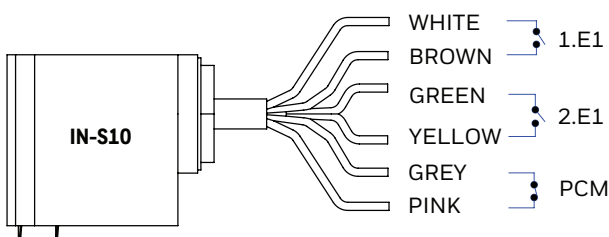
All models include 2 independent switches and a tamper circuit. Pulse value is 10 acf (0.28 x am3) for all meter sizes. IN-S11 and IN-S12 come with mating connector, no cable included.

TECHNICAL SPECIFICATIONS				
DESCRIPTION	Min	Typ.	Max.	Unit
Voltage (U)	1		24	V
Current (I)	2		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



PULSER PIN-OUT CONNECTIONS			
CONNECTORS	1.E1	2.E1	PCM
IN-S11	1 + 2	5 + 6	3 + 4
IN-S12	1 + 2 (Back)	1 + 2 (Front)	3 + 4 (Front)



## Direct mount TCI or EC350

The RABO meter can be shipped by the factory with either a Honeywell Mercury Instruments Temperature Compensation Index (TCI) or an Electronic Volume Corrector (EC350) directly mounted to it, with or without an Automated Meter Reading (AMR) device attached to it.

The TCI is an advanced, yet simple to use, electronic temperature compensating index available for natural gas rotary meters. The TCI is an ideal replacement for mechanical TC indexes.

For higher volume application and greater accuracy, the RABO meter can be fitted with the EC350. The EC350 is Honeywells latest Gas Volume Corrector platform. It features new high accuracy/stability digital pressure transducer, Cellular 4G/LTE communication, advanced audit trail capability and lowers ownership and operating costs.



## Instrument drive

- Provide an output shaft to drive instruments
- Accept known instruments via industry standard mounting plate
- CW shaft rotation
- 1:1 gear ratio
- Replaceable breakaway feature for drive dog
- <0.1% effect on accuracy at  $Q_{min}$
- Able to retrofit in the field



## Thermowell

316 SS, 0.25" Bore Model

### MODEL

1/4" 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.



TECHNICAL SPECIFICATIONS			
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

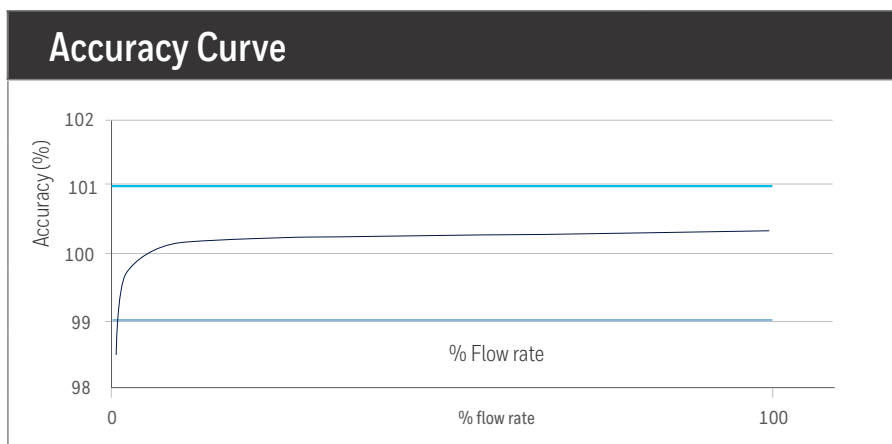
\*Not rated for full MAOP of the meter.



## Elster® Rotary Gas Meter Performance

PERFORMANCE					
	Units	3.5M/G65	5.5M/G100	9M/G160	14M/G250
Rangeability		90:1	160:1	160:1	160:1
Start Rate	acfh [am3/h]	1.3 [0.04]	0.9 [0.03]	2.5 [0.07]	2.5 [0.07]
Stop Rate	acfh [am3/h]	1.1 [0.03]	0.8 [0.02]	1.9 [0.05]	2.3 [0.07]
Flow Rate at 1/2" w.c. DP, Gas	acfh [am3/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]

Note: Values are for air, except Flow rate at 1/2" w.c.DP, which are natural gas values.



## Sizing Chart

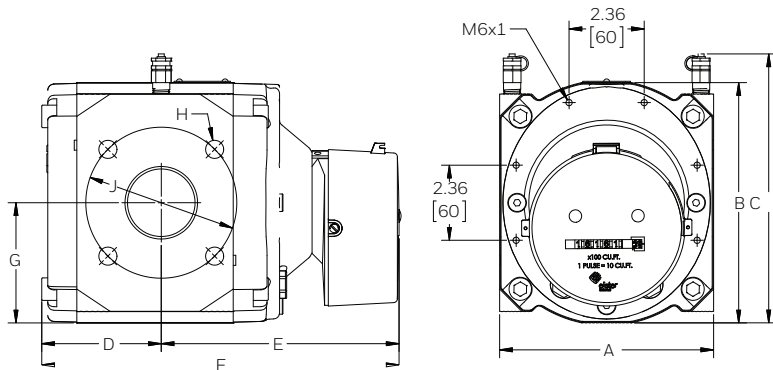
Using the chart below, select the appropriate meter by using the Maximum Instantaneous Flow Rate (scfh) and the Minimum Operating Pressure (psig) at any given point in time.

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.

SIZING CHART									
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]

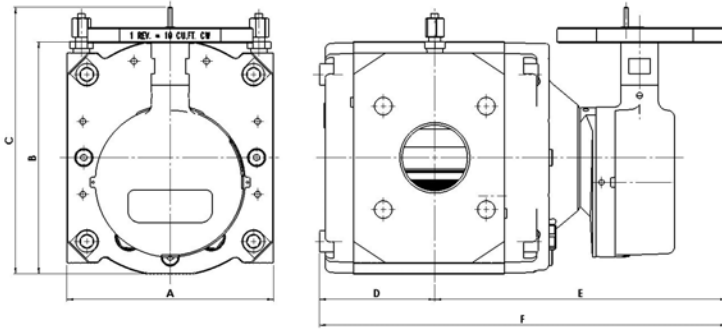
Note: All capacities are based on 14.4 psia atmospheric pressure, 14.73 psia base pressure, and 60° F base temperature.

## RABO-Standard: Dimensions Weights



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	[152]	6	[152]	7.5	[191]
Shipping Weight	lbs. [kg]	29.8	[14]	37.7	[17]	73.9	[34]	82.3	[37]
Carton Size	in. [mm]	18.3L x 10.6W x 12.6H				23.6L x 13.0W x 13.4H			
		465L x 270W x 320H				600L x 330W x 340H			

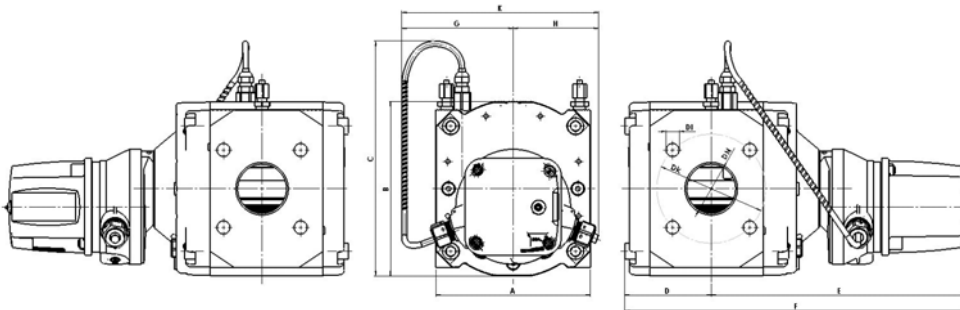
## RABO-ID: Dimensions Weights



### 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]	8.78	[223]	8.78	[223]	11.30	[287]	11.30	[287]
D	in. [mm]	3.78	[96]	5.43	[138]	5.16	[131]	6.14	[156]
E	in. [mm]	9.53	[242]	11.23	[285]	12.72	[323]	13.67	[347]
F	in. [mm]	13.31	[338]	16.66	[423]	17.88	[454]	19.81	[503]
Shipping Weight	lbs. [kg]	32.3	[15]	40.2	[19]	76.4	[35]	84.8	[39]
Carton Size	[in.]	18.3L x 10.6W x 12.6H		18.3L x 10.6W x 12.6H		23.6L x 13.0W x 13.4H		23.6L x 13.0W x 13.4H	
	[mm]	465L x 270W x 320H		465L x 270W x 320H		600L x 330W x 340H		600L x 330W x 340H	

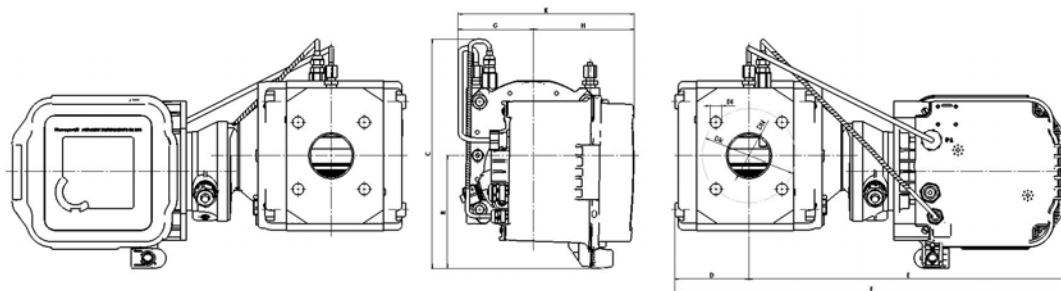
## RABO-TCI: Dimensions Weights



### 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]	10.24	[260]	10.24	[260]	12.76	[324]	12.76	[324]
D	in. [mm]	3.78	[96]	5.43	[138]	5.16	[131]	6.14	[156]
E	in. [mm]	11.18	[284]	12.83	[326]	14.33	[364]	15.31	[389]
F	in. [mm]	14.96	[380]	18.27	[464]	19.49	[495]	21.46	[545]
G	in. [mm]	4.92	[125]	4.92	[125]	4.92	[125]	4.92	[125]
H	in. [mm]	3.74	[95]	3.74	[95]	3.74	[95]	3.74	[95]
K	in. [mm]	8.66	[220]	8.66	[220]	8.66	[220]	8.66	[220]
Shipping Weight	lbs. [kg]	32.8	[15]	40.7	[19]	76.9	[35]	85.3	[39]
Carton Size	[in.]	22L x 12W x 16H				28L x 16W x 19H			
	[mm]	559L x 305W x 153H				711 x 406 x 483H			

# RABO-EC350: Dimensions Weights



## DIMENSIONS AND WEIGHTS

	Units	3.5M/G65		5.5M/G100		9M/G160		14M/G250	
C	in. [mm]	11.42	[290]	11.42	[290]	13.00	[330]	13.00	[330]
D	in. [mm]	3.78	[96]	5.43	[138]	5.16	[131]	6.14	[156]
E	in. [mm]	16.22	[412]	17.87	[454]	19.37	[492]	20.35	[517]
F	in. [mm]	20.00	[508]	23.31	[592]	24.53	[623]	26.50	[673]
G	in. [mm]	3.86	[98]	3.86	[98]	5.12	[130]	5.12	[130]
H	in. [mm]	5.12	[130]	5.12	[130]	5.12	[130]	5.12	[130]
K	in. [mm]	8.98	[228]	8.98	[228]	10.24	[260]	10.24	[260]
R	in. [mm]	5.71	[145]	5.71	[145]	5.71	[145]	5.71	[145]
Shipping Weight	lbs. [kg]	36.0	[17]	48.0	[22]	83.0	[38]	94.0	[43]
Carton Size	[in.]	22L x 12W x 16H				28L x 16W x 19H		30L x 16W x 19H	
	[mm]	559L x 305W x 153H				711 x 406 x 483H		762 x 406 x 483H	

## ORDERING INFORMATION

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

### For more information

To learn more about Honeywell Gas Measurement and Data Management Solutions, visit [www.honeywellprocess.com](http://www.honeywellprocess.com) or contact your Honeywell account manager.

### Honeywell Process Solutions

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