

ELECTROMAGNETIC FLOWMETER

ETRANS –MR–S SERIES SQUARE COMPACT TYPE Datasheet

PULSE | FREQUENCY |
RS485 MODBUS | 4...20MA
(OPTIONAL HART)

Precise Measurement,
Ultimate Control

www.enelsan.com



ELECTROMAGNETIC FLOWMETER



1 4-BUTTON 3-LINE
30-DIGIT LCD PANEL

2 WELDED BODY
DESIGN

3 CORROSION-RESISTANT
OUTER COATING

4 TEFLON / EBONITE /
INTERIOR LINING OPTIONS

WORKING PRINCIPLE

Electromagnetic flow measurement: This is a flow measurement method based on the principle of the electromagnetic field.

The physical foundations of this principle are based on the discovery made by English physicist Michael Faraday in 1831, who found that an electric current could be generated with the help of a magnetic field. In 1941, Swiss scientist Bonaventura Thurlemann applied this knowledge to conductive liquids flowing through pipes and produced the world's first electromagnetic flowmeter.

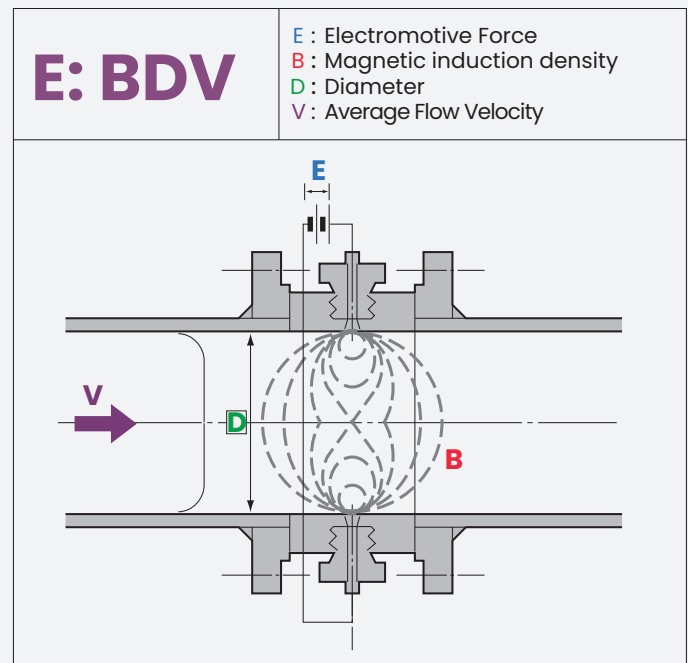
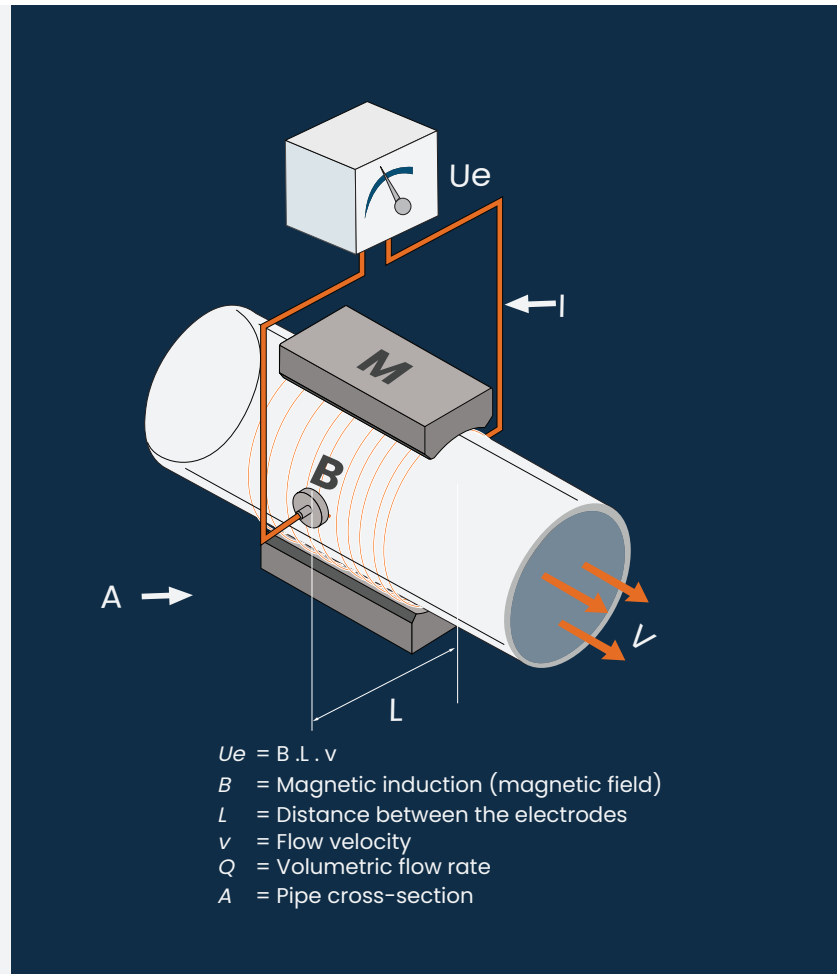
The Etrans MR-S Series electromagnetic flowmeter contains two coils. These coils, with the help of metal blocks placed on them, create a continuous magnetic field across the cross-sectional area of the measurement tube. Two electrodes that detect voltage are placed perpendicular to each other inside the measurement tube. The insulating material coated on the inner surface prevents the formation of short circuits between the conductive liquid and the metal measurement tube.

When there is no flow, no electrical voltage is generated between the two electrodes. In the conductive liquid, negatively and positively charged ions are present in equal amounts. When flow starts, the magnetic field applies a force to the charged ion particles in the liquid. As a result, the negatively and positively charged ions move apart and head toward opposite sides of the measurement tube. This leads to an electrical voltage detected by the electrodes.

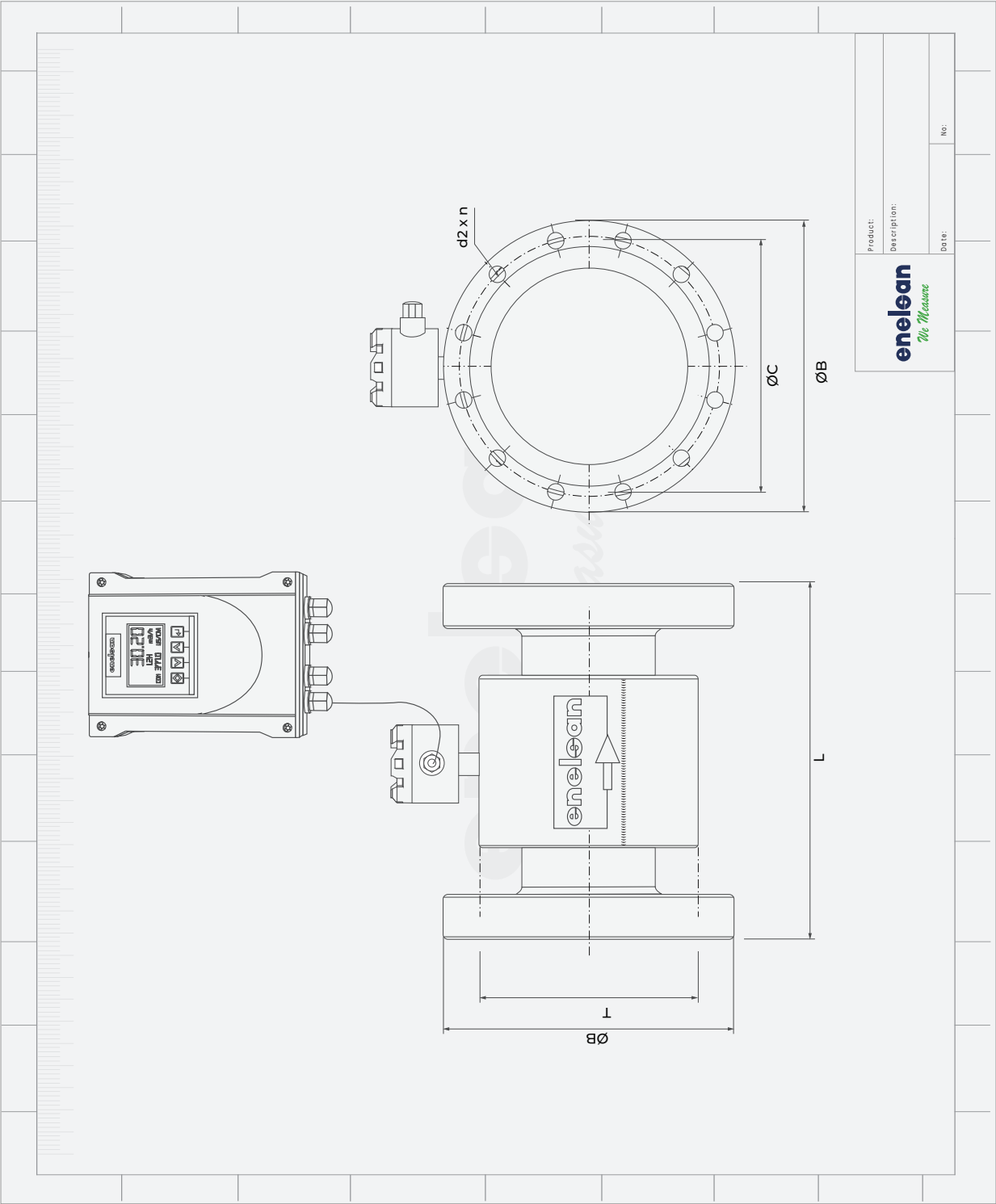
This voltage is directly proportional to the flow rate within the pipe. With the known volume and speed information of the measurement tube, the instantaneous flow rate can be calculated. As the flow rate increases, the separation of charged particles also increases, and thus, the voltage between the electrodes will rise.

The measurement electrodes may sometimes detect magnetic noise present in the environment. It is essential to differentiate this noise signal from the actual measurement signal. To achieve this, the magnetic field must be generated with pulsed direct current. With pulsed direct current, the positions of the charged ions between the electrodes are continuously shifted, eliminating the effect of magnetic noise, allowing for precise and stable flow measurement.

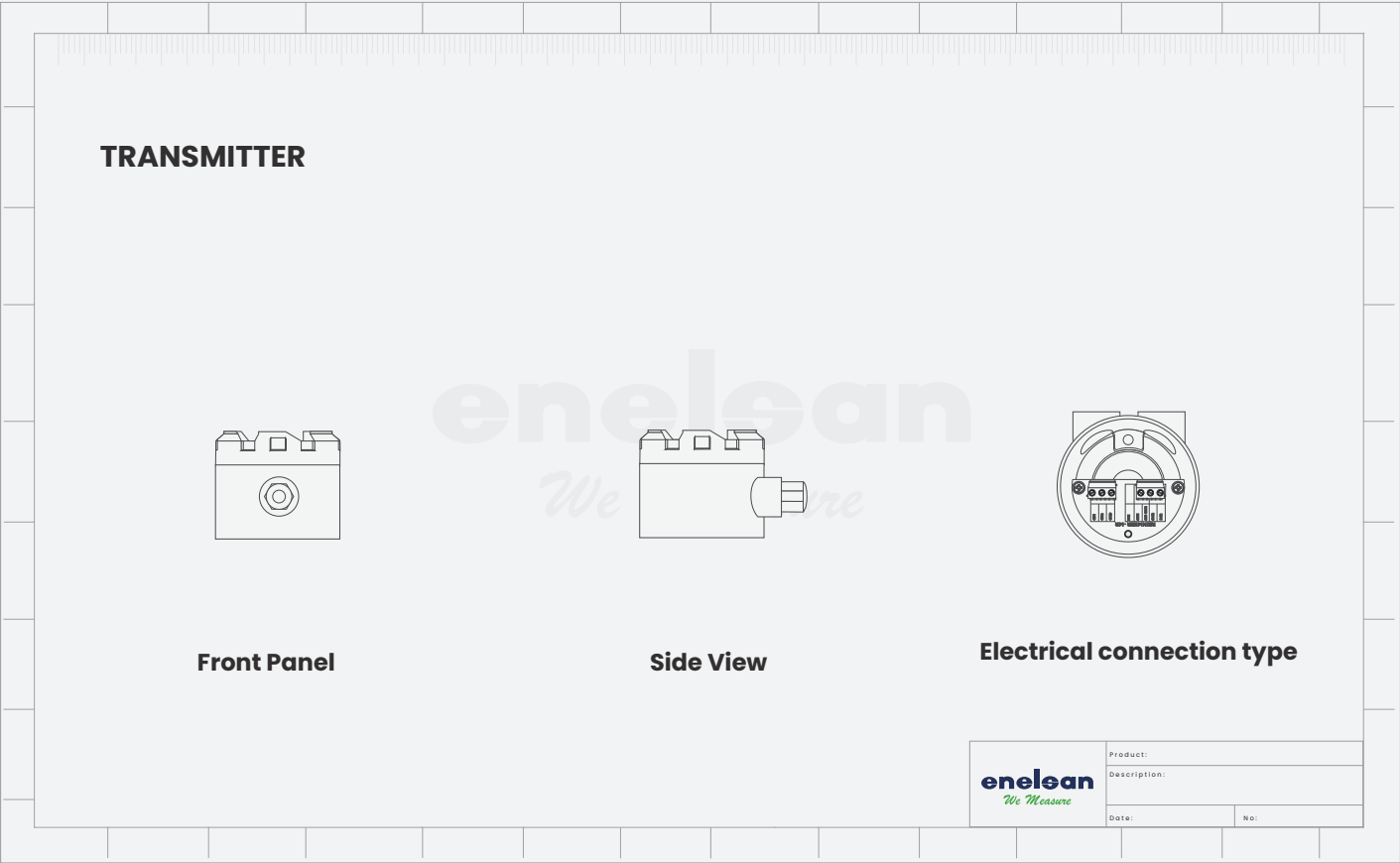
Flow rate information with the electromagnetic measurement principle is calculated using the simplified formula below.



TECHNICAL DRAWING



TECHNICAL DRAWING



APPLICATION AREAS



Chemical Industry

- Chemical Industry: Offers reliable solutions for the volumetric flow measurement of acids, alkalis, and corrosive chemicals, supported by a wide range of internal coating and electrode material options.



Agriculture

- Agriculture: Suitable for measuring water-based and conductive liquids in agricultural processes and irrigation systems.



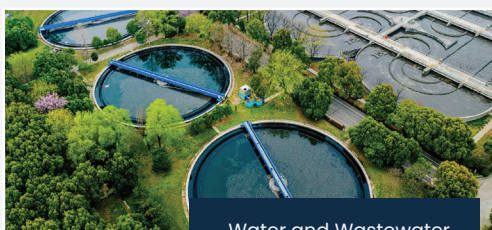
Paper Industry

- Paper Industry: Highly effective for the volumetric flow measurement of specific products such as pastes and pulps.



Food & Beverages

- Food & Beverages: Reliable for the volumetric flow measurement of conductive and water-based liquids used in food processing.



Water and Wastewater

- Water and Wastewater: Easily used for volumetric flow measurements of water and wastewater applications, as well as any water-based or conductive liquids.



Mining

- Mining: Widely used for volumetric flow measurements of special, challenging products like ores, sludges, and slurries.

TECHNICAL SPECIFICATIONS

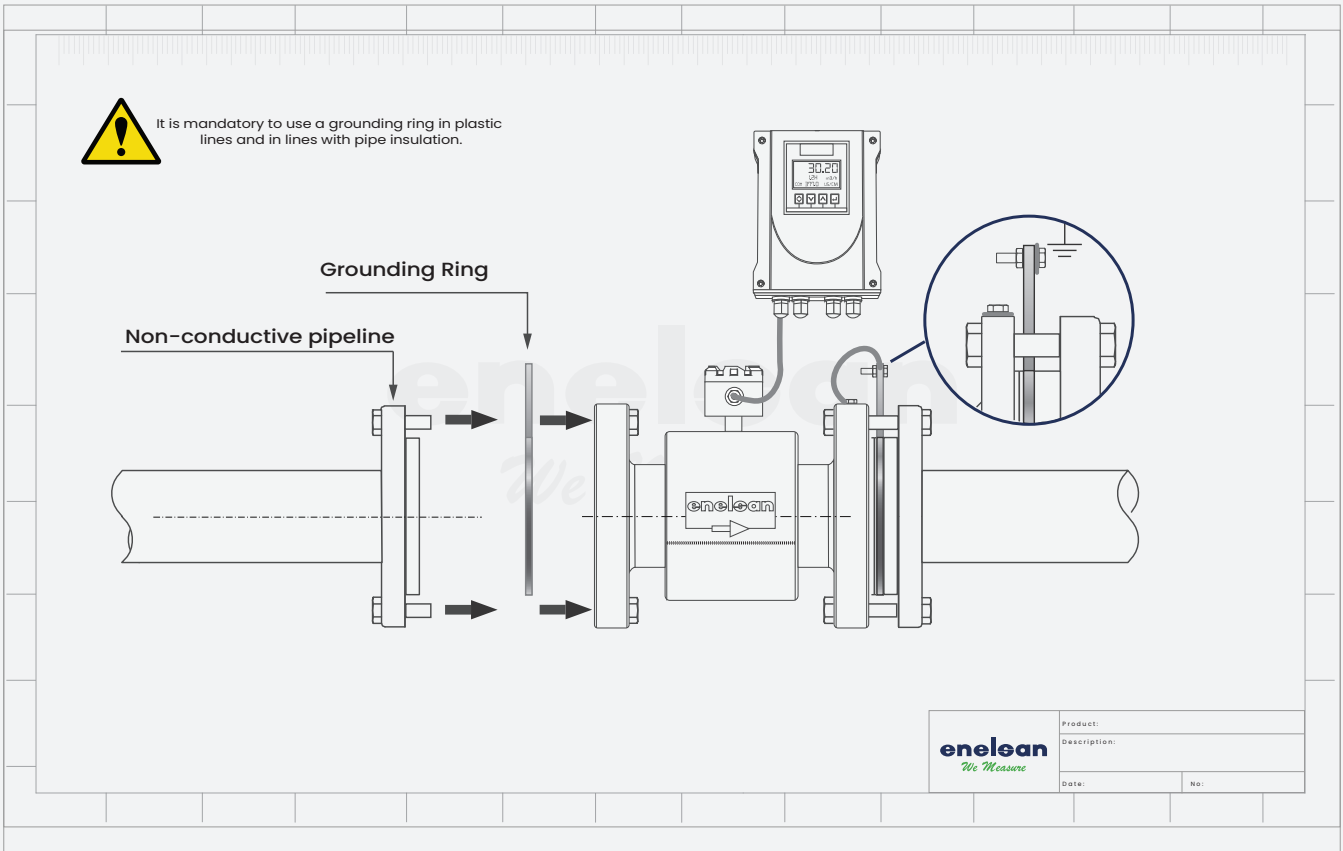
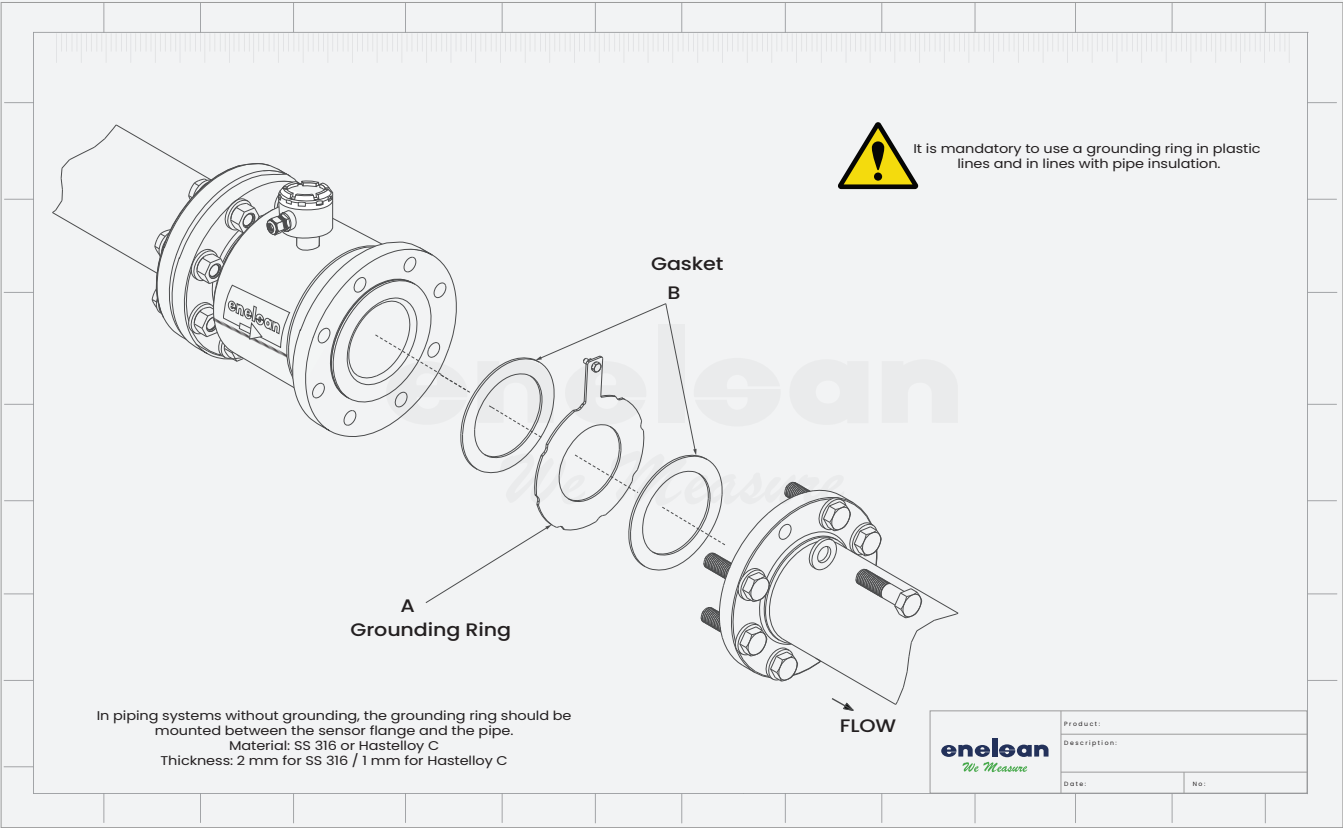
— BODY

Body Structure	Cast aluminum mold (standard)	Stainless Steel 1.4301 (Optional)
Measurement Tube Material	316 Stainless Steel	
Nominal Diameters	DN15 – DN3000 DIN EN 1092-1 From B ½" ... 12" ASME 16,5 RF	
Flange Material	Alloy Steel ST 37-2 (Standard)	Stainless Steel 1.4301 (Optional)
Nominal Pressures	DN15-DN80	PN 40 (standard)
	PN16, PN25, PN10 (Optional)	
	DN100-DN150	PN 16 (standard)
Nominal Pressures	PN10, PN25, PN40 (Optional)	
	DN200-DN3000	PN 10 (standard)
	PN16, PN25, PN40,PN6 (Optional)	
Process Temperature	-10 ... +80 °C	Ebonite
	-10 ... +70 °C	EPDM (Soft Rubber)
	-20 ... +150 °C	PTFE
	-20 ... +120 °C	Black PTFE
	-40 ... +180 °C	Ceramic
Internal Lining Material	Ebonite, EPDM, PTFE, Black PTFE, Ceramic	
Measurement Electrode Mat.	316 Stainless Steel, Hastelloy C22, Tantalum, Titanium, Platinum Rhodium	
Grounding Electrode Mat.	316 Stainless Steel, Hastelloy C22, Tantalum, Titanium, Platinum Rhodium	
Grounding Ring	The grounding ring should be preferred when the pipe material is made of plastic.	
Process Conductivity	≥ 5 µS/cm	
Measurement Speed Range	0,02 ... 12 m/s	
Accuracy	% 0.2	
Protection Class	IP67 (Compact Model) / IP68 (Separated Model)	

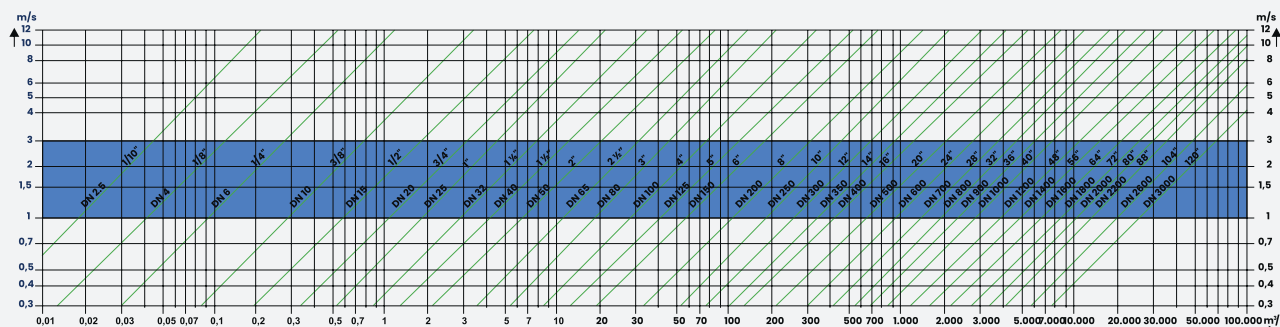
— CYLINDRICAL TRANSMITTER

Body Material	Die-cast Aluminum	
Mounting Type	Square Compact	
Local Display	220 VAC / 24 VDC (one can be selected)	Battery (optional)
Local Display	Backlight LCD Display 64x128	
Display Languages	Turkish, English, German, Spanish (2 languages can be selected)	
Output Signals	Standard (4-20 mA, 0-10V, Frequency, Pulse) Alarm/Status = 2 x Relay Output	
Digital Input	Start/stop flow reading / Clear errors / Reset total flow	
Temperature	-20 ... +60 °C (Depending on process temperature)	
Communications	RS485 MODBUS (Standard) Wifi, Bluetooth, (Standard)	
Data Logging	Puls, Frekans, RS485 MODBUS, 4...20mA, (Opsiyonel HART)	
Protection Class	IP67	

POSITION OF FLANGE SEALS



FLOW RATE / DIAMETER / VELOCITY TABLE

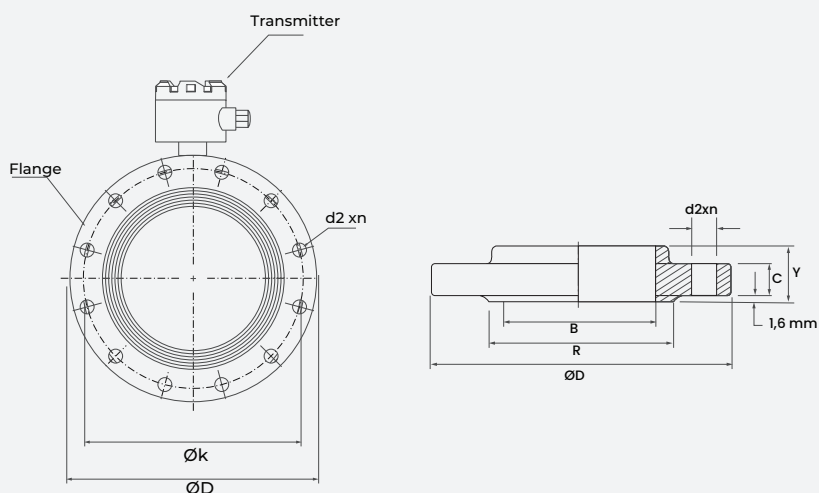


- 1- The appropriate product diameters can be selected based on the flow rate information.
- 2- The appropriate product diameters can be selected based on the velocity information.
- 3- The flow measurement range can be determined based on the diameter information.
- 4- The most stable range for measurement should be considered as 1-3 m/s.

DIAMETER / FLOW VALUES

DN (mm)	DIAMETER	MIN. FLOW RATE (m³/h)	MAX. FLOW RATE (m³/h)	PRECISE MEASUREMENT RANGE (m³/h)
DN 15	1/2"	0,18	8,5	0,6-1,8
DN 20	3/4"	0,35	15	1,2-3,2
DN 25	1"	0,6	22	1,8-4,8
DN 32	1 1/4"	0,85	35	2,8-8,0
DN 40	1 1/2"	1.3	55	4,2-15,0
DN 50	2"	2,2	85	6,8-22,0
DN 65	2 1/2"	3,6	150	13-32
DN 80	3"	5,5	210	18-48
DN 100	4"	8,5	320	28-48
DN 125	5"	13	550	42-130
DN 150	6"	18	750	58-180
DN 200	8"	32	1500	120-320
DN 250	10"	52	2020	180-480
DN 300	12"	78	3010	250-700
DN 350	14"	100	4010	350-900
DN 400	16"	140	5050	440-1400
DN 500	20"	220	7880	650-2000
DN 600	24"	300	10030	950-2800
DN 700	28"	420	18000	1500-3500
DN 800	32"	550	22000	1800-4800
DN 900	36"	700	28000	2400-6000
DN 1000	40"	850	32000	2800-8000
DN 1200	48"	1200	48000	3800-14000
DN 1400	56"	1600	58000	5000-16000
DN 1600	64"	2200	88000	6500-22000

ANSI 15 - 300 Flange Dimensions



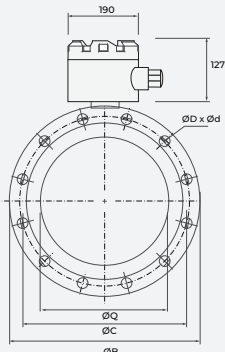
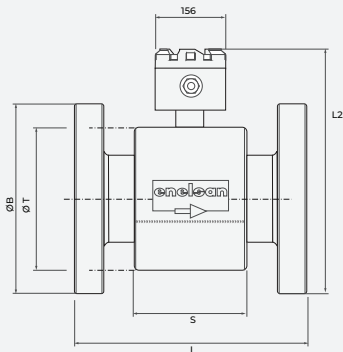
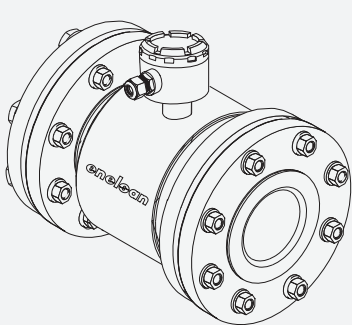
SLIP ON FLANGE CLASS 150
(ASME B 16.5 + MSS - SP 44 - 1996)
BS 3293

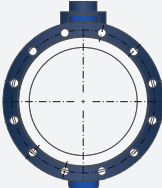
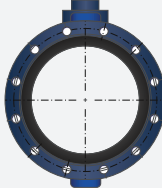
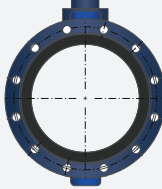
PIPE		D	C min	R	DRILLINGS			B min	X	Y	WEIGHT kg
DN	NPS				n	K	d ₂				
15	1/2"	89	11,2	34,9	4	60,3	15,8	22,4	30	16	0,8
20	3/4"	99	12,7	42,9	4	69,8	15,8	27,7	38	16	0,9
25	1"	108	14,3	50,8	4	79,4	15,8	34,5	49	17	1
32	1 1/4"	117	15,7	63,5	4	88,9	15,8	43,2	59	21	1,3
40	1 1/2"	127	17,5	73	4	98,4	15,8	49,5	65	22	1,5
50	2"	152	19,1	92,1	4	120,6	19	62	78	25	2,3
65	2 1/2"	178	22,3	104,8	4	139,7	19	74,7	90	29	3,7
80	3"	190	23,9	127	4	152,4	19	90,7	108	30	4,2
100	4"	229	23,9	157,2	8	190,5	19	116,1	135	33	5,9
125	5"	254	23,9	185,7	8	215,9	22,2	143,8	164	37	7
150	6"	279	25,4	215,9	8	241,3	22,2	170,7	192	40	8,5
200	8"	343	28,5	269,9	8	298,4	22,2	221,5	246	44	13,5
250	10"	406	30,2	323,8	12	362	25,4	276,4	305	49	19,5
300	12"	483	31,8	381	12	431,8	25,4	327,2	365	56	29

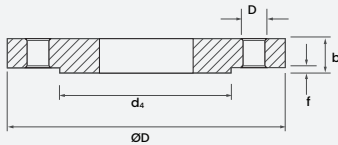
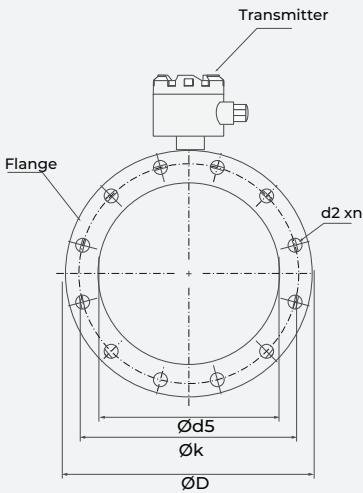
SLIP ON FLANGE CLASS 300
(ASME B 16.5 + MSS - SP 44 - 1996)
BS 3293

PIPE		D	C min	R	DRILLINGS			B min	X	Y	WEIGHT kg
DN	NPS				n	K	d ₂				
15	1/2"	95	14,2	34,9	4	66,7	15,8	22,4	38	22	1,2
20	3/4"	117	15,7	42,9	4	82,6	19	27,7	48	25	1,3
25	1"	124	17,5	50,8	4	88,9	19	34,5	54	27	1,4
32	1 1/4"	133	19	63,5	4	98,4	19	43,2	64	27	1,8
40	1 1/2"	156	20,6	73	4	114,3	22,2	49,5	70	30	2,5
50	2"	165	22,4	92,1	8	127	19	62	84	33	3
65	2 1/2"	190	25,4	104,8	8	149,2	22,2	74,7	100	38	4,5
80	3"	210	28,4	127	8	168,3	22,2	90,7	117	43	6
100	4"	254	31,8	157,2	8	200	22,2	116,1	146	48	10,1
125	5"	279	35	185,7	8	235	22,2	143,8	178	51	12,5
150	6"	318	36,6	215,9	12	269,9	22,2	170,7	206	52	17,5
200	8"	381	41,1	269,9	12	330,2	25,4	221,5	260	62	26
250	10"	444	47,8	323,8	16	387,4	28,5	276,4	320	66	28
300	12"	521	38,1	381	16	450,8	31,8	327,2	375	73	52

Flowmeter Connection Dimensions

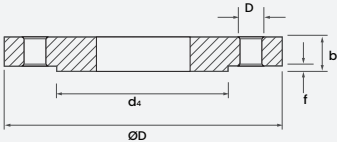
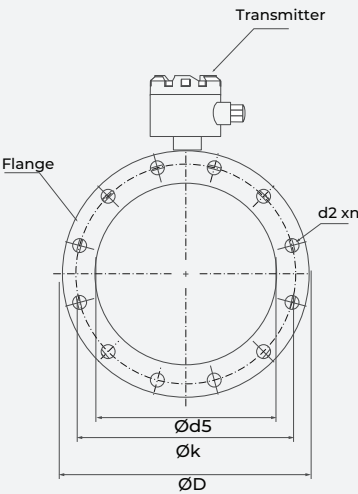


Material Type		DN (mm)	Pressure Class	Flange								Number of holes (d)	Bolt Diameter
				L	L2	B	C	S	T	D			
 Teflon	Mold system	15	40 Bar	150	310	95	65	65	110	14	4	M12	
		20		150	310	105	75	65	110	14	4	M12	
		25		200	310	115	85	80	110	14	4	M12	
		32		200	310	140	100	80	110	18	4	M16	
		40		200	310	150	110	80	110	18	4	M16	
		50		200	340	165	125	80	140	18	4	M16	
		65		200	360	185	145	85	160	18	8	M16	
		80		200	360	200	160	85	160	18	8	M16	
		100	16Bar	250	410	220	180	125	210	18	8	M16	
		125		250	410	250	210	125	210	18	8	M16	
 Ebonite	Mold system	150	16Bar	300	470	285	240	155	270	22	8	M20	
		200		350	520	340	295	175	320	22	8	M20	
		250	10Bar	400	570	395	350	235	370	22	12	M20	
		300		500	650	445	400	240	450	22	12	M20	
		350		500	670	505	460	240	470	22	16	M20	
		400		600	730	565	515	320	530	26	16	M24	
		450		600	790	615	565	320	590	26	20	M24	
		500		600	830	670	620	370	630	26	20	M24	
		600		600	940	780	725	400	740	30	20	M27	
		700		700	1050	895	840	400	850	30	24	M27	
 Rubber	Welded System	800	800	1170	1015	950	500	970	33	24	M30		
		900	900	1270	1115	1050	600	1070	33	28	M30		
		1000	1000	1350	1230	1160	700	1150	36	28	M33		
		1200	1200	1590	1455	1380	800	1390	39	32	M36		
		1400	1400	1790	1675	1590	800	1590	42	36	M39		
		1600	1600	1960	1915	1820	1000	1760	48	40	M45		
		1800	1800	2170	2115	2020	1000	1970	48	44	M45		
		2000	2000	2360	2325	2230	1000	2160	48	48	M45		



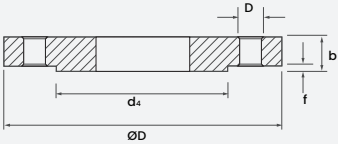
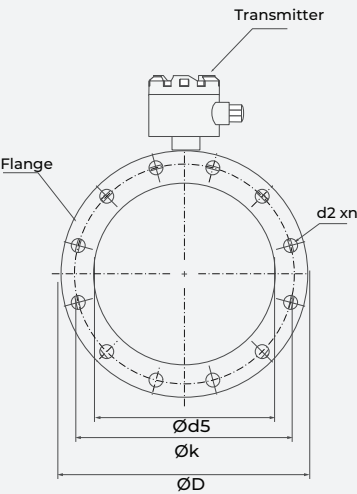
Pn 6 Steel Flat Flange
TS-EN 1092-1 /
TYPE 01/ DIN 2573

PIPE		FLANGE				FOREHEAD PROTRUSION		HOLES			WEIGHT	
DN	d ₅	D	b		k	d ₄	f	n	Screw	d ₂	EN 1092 - 1	DIN2501
			EN 1092-1	DIN2501							kg/ad - kg/pcs	kg/ad - kg/pcs
15	22	80	12	12	55	40	2	4	M10	11	0,35	0,35
20	27,5	90	14	14	65	50	2	4	M10	11	0,53	0,53
25	34,5	100	14	14	75	60	2	4	M10	11	0,65	0,65
32	43,5	120	16	14	90	70	2	4	M12	14	1,05	0,91
40	49,5	130	16	14	100	80	3	4	M12	14	1,20	1,00
50	61,5	140	16	14	110	90	3	4	M12	14	1,30	1,10
65	77,5	160	16	14	130	110	3	4	M12	14	1,60	1,40
80	90,5	190	18	16	150	128	3	4	M16	18	2,60	2,30
100	116	210	18	16	170	148	3	4	M16	18	2,90	2,50
125	141,5	240	20	18	200	178	3	8	M16	18	3,90	3,50
150	170,5	265	20	18	225	202	3	8	M16	18	4,30	3,80
200	221,5	320	22	20	280	258	3	8	M16	18	6,30	5,60
250	276,5	375	24	22	335	312	3	12	M16	18	8,20	7,50
300	327,5	440	24	22	395	365	4	12	M20	22	10,60	9,60
350	359,5	490	26	22	445	415	4	12	M20	22	15,30	12,70
400	411	540	28	22	495	465	4	16	M20	22	18,20	13,90
450	462	595	30	22	550	520	4	16	M20	22	22,70	16,10
500	513,5	645	30	24	600	570	4	20	M20	22	24,40	19,10
600	616,5	755	32	24	705	670	5	20	M24	26	31,50	22,80
700	718	860	40	24	810	775	5	24	M24	26	47,50	27,80
800	819	975	44	24	920	880	5	24	M27	30	65,30	33,50
900	920	1075	48	26	1020	980	5	24	M27	30	79,80	40,80
1000	1022	1175	52	26	1120	1080	5	28	M27	30	94,00	44,00
1100	1126	1300	54	28	1240	1202	5	28	M30	33	136,00	64,00
1200	1225	1405	60	28	1340	1295	5	32	M30	33	153,00	67,00
1300	1326	1520	65	30	1450	1400	5	32	M33	36	199,00	85,00
1400	1426	1630	72	32	1560	1510	5	36	M33	36	246,00	104,00
1500	1526	1730	74	32	1660	1610	5	36	M33	36	273,00	109,00
1600	1626	1830	80	34	1760	1710	5	40	M33	36	311,00	126,00
1800	1826	2045	88	36	1970	1920	5	44	M36	39	411,00	160,00
2000	2026	2265	96	38	2180	2125	5	48	M39	42	541,00	204,00
2200	2226	2475	Customer request Regarding it will be determined.	42	2390	2335	5	52	M39	42	-	273,00
2400	2426	2685		44	2600	2545	5	56	M39	42	-	323,00



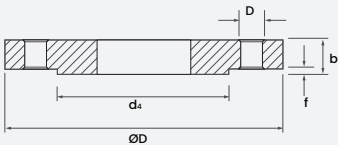
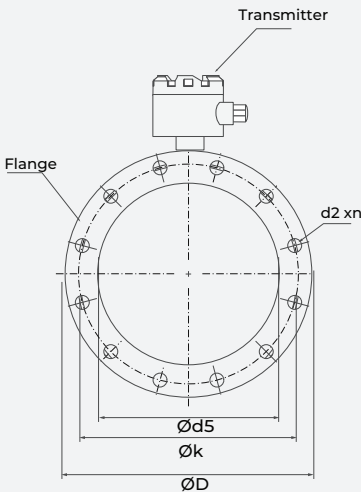
Pn 10 Steel Flat Flange
TS-EN 1092-1 /
TYPE 01 / DIN 2576

PIPE	FLANGE					FOREHEAD PROTRUSION		HOLES			WEIGHT	
DN	d_5	D	b		k	d_4	f	n	Screw	d_2	EN 1092 - 1	DIN2501
			EN 1092-1	DIN2501							kg/ad - kg/pcs	kg/ad - kg/pcs
15	22	95	14	14	65	45	2	4	M12	14	0,59	0,59
20	27,5	105	16	16	75	58	2	4	M12	14	0,85	0,85
25	34,5	115	16	16	85	68	2	4	M12	14	1,01	1,01
32	43,5	140	18	16	100	78	2	4	M16	18	1,70	1,50
40	49,5	150	18	16	110	88	3	4	M16	18	1,80	1,60
50	61,5	165	20	18	125	102	3	4	M16	18	2,50	2,20
65	77,5	185	20	18	145	122	3	(1092)8/4 (DIN)	M16	18	3,00	2,70
80	90,5	200	20	20	160	138	3	8	M16	18	3,30	3,30
100	116	220	22	20	180	158	3	8	M16	18	4,00	3,60
125	141,5	250	22	22	210	188	3	8	M16	18	5,00	5,00
150	170,5	285	24	22	240	212	3	8	M20	22	6,50	6,00
200	221,5	340	24	24	295	268	3	8	M20	22	8,50	8,50
250	276,5	395	26	26	350	320	3	12	M20	22	11,00	11,00
300	327,5	445	26	26	400	370	4	12	M20	22	12,30	12,30
350	359,5	505	30	26	460	430	4	16	M20	22	20,30	17,40
400	411	565	32	26	515	482	4	16	M24	26	25,70	2,50
450	462	615	36	28	565	532	4	20	M24	26	31,50	22,20
500	513,5	670	38	28	620	585	4	20	M24	26	37,90	27,30
550	564	730	40	28	675	635	5	20	M24	26	47,60	33,00
600	616,5	780	42	28	725	685	5	20	M27	30	50,80	32,60
700	718	895	50	30	840	800	5	24	M27	30	77,10	44,50
800	819	1015	56	32	950	905	5	24	M30	33	109,50	60,10
900	920	1115	62	34	1050	1005	5	28	M30	33	133,90	70,60
1000	1022	1230	70	34	1160	1110	5	28	M33	36	179,00	83,00
1100	1126	1340	76	36	1270	1220	5	32	M33	36	224,00	102,00
1200	1225	1455	83	38	1380	1330	5	32	M36	39	280,00	123,00
1300	1326	1575	Customer request Regarding it will be determined.	38	1490	1440	5	32	M39	42	-	145,00
1400	1426	1675		42	1590	1535	5	36	M39	42	-	172,00
1500	1530	1785		44	1700	1648	5	36	M39	42	-	200,00
1600	1626	1915		46	1820	1760	5	40	M45	48	-	250,00
1800	1826	2115		50	2020	1960	5	44	M45	48	-	304,00
2000	2026	2325		54	2230	2170	5	48	M45	48	-	379,00
2200	2226	2550		58	2440	2370	5	52	M52	55	-	491,00
2400	2426	2760		62	2650	2570	5	56	M52	55	-	592,00
2600	2626	2960		66	2680	2780	5	60	M52	55	-	678,00



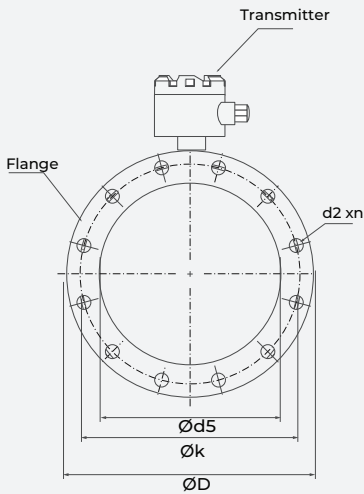
Pn 16 Steel Flat Flange
TS-EN 1092-1 /
TYPE 01 / DIN 2576

PIPE	FLANGE					FOREHEAD PROTRUSION		HOLES			WEIGHT	
DN	d _s	D	b		k	d ₄	f	n	Screw	d ₂	EN 1092 - 1	DIN2501
			EN 1092-1	DIN2501							kg/ad - kg/pcs	kg/ad - kg/pcs
15	22	95	14	14	65	45	2	4	M12	14	0,59	0,69
20	27,5	105	16	16	75	58	2	4	M12	14	0,85	0,97
25	34,5	115	16	16	85	68	2	4	M12	14	1,01	1,15
32	43,5	140	18	18	100	78	2	4	M16	18	1,68	1,68
40	49,5	150	18	18	110	88	3	4	M16	18	1,80	1,80
50	61,5	165	20	20	125	102	3	4	M16	18	2,50	2,50
65	77,5	185	22	22	145	122	3	8	M16	18	3,20	3,20
80	90,5	200	24	24	160	138	3	8	M16	18	4,00	4,00
100	116	235	26	24	190	162	3	8	M20	22	5,60	5,20
125	141,5	270	28	26	220	188	3	8	M24	26	7,60	7,00
150	170,5	300	30	28	250	218	3	8	M24	26	9,60	8,90
200	221,5	360	32	30	310	278	3	12	M24	26	13,50	12,60
250	276,5	425	35	32	370	335	3	12	M27	30	19,10	17,40
300	327,5	485	38	34	430	395	4	16	M27	30	25,00	22,20
350	359,5	555	42	38	490	450	4	16	M30	33	39,60	35,60
400	411	620	48	40	550	505	4	16	M33	36	55,00	45,40
450	462	670	54	42	600	555	4	20	M33	36	66,90	51,40
500	513,5	730	58	44	660	615	4	20	M33	36	83,90	62,80
600	616,5	845	68	46	770	720	5	20	M36	39	122,00	81,00
700	718	960	85	46	875	820	5	24	M39	42	184,00	97,00
800	819	1085	95	50	990	930	5	24	M45	48	257,00	131,00
900	920	1185	Customer request Regarding it will be determined.	54	1090	1030	5	28	M45	48	-	156,00
1000	1022	1320		58	1210	1140	5	28	M52	56	-	207,00
1100	1122	1420		66	1310	1240	5	32	M52	56	-	256,00
1200	1225	1530		70	1420	1350	5	32	M52	56	-	306,00
1300	1326	1640		74	1530	1455	5	32	M58	62	-	355,00
1400	1426	1755		76	1640	1560	5	36	M58	62	-	410,00
1500	1530	1865		84	1740	1670	5	36	M58	62	-	501,00
1600	1626	1975		90	1860	1780	5	40	M58	62	-	595,00
1800	1826	2195		96	2070	1985	5	44	M64	70	-	731,00
2000	2026	2425		102	2300	2210	5	48	M64	70	-	884,00



Pn 25 Steel Flat Flange
TS-EN 1092-1 /
TYPE 01 / DIN 2576

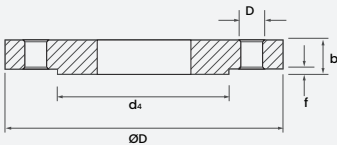
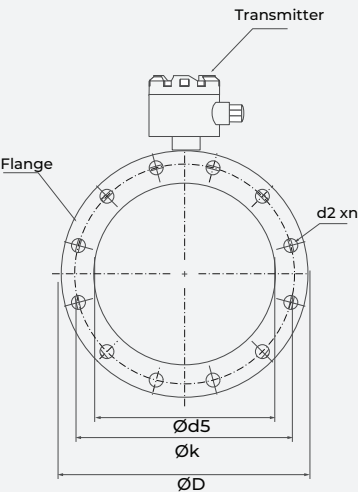
PIPE	FLANGE					FOREHEAD PROTRUSION		HOLES			WEIGHT	
DN	d_5	D	b		k	d_4	f	n	Screw	d_2	EN 1092 - 1	DIN2501
			EN 1092-1	DIN2501							kg/ad - kg/pcs	kg/ad - kg/pcs
15	22	95	14	14	65	45	2	4	M12	14	0,59	0,69
20	27,5	105	16	16	75	58	2	4	M12	14	0,85	0,97
25	34,5	115	16	16	85	68	2	4	M12	14	1,01	1,15
32	43,5	140	18	18	100	78	2	4	M16	18	1,68	1,68
40	49,5	150	18	18	110	88	3	4	M16	18	1,80	1,80
50	61,5	165	20	20	125	102	3	4	M16	18	2,50	2,50
65	77,5	185	22	22	145	122	3	8	M16	18	3,20	3,20
80	90,5	200	24	24	160	138	3	8	M16	18	4,00	4,00
100	116	235	26	24	190	162	3	8	M20	22	5,60	5,20
125	141,5	270	28	26	220	188	3	8	M24	26	7,60	7,00
150	170,5	300	30	28	250	218	3	8	M24	26	9,60	8,90
200	221,5	360	32	30	310	278	3	12	M24	26	13,50	12,60
250	276,5	425	35	32	370	335	3	12	M27	30	19,10	17,40
300	327,5	485	38	34	430	395	4	16	M27	30	25,00	22,20
350	359,5	555	42	38	490	450	4	16	M30	33	39,60	35,60
400	411	620	48	40	550	505	4	16	M33	36	55,00	45,40
450	462	670	54	42	600	555	4	20	M33	36	66,90	51,40
500	513,5	730	58	44	660	615	4	20	M33	36	83,90	62,80
600	616,5	845	68	46	770	720	5	20	M36	39	122,00	81,00
700	718	960	85	46	875	820	5	24	M39	42	184,00	97,00
800	819	1085	95	50	990	930	5	24	M45	48	257,00	131,00
900	920	1185	Customer request Regarding it will be determined.	54	1090	1030	5	28	M45	48	-	156,00
1000	1022	1320		58	1210	1140	5	28	M52	56	-	207,00
1100	1122	1420		66	1310	1240	5	32	M52	56	-	256,00
1200	1225	1530		70	1420	1350	5	32	M52	56	-	306,00
1300	1326	1640		74	1530	1455	5	32	M58	62	-	355,00
1400	1426	1755		76	1640	1560	5	36	M58	62	-	410,00
1500	1530	1865		84	1740	1670	5	36	M58	62	-	501,00
1600	1626	1975		90	1860	1780	5	40	M58	62	-	595,00
1800	1826	2195		96	2070	1985	5	44	M64	70	-	731,00
2000	2026	2425		102	2300	2210	5	48	M64	70	-	884,00



Pn 40 Steel Flat Flange
TS-EN 1092-1 /
TYPE 01 / DIN 2576

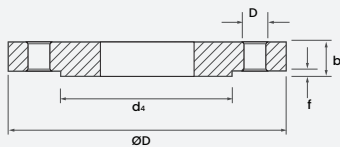
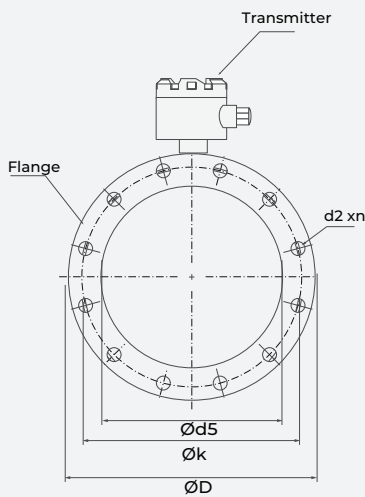
PIPE	FLANGE					FOREHEAD PROTRUSION		HOLES			WEIGHT	
DN	d_5	D	b		k	d_4	f	n	screw	d_2	EN 1092 - 1	DIN2501
			EN 1092-1	DIN2501							kg/ad - kg/pcs	kg/ad - kg/pcs
15	22	95	14	14	65	45	2	4	M12	14	0,59	0,69
20	27,5	105	16	16	75	58	2	4	M12	14	0,85	0,97
25	34,5	115	16	16	85	68	2	4	M12	14	1,01	1,15
32	43,5	140	18	18	100	78	2	4	M16	18	1,67	1,67
40	49,5	150	18	18	110	88	3	4	M16	18	1,80	1,80
50	61,5	165	20	20	125	102	3	4	M16	18	2,40	2,40
65	77,5	185	22	22	145	122	3	8	M16	18	3,20	3,20
80	90,5	200	24	24	160	138	3	8	M16	18	4,00	4,00
100	116	235	26	24	190	162	3	8	M20	22	5,60	5,10
125	141,5	270	28	26	220	188	3	8	M24	26	7,60	7,00
150	170,5	300	30	28	250	218	3	8	M24	26	9,60	8,90
200	221,5	375	36	34	320	285	3	12	M27	30	17,00	16,00
250	276,5	450	42	38	385	345	3	12	M30	33	28,00	25,20
300	327,5	515	52	42	450	410	4	16	M30	33	43,10	34,50
350	359,5	580	58	46	510	465	4	16	M33	36	64,30	50,50
400	411	660	65	50	585	535	4	16	M36	39	94,10	71,70
450	462	685		50	610	560	4	20	M36	39	-	69,00
500	513,5	755		52	670	615	4	20	M39	42	-	83,10
600	616,5	890		60	795	735	5	20	M45	48	-	129,00
700	718	995		64	900	848	5	24	M45	48	-	159,00
800	819	1140		72	1030	970	5	24	M52	56	-	237,00
900	920	1250		76	1140	1080	5	28	M52	56	-	285,00
1000	1022	1360		80	1250	1190	5	28	M52	56	-	343,00
1200	1224	1575		88	1460	1394	5	32	M58	62	-	454,00
1300	1324	1685		94	1570	1504	5	32	M58	62	-	545,00
1400	1424	1795		98	1680	1614	5	36	M58	62	-	624,00
1500	1528	1910		104	1790	1722	5	36	M60	64	-	732,00
1600	1624	2025		108	1900	1826	5	40	M66	70	-	827,00

Customer request
Regarding
it will be determined.



Pn 64 Steel Flat Flange
TS-EN 1092-1 /
TYPE 01 / DIN 2576

PIPE	FLANGE					FOREHEAD PROTRUSION		HOLES			WEIGHT	
DN	d _s	D	b		k	d ₄	f	n	Screw	d ₂	EN 1092 - 1	DIN2501
			EN 1092-1	DIN2501							kg/ad - kg/pcs	kg/ad - kg/pcs
15	22	105	20	20	75	45	2	4	M12	14	1,10	1,10
20	27,5	130	22	22	90	58	2	4	M16	18	1,86	1,86
25	34,5	140	24	24	100	68	2	4	M16	18	2,37	2,37
32	43,1	155	24	24	110	78	3	4	M20	22	2,70	2,70
40	49	170	26	26	125	88	3	4	M20	22	3,60	3,60
50	61,1	180	26	26	135	102	3	4	M20	22	3,90	3,90
65	71,1	205	26	26	160	122	3	8	M20	22	4,70	4,70
80	90,3	215	30	28	170	138	3	8	M20	22	5,90	5,50
100	115,9	250	32	30	200	162	3	8	M24	26	8,00	7,50
125	141,6	295	34	34	240	188	3	8	M27	30	11,70	11,70
150	170,5	345	36	36	280	218	3	8	M30	33	16,90	16,90
200	221,5	415	48	42	345	285	3	12	M33	36	30,50	26,50
250	276,2	470	55	46	400	345	3	12	M33	36	42,20	35,00
300	327,6	530	65	52	460	410	4	16	M33	36	59,00	46,80
350	359,7	600	72	56	525	465	4	16	M36	39	88,70	68,30
400	411	670	80	60	585	535	4	16	M39	42	120,90	89,90
500	513,5	800	Customer request Regarding it will be determined.	60	705	615	4	20	M45	48	-	117,00
600	616,5	930		62	820	735	5	20	M52	56	-	155,00
700	718	1045		68	935	840	5	24	M52	56	-	203,00
800	819	1165		76	1050	960	5	24	M58	62	-	270,00
900	920	1285		84	1170	1070	5	28	M58	62	-	352,00
1000	1022	1415		92	1290	1180	5	28	M66	70	-	454,00
1200	1226	1665		100	1530	1380	5	32	M74	78	-	646,00



Pn 100 Steel Flat Flange
TS-EN 1092-1 /
TYPE 01 / DIN 2576

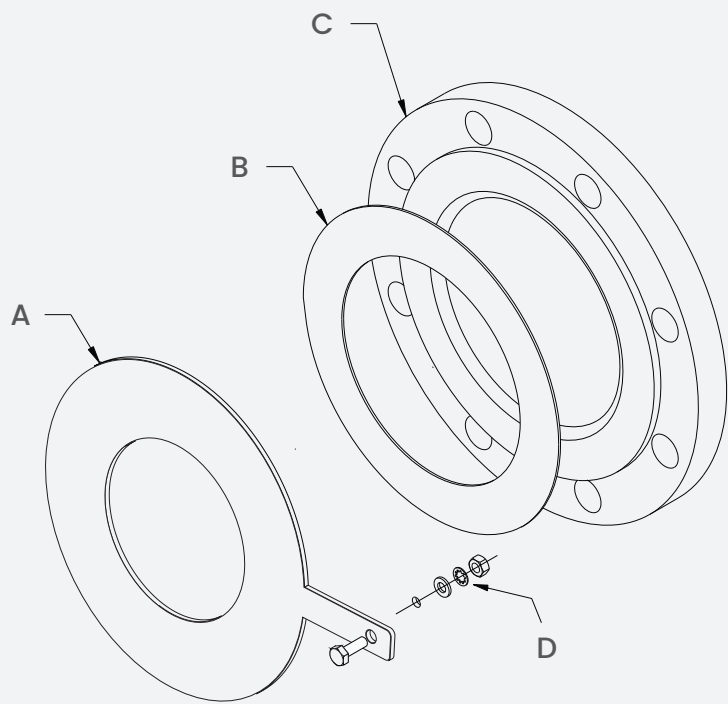
PIPE	FLANGE					FOREHEAD PROTRUSION		HOLES			WEIGHT	
DN	d_5	D	b		k	d_4	f	n	Screw	d_2	EN 1092 - 1	DIN2501
			EN 1092-1	DIN2501							kg/ad - kg/pcs	kg/ad - kg/pcs
15	22	105	20	20	75	45	2	4	M12	14	1,10	1,10
20	27,6	130	22	22	90	58	2	4	M16	18	1,86	1,86
25	34,4	140	24	24	100	68	2	4	M16	18	2,37	2,37
32	43,1	155	24	24	110	78	3	4	M20	22	2,70	2,70
40	49	170	26	26	125	88	3	4	M20	22	3,58	3,58
50	61,1	195	28	28	145	102	3	4	M24	26	5,00	5,00
65	77,1	220	30	30	170	122	3	8	M24	26	6,34	6,34
80	90,3	230	34	32	180	138	3	8	M24	26	7,73	7,24
100	115,9	265	36	36	210	162	3	8	M27	30	10,33	10,30
125	141,6	315	42	40	250	188	3	8	M30	33	17,24	16,40
150	170,5	355	48	44	290	218	3	12	M30	33	23,63	21,60
200	221,5	430	60	52	360	285	3	12	M33	36	42,90	37,00
250	276,2	505	72	60	430	345	3	12	M36	39	69,12	57,20
300	327,6	585	84	68	500	410	4	16	M39	42	103,52	83,10
350	359,7	655	95	74	560	465	4	16	M45	48	149,69	115,60

CONDITIONS OF USE

In order to make precise and reliable measurements in MR-S Series electromagnetic flowmeters, the following conditions must be met;

- 1. The tested fluid must have a conductivity of 5 µS or higher
- 2. The pipeline must have a fully filled flow
- 3. The components within the fluid must be homogenously mixed
- 4. If the fluid induces magnetic fields, the magnetic field of the device will change, and the device will need to be recalibrated.
- 5. Installation methods complying with laminar flow regulations must be applied.
- 6. For plastic and non-conductive pipes, grounding rings and grounding connections must be included during installation.
- 7. Regardless of the pipe type, grounding connections must be made.

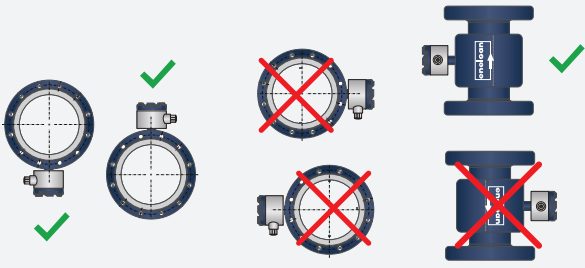
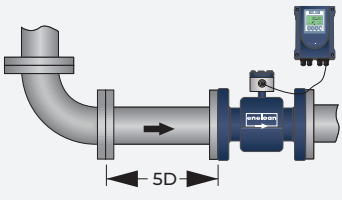
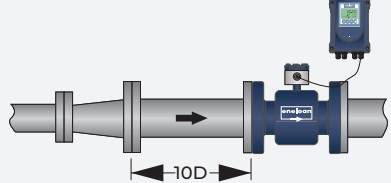
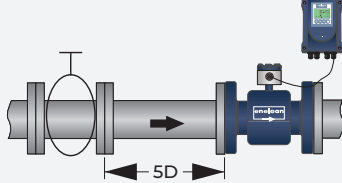
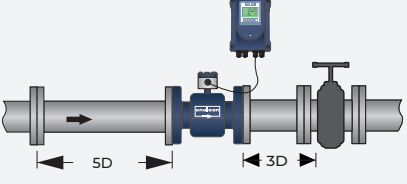
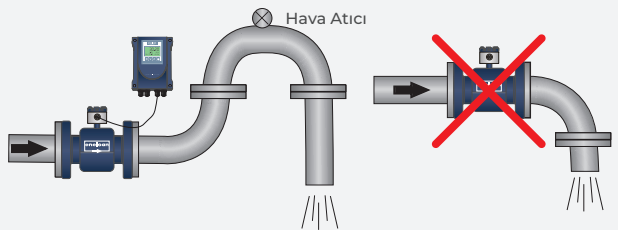
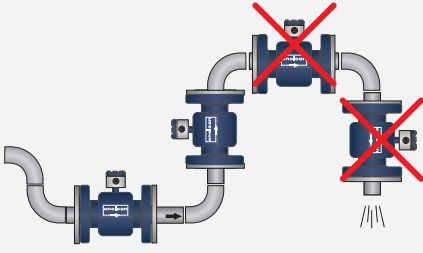
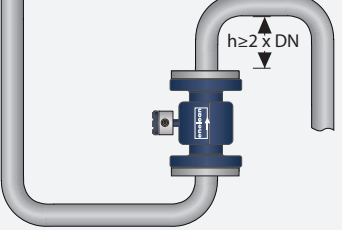
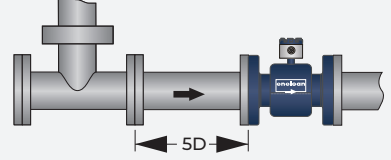
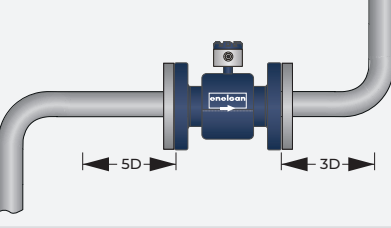
The dimensions of the ground loop of the flange sensor are between 15 and 300 mm.



- A. Grounding ring
- B. Customer-supplied gasket
- C. Measuring flange
- D. Screw

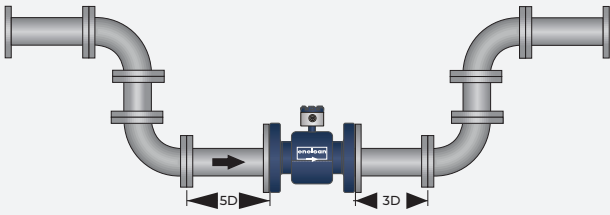
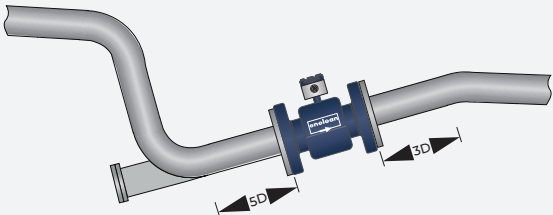
DN	Thickness of grounding ring
15	2
20	2
25	2
32	2
40	2
50	2
65	2
80	2
100	2
125	2
150	2
200	2
250	2
300	2

MOUNTING METHODS

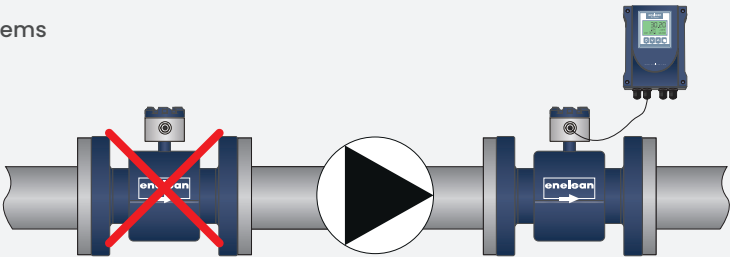
Installation Method 	90° Elbow 
Expansion Pipe 	Various Valves 
Valve Fully Open Position 	Installation on Open-Ended Lines 
Installation in Bent Pipes 	Input-Output Assembly Application 
T-Shaped Pipe 	Input-Output Assembly Application 

MOUNTING METHODS

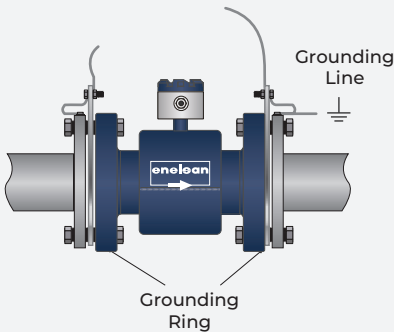
Installation in Partially Filled Installations



Installation in Pumping Systems

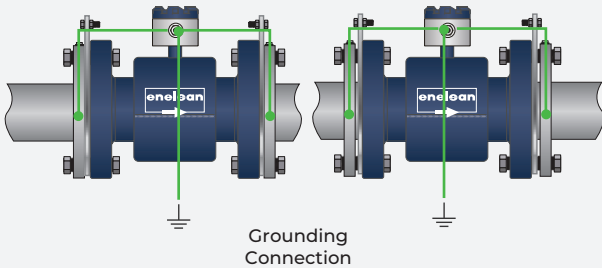


Grounding Line

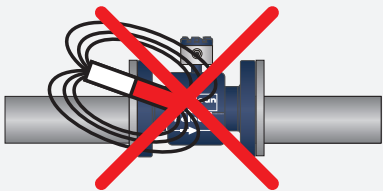


It is mandatory to use a grounding ring in plastic lines and in lines with pipe insulation.

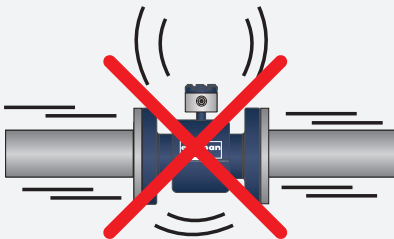
Grounding Connection



Avoid Magnetic Fields Avoid Vibration



Avoid Vibration



DN100 (4") / **EN** - **PL** - **D16C** - **GE** - **MT** - **023** - **R3** - **SI20** - **DC** - **M2R** - **GSM**

1 **2** **3** **4** **5** **6** **7** **8** **9** **10** **11**

1 Internal Lining Material

Ebonite	☒	EN
EPDM (Soft Rubber)	☐	SR
PTFE	☐	PT
Black PTFE	☐	BPT
Ceramic	☐	CR

2 Electrode Material

316 Stainless Steel	☐	SS
Hastelloy C22	☐	HC
Platinum Rhodium	☒	PL
Tantalum	☐	TA
Titanium	☐	Ti

3 Process Connection

PN40, EN1092-1 Flange, St37-2	☐	D40C
PN25, EN1092-1 Flange, St37-2	☐	D25C
PN16, EN1092-1 Flange, St37-2	☒	D16C
PN10, EN1092-1 Flange, St37-2	☐	D10C
PN6, EN1092-1 Flange, St37-2	☐	D6C
Class 300 RF ANSI Flange, St37-2	☐	A30C
Class 150 RF ANSI Flange, St37-2	☐	A15C
PN40, EN1092-1 Flange, SS 316L	☐	D40S
PN25, EN1092-1 Flange, SS 316L	☐	D25S
PN16, EN1092-1 Flange, SS 316L	☐	D16S
PN10, EN1092-1 Flange, SS 316L	☐	D10S
PN6 EN1092-1 Flange, SS 316L	☐	D6S
Class 300 RF ANSI Flange, SS 316L	☐	A30S
Class 150 RF ANSI Flange, SS 316L	☐	A15S
Tri-Clamp Connection, SS 316L	☐	TRIS
DIN 11851 Hygienic Connection, 1.4404 (316L)	☐	SANS

4 Grounding

Standard 3. Electrode	☐	XX
Grounding Ring	☒	GE
316L Grounding Ring	☐	GESS
Hastelloy C22	☐	GEHC

6 Calibration

Dry Calibration, standard	☐	000
0,5%, 3-point factory calibrated	☐	053
0,5%, 5-point factory calibrated	☐	055
0,2%, 3-point TURKAK accredited calibration	☒	023
0,2%, 5-point TURKAK accredited calibration	☐	025

7 Transmitter Type, Protection Class

Compact, IP67	☐	C1
Compact, IP67 (Rectangle)	☐	C2
Remote, IP67 (Rectangle))	☒	R1

8 Cable Length (for Separate Type)

None	☐	XX
5-meter signal cable	☐	5
10-meter signal cable	☐	10
20-meter signal cable	☐	20
30-meter signal cable	☐	30
40-meter signal cable	☐	40
Additional 1 meter signal cable	☐	XX
LP-20 7 Pin S-0/P-E Nut-Type IP68 Plug and Play 5 meter signal cable	☐	SI5
LP-20 7 Pin S-D/P-E Nut-Type IP68 Plug and Play 10 meter signal cable	☐	SI10
LP-20 7 Pin S-0/P-E Nut-Type IP68 Plug and Play 20 meter signal cable	☒	SI20
LP-20 7 Pin S-0/P-E Nut-Type IP68 Plug and Play 30-meter signal cable	☐	SI30
LP-20 7 Pin S-0/P-E Nut-Type IP68 Plug and Play 40 meter signal cable	☐	SI40

9 Power Supply Voltage

Battery Supply	☐	BT
80 ... 230 VAC (48 ... 60 Hz)	☐	AC
8 ... 36VDC	☒	DC

10 Output Signal

4...20 mA, RS485 MODBUS, pulse, alarm, status	☒	M2R
4...20 mA, HART, pulse, alarm, status	☐	M2H
PROFIBUS (Only with rectangular transmitter)	☐	M2P

11 Option 1

No straight pipe required	☐	MXD
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Option 2

Stainless Steel Body	☐	SSB
Stainless Steel Body + Stainless Steel Enclosure	☐	SSBF
Stainless Steel Flange	☐	SSPF

Option 3

Digital GSM Datalogger (Only with rectangular transmitter)	☒	GSM
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Contact us

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