

RBEF Electromagnetic Flow meter

Edition 3



Features

- I Wide Application
- I High Accuracy
- I Simple Operation and Maintenance
- I Advanced Technology
- I Customer-built

Introduction

This technical information brochure contains technical specifications of the RBEF electromagnetic flow meter series and provides installation instructions for end users and design engineers.

Principle of Operation

Faraday's law of electromagnetic induction states that an inductive voltage is generated when a conductor moves through a magnetic field. This principle is used as the basis of flow measurement in the RBEF electromagnetic flow meter. In the electromagnetic flow meter, the flowing fluid corresponds to the moving conductor as described in Faraday's law.

$$U_E \propto B * D * v$$

The induced voltage U_E is directly proportional to magnetic field intensity (B), electrode spacing (D) and average fluid velocity (v). Since magnetic field intensity (B) and the electrode spacing (D) are constant values, induced voltage U_E is therefore directly proportional to the average flow velocity (v).

$$Q = (\pi * D^2) / 4 * v \quad \text{therefore} \quad U_E \propto Q$$

The equation for calculating volumetric flow rate (Q) shows that the induced voltage (U_E) is linear and directly proportional to the average velocity (v). In the flowmeter transmitter, the induced voltage (U_E) from the electrodes is used to calculate volumetric flow rate (Q) based upon the pipe's internal diameter.

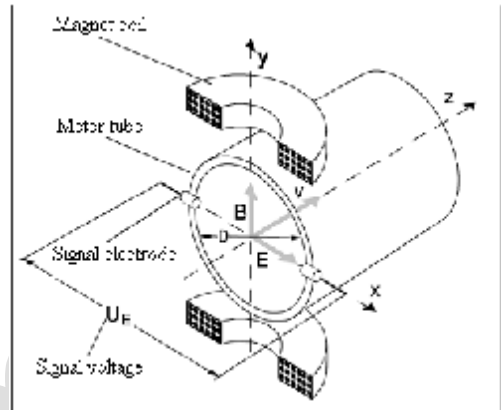
U_E = Induced voltage

B = Magnetic field strength

D = Electrode spacing

V = Fluid velocity

Q = Instantaneous volumetric flow rate



Product Styles, Features and Applications

Product Styles

An electromagnetic flow meter is comprised of a flow tube and a transmitter. Two product styles are available:



Compact type



Remote type

Transmitter is remote from flow tube

Transmitter is integral with flow tube

Features

Available Sizes	ISO: DN15...DN3000 US: 1/2"...56"
Accuracy	Standard: $\pm 0.5\%$ (0.6m/sec to 15 m/sec) Optional: $\pm 0.2\%$ (1.0m/sec to 15 m/sec)
Measurement Range	Up to: 381,704 m ³ /hr 1,727,305 gal/min
Maximum Flow Velocity	12m/sec
Measurement Resolution	± 1 mm/sec
Turndown	Up to 1500:1
Process Connections	GB Flange JIS Flange DIN Flange (DIN 2501) ANSI Flange (B16.5) Wafer Design
Lining Materials	Neoprene PTFE Polyurethane PFA Tefzel (PFA and Tefzel lining available with wire net reinforcement for negative pressure applications) Ceramic
Electrode Materials	316L Stainless Steel Hastelloy-C22 Hastelloy-B10 Titanium Tantalum Platinum/iridium Alloy Tungsten Carbide Coated 316L Stainless Steel Ceramic
Removable Electrode	In-situ Electrode Maintenance and Replacement Option Available
Housing Protection Class	IP65 IP67 (Compact versions only) IP68 (Remote Versions Only)
Remote Transmitter	Pipe Mount or Wall Mount
Available Power Supplies	85...265VAC 16...36VDC
Transmitter Configuration Options	Front Panel Keypad Hand Held Infrared Programmer
Output Signals	1 x Active Current Output 1 x Passive Current Output 1 x Frequency / Pulse Output
Status Outputs	2 x Contact / Status Outputs for Upper and Lower Flow Limit
Digital Communication	RS485 Modbus, GPRS

Applications

The RBEF electromagnetic flowmeter range is designed to measure the volumetric flow of conductive liquids and slurries within closed pipelines in industries such as water & wastewater, chemical, petroleum, metal production, power, pharmaceutical, food & beverage, pulp & paper, etc. The RBEF is the ideal instrument for measuring:

- Acidic & alkali fluids
- Paint
- Viscous fluids and slurries
- Water & wastewater flows

Note: the minimum conductivity of the measured flow must be $\geq 5\mu\text{S/cm}$ for the meter to function correctly.

Specifications

Sizes	Flanged (Metric)	DN15...DN3000
	Flanged (US)	1/2"...118"
	Wafer Design	DN15...DN100
Nominal Pressure	GB, JIS and DIN Flange	0.6 MPa, 1.0 MPa, 1.6 MPa, 4.0 MPa
	ANSI Flange	Class 150, Class 300
	Wafer Design	1.6 MPa, 4.0 MPa
	For additional pressure requirements, please contact manufacturer	
Accuracy (pulse output)	Standard	±0.5% (0.6m/sec to 12 m/sec)
	Optional	±0.2% (1.0m/sec to 12 m/sec)
Measurement Resolution	±1mm/sec	
Max Flow Tube Velocity	SI:	49 ft/s
	US:	12 m/s
Ambient Temperature	-25...+55°C / -13...+131°F	
Relative Humidity	5%...90%	
Conductivity	≥5 µS/cm	
Transmitter Mounting Availability	Compact type	Sizes: DN15...DN1000 1/2"...40"
	Remote type	Sizes: DN15...DN3000 1/2"...118"
Note 1: Cable between flow tube and remote transmitter is type SMFE100		
Note 2: Remote unit supplied with 10m cable as standard		
Note 3: Max cable length is 200m (650ft)		

	Material	SI	US	
Liner Material Options	Neoprene (std)	DN15...DN3000	1/2"...118"	
	PTFE	DN15...DN1000	1/2"...40"	
	Polyurethane	DN15...DN300	1/2"...12"	
	PFA	DN15...DN250	1/2"...10"	
	PFA with optional wire reinforcement	DN80...DN250	3"...10"	
	Tefzel	DN15...DN250	1/2"...10"	
	Tefzel with optional wire reinforcement	DN80...DN250	3"...10"	
	ceramic liner and electrodes	DN15...DN200	1/2"...8"	
Electrode Material Options	316L stainless steel (std)	DN15...DN3000	1/2"...118"	
	Hastelloy – C22	DN15...DN1000	1/2"...40"	
	Hastelloy – B10	DN15...DN1000	1/2"...40"	
	Titanium	DN15...DN250	1/2"...10"	
	Tantalum	DN15...DN250	1/2"...10"	
	Platinum/iridium Alloy	DN15...DN250	1/2"...10"	
	316L with tungsten carbide coating	DN15...DN600	1/2"...24"	
Grounding Options	Flange Grounding	DN15...DN3000	1/2"...56"	
	Grounding Ring	DN15...DN250	1/2"...10"	
	Electrode Grounding	DN50...DN3000	2"...118"	
	Inlet protection ring	DN50...DN300	2"...12"	
Max Process Temperature Limits	Type	Liner	Standard	Optional
		Compact	Neoprene	80°C / 176°F
		PTFE	80°C / 176°F	120°C / 248°F
		Polyurethane	80°C / 176°F	-
		PFA	80°C / 176°F	120°C / 248°F
		Tefzel	80°C / 176°F	-
	Remote	Neoprene	80°C / 176°F	120°C / 248°F
		PTFE	80°C / 176°F	120°C / 248°F 180°C / 356°F
		Polyurethane	80°C / 176°F	-
		PFA	80°C / 176°F	120°C / 248°F
Tefzel		80°C / 176°F	-	
Environmental Protection Class	Compact	IP 65	IP67	
	Remote	IP 65	IP 68	

Power Supply Options	85...265VAC / 45...63Hz, 20VA		
	16...36VDC, 16VA		
Display	2 or 3 line backlit LCD		
Configuration Access	Front panel keypad		
	Hand held infrared remote control (optional)		
Output Signals	Active analog current output	Max load resistance	0...1.5kΩ for 0...10mA 0...750Ω for 4...20mA
			Accuracy = same as pulse output ±0.1% of rate Option: HART Protocol
	Passive analog current output		Requires 24Vdc external supply to operate Accuracy = same as pulse output ±0.1% of rate
	Pulse / frequency and alarm outputs		Optically isolated open collector output powered either internally or externally Int. power: 28VDC with 1.2kΩ pull-up resistor Ext. power: ≤36VDC, max current 250mA
Digital Communications		RS485 Modbus	
		GPRS (superimposed on current output)	
		All interfaces have built in lightning protection	
Electrical isolation	Isolation between all I/O and input power no less than 500V		
	Isolation between all I/O and ground no less than 500V		
	Isolation between flow tube and transmitter outputs no less than 500V		
Standard	JB/T 9248-1999 Electromagnetic Flowmeter		

Accuracy

Standard calibration (pulse output):

±0.5% of reading (flow velocity >0.6 m/s) or ±3mm/s of reading (flow velocity ≤0.6 m/s)

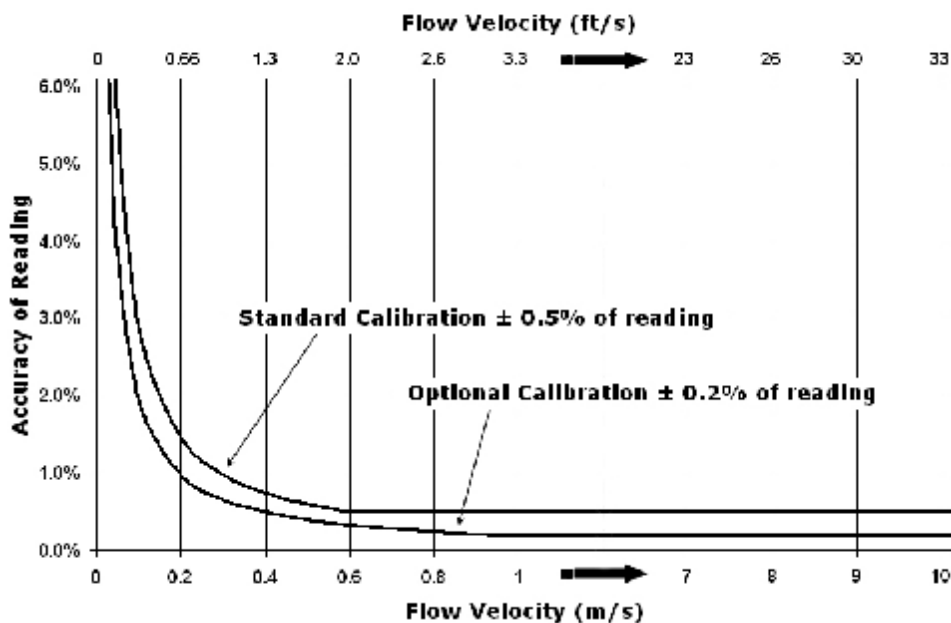
±0.5% of reading (flow velocity >1.97 ft/s) or ±0.01 ft/s of reading (flow velocity ≤1.97 ft/s)

Optional high accuracy calibration (pulse output):

±0.2% of reading (flow velocity >1.0 m/s) or ±2 mm/s of reading (flow velocity ≤1.0 m/s)

±0.2% of reading (flow velocity >3.28 ft/s) or ±0.006 ft/s of reading (flow velocity ≤3.28 ft/s)

Analog Output Accuracy: Same as pulse output plus ±0.1% of rate.



Flow meter Error Curve

Accuracies stated under reference conditions per JB/T9248 – 1999:

- Ambient Temperature: 20°C (68°F) ±2°C (3.6°F)
- Relative Humidity: 60% ... 70%
- Power supply: AC: 85 ... 265 VAC / 45 ... 63Hz or DC: 18...36V
- Installation conditions:
- Straight upstream section with length > 10×Pipe Ø, downstream section >5 Pipe Ø
- Warm-up time before testing: 30 minutes

RB FLOWMETER

Velocity / Flow Characteristics

Nominal Diameter		Full scale flow (m ³ /h)			Full scale flow (US Gal/min)		
mm	Inches	v=0.3 m/s	v=1.0 m/s	v =15m/s	v=1.0 ft/s	v=3.0 ft/s	v=49 ft/s
		Min		Max	Min		Max
15	1/2	0.1909	0.6362	9.543	0.6120	1.836	29.99
20	3/4	0.3393	1.131	16.96	1.377	4.131	67.47
25	1	0.5301	1.767	26.51	2.448	7.344	120.0
32	1 1/2	0.8686	2.895	43.43	3.825	11.47	187.4
40	1 1/2	1.357	4.524	67.86	5.508	16.52	269.9
50	2	2.121	7.069	106.0	9.792	29.38	479.8
65	2 1/2	3.584	11.95	179.2	15.30	45.90	749.7
80	3	5.429	18.10	271.4	22.03	66.10	1080
100	4	8.482	28.27	424.1	39.17	117.5	1919
125	5	13.25	44.18	662.7	61.20	183.6	2999
150	6	19.09	63.62	954.3	88.13	264.4	4318
200	8	33.93	113.1	1696	156.7	470.0	7677
250	10	53.01	176.7	2651	244.8	734.4	11995
300	12	76.34	254.5	3817	352.5	1058	17273
350	14	103.9	346.4	5195	479.8	1439	23510
400	16	135.7	452.4	6786	626.7	1880	30708
450	18	171.8	572.6	8588	793.1	2379	38864
500	20	212.1	706.9	10603	979.2	2938	47981
600	24	305.4	1018	15268	1410	4230	69092
700	28	415.6	1385	20782	1919	5758	94042
800	32	542.9	1810	27144	2507	7520	122830
900	36	687.1	2290	34353	3173	9518	155457
1000	40	848.2	2827	42412	3917	11750	191922
1200	48	1221	4072	61073	5640	16921	276368
1400	56	1663	5542	83127	7677	23031	376168
1600	-	2171	7238	108574	10027	30081	491321
1800	-	2748	9161	137414	12690	38071	621829
2000	-	3393	11310	169647	15667	47001	767690
2200	-	4105	13685	205273	18957	56872	928904
2400	-	4886	16286	244292	22561	67682	1105473
2600	-	5734	19114	286703	26477	79432	1297396
2800	-	6650	22167	332508	30708	92123	1504672
3000	-	7634	25447	381705	35251	105753	1727302

$$\text{Flow (m}^3\text{/h)} = 0.00282744 \times D^2 \times V$$

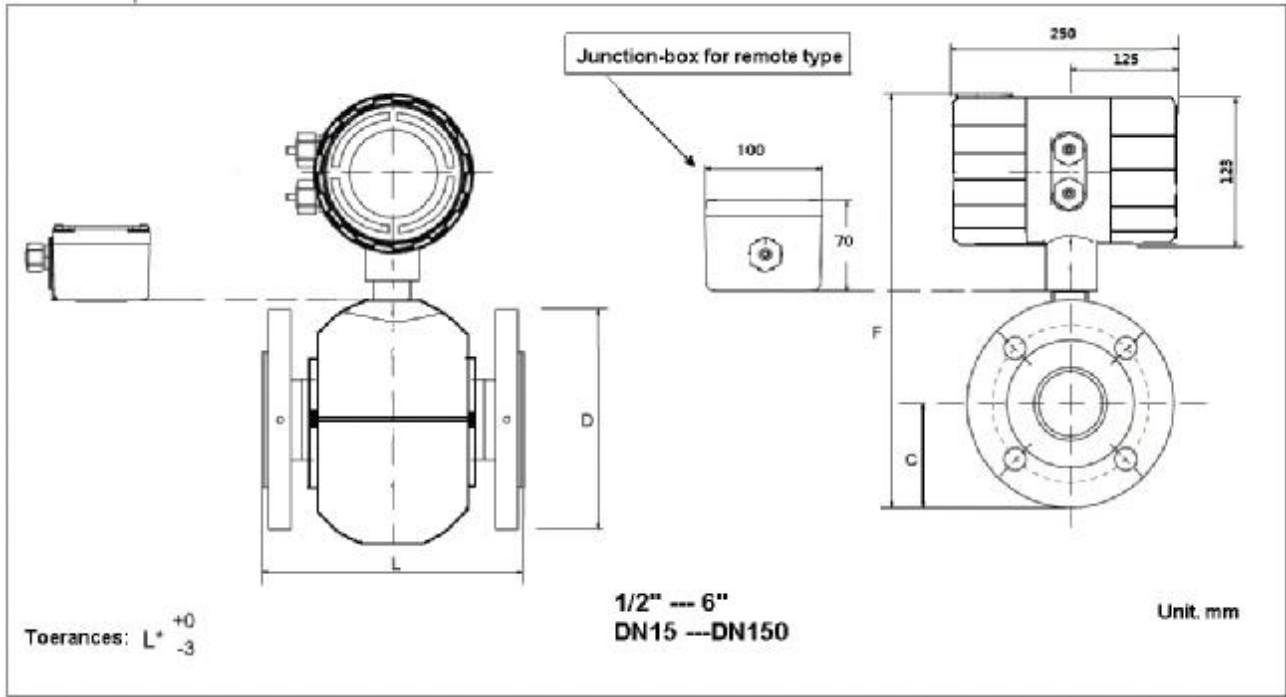
$$(D = \text{mm}, V = \text{m/s})$$

$$\text{Flow (US Gal/min)} = 2.44799 \times D^2 \times V$$

$$(D = \text{inch}, V = \text{ft/s})$$

RBEF Flow Tube Dimensions

1.1 DN15 ... DN150 / 1/2" ... 6" Dimensions



1.1.1 DN15 ... DN150 Dimensions (GB, DIN Sizes)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
GB, DIN		L	C	F	1.6	4.0	1.6	4.0	1.6	4.0	1.6	4.0	1.6	4.0
mm	MPa	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
15	1.6 or 4.0	200	48	315	65	65	14	14	4	4	95	95	7	7
20		200	53	325	75	75	14	14	4	4	105	105	9	9
25		200	58	330	85	85	14	14	4	4	115	115	11	11
32		200	70	380	100	100	18	18	4	4	140	140	12	12
40		200	75	380	110	110	18	18	4	4	150	150	13	13
50		200	83	385	125	125	18	18	4	4	165	165	14	14
65		200	93	405	145	145	18	18	4	8	185	185	22	23
80		200	100	420	160	160	18	18	8	8	200	200	26	28
100		250	118	455	180	190	18	22	8	8	235	235	28	32
125		250	135	500	210	220	18	26	8	8	270	270	35	41
150		300	150	500	240	250	22	26	8	8	300	300	38	44

1.1.2 1/2" ... 6" Dimensions (ANSI, Metric Units)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
inch	ANSI	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
15	150 or 300	200	48	315	60.5	66.5	15.7	15.7	4	4	89	95	8	8
20		200	59	325	69.9	82.6	15.7	19.1	4	4	99	117	10	10
25		200	62	330	79.2	88.9	15.7	19.1	4	4	108	124	11	13
32		200	67	380	88.9	98.6	15.7	19.1	4	4	117	133	11	13
40		200	78	380	98.6	114.3	15.7	22.4	4	4	127	155	12	16
50		200	83	385	120.7	127	19.1	22.4	4	8	152	165	14	16
65		200	96	405	139.7	149.4	19.1	22.4	4	8	178	191	24	27
80		200	105	420	152.4	168.1	19.1	22.4	4	8	191	210	28	33
100		250	127	455	190.5	200.2	19.1	22.4	8	8	229	254	32	40
125		250	140	500	215.9	235	22.4	22.4	8	8	254	279	38	51
150		300	159	500	241.3	269.7	22.4	22.4	8	8	279	318	41	60

1.1.3 1/2" ... 6" Dimensions (ANSI, English Units)

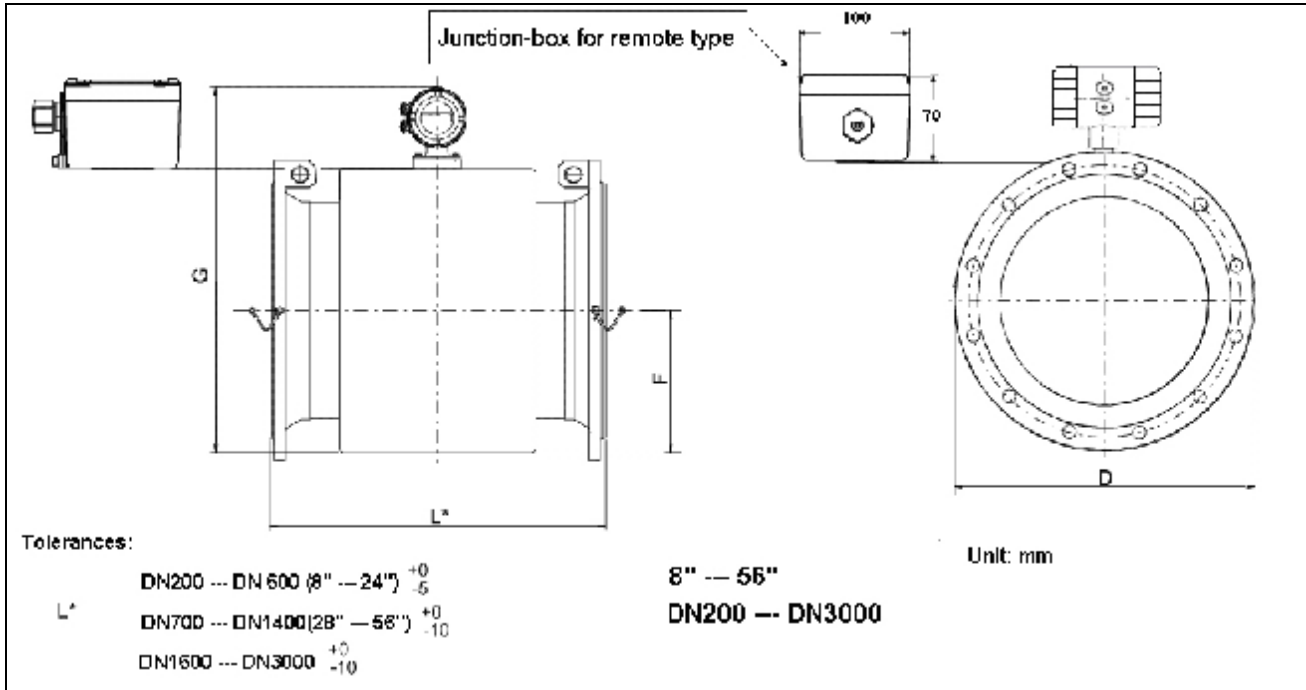
Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
inch	ANSI	inch	inch	inch	inch	inch	inch	inch	n	n	inch	inch	lb	lb
15	150 or 300	7.87	1.89	12.4	2.38	2.62	0.62	0.62	4	4	3.50	3.75	18	19
20		7.87	2.32	12.8	2.75	3.25	0.62	0.75	4	4	3.88	4.62	21	23
25		7.87	2.46	12.99	3.12	3.50	0.62	0.75	4	4	4.25	4.88	26	28
32		7.87	2.64	14.96	3.50	3.88	0.62	0.75	4	4	4.62	5.25	25	30
40		7.87	3.07	14.96	3.88	4.50	0.62	0.88	4	4	5.00	6.12	28	36
50		7.87	3.27	15.16	4.75	5.00	0.75	0.88	4	8	6.00	6.50	31	36
65		7.87	3.77	15.94	5.50	5.88	0.75	0.88	4	8	7.00	7.50	53	59
80		7.87	4.14	16.54	6.00	6.62	0.75	0.88	4	8	7.50	8.25	62	73
100		9.84	5.02	17.91	7.50	7.88	0.75	0.88	8	8	9.00	10.0	71	89
125		9.84	5.52	19.69	8.50	9.25	0.88	0.88	8	8	10.0	11.0	84	112
150		11.81	6.27	19.69	9.50	10.62	0.88	0.88	8	8	11.0	12.5	91	132

Other connection styles and pressure classes can be supplied to customer specification. Please contact manufacturer.

Notes:

- 1) "L" distance is increased 3mm (0.12") when a grounding flange is installed.
- 2) "L" distance is increased 5mm (0.2") when a protection flange at inlet is installed.
- 3) "L" distance is increased 16mm (0.63") when a lining protection flange is installed.
- 4) Approximate weights are for remote flow tube only. For compact type, transmitter weight of 3.5 kg (7.7 lb) should be added to the values in the tables above.

1.2 DN200 ... DN3000 / 8" ... 56" Dimensions



1.2.1 DN200 ... DN600 Dimensions (GB/DIN)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
GB, DIN		L	C	F	1.0	1.6	1.0	1.6	1.0	1.6	1.0	1.6	1.0	1.6
mm	MPa	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
200	1.0 or 1.6	350	170	540	295	295	22	22	8	12	340	340	45	46
250		450	203	600	350	355	22	26	12	12	395	405	67	71
300		500	230	660	400	410	22	26	12	12	445	460	94	103
350		550	260	720	460	470	22	26	16	16	505	520	145	158
400		600	290	780	515	525	26	30	16	16	565	580	180	197
450		600	320	840	565	585	26	30	20	20	615	640	215	242
500		600	358	915	620	650	26	33	20	20	670	715	245	293
600		600	420	1040	725	770	30	36	20	20	780	840	335	418

1.2.2 8" ... 24" Dimensions (ANSI / Metric Units)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
inch	ANSI	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
8	150 or 300	350	191	540	298.5	330.2	22.4	25.4	8	12	343	381	52	80
10		450	223	600	362	387.4	25.4	28.4	12	16	406	445	84	120
12		500	261	660	431.8	450.9	25.4	31.8	12	16	483	521	125	171
14		550	293	720	476.3	514.4	28.4	31.8	12	20	533	584	179	257
16		600	324	780	539.8	571.5	28.4	35.1	16	20	597	648	213	334
18		600	356	840	577.9	628.7	31.8	35.1	16	24	635	711	264	417
20		600	388	915	635	685.8	31.8	35.1	20	24	699	775	311	474
24		600	458	1040	749.3	812.8	35.1	41.1	20	24	813	914	423	690

1.2.3 8" ... 24" Dimensions (ANSI, English units)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
inch	ANSI	inch	inch	inch	inch	inch	inch	inch	n	n	inch	inch	lb	lb
8	150 or 300	13.78	7.52	21.26	11.75	13.0	0.88	1.00	8	12	13.5	15.0	116	176
10		17.72	8.77	23.62	14.25	15.25	1.00	1.12	12	16	16.0	17.5	185	264
12		19.69	10.27	25.98	17.0	17.75	1.00	1.25	12	16	19.0	20.5	277	377
14		21.65	11.52	28.35	18.75	20.25	1.12	1.25	12	20	21.0	23.0	395	568
16		23.62	12.77	30.71	21.25	22.5	1.12	1.38	16	20	23.5	25.5	471	736
18		23.62	14.02	33.07	22.75	24.75	1.25	1.38	16	24	25.0	28.0	583	919
20		23.62	15.27	36.02	25.0	27.0	1.25	1.38	20	24	27.5	30.5	687	1045
24		23.62	18.02	40.94	29.5	32.0	1.38	1.62	20	24	32.0	36.0	934	1521

Other connection styles and pressure classes can be supplied to customer specification. Please contact manufacturer.

Notes:

- 1) "L" distance is increased 4mm (0.16") when a grounding flange is installed.
- 2) "L" distance is increased 8mm (0.32") when a protection flange at inlet is installed.
- 3) "L" distance is increased 20mm (0.79") when a lining protection flange is installed.
- 4) Approximate weights are for remote flow tube only. For compact type, transmitter weight of 3.5 kg (7.7 lb) should be added to the values in the tables above.

1.2.4 DN700 ... DN1400 Dimensions (GB/DIN)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
GB,DIN		L	C	F	0.6	1.0	0.6	1.0	0.6	1.0	0.6	1.0	0.6	1.0
mm	MPa	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
700	0.6 or 1.0	700	448	910	810	840	26	30	24	24	860	895	435	509
800		800	508	1215	920	950	30	33	24	24	975	1015	545	626
900		900	558	1315	1020	1050	30	33	24	28	1075	1115	655	756
1000		1000	615	1430	1120	1160	30	36	28	28	1175	1230	810	935
1200		1200	728	1605	1340	1380	33	39	32	32	1405	1455	875	1051
1400		1400	838	1830	1560	1590	36	42	36	36	1630	1675	1235	1453

1.2.5 28" ... 56" Dimensions (ANSI / Metric Units)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
inch	ANSI	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
28	150 or 300	27.56	18.15	37.8	31.3	33.74	0.87	1.42	40	36	32.95	36.26	1074	1613
32		31.5	20.76	49.61	35.43	38.5	0.87	1.65	48	32	37.05	41.5	1357	2257
36		35.43	23.09	53.54	39.76	42.87	1.02	1.77	44	32	41.61	46.14	1728	2765
40		39.37	25.07	58.66	44.13	46.89	1.18	1.77	44	40	46.26	50.12	2228	3419
48		47.24	29.76	65.35	52.56	55.75	1.30	2.01	44	40	54.8	59.49	2606	4410
56		55.12	34.76	74.41	60.75	65.0	1.30	2.36	60	36	62.99	69.49	3506	6951

1.2.6 28" ... 56" Dimensions (ANSI, English units)

Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
ANSI		L	C	F	150	300	150	300	150	300	150	300	150	300
inch	ANSI	inch	inch	inch	inch	inch	inch	inch	n	n	inch	inch	lb	lb
28	150 or 300	27.56	18.15	37.8	31.3	33.74	0.87	1.42	40	36	32.95	36.26	1074	1613
32		31.5	20.76	49.61	35.43	38.5	0.87	1.65	48	32	37.05	41.5	1357	2257
36		35.43	23.09	53.54	39.76	42.87	1.02	1.77	44	32	41.61	46.14	1728	2765
40		39.37	25.07	58.66	44.13	46.89	1.18	1.77	44	40	46.26	50.12	2228	3419
48		47.24	29.76	65.35	52.56	55.75	1.30	2.01	44	40	54.8	59.49	2606	4410
56		55.12	34.76	74.41	60.75	65.0	1.30	2.36	60	36	62.99	69.49	3506	6951

1.2.7 DN1600 ... DN3000 Dimensions (GB/DIN)

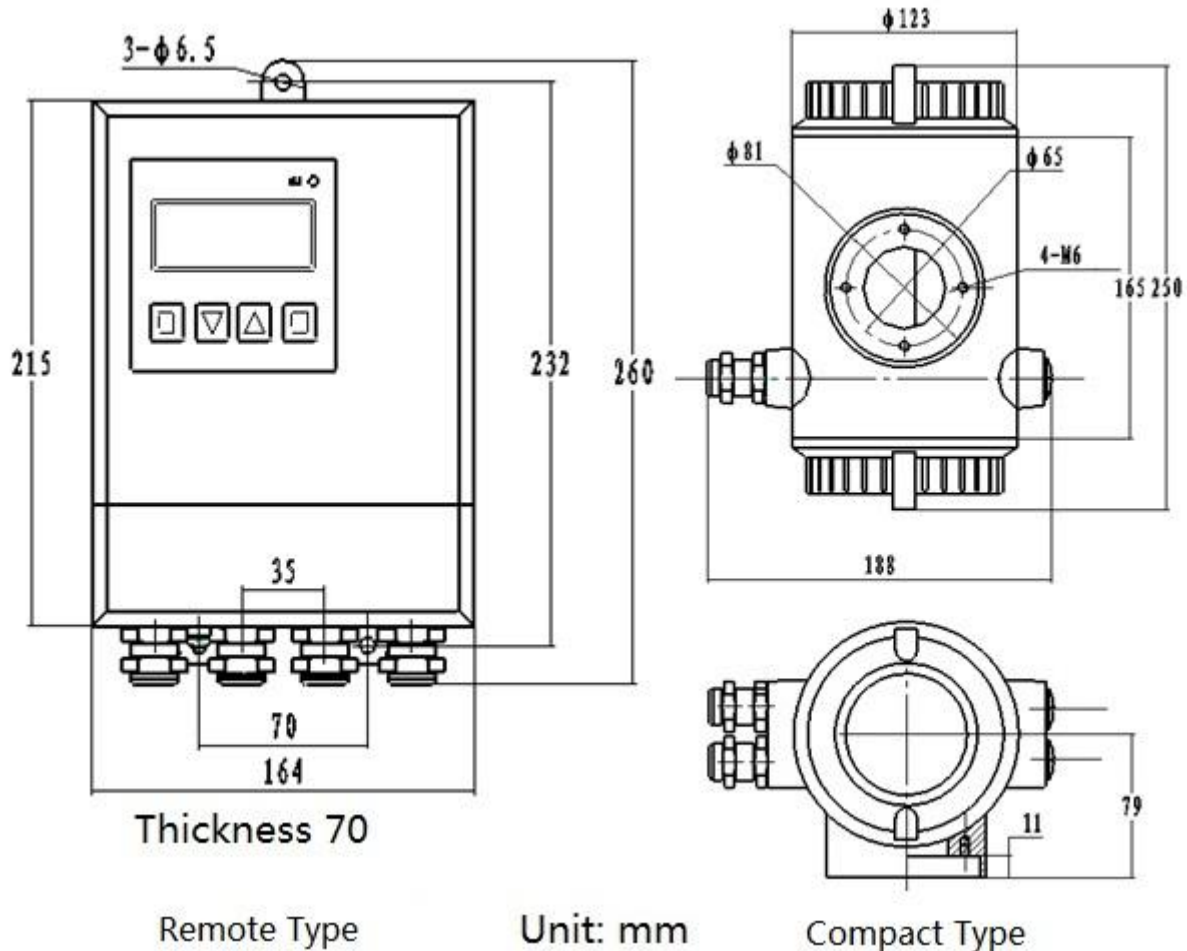
Nominal Size	Nominal Pressure Class	Dimensions			Bolt information						OD of flange (D)		Approximate weight	
					Diameter of Bolt Circle (K)		Diameter of Bolt Holes (A)		Number of bolts (n)					
GB, DIN		L	C	F	0.2 5	0.6	0.2 5	0.6	0.2 5	0.6	0.2 5	0.6	0.2 5	0.6
mm	MPa	mm	mm	mm	mm	mm	mm	mm	n	n	mm	mm	kg	kg
1600	0.25 or 0.6	1600	915	2180	1730	1760	30	36	40	40	1790	1830	1496	1555
1800		1800	1023	2380	1930	1970	30	39	44	44	1990	2045	1993	2085
2000		2000	1133	2580	2130	2180	30	42	48	48	2190	2265	2459	2610
2200		2200	1238	2680	2340	2390	33	42	52	52	2405	2475	2648	2830
2400		2400	1343	2890	2540	2600	33	42	56	56	2605	2685	3070	3310
2600		2600	1453	3110	2740	2810	33	48	60	60	2805	2905	3539	3875
2800		2800	1558	3320	2960	3020	36	48	64	64	3030	3115	4604	4930
3000		3000	1658	3480	3160	3220	36	48	68	68	3230	3315	5214	5580

Other connection styles and pressure classes can be supplied to customer specification. Please contact manufacturer.

Notes:

- 1) Approximate weights are for remote flow tube only. For compact type, transmitter weight of 3.5 kg (7.7 lb) should be added to the values in the tables above.

1.3 Transmitter Dimensions



Model RBEF Electromagnetic Flow Meter Ordering Code

RBEF-	DN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	15

1 Nominal Diameter(mm) / [inches] ⁽¹⁾

0015 [½"]	0100 [4"]	0450 [18"]	1400 [56"]
0020 [¾"]	0125 [5"]	0500 [20"]	1600
0025 [1"]	0150 [6"]	0600 [24"]	1800
0032 [1¼"]	0200 [8"]	0700 [28"]	2000
0040 [1½"]	0250 [10"]	0800 [32"]	2200
0050 [2"]	0300 [12"]	0900 [36"]	2400
0065 [2½"]	0350 [14"]	1000 [40"]	2600
0080 [3"]	0400 [16"]	1200 [48"]	3000

2 Flange Rating ⁽¹⁾

02	0.25 MPa	1600 ... 3000
06	0.6 MPa	700 ... 3000
10	1.0 MPa	200 ... 1400
16	1.6 MPa	15 ... 600
20	ANSI Class 150	15 ... 1400
40	4.0 MPa	15 ... 150
50	ANSI Class 300	15 ... 1400
AA	Special	

3 Electrode Material

1	316L Stainless Steel
3	Hastelloy C-22
4	Hastelloy B-10
5	Titanium
6	Tantalum
7	Platinum / Iridium Alloy
8	Tungsten Coated Stainless Steel
9	ceramic

4 Lining Material

1	Neoprene (Hard rubber)	≤ 3000
2	PTFE	≤ 1000
3	Polyurethane	≤ 300
4	PFA	≤ 250
5	Tefzel	≤ 250
6	PFA with Wire Net	80 ... 250
7	Tefzel with Wire Net	80 ... 250
8	Ceramic	15 ... 200

5 Grounding and Lining Protection

0	Flange ground	15 ... 3000
1	Earth ring	15 ... 250
2	Ground electrode	50 ... 3000
3	Inlet protection ring	50 ... 3000

6 Max. Process Temperature

A	80°C	All Linings
B	120°C	Neoprene / PTFE / PFA / Tefzel
C	180°C	PTFE only

7 Environmental Protection Class

1	IP65
2	IP67 (Compact Type Only)
3	IP68 (Remote Type Only)

8 Explosion Proofing

1	None
2	Ex DE IIC T6

9 Configuration – sensor/transmitter

1	Compact (15 ... 1000)
2	Remote (with 10m cable) ⁽²⁾
3	Wafer

10 Power Supply

A	AC: 85 ... 265 VAC / 45 ... 63Hz
D	DC: 18 ... 36 VDC

11 Display and Programming

2	2 line LCD display + keypad programming
3	3 line LCD display + keypad programming

12 Output and Input

0	Basic Configuration (current, pulse and contact outputs)
2	Basic Configuration + RS485
3	Basic Configuration + GPRS
4	Basic Configuration + MODBUS

13 Calibration Specification

1	3 point, 0.5% accuracy
2	3 point, 0.25% accuracy
3	Special

14 Flow Tube Configuration

1	Flange Type	15 ... 3000
D	DIN	
A	ANSI	
O	Others(pls clarify)	
2	Flange type with removable electrodes	15 ... 3000
3	Flange material	
C	Carbon Steel	
S	304 Stainless Steel	

15 Special Function

O	No	R	IR Remote
T	Power off timer	H	Cumulative hours
Q	Quantitative control	J	Relay Output

(1) Line size selection will be inches for ANSI Class 150/300 rating selection, DIN size for all other ratings

(2) Order longer cable length separately

(3) Ceramic liner and electrodes is with wafer type only

Electromagnetic Flowmeter Application Worksheet

RB	Flow meter Application Worksheet (Electromagnetic flow meter)	
Customer Name		
Contact		
Tel/Fax/Email		
Project Name		
Tag.No		
	Process Parameters	
Pipe Spec / Material		
Process Connection		
Fluid Type		
Max Flow		
Nor. Flow		
Min. Flow		
Fluid Temperature		
Operating Pressure		
Measuring range		
Power Supply	85 --- 265 VAC or 16 --- 36 VDC	
Accuracy % required	(±0.5 or ±0.2)	
	Manufacturers Configuration Sheet	
Nominal Diameter mm		
Nominal pressure MPa		
Electrode Material		
Lining Material		
Grounding/ Protection		
Temperature Rating		
IP Protection Class		
EX Certification		
Configuration	Compact or Remote	
Power Supply	85 --- 265 VAC or 16 --- 36 VDC	
Programming Display		
Input/output signal		
Inspection		
Connection type		
Electric connection		
Special signal cable		
Mating Flange Set		
Accessory 1		
Accessory 2		
Model Number	RBEF-	
Remark		