VNER

ELECTROMAGNETIC FLOWMETER

VE11/13/15

JIANGSU VNER ELECTRONIC TECHNOLOGY LTD

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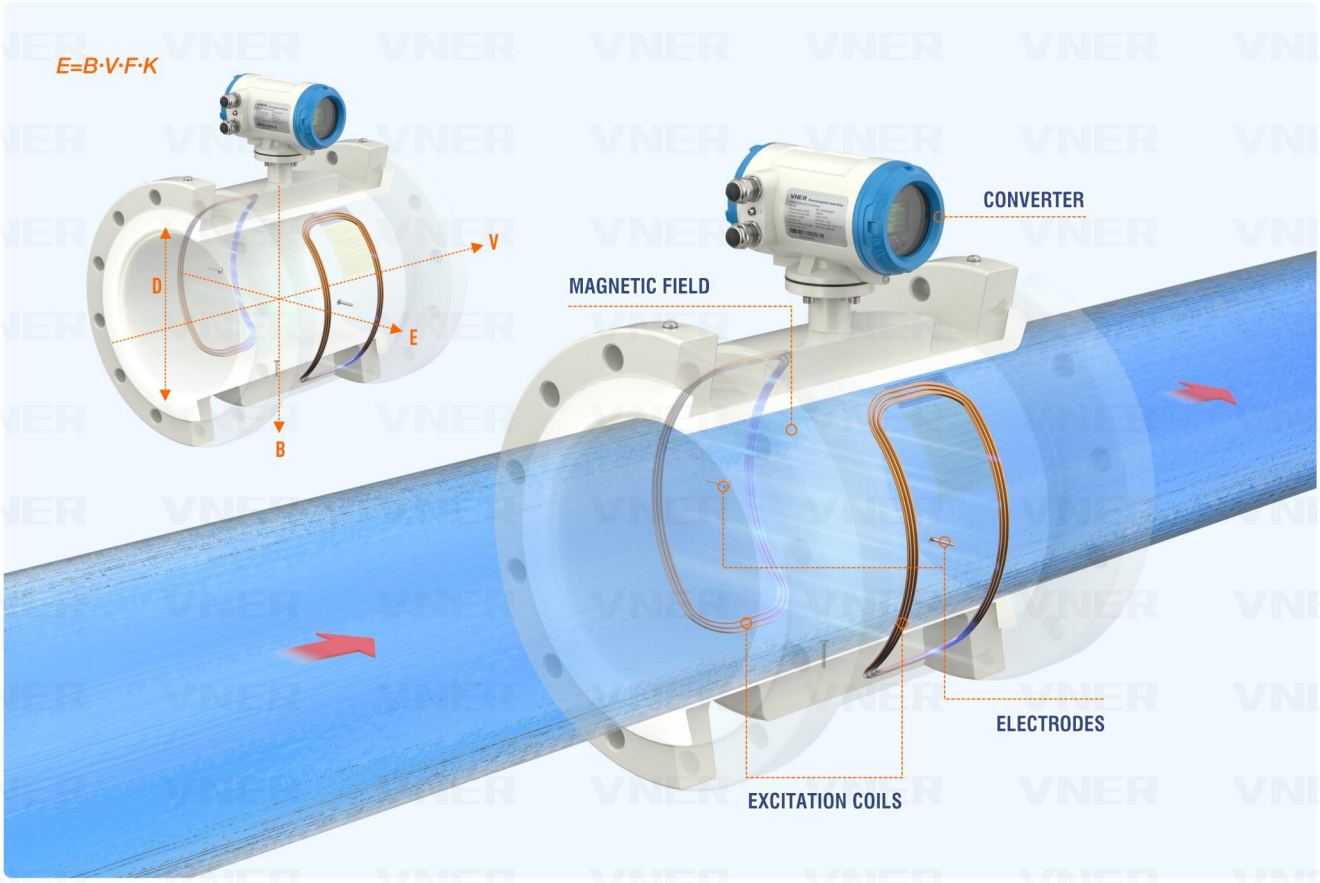
PRODUCT FEATURES

- No moving parts or obstructive components inside the pipeline, resulting in almost no additional pressure loss during measurement.
- Measurement results are almost independent of the fluid's pressure, temperature, density, and viscosity.
- Range can be set online based on user requirements in the field.
- Suitable for measuring the flow of various conductive liquids, such as water, wastewater, beverages, chemical raw materials, viscous liquids, pulp, mud, slurry, etc.
- Uses SMD components and SMT technology for high circuit reliability and low power consumption.
- Embedded microprocessor for fast computation and programmable low-frequency rectangular wave excitation, improving the stability of flow measurements.
- Full digital processing with strong anti-interference capability, reliable measurement, high accuracy, and wide rangeability.
- Ultra-low power EMI switching power supply with a wide power voltage range and good EMC performance.
- Contains three totalizers that can accumulate forward flow, reverse flow, and the algebraic sum of both.
- Easy to use: only powersupply is needed after installation to output standard signals, facilitating use.
- Automatic average flow calculation function for stable instrument output.
- Power failure protection; the flowmeter's calculation results and user-set parameters will not disappear after a power failure.
- EEPROM protects set parameters and cumulative values.
- Small signal cut-off function allows users to set the lower limit voltage and lower limit flow to eliminate interference from small flows.
- Password lock function; to set parameters, a five-digit password must be entered after powering on the flowmeter, effectively preventing unauthorized personnel from modifying instrument parameters.
- The converter and sensor have multiple protection levels and installation methods. The sensor is suitable for submersible installations with IP68 rating.
- Insertion type electromagnetic flowmeter is easy to install in large pipeline flow detection, does not require flow interuption, and can be pressure drilled onsite, offering significant installation and cost advantages.
- Insertion type electromagnetic flow measurement is only related to the insertion depth, making this flowmeter widely applicable and highly interchangeable. One model can meet the fluid measurement requirements of various pipeline specifications.
- Supports parameter setting via Bluetooth communication, allowing wireless parameter setting within short distances (within 20 meters), facilitating field operations. Provides up to 1-second fast response measurement capability.
- Excellent low conductivity performance, capable of measuring media with conductivity as low as 1μS.
- Unique patented mixed-frequency excitation technology can overcome noise interference from pulp, mud, slurry, and other types of slurry.
- Unique zero-point technology for quick response capability and high-quality manufacturing, providing users with 0.2% measurement accuracy.

OPERATING PRINCIPLE

The electromagnetic flowmeter operates based on Faraday's Law of Induction, which states that an electromotive force (EMF) is induced in a conductor when it moves through a magnetic field. This measurement principle can be applied to conductive fluids. When such a fluid flows through a pipeperpendicular to the direction of a magnetic field, an induced EMF is generated in the fluid. This induced EMF can be measured using two symmetrically placed electrodes.

The signal voltage Ue is directly proportional to the magnetic flux density B, the distance between the electrodes D, and the average velocity of the fluid V. Since the magnetic flux density B and the distance between the electrodes D are constants, the signal voltage Ue is directly proportional to the average flow velocity V.
The equation used to calculate the volumetric flow rate indicates that the signal voltage Ue is linearly proportional to the volumetric flow rate.
The induced signal voltage is converted into scaled, analog, as well as digital output signals in the converter.



STANDARD TECHNICAL SPECIFICATIONS

1. NORMAL OPERATING CONDITIONS

Ambient Temperature: (-25 to +60)°C

Relative Humidity: 5% to 93%

Power Supply: Single-phase AC power (85 to 250)V, (45 to 63)Hz; DC power 16VDC to 36VDC

Power Consumption: Less than 20W

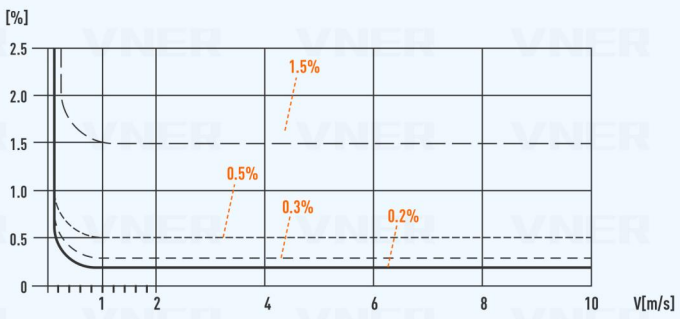
2. MEASUREMENT ACCURACY

VE11E / VE11H: ±0.5% ±0.3% ±0.2%

VE12: ±0.5%

VE13E: ±0.5%

VE15: ±1.5% ±1.0%



MEASUREMENT ERROR

3. OUTPUT VARIABLES

3.1 Analog current output

Load resistance: (0-10)mA: (0-1.5)kΩ ; (4-20)mA: (0-750)Ω

Basic error: 0.1% ±10μA

3.2 Digital frequency output

Frequency output range: (1~5000)Hz

Output Electrical Isolation: Optical isolation, isolation voltage: >1000VDC

Frequency Output Drive: Field-effect transistor output, maximum withstand voltage 36VDC, maximum load current 250mA.

3.3 Digital pulse output

Output Pulse Range: (0~100) pulses/s

Output Pulse Equivalent: (0.001~1.000) m³/cp

(0.001~1.000) LTR/cp

(0.001~1.000) USG/cp

(0.001~1.000) UKG/cp

Output Pulse Width: User software configurable.

Output Electrical Isolation: Optical isolation, isolation voltage: >1000VDC

Pulse Output Drive: Field-effecttransistor output, maximumwithstand voltage 36VDC, maximum load current 250mA.

3.4 Alarm output

Alarm Output Contacts: AUIH-Upper Limit Alarm; AUIL-Lower Limit Alarm.

Output Electrical Isolation: Optical isolation, isolation voltage: >1000VDC

Alarm Output Drive: Transistor output, maximum withstand voltage 36VDC, maximum load current 250mA.

3.5 Digital Communication Interface and Communication Protocol

MODBUS Interface: RTU format, physical interface RS-485, electrical isolation 1000V.

HART Interface: Supports standard HART protocol, with HART handheld communicator, can display measured values online, and modify instrument parameters.

MAIN TECHNICAL PARAMETER

DIAMETER	VE11E	VE11H	VE12	VE13E	VE15
Measuring fluids	Conductive fluids				
Accuracy	±0.5% ±0.3% ±0.2%		±0.5%		±1.5% ±1.0%
Repeatbility	0.16% 0.1% 0.07%		0.16%		0.5% 0.33%
Fluids temperature	(-40~200)°C		(-40~200)°C		(-40~200)°C
Conductivity	5μS/cm (softened water reauires 20μS/cm), suitable for low conductivitv: VE11E/VE11H ≥1μS/cm Note: If the fluid flow noise is too high (such as with pure water, pure alcohol, or other liquids) and the conductivity is too low. Please contact our company for technical support in selecting the appropriate model.				
Diameter range	(3~2000)mm		(6~2000)mm	(10~125)mm	(200~4000)mm
Rated working pressure	0.6MPa / 1.0MPa / 1.6MPa / 2.5MPa / 4.0MPa / others			1.0MPa	1.6MPa
Full-scale flow velocity range	(0.3~10)m/s				(0.5~8)m/s
Flow direction	Forward/Reverse				
Electrode material	316L, Hastelloy B, Hastelloy C, Titanium, Tantalum, Platinum-iridium, Tungsten carbide, Others.	Wear-resistant and anti-noise electrode, 316L, Hastelloy B, Hastelloy C, Titanium, Tantalum, Patoum-nditm, Others	316L Hastelloy C Titanium	316L Hastelloy C Titanium	316L Hastelloy C
Lining material	Neoprene rubber, PTFE, F46, PFA.	Polyurethane, ETFE, Ceraimic, Nitrle rubber, PTFE, F46, PFA.	Neoprene rubber, PTFE, F46, PFA	F46 / PFA	PTFE
Electrode type	Standard electrode, scraper-type electrode.				
Number of electrodes	Two electrodes / Four electrodes		Four electrodes	Two electrodes	
Measuring tube material	304 stainless steel				304 stainless steel (insertion rod)
Flange interface material	Carbon steel / Stainless steel			Stainless steel	
Installation types	Flange			Clamp / Threaded	Flange / Online insertion and removal
Protection level	IP65 / IP67 / IP68				
Power	220VAC / 24VDC			220VAC / 24VDC	
Signa output	(4~20)mA / Frequence / Pulse		(4~20)mA / Bluetooth	(4~20)mA / Frequence/ Pulse / Bluetooth	(4~20)mA/ Frequence / Pulse
Communication	HART communication/ Modbus protocol/ Profibus protocol	HART communication/ Modbus protocol	Modbus protocol/ user-defined protocol	HART communication/ Modbus protocol	HART communication/ Modbus protocol/ Profibus protocol
Electrical interface	1/2-14NPT、M20*1.5				
Explosion-proof type	Non-explosion-proof / Explosion-proof.				
Structural form	Integral / Remote				
Working conditions	Ambient temperature: -25~60°C, Humidity: 5%~93%				

Notes: For more details, please refer to the order information lists.

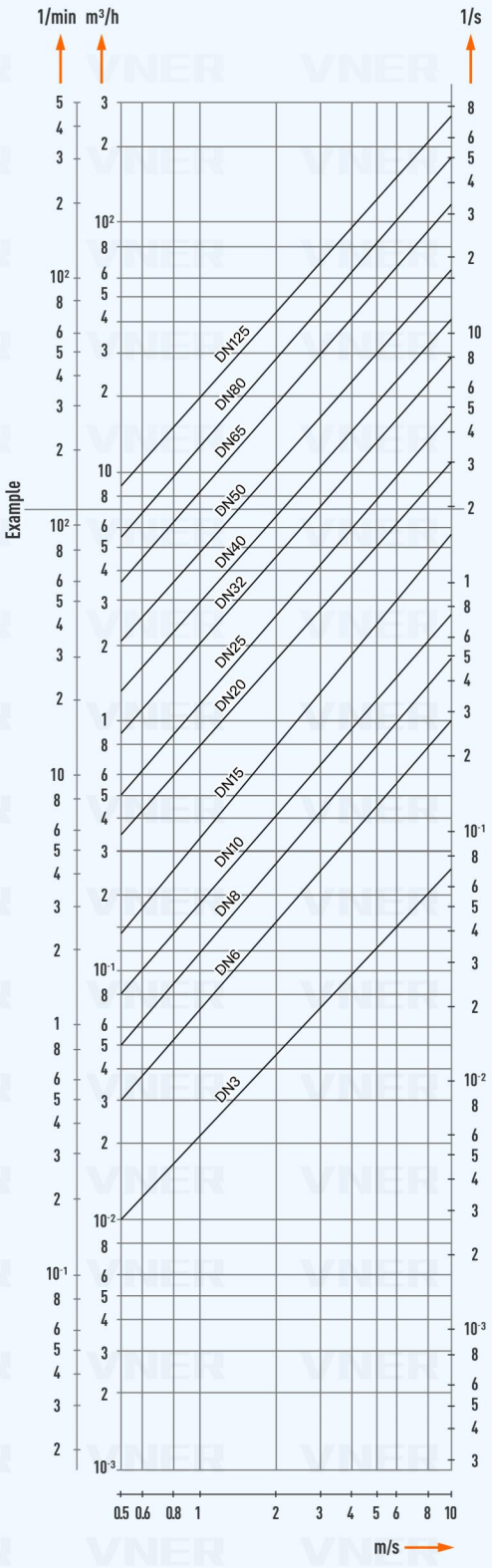
FLOWMETER DIAMETER,NOMINAL PRESSURE,AND FULL-SCALE FLOW RANGE

Instantaneous volumetric flow rate is a function of flow velocity and sensor diameter. The instantaneous flow rate curve indicates the flow range that each diameter flowmeter can measure, while also providing several sensor diameter specifications suitable for measuring a given flow rate.

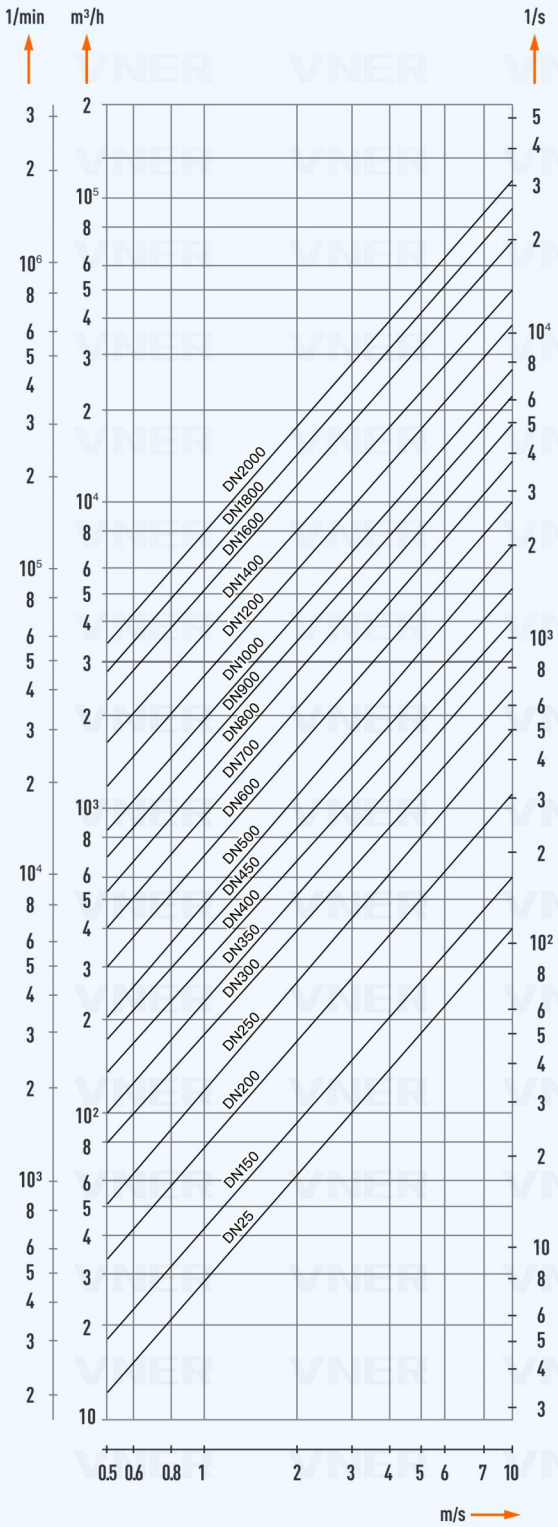
DIAMETER	MINIMUM FLOW RATE(M^3/H) 0.3M/S	MAXIMUM FLOW RATE(M^3/H) 10M/S
3	0.13L/min	4.2L/min
6	0.5L/min	17L/min
8	1.0L/min	30L/min
10	1.5L/min	47L/min
15	3.2L/min	106L/min
20	6.0L/min	188L/min
25	9.0L/min	294L/min
32	15L/min	482L/min
40	23L/min	754L/min
50	2.1	70.0
65	3.6	119
80	5.5	180
100	8.5	283
125	13.3	441
150	19	636
200	34	1130
250	53	1767
300	76	2544
350	104	3463
400	136	4523
450	172	5725
500	212	7068
600	305	10178
700	416	13854
800	543	18095
900	688	22902
1000	850	28274
1200	1222	40715
1400	1663	55417
1600	2172	72382
1800	2750	91608
2000	3393	113097

INSTANTANEOUS FLOW RATE CURVE OF AN ELECTROMAGNETIC FLOWMETER

For example: Instantaneous flow rate = 7m³/h (maximum value, i.e., the upper limit of the range). When the flow velocity is between 0.5-10 m/s, the applicable sensor diameters are [DN20-DN65].



DN3-DN100



DN125-DN2000

SELECTION OF ELECTRODE MATERIALS FOR ELECTROMAGNETIC FLOWMETERS

Select the electrode material based on the corrosiveness of the measured fluid.

MATERIAL	CORROSION RESISTANCE
316L	Suitable for: 1. Domestic water, industrial water, raw well water, municipal water
	2. Weakly corrosive fluids such as dilute acids and alkalis, alkaline salt solutions
Hastelloy B	Suitable for: 1. Hydrochloric acid (concentration less than 10%) and other non-oxidizing acids
	2. Sodium hydroxide (concentration less than 50%), all concentrations of ferrous hydroxide alkaline solutions
	3. Phosphoric acid, organic acids
	Not suitable for: Nitric acid
Hastelloy C	Suitable for: 1. Mixed acids such as a mixture of nitric acid and sulfuric acid
	2. Oxidizing salts like Fet++, Cu++, seawater
	Not suitable for: Hydrochloric acid
Ti	Suitable for: 1. Salts such as: (1) Chlorides (Chloride / Magnesium / Aluminum / Calcium / Iron, etc.)
	(2) Sodiumsalts, iron salts, hypochlorites, seawater
	2. Alkaline solutions like potassium hydroxide (concentration less than 50%), ferrous hydroxide, barium hydroxide
	Not suitable for: Hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid, and other reducing acids
Ta	Suitable for: 1. Hydrochloric acid (concentration less than 40%), dilute sulfuric acid, and concentrated sulfuric acid
	(excluding fuming sulfuric acid)
	2. Chlorine dioxide, ferric chloride, hypochlorites, sodiumfluoride, lead acetate
	3. Nitric acid (including fuming nitricacid) and other oxidizing acids, aqua regia at temperatures below 80°C
	Not suitable for: Alkaline, hydrofluoric acid
Pt	Suitable for: Almost all acids, alkalis, and salt solutions (including fuming sulfuric acid, fuming nitric acid)
	Not suitable for: Aqua regia, ammonium salt
Hard alloy (Anti-noise electrode)	Suitable for: Slurry-specificelectrodes, good wear resistance, can reduce slurry noise
	Not suitable for: Corosive liquids

SELECTION OF LINING MATERIALS

The selection should be based on the corrosiveness, abrasiveness, and temperature of the measured medium. Neoprene rubber can resist the corrosion of general weak acids and alkalis and withstand temperatures up to 55°C. Chlorinated Polyethylene (CPTFE) can resist corrosion by strong acids and alkalis, except for hot phosphoric acid, and can handle medium temperatures up to 130°C, but it is not resistant to abrasion. Polyurethane rubber has good abrasion resistance but it'is not resistant to acid or alkali corrosion and has poor temperature resistance, with a medium temperature limit of less than 65°C.

LINING MATERIAL	MAIN FUNCTIONS	USAGE RANGE
Neoprene Rubber	1. Can resist hydrochloric acid, acetic acid, oxalic acid, ammonia, phosphoric acid, and 50% sulfuric acid, sodium hydroxide, and potassium hydroxide at room temperature. 2. Avoid strong oxidizing agents	1. Below 65°C 2. General acid, alkali, and salt solvents
Polytetrafluoro ethylene (PTFE)	1. The most chemically stable plastic, can resist boiling hydrochloric acid, sulfuric acid, nitric acid, and aqua regia. Also resists concentrated alkalis and various organic solvents. 2. Poor wear resistance and adhesion	1. -40°C to +150°C 2. Strongly corrosive media such as acids and alkalis 3. Hygienic media
Modified Polytetrafl -uoroethylene (F46) Modified Polytetrafl -uoroethylene (PFA)	Corrosion resistance is similar to PTFE. It has stainless steel mesh inside the measuring tube, enhancing the bonding strength between the lining and the metal tube, and has goodnegative pressure resistance.	1. -40°C to +200°C 2. Strongly corrosive media such as acids and alkalis 3. Hygienic media
Polyurethane (PU)	1. Excellent wear resistance (ten times that of natural rubber) 2. Poor resistance to acids, alkalis, and some organic solvents	1. -5°C to +65°C 2. Neutral highly abrasive slurries, coalslurries, mud
ETFE	1. Corrosion resistance similar to PTFE. 2. Excellent wear resistance. 3. Good adhesion to metals. 4. Thermal expansion coefficient close to that of carbon steel, making ETFE an ideal composite material with metal, with excellent negative pressure resistance.	1. -40°C to +150°C (PTFE) -40°C to +200°C (PFA) 2. Strongly corrosive media such as acids and alkalis 3. Neutral highly abrasive slurries, coalslurries, mud
Polyurethane+ Ceramic Pieces	1. Excellent wear resistance. 2. Resistant to erosion. 3. Poor resistance to acids, alkalis, and some organic solvents	1. -5°C to +65°C 2. Neutral highly abrasive slurries, coalslurries, mud
Ceramic	1. Excellent corrosion resistance. 2. Excellent wear resistance (overten times that of polyurethane) 3. High-temperature resistance.	1. -5°C to +200°C 2. High-intensity abrasive slurries, coal slurries, mud

SELECTION OF PROTECTION LEVEL

According to the international standard GB/T4208-1993 regarding enclosure protection levels, they can be divided into:

IP65: Water-resistant type, allowing the instrument to be sprayed with water from a faucet from any direction. The spray pressure is 30 kPa, the water output is 12.5 liters per minute, and the distance from the instrument to the water spray is 3 meters.

IP67: Water immersion resistant type, allowing the instrument to be fully immersed in water for a short time. During testing, the highest point of the instrument should be at least 150 cm underwater, and the duration should be at least 30 minutes.

IP68: Submersible type,allowing the instrument to work underwater for an extended period.The maximum immersion depth should be determined through negotiation between the manufacturer and the user.

The selection of the protection level should be based on the above requirements and the actual conditions of the instrument.If the instrument is below ground level and frequently submerged, IP68 should be selected; if the instrument is above ground, IP65 can be chosen.

PROPER INSTALLATION OF ELECTROMAGNETIC FLOWMETERS

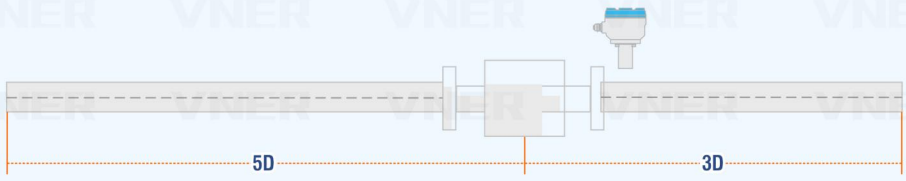
1. Selection of Installation Site:

- Choose a location where negative pressure will not occur inside the measurement pipe.
- Avoid installing near strong electrical equipment like motors and transformers to prevent electrical interference.
- Avoid installing in areas with strong corrosive gases.
- When measuring multiphase fluids, avoid locations that could cause phase separation.
- The ambient temperature should generally be within the range of -25°C to 60°C; avoid direct sunlight if possible.
- Installing areas with no vibration or minimal vibration. If the vibration is too strong, install fixed supports on the pipelines before and after the sensor.
- The ambient relative humidity should be between 5% and 93%.
- Avoid installing in locations directly exposed to rain or where the device could be submerged.

2. Requirements for Straight Pipe Length (D refers to the internal diameter of the flowmeter):

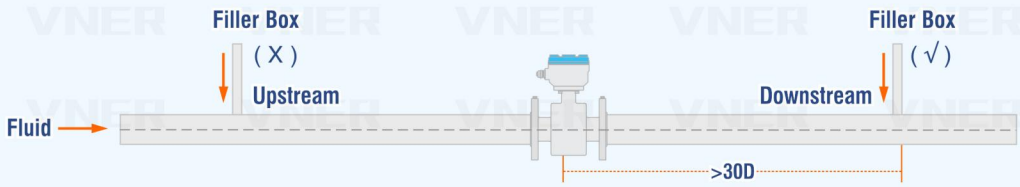
The electromagnetic flowmeter has relatively low requirements for the length of the straight pipe sections before and after the meter. For 90° elbows, T-joints, reducers, fully open valves, and other flow resistance elements, there should be a straight pipe section of 5D from the electrode axis of the electromagnetic flowmeter (not the sensor's end face). For adjustable valves with different openings, the upstream straight pipe section should be 10D. Generally, the downstream straight pipe section only needs to be 3D to meet the requirements.

As the figure shows below:



When measuring mixed liquids of different media, the distance between the mixing point and the flowmeter should be at least greater than 30D.

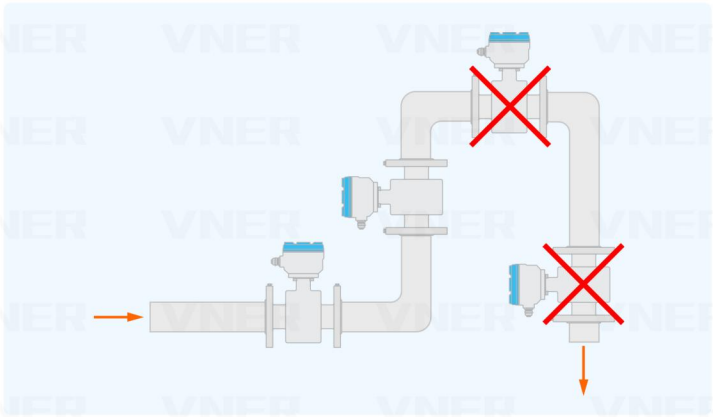
As the figure shows below:

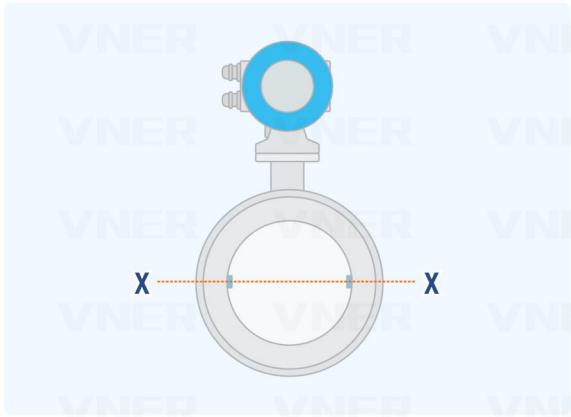


3. Installation Position and Flow Direction:

The electromagnetic flowmeter can be installed horizontally, vertically, or at an incline on the pipeline:

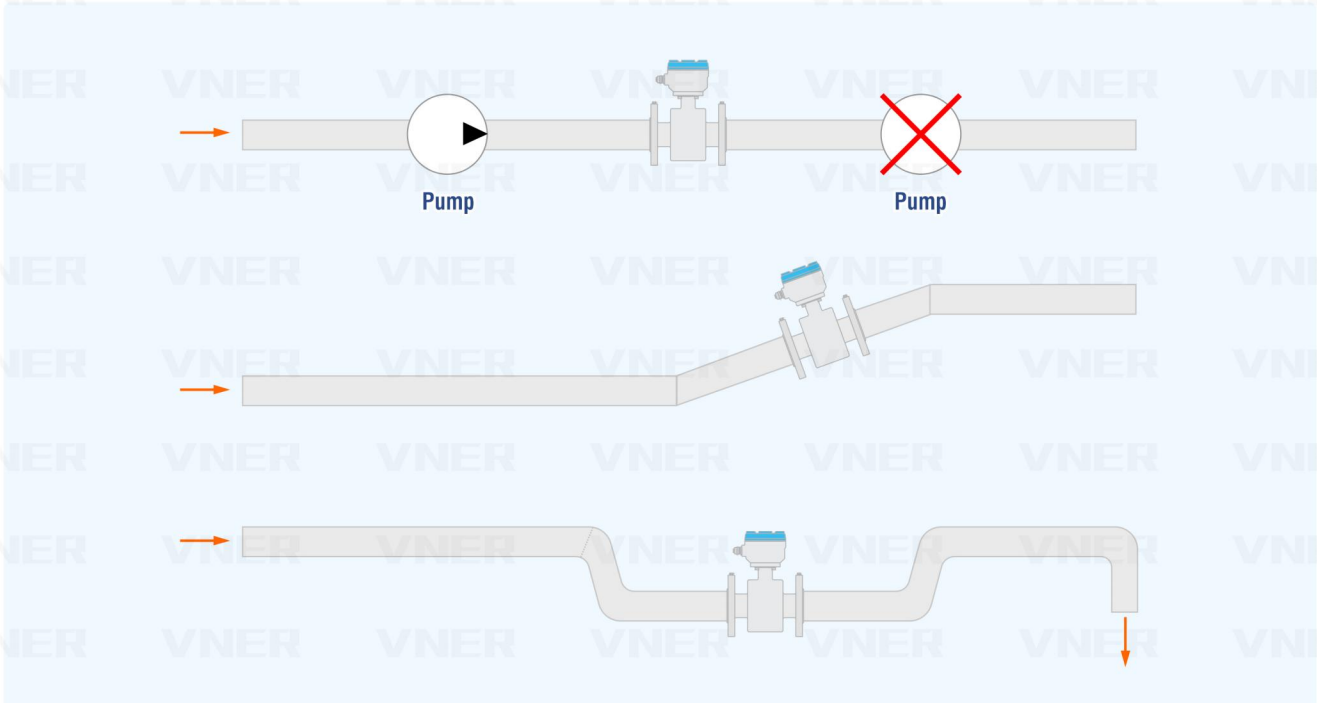
When installed horizontally, the electrode axis of the electromagnetic flowmeter must be horizontal. This prevents short-term insulation of the electrodes caused by air bubbles carried by the fluid and also prevents the electrodes from being covered by deposits in the fluid. The sensor should not be installed at the highest point in the pipeline to avoid gas accumulation.

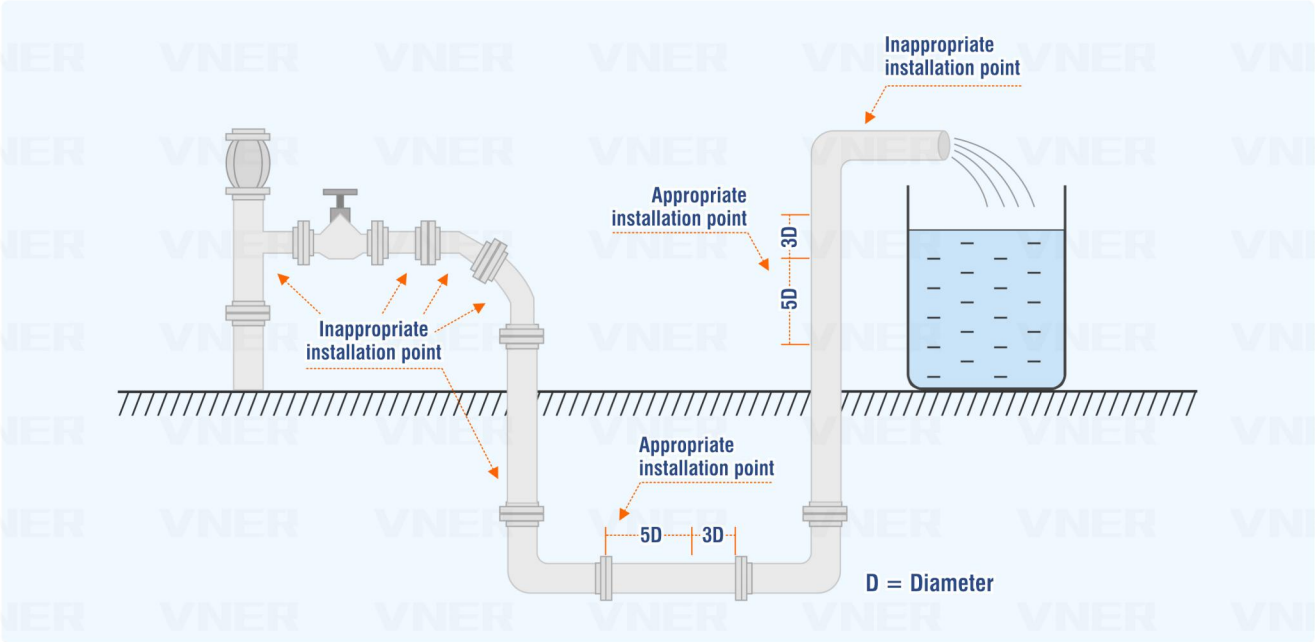




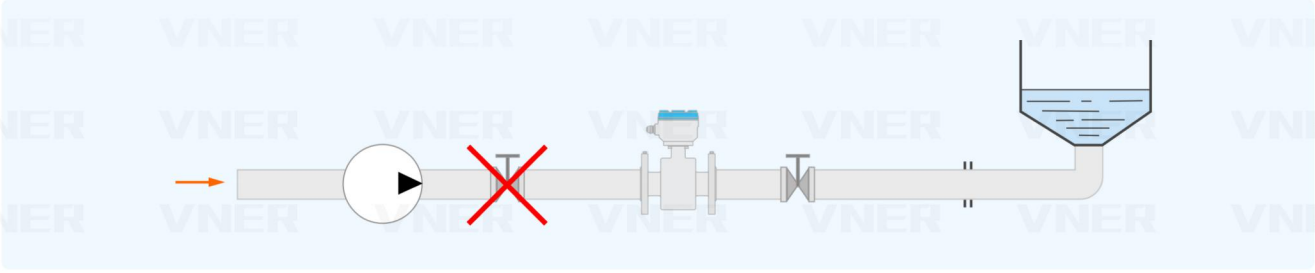
When installing vertically, the flow direction should be upwards. This ensures that when there is no flow or very low flow, heavier solid particles in the fluid will settle, while lighter fatty substances will rise, moving away from the sensor electrode area of the electromagnetic flowmeter. This setup helps prevent solid phase sedimentation and uneven abrasion of the sensor lining when measuring slurry, ore slurry, and other liquid-solid two-phase media, as shown in the figure.

The sensor's measurement pipeline must be fully filled with fluid and must have a certain amount of back pressure. To prevent the occurrence of negative pressure (which could damage the lining), the electromagnetic flowmeter should not be installed at the pump's inlet but rather at the pump's outlet. When installing on an inclined pipeline, it must be installed on the ascending section of the pipeline. When installed on an open discharge pipeline, it must be placed at a lower point in the pipeline.

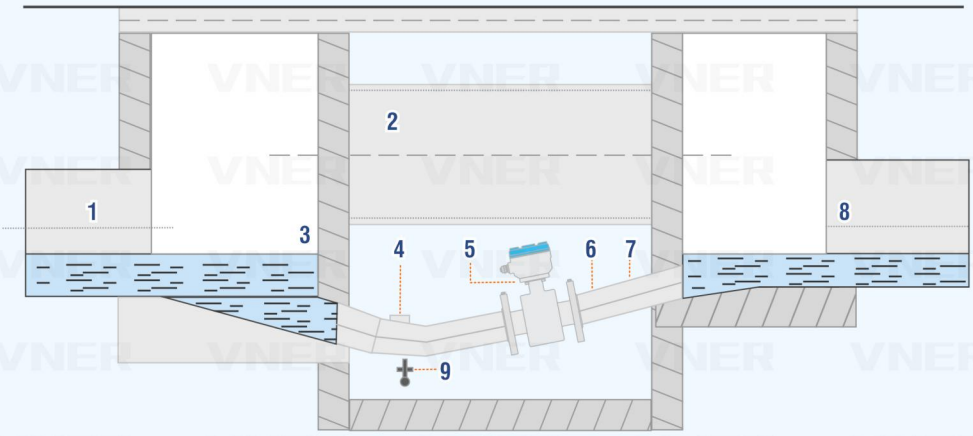




The control valve and shut-off valve should be installed downstream of the sensor, not upstream.



Installation of flow meters in measuring wells



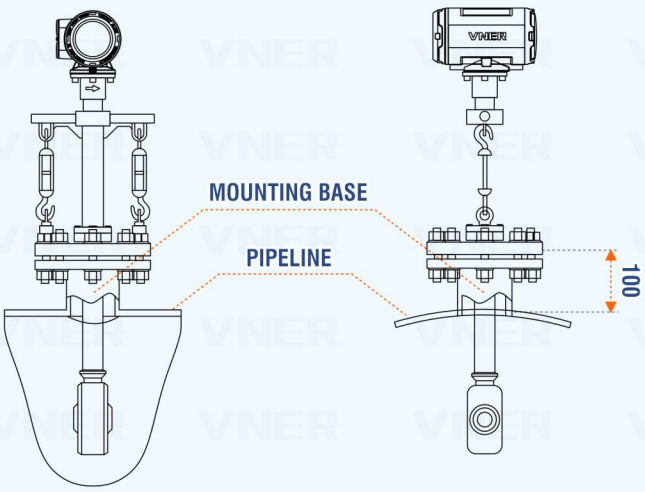
1. Inlet
2. Overflow pipe
3. Inlet
4. Cleaning port
5. Flowmeter
6. Short pipe
7. Outlet
8. Drain outlet
9. Drain valve

4. Installation diagram of the insertion-type electromagnetic flowmeter

Drill a hole with a 90mm diameter on the site pipeline, and insert the steel pipe with the mounting base into the hole.

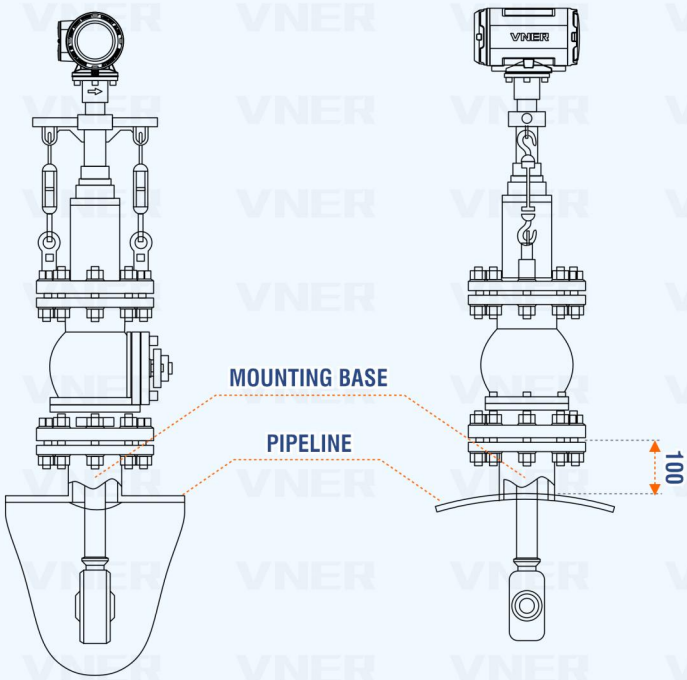
Align the indicator line on the steel pipe with the top of the site pipeline.

Weld the mounting base to the site pipeline, then fix the standard flange and install the insertion-type electromagnetic flowmeter onto the flange.



VE15 STANDARD FLANGE-MOUNTED INSERTION-TYPE ELECTROMAGNETIC FLOWMETER

Based on the installation of the standard flange-mounted insertion-type electromagnetic flowmeter, a full-bore DN80 ball valve is added. The user can, without interrupting the medium, pull the standard inline plug-in type electromagnetic flowmeter to the highest point, close the ball valve, and remove the flowmeter. (Please pay attention to safety during this operation.)



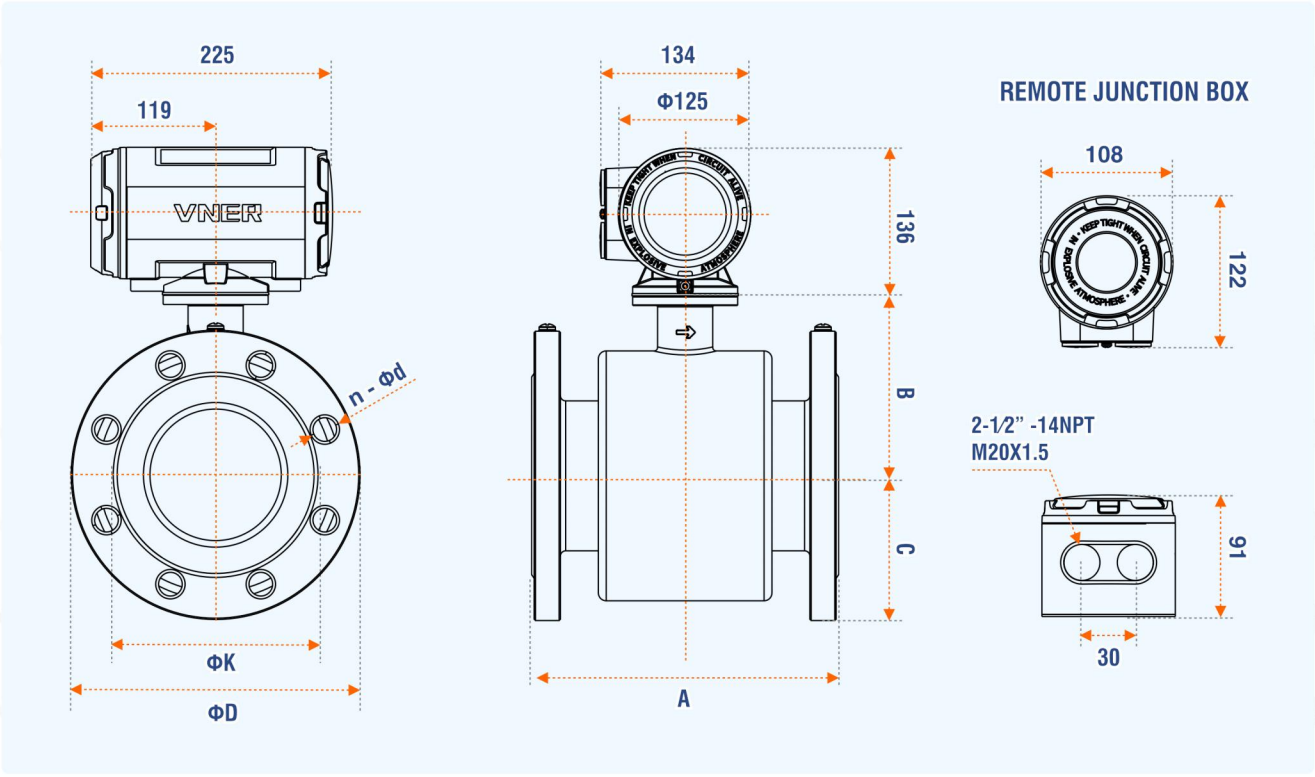
VE15 STANDARD INLINE PLUG-IN TYPE ELECTROMAGNETIC FLOWMETER

5. Insertion Depth of the Insertion-Type Electromagnetic Flowmeter

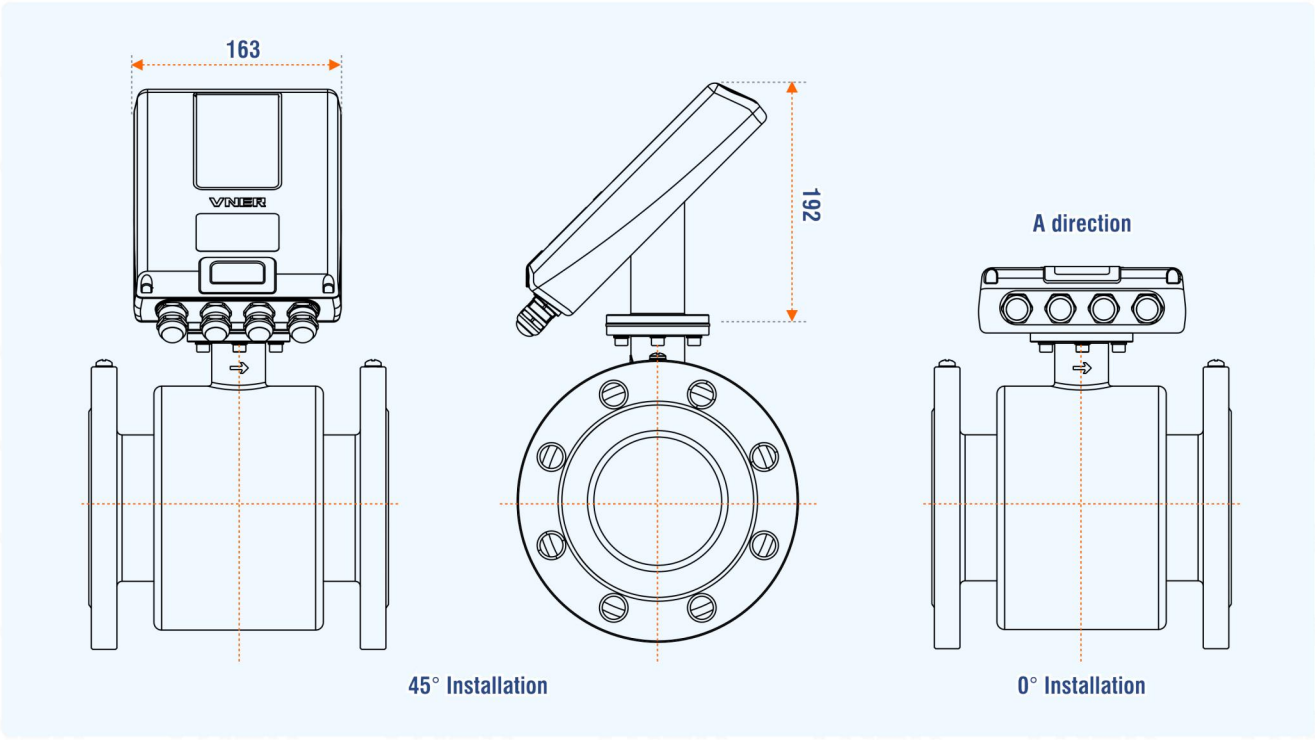
For the VE15 series insertion-type electromagnetic flowmeter, the insertion depth H at themeasurement point is as follows:

When the pipe diameter D is less than DN450mm, H=1/2D; When the pipe diameter D is greater than or equal to DN450mm, H=1/5 D.

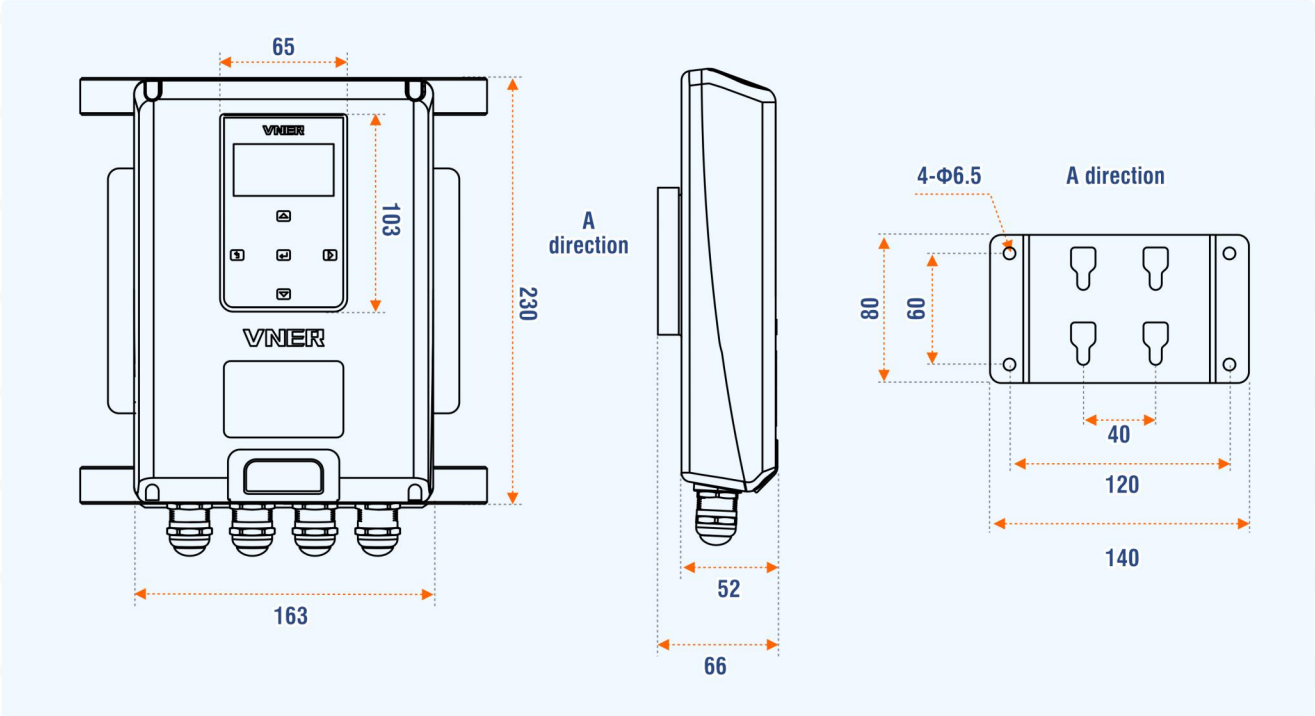
VE11E/VE11H OUTLINE DIMENSIONS DIAGRAM OF THE ELECTROMAGNETIC FLOWMETER (DN3-DN500)



DN3-DN500 VE11E/VE11H PIPELINE ELECTROMAGNETIC FLOWMETER



VE11E/VE11H INTEGRATED CONVERTER 45° AND 0° INSTALLATION

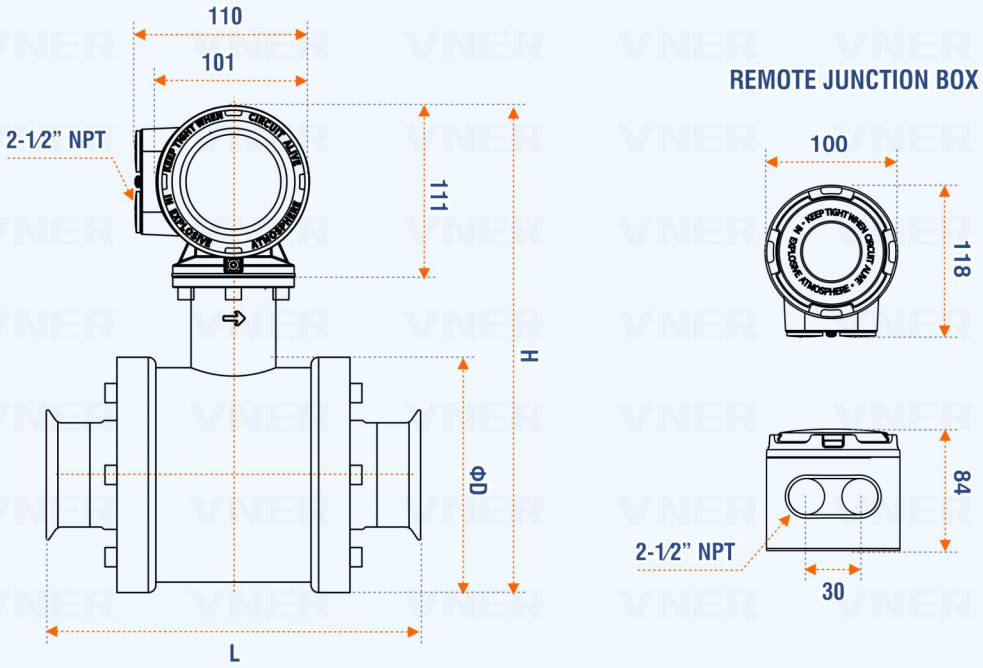


VE11E REMOTE CONVERTER

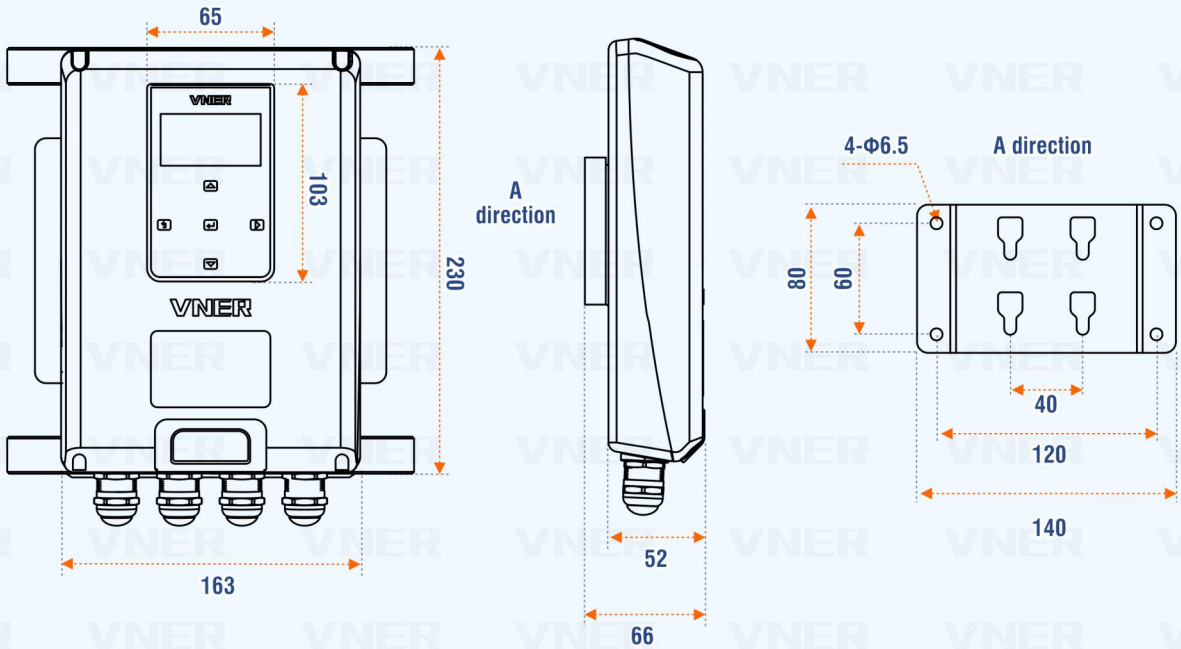
VE11E/VE11H/VE12 SERIES RATED PRESSURE SIZE TABLE (DN3~DN2000)

DN	RATED PRESSURE MPA	INSTRUMENT DIMENSIONS UNIT: MM								
		A		B	C	E	F	D	K	n x Φd
10	4.0	150	±2	102	45			90	60	4×Φ14
15					48			95	65	4×Φ14
20					53			105	75	4×Φ14
25					58			115	85	4×Φ14
32					70			140	100	4×Φ18
40		200		102	75			150	110	4×Φ18
50				112	83			165	125	4×φ18
65				123	93			185	145	8×φ18
80				123	100			200	160	8×Φ18
100	1.6	250		149	110			220	180	8×Φ18
125				149	125			250	210	8×Φ18
150		300		161	143			285	240	8×Φ22
200		350		191	170			340	295	12×Φ22
250		450		224	203			405	355	12×Φ26
300		500	±3	249	230			460	410	12×Φ26
350				274	260			520	470	16×Φ26
400		600		305	290			580	525	16×Φ30
450	1.0			330	308			615	565	20×Φ26
500				367	403	300	240	670	620	20×Φ26
600			±5	417	453		270	780	725	20×Φ30
700		700		473	559	400	350	895	840	24×Φ30
800		800		523	609		400	1015	950	24×Φ33
900		900		573	659		470	1115	1050	28×Φ33
1000		1000		623	711		570	1230	1160	28×Φ36
1200	0.6	1200		725	813	600	710	1405	1340	32×Φ33
1400		1400		826	914		900	1630	1560	36×Φ36
1600		1600		926	1036	800	1040	1830	1760	40×Φ36
1800		1800		1026	1136		1180	2045	1970	44×Φ39
2000		2000		1126	1236		1350	2265	2180	48×Φ42

OUTLINE DIMENSIONS DIAGRAM OF VE13E ELECTROMAGNETIC FLOWMETER



VE13E INTEGRATED ELECTROMAGNETIC FLOWMETER

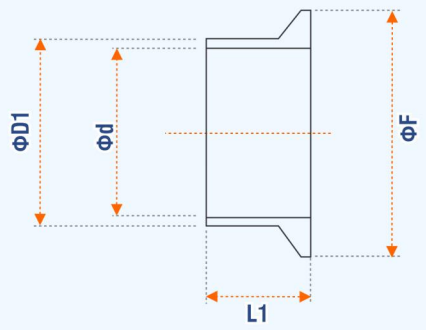


VE13E REMOTE CONVERTER

VE13E RATED PRESSURE SIZE TABLE

DN	RATED PRESSURE MPA	INSTRUMENT DIMENSIONS UNIT: MM L	D	H
10	1.0	170	85	268
15			85	268
25		180	102	286
32			112	296
40			112	296
50		225	147	331
65			166	350
80			175	359
100		270	201	385
125			226	403

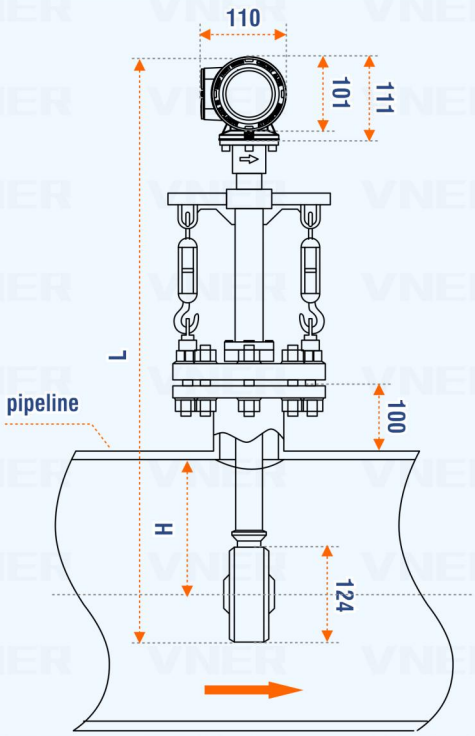
VE13E RATED PRESSURE SIZE TABLE



DN MPA	RATED PRESSURE D1	CLAMP JOINT SIZE UNIT: MM d	F	L1	
10	1.0	14	10	34	18
15		19.2	15.7	34	18
25		25.6	22.6	50.5	21.5
32		34.3	31.3	50.5	21.5
40		38.6	35.6	50.5	21.5
50		51.6	48.6	64	21.5
65		64.1	60.3	77.5	21.5
80		76.7	72.9	91	21.5
100		102.5	97.6	119	21.5
125		141.2	135.7	155	28

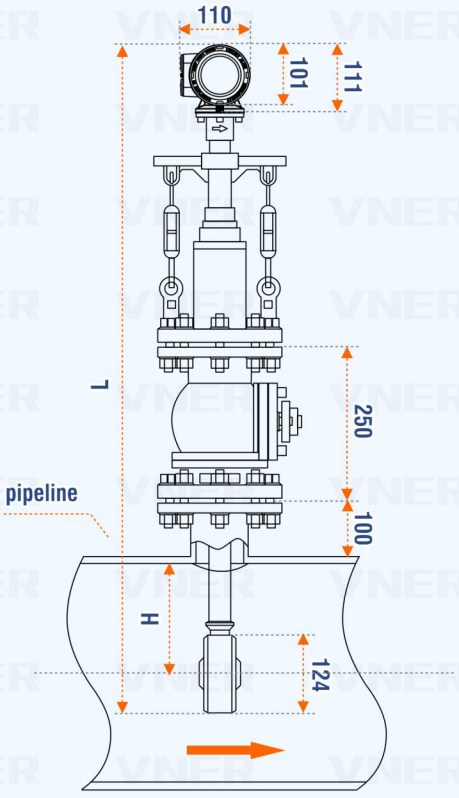
CLAMP JOINT SIZE TABLE

OUTLINE DIMENSIONS DIAGRAM OF VE15 SERIES ELECTROMAGNETIC FLOWMETER



DN	N	L
200	102	830
250	129	830
300	154	830
350	180	830
400	204	830
450	92	830
500	102	830
600	122	830
700	140	830
800	160	830
900	180	830
1000	200	830
1200	240	830
1400	280	995
1600	320	995
1800	360	995
2000	400	995

VE15 FLANGE-MOUNTED DIMENSIONS DIAGRAM



DN	N	L
200	102	1145
250	129	1145
300	154	1145
350	180	1145
400	204	1145
450	92	1145
500	102	1145
600	122	1145
700	140	1145
800	160	1145
900	180	1145
1000	200	1145
1200	240	1145
1400	280	1295
1600	320	1295
1800	360	1295
2000	400	1295

VE15 INLINE PLUG-IN TYPE DIMENSIONS DIAGRAM

VE11E ELECTROMAGNETIC FLOWMETER ORDERING INFORMATION

VE11E SERIES ELECTROMAGNETIC FLOWMETER DN3-DN2000

Accuracy: ±0.5%; ±0.3%; ±0.2%

PRODUCT DESCRIPTION	CODE																			
ElectromagneticFlowmeter	**VE11E**																			
Accuracy Level																				
Standard Type±0.5%		A																		
High Accuracy Type±0.3% [1]		B																		
High Accuracy Type±0.2% [1]		C																		
Mounting Style																				
Flange Type			F																	
Lining																				
Polyurethane				J																
Neoprene Rubber				H																
PTFE				T																
F46				R																
PFA				P																
Others				Z																
Diameter	**Standard Rated Pressure**																			
DN3	4.0MPa				03															
DN6	4.0MPa				06															
DN8	4.0MPa				08															
DN10	4.0MPa				10															
DN15	4.0MPa				15															
DN20	4.0MPa				20															
DN25	4.0MPa				25															
DN32	4.0MPa				32															
DN40	4.0MPa				40															
DN50	4.0MPa				50															
DN65	4.0MPa				65															
DN80	4.0MPa				80															
DN100	1.6MPa				1H															
DN125	1.6MPa				1Q															
DN150	1.6MPa				1F															
DN200	1.6MPa				2H															
DN250	1.6MPa				2F															
DN300	1.6MPa				3H															
DN350	1.6MPa				3F															
DN400	1.6MPa				4H															
DN450	1.0MPa				4F															
DN500	1.0MPa				5H															
DN600	1.0MPa				6H															
DN700	1.0MPa				7H															
DN800	1.0MPa				8H															
DN900	1.0MPa				9H															
DN1000	1.0MPa				1T															

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE																			
DN1200	0.6MPa			2M																
DN1400	0.6MPa			4M																
DN1600	0.6MPa			6M																
DN1800	0.6MPa			8M																
DN2000	0.6MPa			0M																
Measuring Electrode Materials	**Grounding Electrode Materials**																			
Measuremeat Electrode Materials	/None				A															
HastelloyB	/None				B															
Hastelloy C	/None				H															
Titanium	/None				M															
Tantalum	/None				T															
Platinum-iridium	/None				P															
Tungsten Carbide	/None				U															
316L	/Yes				E															
Hastelloy B	/Yes				N															
Hastelloy C	/Yes				O															
Titanium	/Yes				I															
Tantalum	/Yes				Q															
Platinum-iridium	/Yes				G															
Tungsten Carbide	/Yes				V															
Others	/Yes				Z															
Rated Pressure																				
0.6MPa						B														
1.0MPa						C														
1.6MPa						D														
2.5MPa						E														
4.0MPa						F														
6.3MPa						G														
10.0MPa						H														
Class 150						I														
Class 300						J														
Class 600						K														
Others						Z														
Body Flange Material																				
Carbon Steel(CS)							1													
Stainless Steel304							2													
Stainless Steel 316							3													
Stainless Steel 316L							4													
Mating Flange Materials (including bolts and gaskets)																				
None								0												
Carbon Steel(CS)								1												
Stainless Steel304								2												
Stainless Steel 316								3												
Stainless Steel 316L								4												

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE
GroundingRings [2]	
None	A
Grounding Ring 304	B
Grounding Ring 316	C
Grounding Ring 316L	D
Grounding Ring Titanium	E
Grounding Ring Tantalum	F
Others	Z
Temperature Range	
Standard Temperature <65°C	0
Standard Temperature<150°C	1
Standard Temperature<180°C	2
Standard Temperature<200°C	3
Converter Types	
Integrated	T
Integrated, 0° Installation	L
Integrated, 45° Installation	S
Separated	R
Output Modes	
(4-20)mA+Pulse	01
(4-20)mA+HART Communication	02
(4-20)mA+Modbus Protocol	03
(4-20)mA+Profibus Protocol	04
(4-20)mA+Modbus Protocol+HART Communication	05
Power Supply	
220VAC	G
24VDC	K
Protection Level	
IP65	0
IP67	1
IP68	2
Explosion-proof Rating	
None	0
Explosion-proof ExdeiaIICT3~T6	EX
Electrical Interface	
1/2-14NPT	0
M20*1.5	1
Cable Length	
5 Meters	R5
Customer Specified (up to 50 meters)	RX
SpecialOptions	
Anti-noisedesign (for electrolytic cells)	/K
Third-party Inspection Report	/W
304 Stainless Steel Sensor	/X

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE
316 Stainless Steel Sensor	/ Y
316L Stainless Steel Sensor	/ Z
Electrical Connector (brass,silver-plated)	/ J1
Electrical Connector (304 stainless steel)	/ J2
Low-temperature Protection [4]	/ P
Bluetooth Function	/ L
Pressure Pipeline Component Supervision And Inspection	/ T1
Cnas Calibration Report	/ C

Notes:

(1) When the accuracy is ±0.3% or ±0.2%, the diameter range is limited to DN10-DN500.

(2) DN3/DN6/DN8 sensors are of a dual-electrode type and must be equipped with grounding rings.

(3) DN3 diameter is standardly equipped with a 304 stainless steel sensor.

(4) When the medium temperature is less than or equal to -30°C, low-temperature protection must be selected.

(5) For the remote non-explosion-proof converter, the electrical interface can only be selected as M20×1.5.

VE11H ELECTROMAGNETIC FLOWMETER ORDERING INFORMATION

VE11E SERIES ELECTROMAGNETIC FLOWMETER DN3-DN2000

Accuracy: ±0.5%; ±0.3%; ±0.2%

PRODUCT DESCRIPTION	CODE																			
ElectromagneticFlowmeter	**VE11H**																			
Accuracy Level																				
Standard Type±0.5%		A																		
High Accuracy Type±0.3% [1]		B																		
High Accuracy Type±0.2% [1]		C																		
Mounting Style																				
Flange Type			F																	
Medium Characteristics																				
General				0																
Pulp				1																
Ore Slurry/sand Slurry				2																
Coal-water Slurry				3																
Other				Z																
Lining Materials [2]																				
Polyurethane					J															
Polyurethane+Ceramic Pieces					K															
ETFE					E															
Ceramic					C															
Neoprene Rubber					H															
PTFE					T															
F46					R															
PFA					P															
Others					Z															
Diameter	**Standard Rated Pressure**																			
DN3	4.0MPa					03														
DN6	4.0MPa					06														
DN8	4.0MPa					08														
DN10	4.0MPa					10														
DN15	4.0MPa					15														
DN20	4.0MPa					20														
DN25	4.0MPa					25														
DN32	4.0MPa					32														
DN40	4.0MPa					40														
DN50	4.0MPa					50														
DN65	4.0MPa					65														
DN80	4.0MPa					80														
DN100	1.6MPa					1H														
DN125	1.6MPa					1Q														
DN150	1.6MPa					1F														
DN200	1.6MPa					2H														
DN250	1.6MPa					2F														
DN300	1.6MPa					3H														

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE																				
DN350	1.6MPa				3F																
DN400	1.6MPa				4H																
DN450	1.0MPa				4F																
DN500	1.0MPa				5H																
DN600	1.0MPa				6H																
DN700	1.0MPa				7H																
DN800	1.0MPa				8H																
DN900	1.0MPa				9H																
DN1000	1.0MPa				1T																
DN1200	0.6MPa				2M																
DN1400	0.6MPa				4M																
DN1600	0.6MPa				6M																
DN1800	0.6MPa				8M																
DN2000	0.6MPa				0M																
Measuring Electrode Materials	**Grounding Electrode Materials**																				
Wear-resistant, Anti-noise Electroke (316L)	/None				V2																
Wear-resistant, Anti-noise Electroke (HC)	/None				V2																
316L	/None				A																
HastelloyB	/None				B																
Hastelloy C	/None				H																
Titanium	/None				M																
Tantalum	/None				T																
Platinum-iridium	/None				P																
Wear-resistant, Anti-noise Electroke (316L)	/Yes				R1																
Wear-resistant, Anti-noise Electroke (HC)	/Yes				R2																
316L	/Yes				E																
HastelloyB	/Yes				N																
Hastelloy C	/Yes				0																
Titanium	/Yes				I																
Tantalum	/Yes				Q																
Platinum-iridium	/Yes				G																
Others	/Yes				Z																
Rated Pressure																					
0.6MPa						B															
1.0MPa						C															
1.6MPa						D															
2.5MPa						E															
4.0MPa						F															
6.3MPa						G															
10.0MPa						H															
Class 150						I															
Class 300						J															
Class 600						K															
Class 900						L															

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE																				
Class 1500								M													
Others								Z													
Body Flange Material																					
Carbon Steel (CS)									1												
Stainless Steel 304									2												
Stainless Steel 316									3												
Stainless Steel 316L									4												
Mating Flange Materials (including bolts and gaskets)																					
None										0											
Carbon Steel (CS)										1											
Stainless Steel 304										2											
Stainless Steel 316										3											
Stainless Steel 316L										4											
GroundingRings [3]																					
None											A										
GroundingRing 304											B										
Grounding Ring 316L											C										
GroundingRing Titanium											D										
Grounding Ring Tantalum											E										
Protective Grounding Ring 304											F										
Protective Grounding Ring 316L											G										
Others											Z										
Temperature Range																					
Standard Temperature <65°C												0									
Standard Temperature <150°C												1									
Standard Temperature <180°C												2									
Standard Temperature <200°C												3									
Converter Types																					
Integrated													T								
Integrated, 0° Installation													L								
Integrated, 45° Installation													S								
Separated													R								
Output Modes																					
(4-20)mA+Pulse														01							
(4-20)mA+HART Communication														02							
(4-20)mA+Modbus Protocol														03							
(4-20)mA+Profibus Protocol														04							
(4-20)mA+Modbus Protocol+HART Communication														05							
Power Supply																					
220VAC															G						
24VDC															K						
Protection Level																					
IP65																	0				
IP67																	1				

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE																				
IP68																	2				
Explosion-proof Rating																					
None																		0			
Explosion-proof ExdeiaIICT3~T6																		EX			
Electrical Interface																					
1/2-14NPT																			0		
M20*1.5																			1		
Cable Length																					
5 Meters																				R5	
Customer Specified (up to 50 meters)																				RX	
SpecialOptions																					
Third-party Inspection Report																					/ W
304 Stainless Steel Sensorf [4]																					/ X
316 Stainless Steel Sensor																					/ Y
316L Stainless Steel Sensor																					/ Z
Electrical Connector (Brass, Nickel-plated)																					/ J1
Electrical Connector (304 Stainless Steel)																					/ J2
Low-temperature Protection [5]																					/ P
Bluetooth Function																					/ L
Pressure Pipeline Component Supervision And Inspection																					/ T1
CNAS Calibration Report																					/ C

Notes:

(1) When the accuracy is ±0.3% or ±0.2%, the diameter range is limited to DN10-DN500.

(2) The lining material can be selected based on the medium's temperature range:

LINING MATERIAL	MEDIUM TEMPERATURE RANGE
Polyurethane	Temperature <65°C
Polyurethane+CeramicPieces	Temperature <65°C
ETFE	Temperature <150°C
Ceramic	Temperature <200°C
Neoprene Rubber	Temperature <65°C
PTFE	Temperature <150°C
F46	Temperature <180°C
PFA	Temperature <200°C

(3) When the measured medium is pulp, ore slurry, sand slurry, orcoal-water slurry, the sensor is of a dual-electrode type and must be equipped with grounding rings. DN3/DN6/DN8 sensors are also dual-electrode types and must be equipped with grounding rings.

(4) DN3 diameter is standardly equipped with a 304 stainless steel sensor.

(5) When the medum temperature is less than or equal to -30°C, low-temperature protection must be selected.

(6) For the remote non-explosion-proof converter, the electrical interface can only be M20×1.5.

VE12 ELECTROMAGNETIC HEAT (COOLING) METER ORDERING INFORMATION

VE12 SERIES ELECTROMAGNETIC HEAT (COOLING) METER DN6-DN2000

Flow Accuracy: ±0.5%

Heat (Cooling) Metering Level: Level 1; Level 2

PRODUCT DESCRIPTION	CODE				
Electromagnetic Heat (cooling) Meter	**VE12**				
Accuracy Level					
Standard Type±0.5%		A			
Mounting Style					
Flange Type			F		
Lining					
Neoprene Rubber				H	
PTFE				T	
F46				R	
PFA				P	
Others				Z	
Diameter	**Standard Rated Pressure**				
DN6	4.0MPa				06
DN8	4.0MPa				08
DN10	4.0MPa				10
DN15	4.0MPa				15
DN20	4.0MPa				20
DN25	4.0MPa				25
DN32	4.0MPa				32
DN40	4.0MPa				40
DN50	4.0MPa				50
DN65	4.0MPa				65
DN80	4.0MPa				80
DN100	1.6MPa				1H
DN125	1.6MPa				1Q
DN150	1.6MPa				1F
DN200	1.6MPa				2H
DN250	1.6MPa				2F
DN300	1.6MPa				3H
DN350	1.6MPa				3F
DN400	1.6MPa				4H
DN450	1.0MPa				4F
DN500	1.0MPa				5H
DN600	1.0MPa				6H
DN700	1.0MPa				7H
DN800	1.0MPa				8H
DN900	1.0MPa				9H
DN1000	1.0MPa				1T
DN1200	0.6MPa				2M
DN1400	0.6MPa				4M
DN1600	0.6MPa				6M
DN1800	0.6MPa				8M

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE																		
DN2000	0.6MPa				0M														
Measurement Grounding Electrode Materials																			
316L						E													
Hastelloy C						0													
Titanium						I													
Rated Pressure																			
0.6MPa							B												
1.0MPa							C												
1.6MPa							D												
2.5MPa							E												
4.0MPa							F												
Class 150							I												
Class 300							J												
Others							Z												
Body Flange Material																			
Carbon Steel (CS)								1											
Stainless Steel 304								2											
Stainless Steel 316								3											
Mating Flange Materials (including bolts and gaskets)																			
None									0										
Carbon Steel (CS)									1										
Stainless Steel 304									2										
Stainless Steel 316									3										
Grounding Rings																			
None										A									
Grounding Ring 304										B									
Grounding Ring 316										C									
Temperature Range																			
Standard Temperature <65°C											0								
Standard Temperature <150°C											1								
Standard Temperature <180°C											2								
Standard Temperature <200°C											3								
Converter Types																			
Integrated												T							
Separated												R							
Output Modes																			
(4-20)mA+RS485 (Modbus Protocol)													01						
(4-20)mA+RS485 (User-defined Protocol)													02						
Power Supply																			
220VAC														G					
24VDC														K					
Protection Level																			
IP65																0			
IP67																1			
IP68																2			

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE
Explosion-proof Rating	
None	0
Cable Length	
5 Meters	R5
Customer Specified (up to 50 meters)	RX
Temperature sensor	
None	/ 0
PT100	/ 1
PT1000	/ 2
Special Options (Option)	
Third-party Inspection Report	/ W
304 Stainless Steel Sensor	/ X
316 Stainless Steel Sensor	/ Y
316L Stainless Steel Sensor	/ Z
Electrical Connector (brass, silver-plated)	/ J1
Electrical Connector (304 stainless steel)	/ J2
Bluetooth Function	/ L
Pressure Pipeline Component Supervision And Inspection	/ T1

VE13E HYGIENIC ELECTROMAGNETIC FLOWMETER ORDERING INFORMATION

VE13E SERIES ELECTROMAGNETIC FLOWMETER DN10-DN125

Accuracy: ±0.5%

PRODUCT DESCRIPTION	CODE															
Hygienic Electromagnetic Fowmeter	**VE13E**															
Process Fittings																
Tri-clamp (ISO 2852)		T														
DIN11851		R														
Others		Z														
Lining																
E46			R													
PFA			P													
Diameter																
DN10				10												
DN15				15												
DN25				25												
DN32				32												
DN40				40												
DN50				50												
DN65				65												
DN80				80												
DN100				100												
DN125				125												
Measmng Eleciode Matenal Goundng Electode Mateias																
316L	/None				S											
Hastelloy C	/None				H											
Titanium	/None				M											
Clamp Material																
304 Stainless Steel						0										
316 Stainless Steel						1										
316L Stainless Steel						2										
Clamp Rated Pressure																
1.0MPa							C									
Temperature Range																
Standard Temperature <180°C								1								
Standard Temperature <200°C								2								
Converter Types																
Integrated									T							
Separated									R							
Output Modes																
(4-20)mA+Pulse										01						
(4-20)mA+HART communication										02						
(4-20)mA+Modbus protocol										03						
(4-20)mA+Modbus protocol+HART communication										04						

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE
Power Supply	
220VAC	G
24VDC	K
Protection Level	
IP65	0
Explosion-proof Rating	
None	0
Explosion-proof ExdeialICT3~T6	EX
Electrical Interface	
1/2-14NPT	0
M20*1.5	1
Cable Length	
5 Meters	R5
Customer Specified (Up To 50 Meters)	RX
Special Options(Option)	
Third-party Inspection Report	/W
316 Stainless Steel Sensor	/Y
316L Stainless Steel Sensor	/Z
Electrical Connector (Brass, Nickel-plated) Electrical	/J1
Connector (304 Stainless Steel)	/J2
Low-temperature Protection	/P
BluetoothFunction	/L
CNAS Calibration Report	/C

Notes: (1) The VE13 comes equipped with all-304 stainless steel sensor.

(2) For the remote non-explosion-proof converter, the electrical interface can only be selected asM20×1.5.

VE15 ORDERING INFORMATION

VE15 SERIES ELECTROMAGNETIC FLOWMETER DN200-DN3000

Accuracy: ±1.5%, ±1.0%

PRODUCT DESCRIPTION	CODE																		
Insetion Type Electromagnetic Howmeter	**VE15**																		
Accuracy																			
±0.5%		A																	
±1.0%		B																	
Mounting Style																			
Flange Type			G																
Inline Plug-in Type			Z																
Lining																			
PFA				T															
Diameter																			
DN200					2H														
DN250					2F														
DN300					3H														
DN350					3F														
DN400					4H														
DN450					4F														
DN500					5H														
DN600					6H														
DN700					7H														
DN800					8H														
DN900					9H														
DN1000					1T														
DN1200					2M														
DN1400					4M														
DN1600					6M														
DN1800					8M														
DN2000					0M														
Others					XX														
Electrode Material																			
316L						S													
Others						Z													
Rated Pressure																			
1.6MPa							D												
Body Flange Material																			
304 Stainless Steel (DN80 PN16)								0											
Mounting Base (Including Flange, Bolts, Gaskets)																			
None									0										
Mounting Base Carbon Steel									1										
MountingBase 304 Stainless Steel									2										
Clamp Connection (Pvc Pipe)									3										
Clamp Connection (Cast Iron Pipe)									4										

CONTINUED FROM THE PREVIOUS PAGE

PRODUCT DESCRIPTION	CODE
Converter Types	
Integrated	T
Separated	R
Output Modes	
(4-20)mA+Pulse	01
(4-20)mA+HART communication	02
(4-20)mA+Modbusprotocol	03
(4-20)mA+Profibusprotocol	04
(4-20)mA+Modbus protocol+HART communication	05
Power Supply	
220VAC	G
24VDC	K
Protection Level	
IP65	0
IP67	1
IP68	2
Explosion-proof Rating	
None	0
Explosion-proof ExdeiaIICT3~T6	EX
Electrical Interface	
1/2-14NPT	0
M20*1.5	1
Cable Length	
5 Meters	R5
Customer Specified (Up To 50 Meters)	RX
Ball Valve (Optional For Inline Plug-in Type)	
None	/A
DN80(304)	/B
Special Options (Option)	
Third-party Inspection Report	/ W
Electrical Connector (Brass, Nickel-plated)	/ J1
Electrical Connector (304 Stainless Steel)	/ J3
Bluetooth Function	/ L

Notes: (1) For the remote non-explosion-proof converter, the electrical interface can only be selected as M20×1.5

ELECTRODE MATERIAL CORROSION RESISTANCE REFERENCE TABLE

SYMBOL EXPLANATION: A - SUITABLE; X - CORROSION-RESISTANT; B - USABLE, SHORT LIFESPAN; BLANK - NO DATA; N - NOT USABLE; SAT - SATURATED

MEDIUM NAME	CONCENTATION %	TEMPERATURE °C	316L	HASTELLOY C	TITANIUM	TANTALUM	PLATINUM
Sulfuric Acid	2-5	Room Temperature	N	X	X	A	A
		Boiling Point	N	N	X	N	A
	10	Room Temperature	N	X	X	A	A
		Boiling Point	N	N	N	N	A
	25-60	Room Temperature	N	X	B	A	A
		Boiling Point	N	N	N	N	A
	70-85	Room Temperature	N	X	N	A	A
		Boiling Point	N	N	N	N	A
	90-96	Room Temperature	X	X	N	A	A
		Boiling Point	N	N	N	N	A
Hydrochloric Acid	0.5-5	Room Temperature	N	X	A	A	A
		Boiling Point	N	N	A	X	X
		Room Temperature	N	B	A	A	A
		Boiling Point	N	N	N	X	X
	37	Room Temperature	B	N	N	A	X
		Boiling Point	N	N	N	X	X
Nitric Acid	7-65	Room Temperature	X	X	X	A	A
		Boiling Point	X	N	X	A	A
	100	Room Temperature	N		X	A	A
		Boiling Point			X	A	A
Chromic Acid	10	Room Temperature	A	A	A	A	A
		Boiling Point	N	A	A	A	N
	50	Room Temperature	N	A	A	A	A
		Boiling Point	N	A	A	A	A
	100	Room Temperature	N	N	A	A	A
		Boiling Point	N	N	A	A	A
Aqua Regia	100	Room Temperature	N	N	B	A	N
		BoilingPoint	N	N	N	N	A
Hydrofluoric Acid	1-50	Room Temperature	N	N	N	N	A
	98-100	Boiling Point	N	N	N	N	A
Phosphoric Acid		Room Temperature	X	X	X	A	A
	45-Sat	Room Temperature	B	X	B	A	A
	80-Sat	Boiling Point	N	N	N	A	A
Acetic Acid		Room Temperature	A	A	A	A	A
	>50	Room Temperature	N	A	A	A	A
	Sat	Room Temperature	A	A	A	X	A
Methanol	100	Room Temperature	A	A	A	X	A
	100	Boiling Point	B	A	B	X	A
Wastewater		Room Temperature	A	A	A	A	A
Seawater		Room Temperature	B	A	A	A	A

CONTINUED FROM THE PREVIOUS PAGE

MEDIUM NAME	CONCENTATION %	TEMPERATURE °C	316L	HASTELLOY C	TITANIUM	TANTALUM	PLATINUM
FormicAcid	10-50	Room Temperature	N	A	A	A	A
		Boiling Point	N	B	A	A	A
	50-100	Room Temperature	N	B	B	A	A
		Boiling Point	N	N	N	A	A
Oxalic Acid		Room Temperature	A	A	A	X	A
	25-50	Room Temperature		A	A	X	A
	Sat	Room Temperature	N	B	X	A	
	5-Sat	Boiling Point	N	N	N	X	A
Citric Acid		Room Temperature	A	A	A	X	A
		Boiling Point	A	A	A	X	A
	50	Room Temperature	A	A	A	X	A
		Boiling Point	A	A	B	X	A
Ferric Chloride	10-Sat	Room Temperature	N	A	A	A	N
		Boiling Point	N	A	A	A	N
SodiumChloride	100	Room Temperature	B	A	A	X	A
		Boiling Point	B	A	A	X	A
Ferric Chloride		Room Temperature	N	B	B	A	A
		Boiling Point	N	B	B	A	A
	50-100	Room Temperature	N	B	B	X	A
		Boiling Point	N	B	B	X	A
Calcium Chloride	100	Room Temperature	N	N	A	A	A
		Boiling Point		X	A	A	A
Magnesium Chloride		Room Temperature	N	B	B	A	A
		Boiling Point	N	B	X	A	A
Potassium Nitrate	20-50	Room Temperature	A	A	A	X	A
		Boiling Point	A	A	A	X	A
	80-Sat	Room Temperature	A	A	A	X	A
		Boiling Point	N	A	A	X	A
Sodium Sulfate	Sat	Room Temperature	A	A	A	A	A
		Boiling Point	N	N	N	A	A
Fatty Acid	100	Room Temperature	A	A	A	X	A
	100	Boiling Point	B	A	A	X	A
Lactic Acid	1.5-10	Room Temperature	A	A	A	X	A
	1.5-10	Boiling Point	N	A	A	X	A
	Sat	Boiling Point	N	N	A	A	A
Aluminum Nitrate	10	Room Temperature	A	X	A	A	A
	10-100	Room Temperature	N	X	A	X	A
	57-120	Room Temperature	N	X	A	X	A
Pulp		Room Temperature	B	A	A	A	A
Lime Slurry		Room Temperature	N	B	A	A	A

COMMON LIQUID CONDUCTIVITY PARAMETERS TABLE

MEDIUM NAME	CONCENTATION %	TEMPERATURE °C	CONDUCTIVITY (S/CM)
Sulfuric Acid	5	18	$20.85*10^{-2}$
	85		$98.50*10^{-3}$
	99.4		$85.00*10^{-4}$
Hydrochloric Acid	5	15	$39.48*10^{-2}$
	40		$51.52*10^{-2}$
Nitric Acid	6.2	18	$31.23*10^{-2}$
	31		$79.19*10^{-2}$
	62		$49.04+10^{-2}$
Hydrofluoric Acid	0.004	18	$2.50*10^{-4}$
	0.121		$21.00*10^{-4}$
	4.80		$59.3*10^{-3}$
	29.80		$34.11*10^{-2}$
Acetic Acid	0.30	18	$3.18*10^{-4}$
	20		$16.05*10^{-4}$
	70		$2.35*10^{-4}$
	99.70		$4.00*10^{-8}$
	100 (Pure)	25	$1.20*10^{-8}$
Phosphoric Acid	10	15	$56.6*10^{-3}$
	70		$14.73*10^{-2}$
	87		$70.90*10^{-3}$
Ammonia Solution	0.10	15	$2.51*10^{-4}$
	8.03		$10.38*10^{-4}$
	30.50		$1.93*10^{-4}$
Butyric Acid	1.00	18	$4.55*10^{-4}$
	50.04		$2.96*10^{-4}$
	70.01		$5.6*10^{-7}$
	100		$6.0*10^{-8}$
Hydrobromic Acid	5	15	$19.08*10^{-2}$
	15		$49.40*10^{-2}$
	100		$8.0*10^{-4}$
Barium Chlonide	5	18	$3.89*10^{-2}$
	24		$15.34*10^{-2}$
Potassium Sulfate	5	18	$45.80*10^{-3}$

MEDIUM NAME	CONCENTATION %	TEMPERATURE °C	CONDUCTIVITY (S/CM)
Formic Acid	4.94	18	$55.00*10^{-4}$
	39.955		$98.40*10^{-4}$
	100		$2.80*10^{-4}$
	100 (Pure)		$5.60*10^{-5}$
Oxalic Acid	3.5	18	$5.08*10^{-2}$
	5	18	$67.20*10^{-3}$
Sodium Chloride	10		$12.11*10^{-2}$
	26		$21.51*10^{-2}$
CalciumChloride	5		$6.43*10^{-2}$
	25		$17.81*10^{-2}$
	35		$13.66*10^{-2}$
Ammonium Chloride	5	18	$91.80*10^{-3}$
	25		$40.25*10^{-2}$
Potassium Chloride	5	18	$69.90*10^{-3}$
	21		$28.10*10^{-2}$
Magnesium Chloride	5	18	$68.30*10^{-3}$
	30		$10.61*10^{-2}$
Sodium Sulfate	5	18	$40.90*10^{-3}$
	15		$88.60*10^{-3}$
Copper Sulfate	2.50	18	$10.90*10^{-3}$
	17.50		$45.80*10^{-3}$
Potassium Chloride	5	15	$45.4*10^{-3}$
	22		$16.25*10^{-2}$
Ammonium Sulfate	5	15	$55.20*10^{-3}$
	31		$23.21*10^{-2}$
Ammonium Chloride	5	15	$55.20*10^{-3}$
	50		$23.21*10^{-2}$
Zinc Chloride	2.5	15	$27.60*103$
	30		$92.60*10^{-3}$
	60		$36.9*10^{-3}$
Sodium Carbonate	5	18	$45.10*10^{-3}$
	15		$83.60*10^{-3}$
Urea	100	145	$5.0*10^{-3}$

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JIANGSU VNER ELECTRONIC TECHNOLOGY LTD

We adapt to local regulations, we strive to deliver quality solutions and we are constantly trying to reduce our environmental impact.

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