LMF11-F High performance electromagnetic flowmeter

WINTERS Instruments
Excellence Since 1953

Performance & Features

- Adopt electromagnetic principle, high measurement accuracy, good repeatability, accuracy up to 0.2%
- Measurable conductivity as low as 1μS/cm, minimum detectable flow speed of 1L/h
- Optional lightning protection design for safer use
- The transmitter has high reliability, strong interchangeability and a range ratio of up to 100:1

Applications

- Paper making
- Chemical Industry
- Pharmaceuticals.
- Water treatment

Product parameter

Measurement parameter	
Measurement principle	Electromagnetic induction
Measurable medium	Liquid (conductivity ≥1μS/cm)
Measurement direction	Positive and negative direction (field configurable)
Measured value	Velocity of flow
Calculated value	Flow rate
Measurement accuracy	0.5% ,0.3% or 0.2%
Repeatability	0.16% ,0.1% or 0.06%
Liquid material	
Body:	Carbon steel spray paint,304SS
Flange:	Carbon steel spray paint,304SS
Body:	316LSS,hastelloy C,titanium, tantalum, tungsten carbide or platinum-iridium alloy
Lining:	Chloroprene rubber,PTFE, PU, FEP or PFA
Environmental parameter	
Ambient temperature	-20 … 85 °C
Medium temperature	-40 ... 180℃(See the inner lining temperature table for details)
Storage temperature	-40 … 70 °C
IP	IP65,IP67 or IP68
Ambient humidity	<98% RH,non-condensing

Output parameter	
Output signal	4-20mA,4-20mA with HART,RS485 or pulse
Supply voltage	24VDC or 220VAC
Electrical connection	
Interface type	Glen head
Electrical protection	
Short circuit protection	Yes
Reverse protection	Yes
Lightning protection design	Optional
Structural parameter	
Flange standard	GB/T 9119, Others, please consult
Pipe size	DN10 to DN2000
Installation mode	Flange type, clamp type
Type of structure	Integrated, split type
Display parameters	
Digital display type	LCD
Display language	English and Chinese can be switched
Display content	Instantaneous flow, cumulative flow, percentage flow, velocity, etc
Alarm	Air traffic control alarm, reverse alarm, upper and lower alarm

Flow range

DN	Upper limit of flow scale m^3/h														
10a	0.03	0.05	0.06	0.08	0.1	0.12	0.16	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0
10	0.1	0.16	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.6	2.0	2.5	2.8
15	0.2	0.4	0.5	0.6	0.8	1	1.2	1.6	2	2.5	3	4	5	6	6.3
25	0.6	1	1.2	1.6	2	2.5	3	4	5	6	8	10	12	16	17.7
32	0.9	1.6	2	2.5	3	4	5	6	8	10	12	16	20	25	28
40	1.4	2.5	3	4	5	6	8	10	12	16	20	25	30	40	45
50	2.1	4	5	6	8	10	12	16	20	25	30	40	50	60	70
65	4	6	8	10	12	16	20	25	30	40	50	60	80	100	120
80	6	10	12	16	20	25	30	40	50	60	80	100	120	160	180
100	8	16	20	25	30	40	50	60	80	100	120	160	200	250	280
125	13	25	30	40	50	60	80	100	120	160	200	250	300	400	440
150	19	40	50	60	80	100	120	160	200	250	300	400	500	600	630
200	34	60	80	100	120	160	200	250	300	400	500	600	800	1000	1100
250	53	100	120	160	200	250	300	400	500	600	800	1000	1200	1400	1600
300	76	160	200	250	300	400	500	600	800	1000	1200	1600	1800	2000	2500
350	100	200	250	300	400	500	600	800	1000	1200	1600	2000	2200	2500	3000
400	140	250	300	400	500	600	800	1000	1200	1600	2000	2500	2600	3000	4000
450	170	300	400	500	600	800	1000	1200	1600	2000	2500	3000	3600	4000	5000
500	210	400	500	600	800	1000	1200	1600	2000	2500	3000	3600	4000	5000	7000
600	310	500	600	800	1000	1200	1600	2000	2500	3000	3600	4000	5000	6000	10000
700	420	700	800	1000	1200	1600	2000	2500	3000	3600	4000	5000	6000	8000	13000
800	540	800	1000	1200	1600	2000	2500	3000	4000	5000	6000	7000	8000	10000	18000
900	690	1000	1200	1600	2000	2500	3000	4000	5000	6000	7000	8000	10000	12000	20000
1000	850	1200	1600	2000	2500	3000	4000	5000	6000	7000	8000	10000	12000	16000	28000
1200	1220	2000	2500	3000	4000	5000	6000	8000	9000	10000	12000	16000	20000	26000	40000
1400	1660	2500	3000	4000	5000	6000	8000	10000	12000	16000	20000	25000	26000	30000	54000
1600	2160	3000	4000	5000	6000	8000	10000	12000	16000	20000	25000	30000	36000	40000	71000
1800	2740	5000	6000	7000	8000	10000	12000	16000	20000	25000	30000	36000	40000	45000	90000
2000	3380	6000	7000	8000	10000	12000	16000	20000	25000	30000	36000	40000	45000	50000	$11*10^4$

Note: It is recommended that the measured flow value should be 50%-80% of the upper limit of the flow scale

Different caliber optional lining

" √"indicates optional

DN(mm)	PN(MPa)	Lining material/medium temperature				
		FEP -40...150℃	chloropre ne rubber -30...80℃	PU -30...80℃	PTFE -40...110℃	PFA -40...180℃
10a	4.0	√				√
10		√				√
15		√		√	√	√
20		√		√	√	√
25		√		√	√	√
32		√		√	√	√
40		√		√	√	√
50		√	√		√	√
65		√	√		√	√
80		√	√		√	√
100	1.6	√	√		-40-80℃	√
125		√	√		-40-80℃	√
150		√	√		-40-80℃	√
200	1.0	√	√		-40-80℃	√
250		√	√		-40-80℃	√
300		√	√		-40-80℃	√
350		√	√		-40-80℃	√
400		√	√		-40-80℃	√
450		√	√		-40-80℃	√
500			√		-40-80℃	
600			√		-40-80℃	
700			√		-40-80℃	
800			√		-40-80℃	
900			√		-40-80℃	
1000			√		-40-80℃	
1200	0.6		√		-40-80℃	
1400			√		-40-80℃	
1600			√		-40-80℃	
1800			√		-40-80℃	
2000			√		-40-80℃	

Electrode material selection

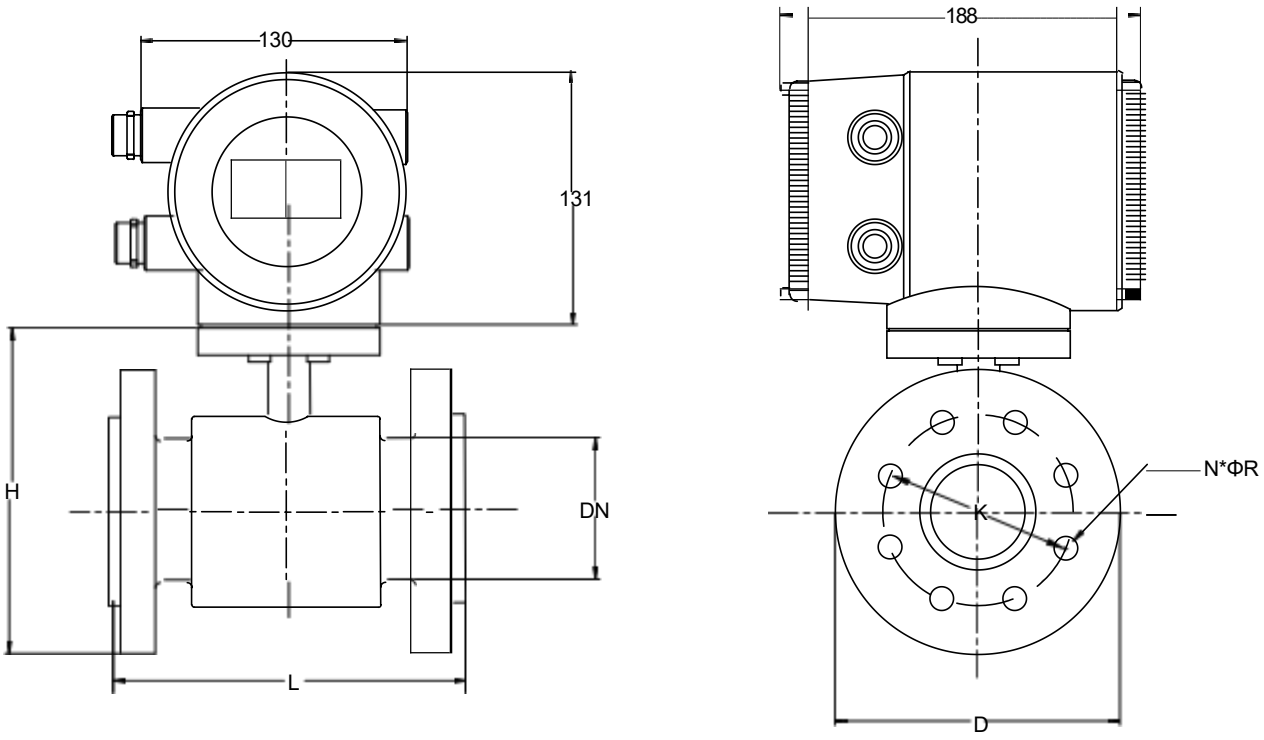
Electrode material selection	Material abbreviation	Performance description
316LSS	316L	1. Domestic water, industrial water, raw water, urban water 2. Dilute acid, dilute alkali and other weak corrosive, alkaline salt solution
Hastelloy C	HaC	1. A mixed solution of a mixed acid such as chromic acid and sulfuric acid 2. Oxidizing salts such as Fe +++, Cu ++, seawater *Not applicable: hydrochloric acid
Titanium	Ti	1. Salt, such as a) chloride (oxide / magnesium / aluminum / calcium / plating / iron, etc.) b) Sodium salt, ammonium salt, hypochlorite, sea water 2. Concentration of less than 50% potassium hydroxide, ammonium hydroxide, barium hydroxide alkaline solution *Not applicable: hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid and other reducing acids
Tantalum	Tan	1. Hydrochloric acid (concentration less than 40%), dilute sulfuric acid and concentrated sulfuric acid (not including fuming sulfuric acid) 2. Chlorine dioxide, ferric chloride, hypochlorous acid, sodium cyanide, lead acetate, etc. 3. Nitric acid (including fuming nitric acid) and other oxidizing acid, the temperature below 80 ℃ of aqua regia *Not applicable: Alkaline, hydrofluoric acid
Tungsten carbide	W	1. Applicable: pulp, sewage, can interfere with solid particles *Not applicable: inorganic acid, organic acid, chloride
Platinum-iridium alloy	Pt	1. Applicable: almost all acid, alkali, salt solution <including fuming sulfuric acid, fuming nitric acid) *Not applicable: aqua regia, ammonium salt

Lining material selection

Lining material	Material abbreviation	Performance description	Medium temperature
Polytetrafluoroethylene	PTFE	All corrosive media	-40-150℃
Neoprene rubber	Ne	Generally corrosive medium, not resistant to oil	-30-80℃
Polyurethane rubber	PU	Excellent wear resistance and no corrosion resistance	-30-80℃
Polyperfluorinated ethylene propylene	FEP	Corrosion-resistant as PTFE	-40-150℃
Soluble polyteflon	PFA	Corrosion-resistant as PTFE	-40-180℃

1. For medium temperatures above 140 ℃, PFA material is preferred
2. For hygiene requirements, FEP material is preferred
3. For media such as slurry and mud, PU material is preferred
4. For media such as pulp that are prone to scaling, FEP or PFA materials are preferred
5. For pipelines with negative pressure, FEP or PFA materials are preferred

Flange type integrated dimension diagram

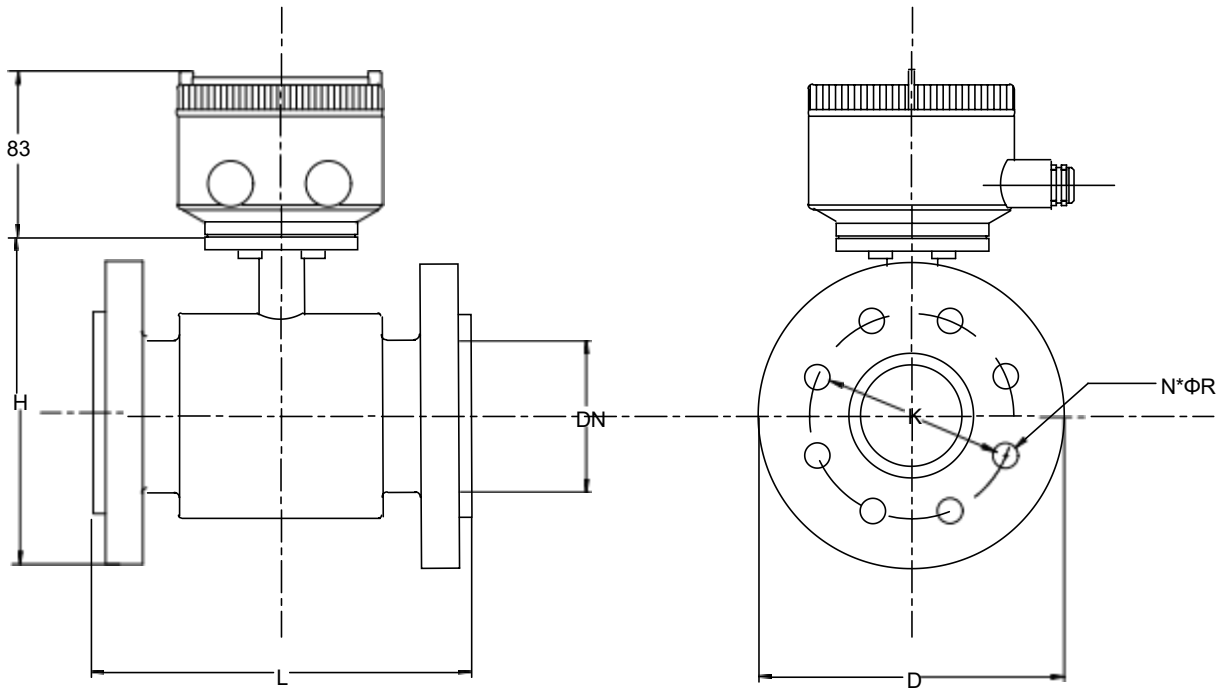


unit:mm

DN	10a	10	15	20	25	32	40	50	65	80	100	125	150	200	250
PN（bar）	40										16			10	10
L	120		150					200			250		300	350	400
D	95		95	105	115	140	150	165	185	200	220	250	285	340	395
H	142		142	147	152	172	177	205	216	228	258	284	315	366	420
K	60		65	75	85	100	110	125	145	160	180	210	240	295	350
N*R	4*14					4*18			8*18				8*22	8*22	12*22

DN	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000
PN（bar）	10										6				
L	450		500	600			700	800	900	1000	1200	1400	1600	1800	2000
D	445	505	565	615	670	780	895	1015	1115	1230	1405	1630	1830	2045	2265
H	470	525	580	629	682	791	890	1007	1118	1228	1416	1630	1830	2045	2265
K	400	460	515	565	620	725	840	950	1050	1160	1380	1590	1820	2020	2230
N*R	12*22	16*22	16*26	20*26		20*30	24*30	24*33	28*33	28*36	32*33	36*36	40*36	44*39	48*42

Flange type split dimension drawing

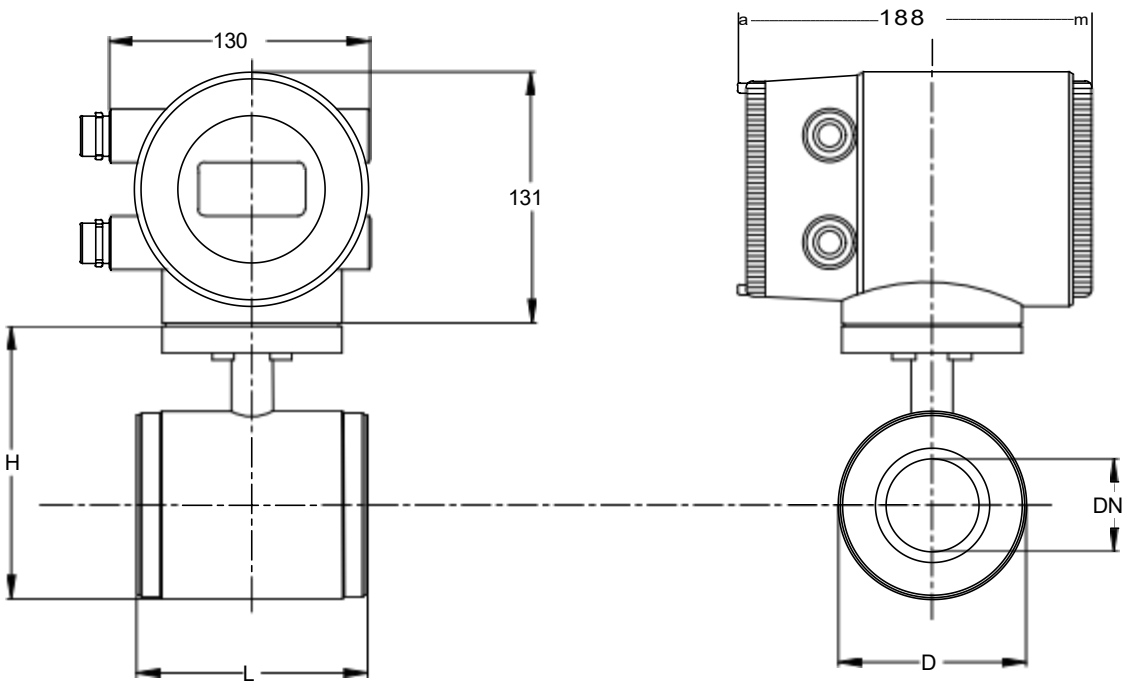


unit:mm

DN	10a	10	15	20	25	32	40	50	65	80	100	125	150	200	250
PN（bar）	40										16			10	10
L	120		150					200			250		300	350	400
D	95		95	105	115	140	150	165	185	200	220	250	285	340	395
H	142		142	147	152	172	177	205	216	228	258	284	315	366	420
K	60		65	75	85	100	110	125	145	160	180	210	240	295	350
N*R	4*14					4*18			8*18				8*22	8*22	12*22

DN	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800	2000
PN（bar）	10										6				
L	450		500	600			700	800	900	1000	1200	1400	1600	1800	2000
D	445	505	565	615	670	780	895	1015	1115	1230	1405	1630	1830	2045	2265
H	470	525	580	629	682	791	890	1007	1118	1228	1416	1630	1830	2045	2265
K	400	460	515	565	620	725	840	950	1050	1160	1380	1590	1820	2020	2230
N*R	12*22	16*22	16*26	20*26		20*30	24*30	24*33	28*33	28*36	32*33	36*36	40*36	44*39	48*42

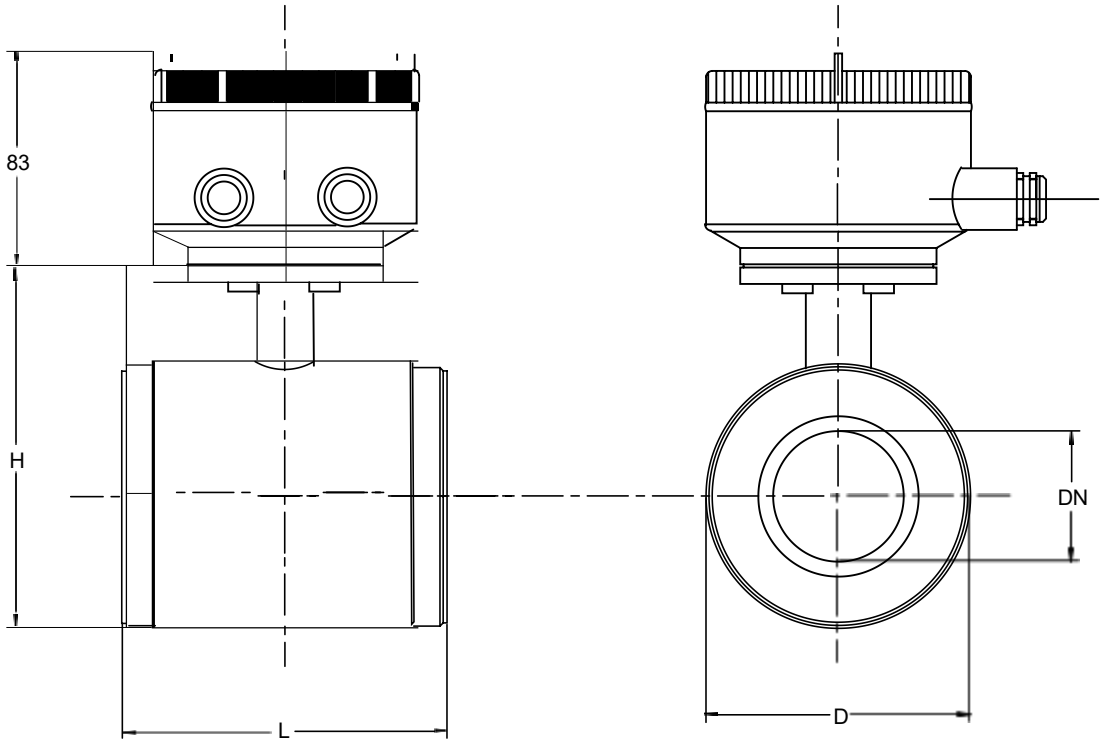
Clamping type split shape dimension drawing



unit:mm

DN	25	32	40	50	65	80	100	125	150	200	250	300
D	67	76	82	96	116	127	147	177	202	257	320	372
L	90	100	100	115	115	130	155	155	185	215	250	290
H	116	125	131	145	165	176	196	226	251	306	369	421

Clamping type split shape dimension drawing



Unit:mm

DN	25	32	40	50	65	80	100	125	150	200	250	300
D	67	76	82	96	116	127	147	177	202	257	320	372
L	90	100	100	115	115	130	155	155	185	215	250	290
H	116	125	131	145	165	176	196	226	251	306	369	421

Ordering information

		Code	Technical Parameter
1.		LMF11	Electromagnetic Flowmeter
			Product series
2.		F	High performance
			Accuracy
3.		A	0.5%
		3	0.3% (DN10-DN300 optional)
		B	0.2% (DN10-DN200 optional)
			Installation method
4.		F	Flange type
		S	Clamp type (DN25-DN300 optional))
			Lining material
5.		N	Ne
		T	PTFE
		P	PU
		F	FEP
		A	PFA
			Nominal size
6.		10	DN10
		15	DN15
		20	DN20
		25	DN25
		32	DN32
		40	DN40
		50	DN50
		65	DN65
		80	DN80
		1H	DN100
		1Q	DN125
		1F	DN150
		2H	DN200
		2F	DN250
		3H	DN300
		3F	DN350
		4H	DN400
		4F	DN450
		5H	DN500
		6H	DN600
		7H	DN700
		8H	DN800
		9H	DN900
		1T	DN1000
		2M	DN1200
		4M	DN1400
		6M	DN1600
		8M	DN1800
		0M	DN2000

Ordering information

		Code	Technical Parameter
			Electrode material
7.		E	316L
		O	Hastelloy C
		I	Titanium
		Q	Tantalum
		V	Tungsten carbide
		G	Platinum-iridium alloy
			Operating pressure
8.		B	0.6MPa
		C	1.0MPa
		D	1.6MPa
		F	4.0MPa(Maximum DN65 available)
		Z	Other
			Flange material
9.		0	None (clamp type selection)
		1	Carbon steel spray paint
		2	304SS
			Companion flange materiall
10.		0	None (standard)
		1	Carbon steel
		2	304SS
			Grounding ring
11.		0	None
		1	Carbon steel
		2	304SS
			Medium temperature
12.		0	Maximum 80℃
		1	Maximum 150℃
		2	Maximum 180℃
			Sensor
13.		T	Integrated
		R	split
			Output + Communication
14.		01	4 ~ 20mA + pulse
		02	(4~20)mA+HART
		03	(4~20)mA+Modbus
			Power supply
15.		G	220VAC
		K	24VDC
			Protection grade
16.		0	IP65 (standard)
		1	IP67
		2	IP68(split optional only)

Ordering information

		Code	Technical Parameter
			Explosion protection
17.		0	No
		X	Exd IIC T6 Gb
		I	Exia IIC T6 Gb
			Electrical connection
18.		0	M20*1.5
			Cable length
19.		0	No(Integrated)
		R5	5m
		RX	Customer specified, up to 50 meters (code X is cable length, e.g. 10 meters, code R10)
			Special selection
20.		0	No
		LP	Lightning protection design
		MU	Suitable for cement media
		PU	Dedicated to pulp media