Selection Guide
CX011 REV2.1

N Series Normalized Mass Flow & Density Meter

- ■ Applied to Liquid Mass Flow
- ■ Mass Flow Accuracy ±0.15% / ±0.2%
- ■ Density Measuring Accuracy ±2kg/m3
- ■ Normal Diameter DN5～DN250
- ■ Process Temperature Ranges -40℃～+350℃

ZAX TECHNOLOGY CO.,LTD

Component Parts of N Series Coriolis Mass Flow Meter

N Series Coriolis Mass Flow Meter is defined as N series Mass Flow Meter with flow accuracy is 0.15% or 0.2%, whom is made of N series mass flow Sensor and DPT100 Transmitter.

Features and Benefits of N Series Coriolis Mass Flow Meter

- Double U or double C type flow pipe design is better for measuring accuracy
- Provides integrated mass flow, volume flow, density, temperature measurement and the calculates the others relevant parameters
- Easy on installation, no need rectifier, filter parts, no special requirements for installing direct pipe section
- Without moving parts and no need frequent maintain; high stable function no need frequent calibration
- Allows low range flow running, reducing pressure loss to keep high efficiency
- Compact installation to save installation costs
- Being compatible with P series A(flanges faces interval distance) dimension
- The connected Transmitter can be exchanged for easy maintain
- Not being influenced by ambient temperature

Model Selection Principle

- In the applied fields of Coriolis Mass Flow Meter, the Max. Flow rate is decided by pressure loss while the Min. Flow rate is decided by measuring accuracy
- Before selecting the product, the client or user should firstly refer to this manual, using the size selection software provided by ZAX TECHNOLOGY Co., Ltd., as well as the user should provide the relevant data such as accuracy, flow rate, pressure loss, density, viscosity, temperature, etc., which ensures the correct size selection and application. The software can be obtained from salespersons of the agency or downloaded from the company website: www.zaxtechnology.com

Catalog

Liquid Flow Rate Performance Index

		Mass flow rate Kg/h	Volume flow rate[1] L/h
Maximum mass flow rate			
	N5	350	350
	N10	1500	1500
	N15	4500	4500
	N20	9450	9450
	N25	25500	25500
	N50	94500	94500
	N80	240000	240000
	N100	540000	540000
	N150	825000	825000
	N200	1650000	1650000
	N250	2700000	2700000

Mass flow accuracy[2]	15:1	within turndown[3]	±0.15%
	15:1	beyond turndown	±(zero stability/instant rate)×100%
Volume flow accuracy[2]	FS		±0.15±（Zero Stability / Instant Flow Rate）×100%
Repeatability	15:1	within turndown	±0.075%
	15:1	beyond turndown	±1/2(Zero Stability / Instant Flow Rate)×100%

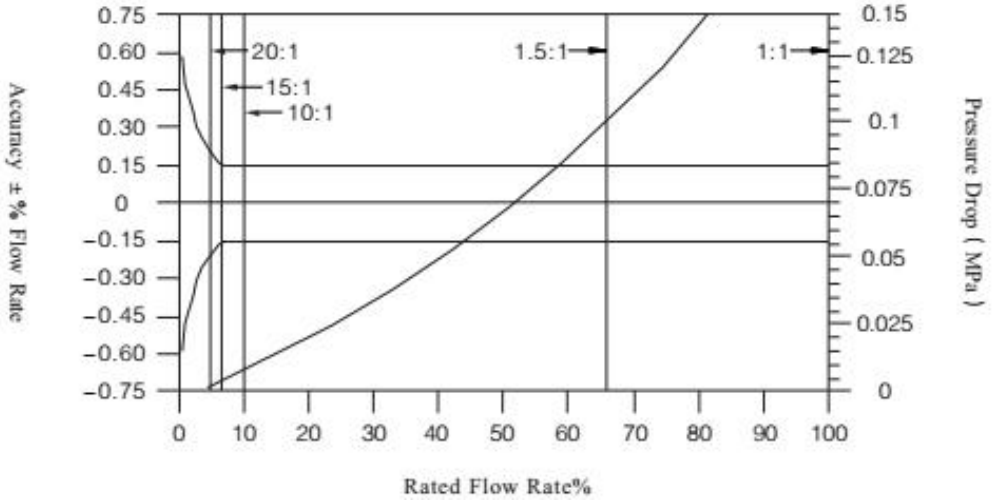
		Kg/h
Zero Stability	N5	0.045
	N10	0.15
	N15	0.45
	N20	0.95
	N25	2.55
	N50	9.45
	N80	24.00
	N100	54.00
	N150	82.50
	N200	165.00
	N250	270.00

[1]The criterion of volume flow rate is as per density. Regarding to the process liquid density isn't 1000kg/m^3, the value of volume flow is value of maximum mass flow divided by liquid density.

[2]Flow Accuracy includes repeatability, linearity and hysteresis.

[3]Turndown is defined as the value of maximum flow divided by minimum flow.

Accuracy, Turndown and Pressure Loss of N50 connected with DPT100 Transmitter



Turndown (from the maximum flow)	20:1	15:1	1.5:1	1:1
Accuracy ±%	0.2	0.15	0.15	0.15
Pressure Drop MPa	0.001	0.002	0.1	0.2

Note：when the maximum flow rate exceeds the given flow rate range, the noise from the pipe will affect the accuracy.

Density Performance Index(only liquid)

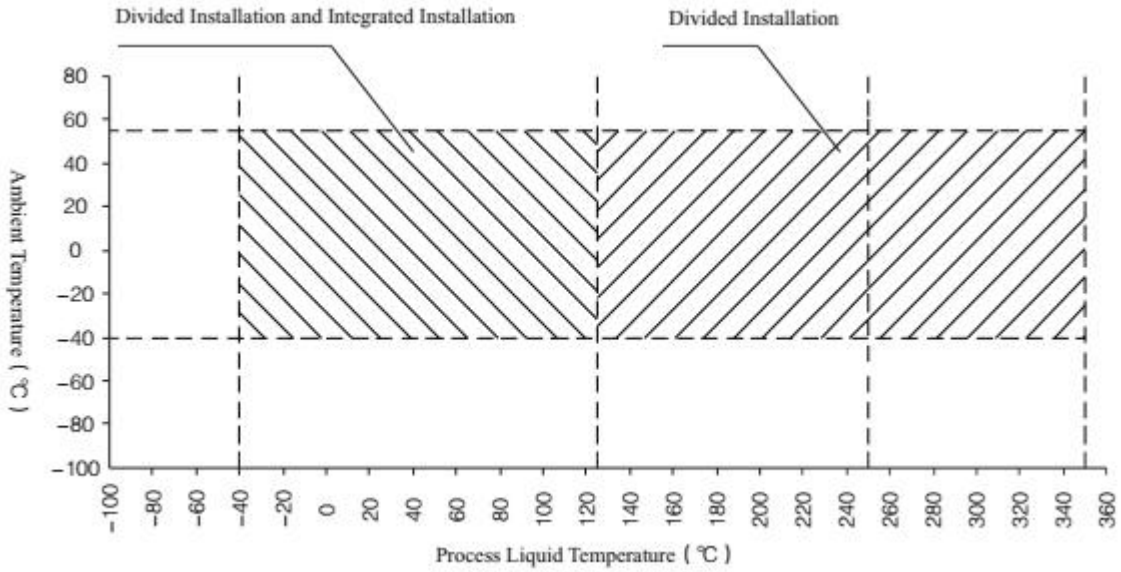
Accuracy[1]	±0.002g/cm^3	±2.0kg/m^3
Repeatability	±0.001g/cm^3	±1.0kg/m^3
Measuring Range	0.2~3.00g/cm^3	200~3000kg/m^3

[1] Flow Accuracy includes repeatability, linearity and hysteresis, density accuracy index of ±1.0kg/m^3 is calculated under the condition of water of 20℃ & -2bar.

Temperature Performance Index

Accuracy	All Models	± 1℃
Repeatability	All Models	± 0.2℃
Temperature Limits[2]	All Models matched all Electronics options	

[2]Temperature Limits maybe need explosion protection for further limit because installed in hazardous area, refer to P8.



■ The temperature must be heated to the local ambient temperature between -40℃~+55℃ (such as using steam tracing method) when the temperature below -40℃.

Temperature Measuring Range:	- 50℃～+ 350℃ (Pt100)	
Temperature of Measured Liquid:	Compact Installation	- 40℃～+ 125℃
	Remote Installation	- 40℃～+ 350℃
Ambient Temperature:	Storage	- 40℃～+ 70℃
	Usage	- 40℃～+ 55℃

Power Supply & Power Consumption

Matched DPT100	Maximum 10W
For sensor N100 N150 N200 N250, the power amplifiers should be provided with extra power supply.	
220VAC（or 24VDC）power supply	Maximum 30W（20W）

Note：The DC Starting Current of Flow Meter is Less Than 1A(Without Power Amplifier).

Process Temperature Influence

Process Temperature Influence Process Temperature Influence is defined as below:

■ Regarding to Mass Flow Measurement, Process Temperature Influence is the maximum zero offset which is caused by the Process temperature deviates zero coordinate temperature.

■ Regarding to Density Measurement, process temperature Influence is the maximum measurement deviation which is caused by the process temperature deviates density calibrated temperature.

Process Temperature Influence

		%Maximum Flow Rate Value/℃	Density Accuracy/℃[1]（kg/m3）
Maximum Error	N5	±0.0002	±0.015
	N10	±0.0001875	±0.015
	N15	±0.0001875	±0.015
	N20	±0.0001875	±0.015
	N25	±0.0001875	±0.015
	N50	±0.00075	±0.015
	N80	±0.00075	±0.015
	N100	±0.001125	±0.015
	N150	±0.0040	±0.015
	N200	±0.00025	±0.015
	N250	±0.00025	±0.015

Pressure Influence

Pressure Influence Pressure Influence is defined as：

The changes of sensor flow and density sensibility is caused by process pressure deviates calibrated pressure. Pressure Influence can be amended.

		flow accuracy influenced by pressure[1] (% flow value / MPa)	density accuracy influenced by pressure[1] (Kg/m3/ MPa)
Pressure Influence	N5	-	-
	N10	-	-
	N15	-	+0.58
	N20	-	-0.29
	N25	-0.03	-0.87
	N50	-0.11	+0.145
	N80	-0.25	+0.029
	N100	-0.58	-1.45
	N150	-0.35	-0.41
	N200	-0.20	-0.37
	N250	-0.14	-0.21

■ The Data is achieved from pressure influence tests of flow rate, and the specific values are referred to the selection guide.

■ The maximum calibrated pressure we apply in our factory is 0.4MPa.

Pressure Rating

		Normal Pressure	Max. Pressure
		MPa	MPa
flow tube pressure rating			
	N5	4	11
	N10	4	11
	N15	4	11
	N20	4	11
	N25	4	11
	N50	4	11
	N80	4	11
	N100	4	11
	N150	4	11
	N200	4	11
	N250	4	11

The pressure(the unlisted temperature can be calculated by the linear insert method) should be lowered down as per the following terms if operating temperature surpass 148℃:

	flow tube	
	316L Sensor	304 Sensor
Less Than 148℃	null	null
204℃	low down 7.2%	low down 5.4%
260℃	low down 13.8%	low down 11.4%
316℃	low down 19.2%	low down 16.2%
343℃	low down 21.0%	low down 18.0%
371℃	low down 22.8%	low down 19.2%

Vibration Limits

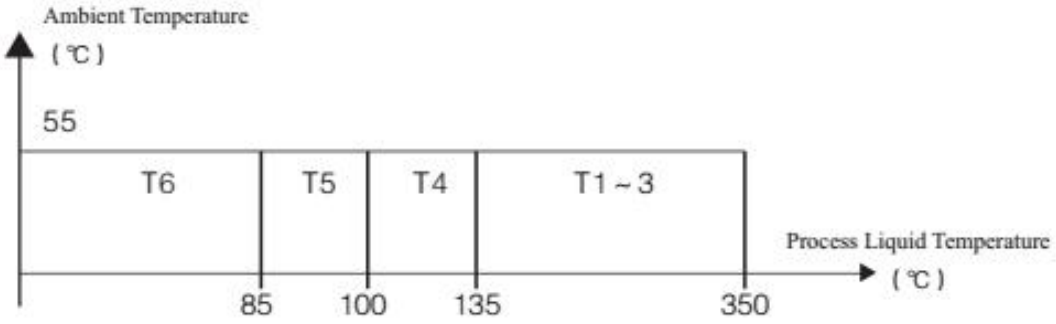
In accordance with the standard GB/T2423.11 . To bear 50 periods at the condition of a=1g(g=9.8m2/s) and (20～500)Hz frequency to scan.
Suggested to apply remote installation if the application area vibration surpass a=0.5g.

Safety & Protection

Tested and Issued certification by National Explosive-proof Electrical Products Quality Supervising and Testing Center:

Explosion-proof Mark:	N5~ N80	Ex ib llC T3~T6
	N100~N250	Ex ib llC T6 Gb(T6 Includes T1 ~T6)
Explosion-proof Certification No:	N5～N80	CNEx 10.0468
	N100～N250	CNEx 12.2660
Protection Level:	IP67（Sensor）	

"T" temperature groups refer to the maximum surface temperature of the sensor at the working temperature of 55℃.



Explosion-proof performance is accordance with GB3836.1-2010、GB3836.3-2010、GB3836.4-2010.
Applications: applied in the explosive dangerous location zone 1 and zone 2, device type is llC, which is compatible with llA、IIB, temperature groups are T1~T6.

Note:The Ex-proof performance will not be affected by the installation of sensor and transmitter(remote or compact installation).

Structure Material

Wetted Parts	Sensitive Pipe	00Cr17Ni14Mo2(316L)
	Separated Liquid	0Cr18Ni9(304)or 00Cr17Ni14Mo2(316L)
	Flange	0Cr18Ni9(304)or 00Cr17Ni14Mo2(316L)
Cover	Sensor	0Cr18Ni9(304)
	Transmitter	Cast aluminum alloy(coated polyester epoxy)
	Junction Box	Cast aluminum alloy(coated polyester epoxy)

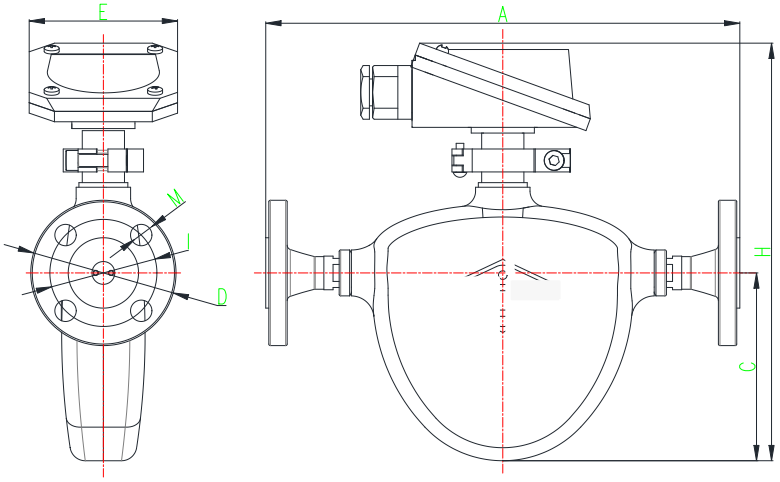
Weight

Weight: the weight refers to the mass flow meter welded the GB/T9115.1-2000 PN 40 welding neck flanges. The weight unit is (kg) .

Sensor Model	Compact Mount weight(kg)	Remote Mount weight(kg)
N5	8.0	5.0
N10	9.5	6.5
N15	10.5	7.5
N20	14.0	11.0
N25	24.5	21.5
N50	50.0	46.0
N80	-	89.0
N100	-	208.0
N150	-	248.0
N200	-	365.0
N250	-	580.0

Dimensions

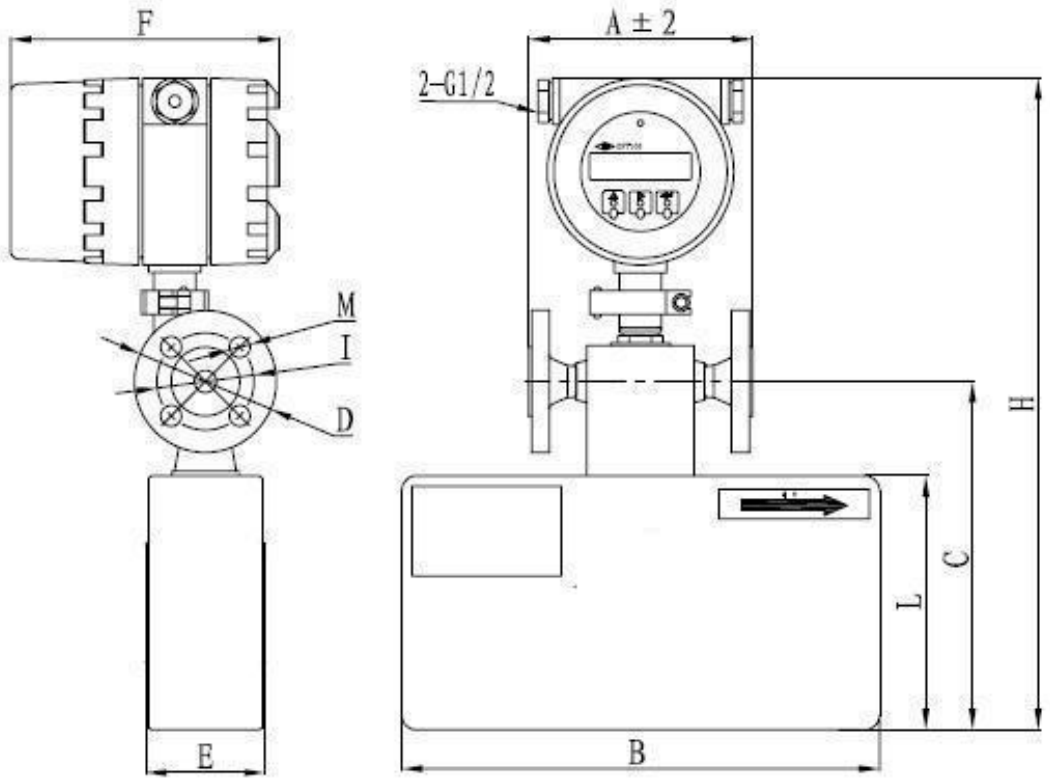
N5 Remote Installation



Flange(GB/T9115.1-2000)		A	H	C	E	M	I	D	
Flange(HG/T20592-2009)									
DN(mm)	PN(MPa)								
15	4.0	310	273	123	95	14	65	95	
Flange(HG/T20615-2009)		A	H	C	E	M	I	D	
Flange(ASME B16.5)									
DN(mm)	PN(Class)								
15	300	328	273	123	95	16	67	95	

Note: VOC Joint can be selected

N10 Compact Installation

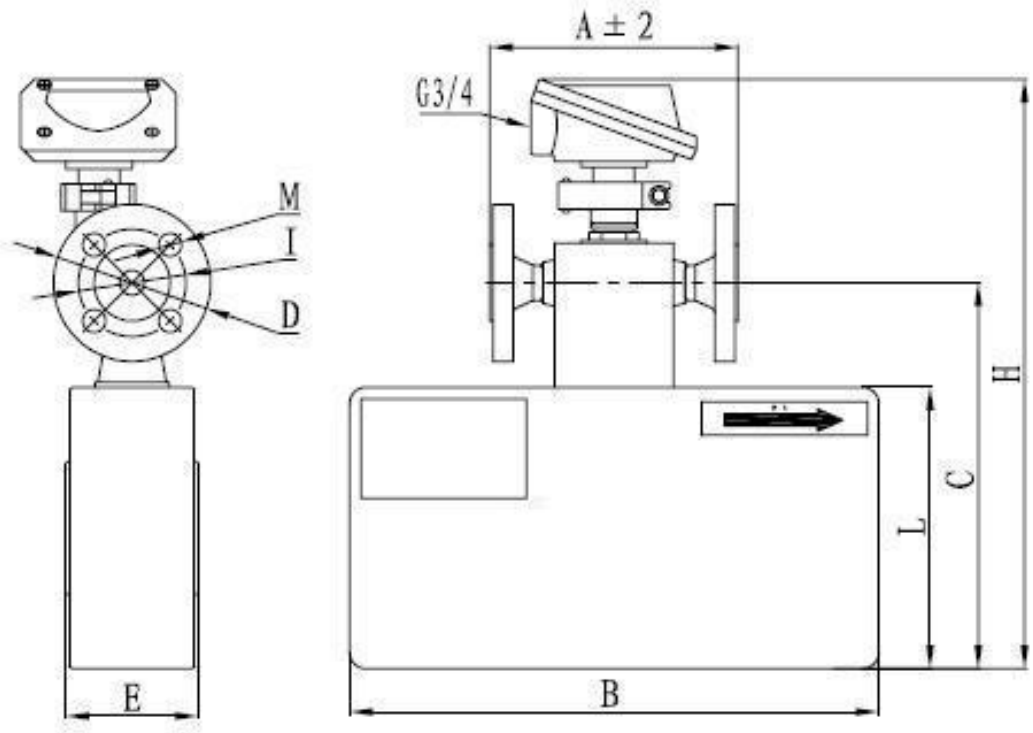


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D	F
Flange(HG/T 20592-2009)											
DN(mm)	PN(MPa)										
15(Standard)	4.0	162	321	170	233	455	106	14	65	95	180

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D	F
Flange(ASME B16.5-2009)											
DN（mm）	PN（Class）										
15(Optional)	300	192	321	170	233	455	106	16	66.7	95	180

N10 Remote Installation

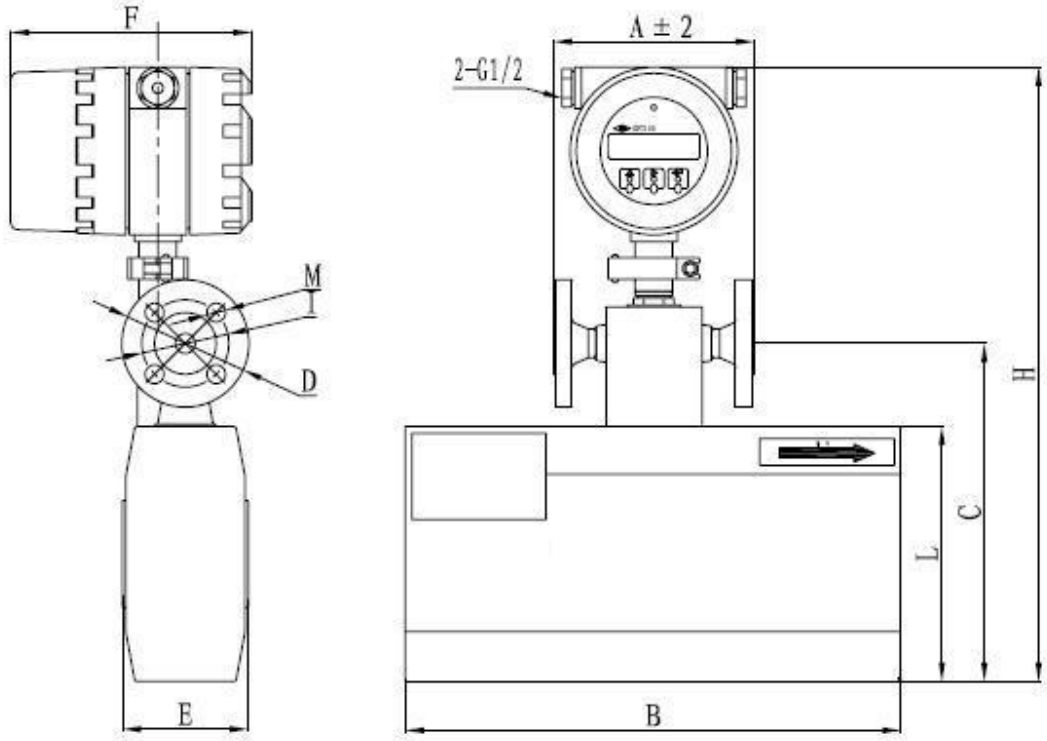


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
15(Standard)	4.0	162	321	170	233	380	106	14	65	95

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
15(Optional)	300	192	321	170	233	380	106	16	66.7	95

N15 Compact Installation

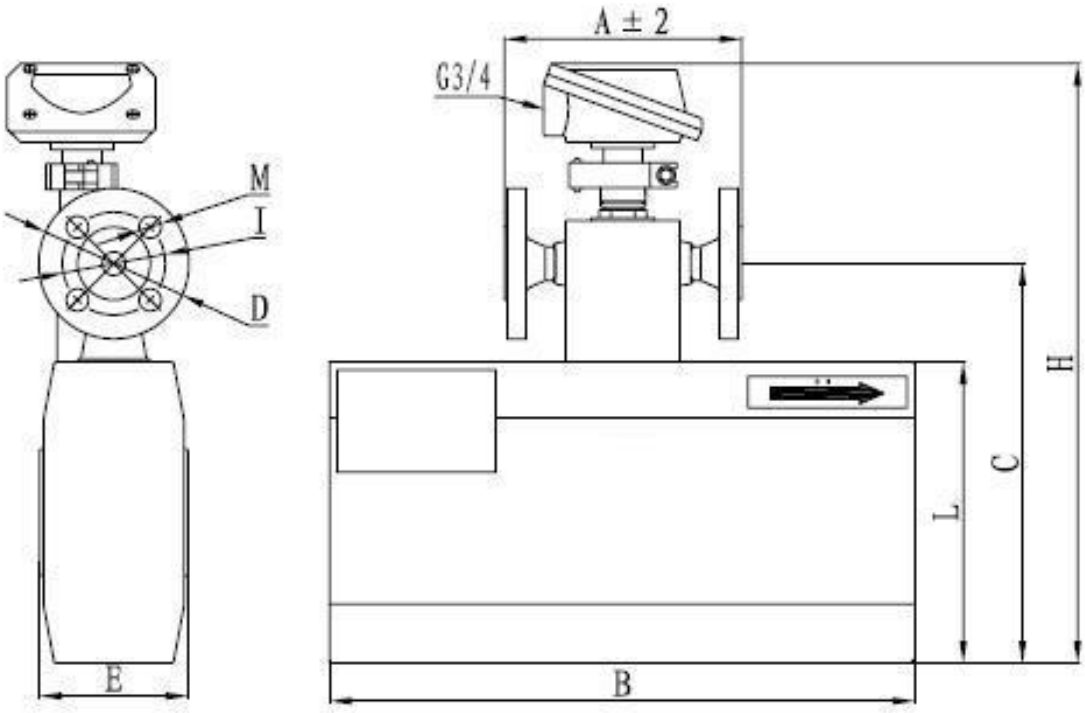


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D	F
Flange(HG/T 20592-2009)											
DN(mm)	PN(MPa)										
15(Standard)	4.0	162	370	190	252	477	124	14	65	95	180

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D	F
Flange(ASME B16.5-2009)											
DN(mm)	PN(Class)										
15(Optional)	300	192	370	190	252	477	124	16	66.7	95	180

N15 Remote Installation

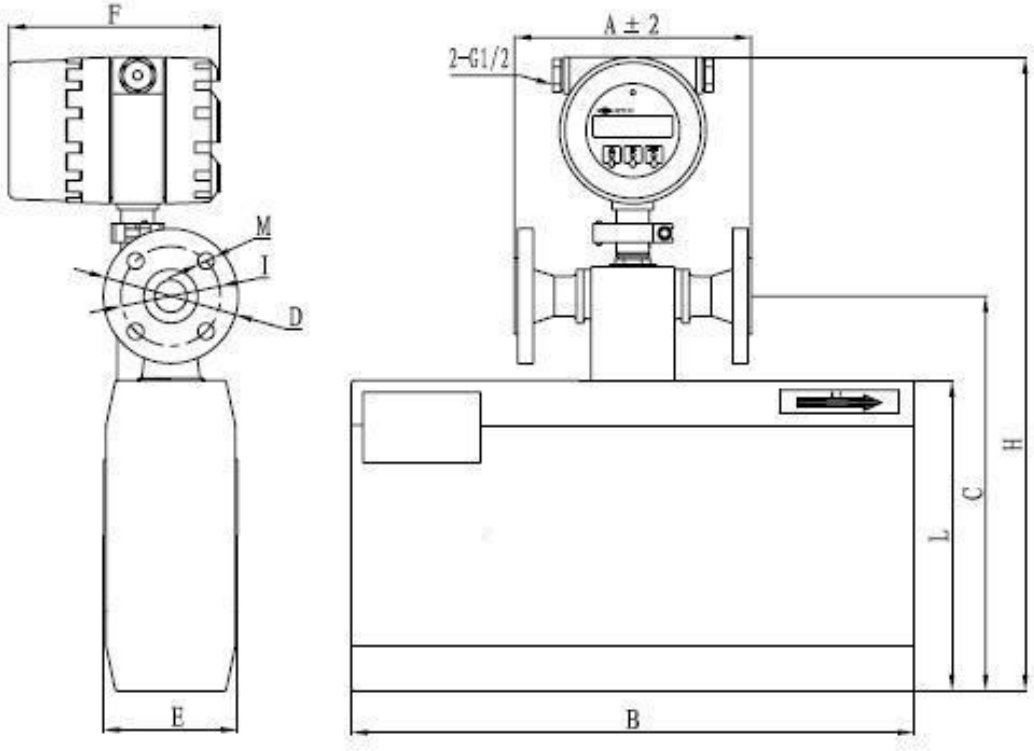


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
15(Standard)	4.0	162	370	190	252	400	124	14	65	95

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
15(Optional)	300	190	370	190	252	400	124	16	66.7	95

N20 Compact Installation

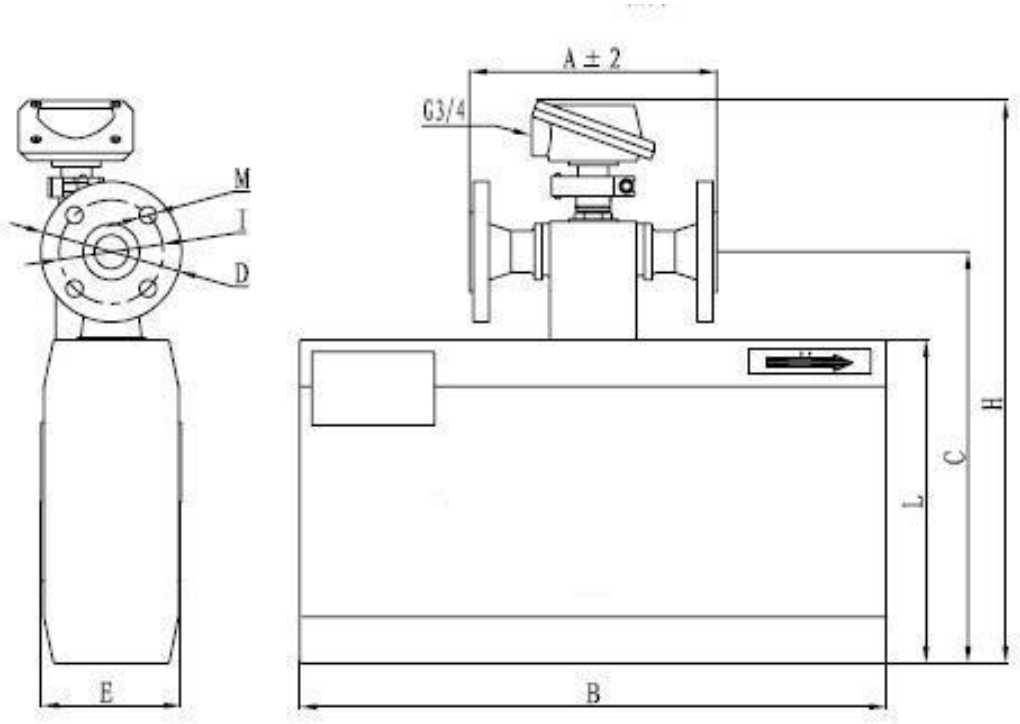


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D	F
Flange(HG/T 20592-2009)											
DN(mm)	PN(MPa)										
25(Standard)	4.0	202	480	265	337	550	134	14	85	115	180

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D	F
Flange(ASME B16.5-2009)											
DN(mm)	PN(Class)										
25(Optional)	300	246	480	265	337	550	134	18	88.9	125	180

N20 Remote Installation

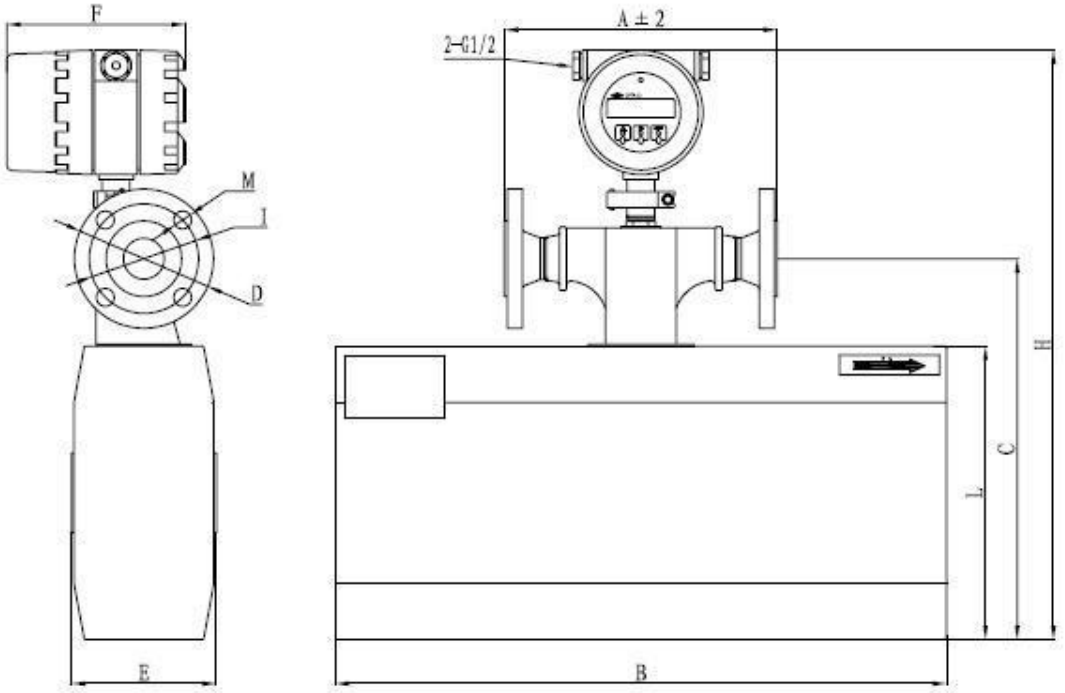


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
25(Standard)	4.0	202	480	265	337	477	134	14	85	115

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
25(Optional)	300	246	480	265	337	477	134	18	88.9	125

N25 Compact Installation

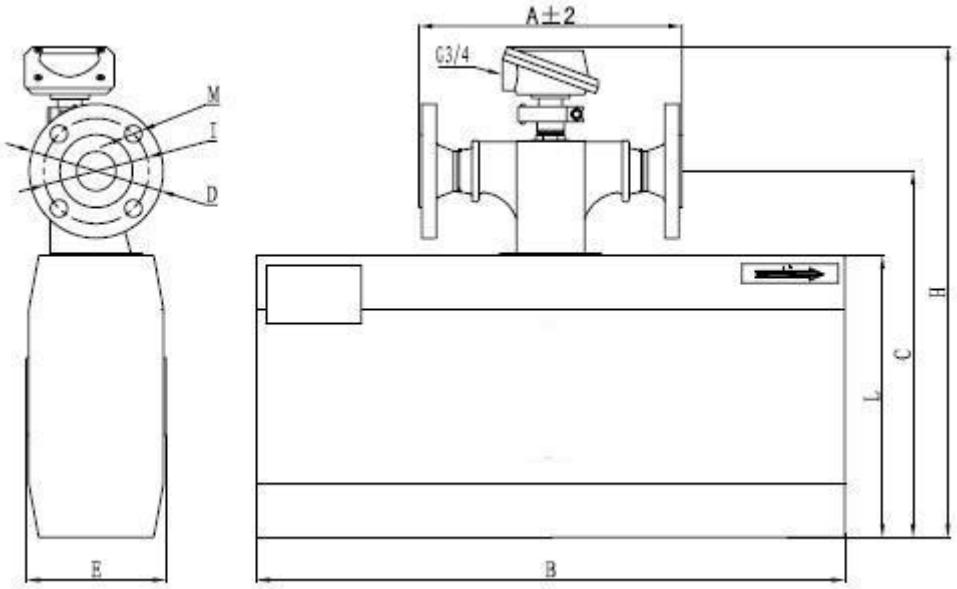


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D	F
Flange(HG/T 20592-2009)											
DN(mm)	PN(MPa)										
40(Standard)	4.0	274	615	295	383	579	146	18	110	150	180

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D	F
Flange(ASME B16.5-2009)											
DN(mm)	PN(Class)										
40(Optional)	300	320	615	295	383	579	146	22	114.3	155	180

N25 Remote Installation

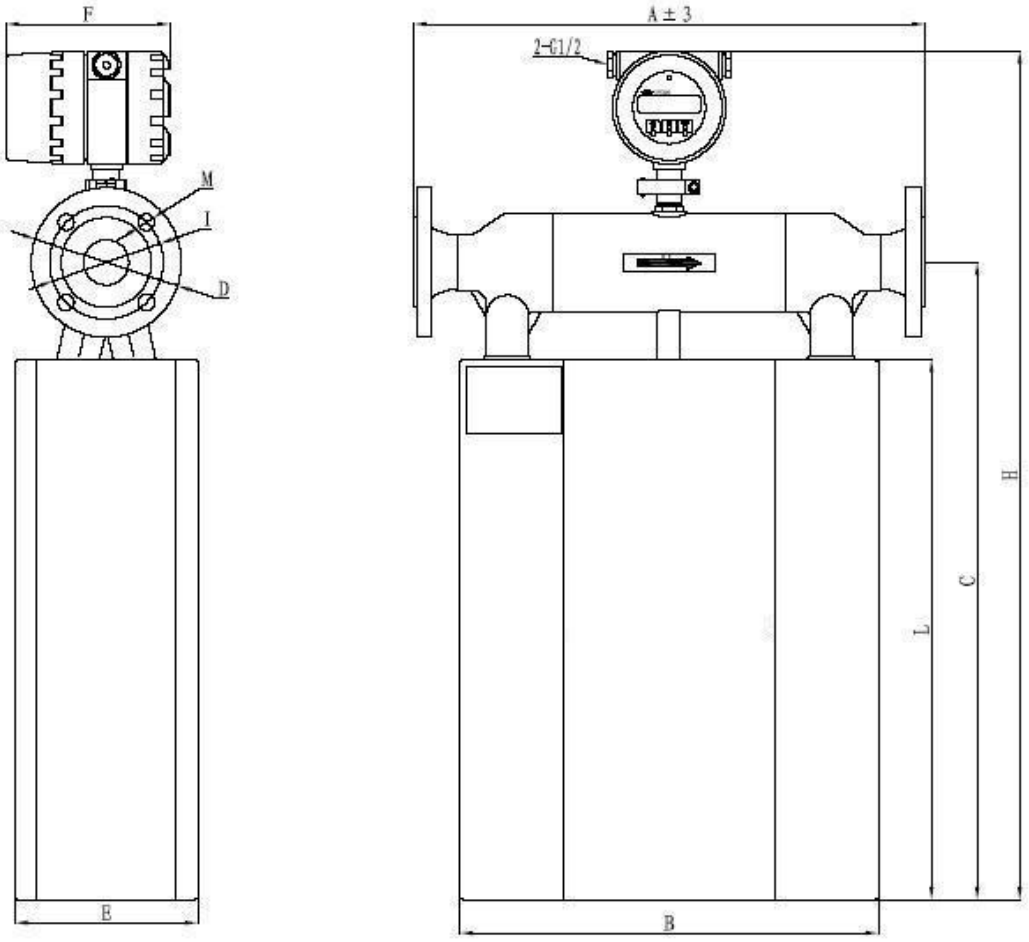


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
40(Standard)	4.0	274	615	295	383	516	146	18	110	150

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
40(Optional)	300	320	615	295	383	516	146	22	114.3	155

N50 Compact Installation

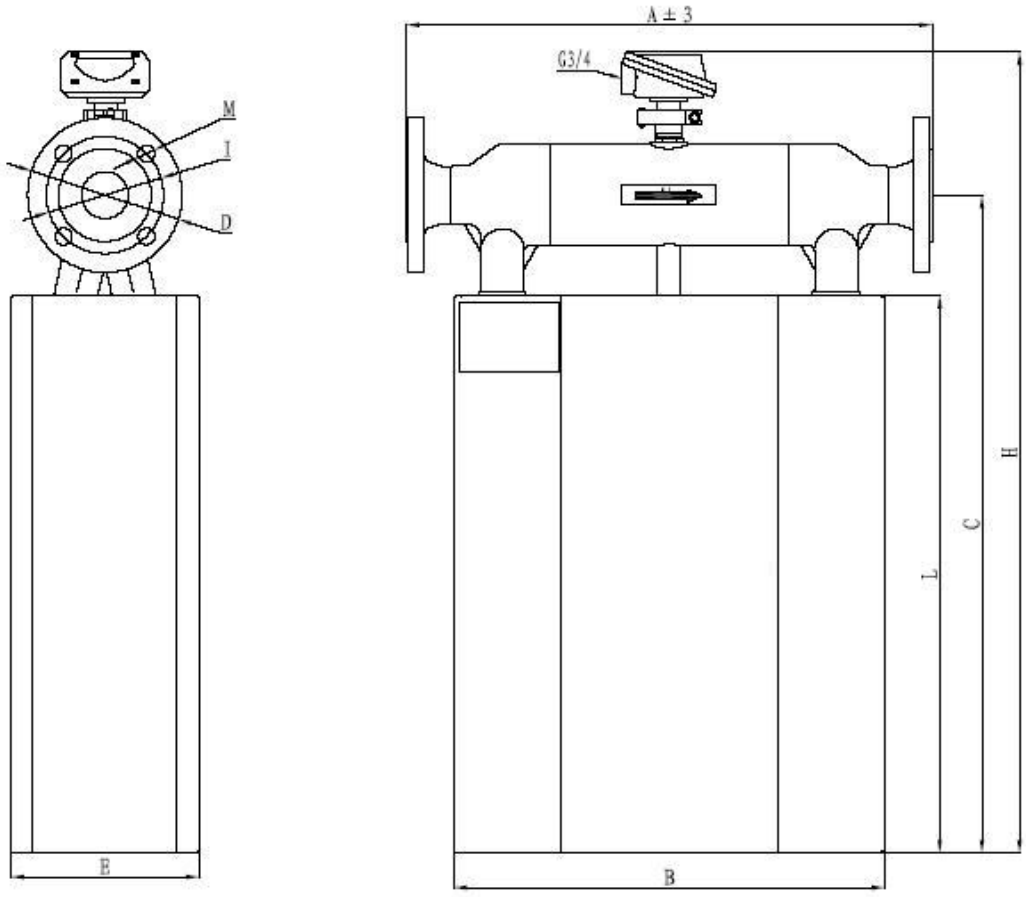


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D	F
Flange(HG/T 20592-2009)											
DN(mm)	PN(MPa)										
50(Standard)	4.0	562	460	595	702	922	201	18	125	165	180
65(Optional)	4.0	570	460	595	702	922	201	18	145	185	180

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D	F
Flange(ASME B16.5-2009)											
DN(mm)	PN(Class)										
50(Standard)	300	606	460	595	702	922	201	18	127	165	180
65(Optional)	300	620	460	595	702	922	201	22	149.2	190	180

N50 Remote Installation

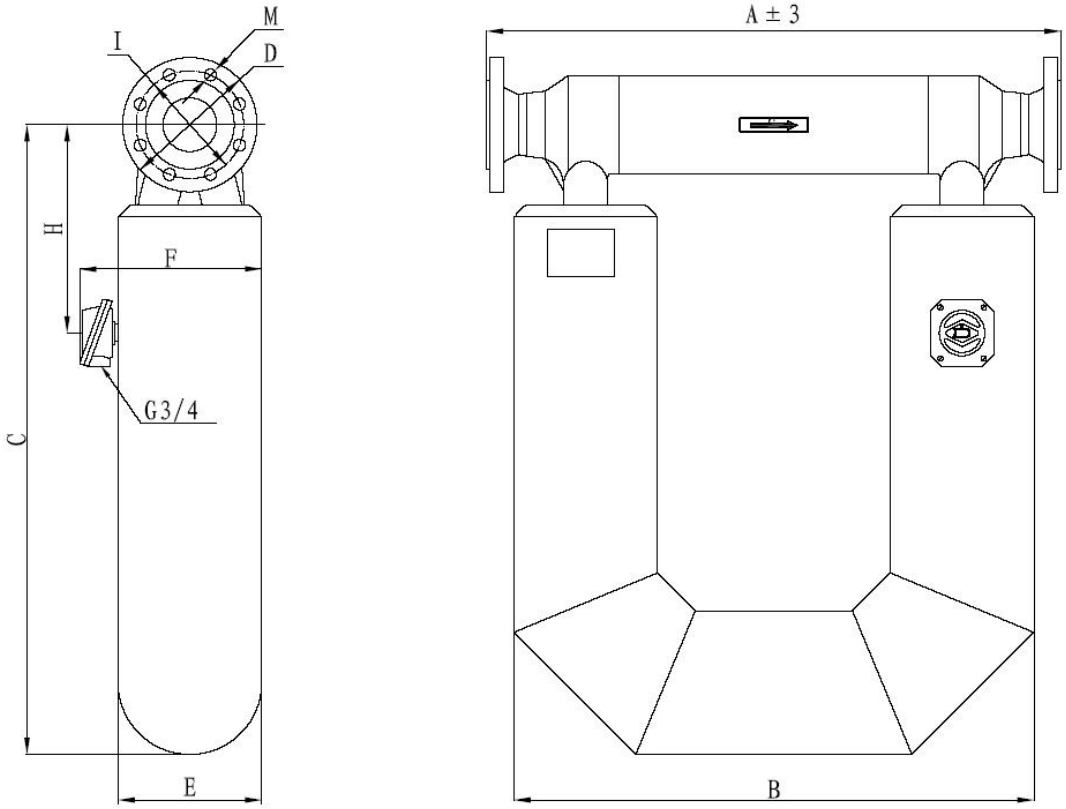


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	L	C	H	E	M	I	D
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
50(Standard)	4.0	562	460	595	702	845	201	18	125	165
65(Optional)	4.0	570	460	595	702	845	201	18	145	185

Flange(HG/T 20615-2009)		A	B	L	C	H	E	M	I	D
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
50(Standard)	300	606	460	595	702	845	201	18	127	165
65(Optional)	300	620	460	595	702	845	201	22	149.2	190

N80 Mass Flow Sensor

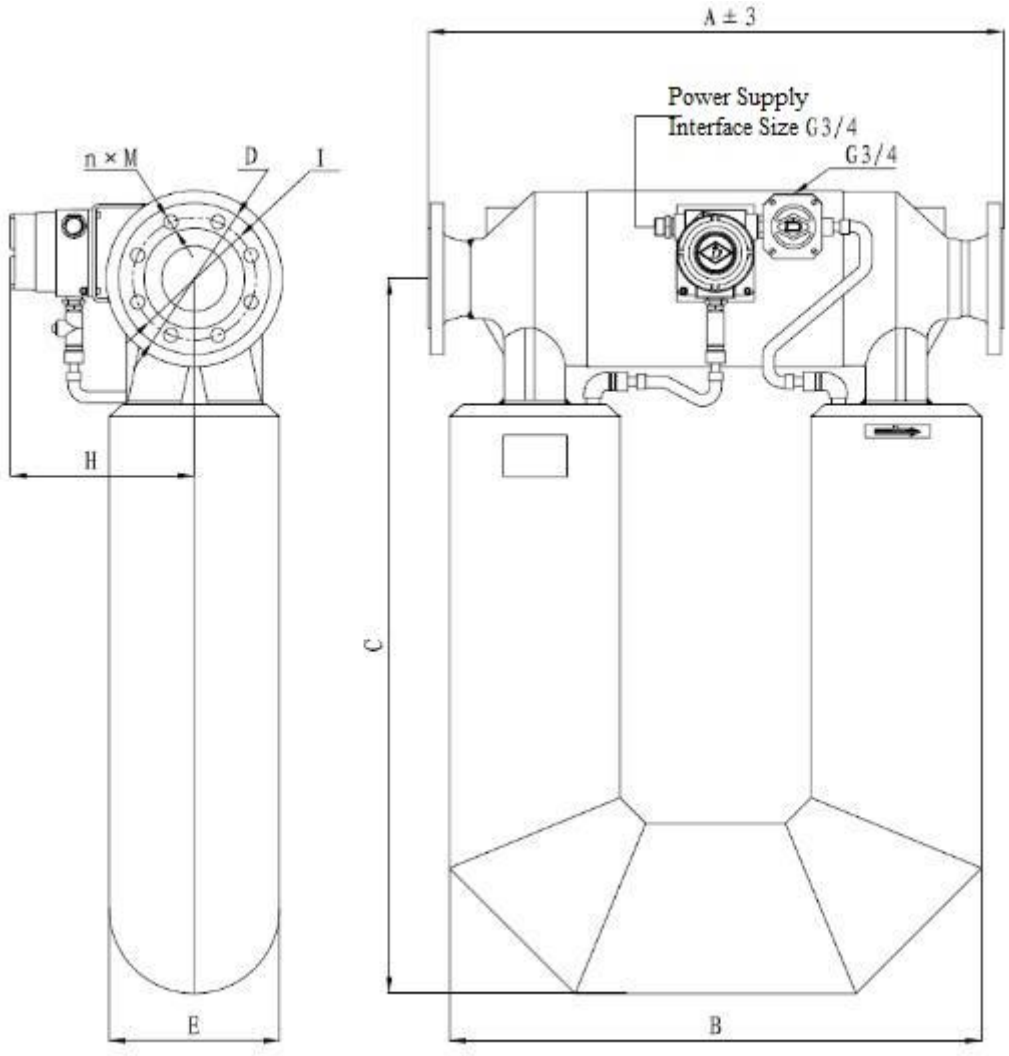


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	C	D	E	F	H	I	M
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
80(Standard)	4.0	850	774	941	200	214	277	313	160	18
100(Optional)	4.0	864	774	941	235	214	277	313	190	22

Flange(HG/T 20615-2009)		A	B	C	D	E	F	H	I	M
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
80(Optional)	300	892	774	941	210	214	277	313	168.3	22
100(Optional)	300	904	774	941	255	214	277	313	200	22

N100 Mass Flow Sensor

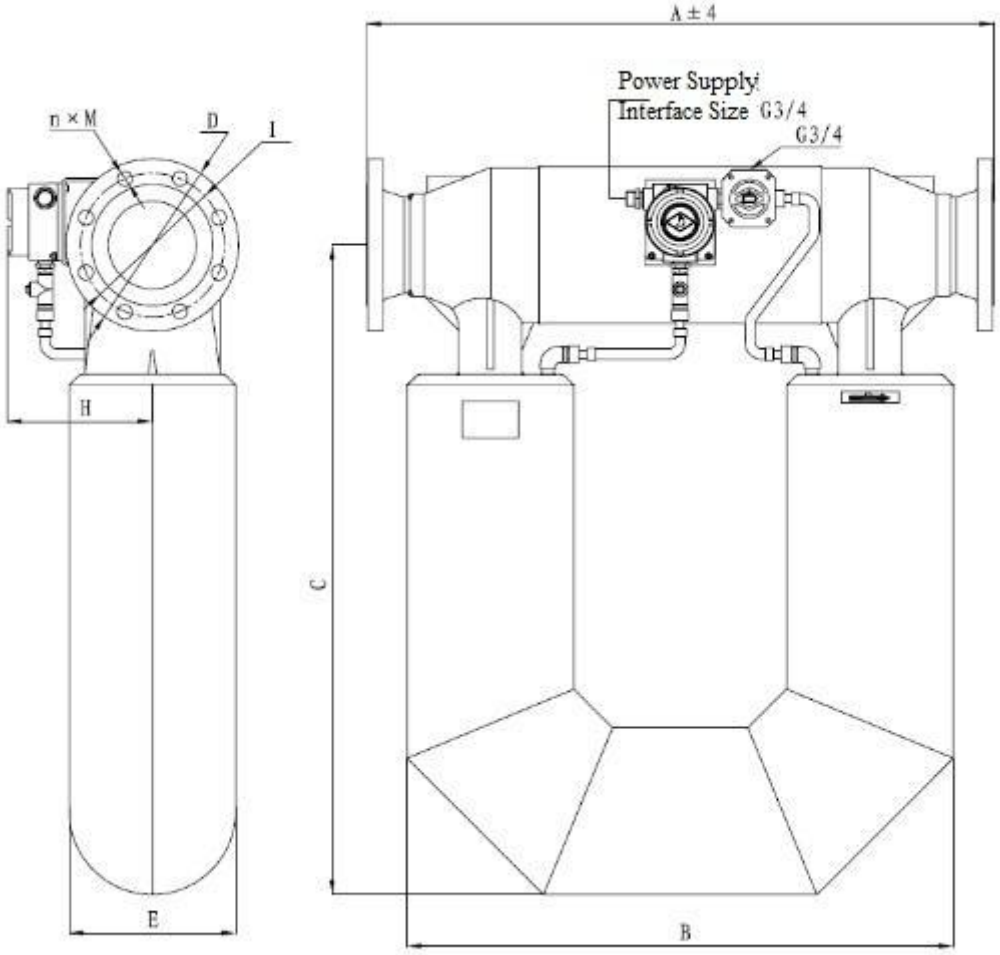


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	C	D	E	H	I	M	n
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
100(Standard)	4.0	890	824	1135	235	264	287	190	22	8
150(Optional)	4.0	910	824	1135	300	264	287	250	26	8

Flange(HG/T 20615-2009)		A	B	C	D	E	H	I	M	n
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
100(Optional)	300	932	824	1135	255	264	287	200	22	8
150(Optional)	300	956	824	1135	320	264	287	269.9	22	12

N150 Mass Flow Sensor

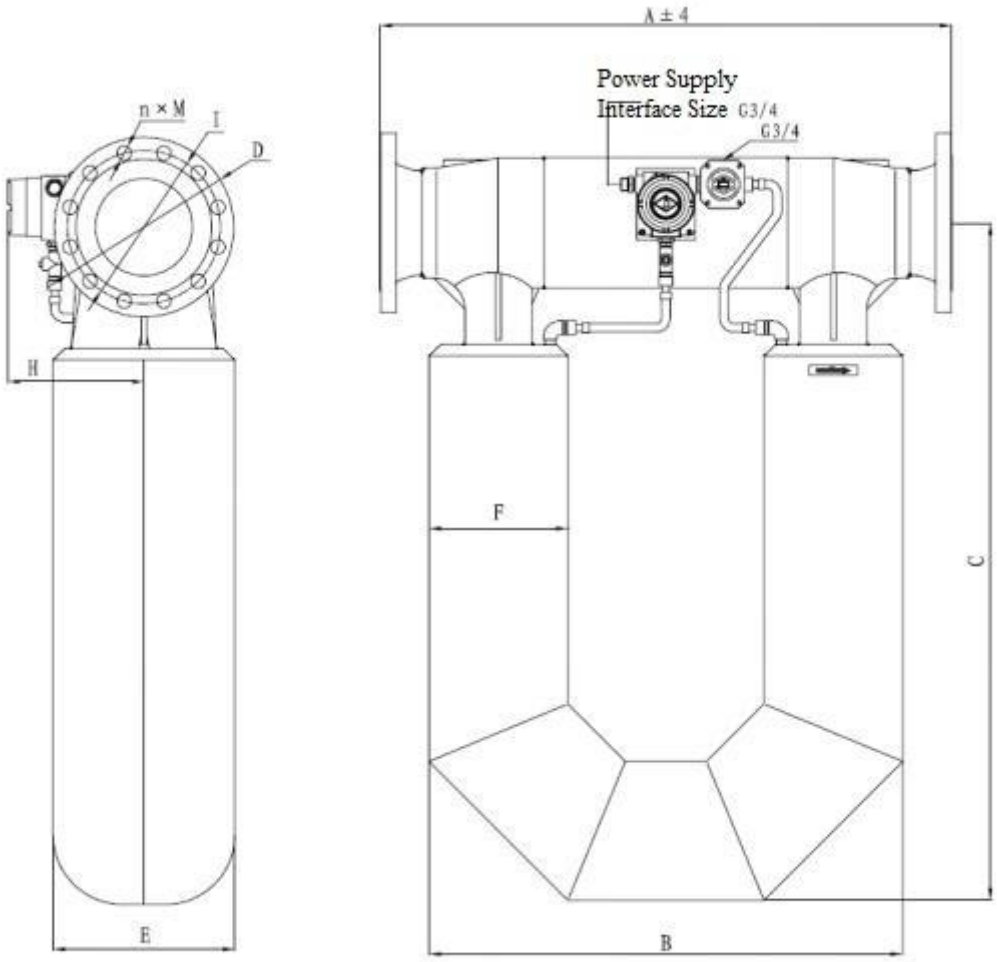


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	C	D	E	H	I	M	n
Flange(HG/T 20592-2009)										
DN(mm)	PN(MPa)									
150(Standard)	4.0	1090	950	1130	300	290	287	250	26	8
200(Optional)	4.0	1116	950	1130	375	290	287	320	30	12

Flange(HG/T 20615-2009)		A	B	C	D	E	H	I	M	n
Flange(ASME B16.5-2009)										
DN(mm)	PN(Class)									
150(Optional)	300	1136	950	1130	320	290	287	269.9	22	12
200(Optional)	300	1162	950	1130	380	290	287	330.2	26	12

N200 Mass Flow Sensor

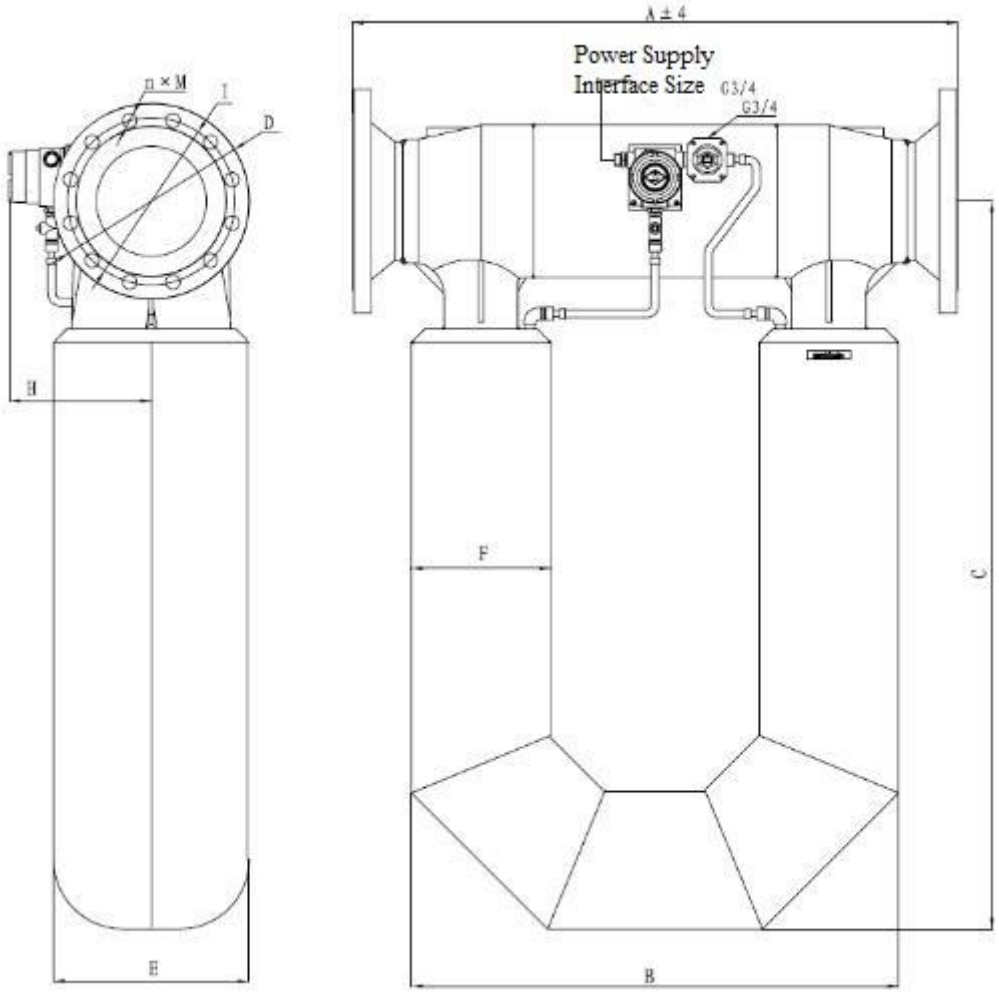


Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	C	E	F	H	M	I	D	n
Flange(HG/T 20592-2009)											
DN(mm)	PN(MPa)										
200(Standard)	4.0	1206	1005	1407	380	290	287	30	320	375	12
250(Optional)	4.0	1240	1005	1407	380	290	287	33	385	450	12

Flange(HG/T 20615-2009)		A	B	C	E	F	H	M	I	D	n
Flange(ASME B16.5-2009)											
DN(mm)	PN(Class)										
200(Optional)	300	1252	1005	1407	380	290	287	26	330.2	380	12
250(Optional)	300	1264	1005	1407	380	290	287	30	387.4	445	16

N250 Mass Flow Sensor



Note:The Listed Flanges In The Below Tables Are Welding-neck Steel Pipe Flanges RF

Flange(GB/T 9115-2010)		A	B	C	E	F	H	M	I	D	n
Flange(HG/T 20592-2009)											
DN(mm)	PN(MPa)										
250(Standard)	4.0	1360	1120	1683	448	290	328	33	385	450	12
300(Optional)	4.0	1380	1120	1683	448	290	328	33	450	515	16

Flange(HG/T 20615-2009)		A	B	C	E	F	H	M	I	D	n
Flange(ASME B16.5-2009)											
DN(mm)	PN(Class)										
250(Optional)	300	1382	1120	1683	448	290	328	30	387.4	445	16
300(Optional)	300	1408	1120	1683	448	290	328	33	450.8	520	16

Note:

For the model N100、N150、N200、N250, the ambient temperature of the power amplifiers is -20℃~+55℃, it is not allowed to cover or wrap, nor apply heat tracing to the power amplifiers in the process of heat tracing, otherwise the internal components will be damaged.

Order Information

Options	Codes	Codes Description
Sensor Model□	N	N Series
	5	(0～350)kg/h
	10	(0～1500)kg/h
	15	(0～4500)kg/h
	20	(0～9450)kg/h
	25	(0～25500)kg/h
	50	(0～94500)kg/h
	80	(0～240000)kg/h
	100	(0～540000)kg/h
	150	(0～825000)kg/h
	200	(0～1650000)kg/h
	250	(0～2700000)kg/h
Transmitter Model□□□□	W000	None
	D100	DPT100 【English Display、IP67、Ex d e ib IIC T6 NF、Remote Type】
	D101	DPT100 【English Display、IP67、Ex d e ib IIC T6 NF、Compact Type】
Sensor Characters□	B	304&316L
	C	316L High Temperature of 350℃
	L	316L
	H	C-22
	T	Specified
Power Supply□	0	None
	1	18VDC-36VDC
	2	85VAC-265VAC
	3	Intelligent Type
Process Connection Type□	A	GB/T 9124.1 welding neck flanges 4MPa WN-RF
	C	GB/T 9124.1 welding neck flanges 6.3MPa WN-RF
	E	HG/T 20615 welding neck flanges Class300 WN-RF
	F	ASME B16.5 welding neck flanges Class150 WN-RF

	G	ASME B16.5 welding neck flanges Class300 WN-RF
	I	HG/T 20592 welding neck flanges 4MPa WN-RF
	T	Specified

Options	Codes	Codes Description
Size	B	DN15
	D	DN25
	F	DN40
	G	DN50
	H	DN65
	I	DN80
	J	DN100
	L	DN150
	M	DN200
	N	DN250
	O	DN300
	T	Specified
Accessories□	0	None
	1	10m cable
	2	Carbon steel flanges, bolts and nuts, metal winding gaskets, 5m cable
	3	Stainless steel flanges, bolts and nuts, metal winding gaskets, 5m cable
	4	Carbon steel flanges, bolts and nuts, metal winding gaskets
	5	Stainless steel flanges, bolts and nuts, metal winding gaskets
	9	Specified
Electrical Interfaces□	W	None
	M	M20×1.5
	N	1/2NPT
	P	3/4NPT
	G	G1/2
	E	G3/4
	T	Specified
Communications □	0	None
	1	Active Current (4～20)mA、Active Frequency(0～10)kHz、RS-485
	2	Active Current(4～20)mA、RS-485
	3	Active Frequency(0～10)kHz、RS-485
	4	Passive Frequency(0～10)kHz、RS-485
	5	Active Frequency(0～10)kHz、Passive Current(4～20)mA+ HART(DPT)
	6	Active Frequency(0～10)kHz、Active Current(4～20)mA+ HART(DPT)

	7	Passive Frequency(0～10)kHz、Active Current(4～20)mA+ HART(DPT)
	8	Passive Frequency(0～10)kHz、Passive Current(4～20)mA+ HART(DPT)
	9	Specified
Measuring Modes□	B	General Measuring Type
	C	Water-cut Type
	E	Concentration Measurement Type
	F	Viscosity Measuring Type
	G	Velocity Measuring Type
	Z	Undefined