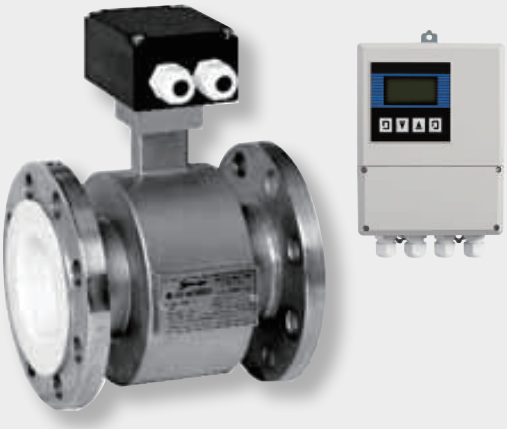
Electromagnetic Flowmeters Combined type

Model : F950



Electromagnetic Flowmeters Separated type

Model : F951

WISE®(주)와이즈산전
www.wisecontrol.com

Business Founded

1965-05-06

Original Company Name WISE Control Inc.

Home page www.wisecontrol.com

For more than 54 years, the name WISE has been standing for innovation and quality in the field of Pressure, Temperature, Flow, Level and Gas measurement.
WISE is comprised of several products divisions, state-of-the art manufacturing facilities, service center and over 60 distributors worldwide.
WISE is a unique organization of individuals linked by the pursuit of excellence in product design, manufacture, service and distribution.
Major markets are served by WISE including the power generating industry, oil & gas, petrochemical and chemical processing, the pulp & paper industry,
semicondustor manufacturing, the metallurgical industry, biopharmaceutical and food & beverage industry.
WISE will continue its efforts to make WISE products an integral part of the development plans of its customers.
The new and exciting challenges will be met by building on a successful part rooted in recognizing and responding to customer needs, designing and producing quality products to meet those needs, proving premier customer service, and building a strong & lasting business relationship.

Quality Management System (ISO 9001:2008)

Environment Management System (ISO 14001:2004)

KEPIC Certificate (EN)

ASME Certificate Mark


3-A Symbol Certificate

Company History

1965. 05	Established in Seoul Woojin Instruments Co. ,LTD
1982. 04	Acquired KS Certification
1988. 06	Established R&D
1994. 09	Acquired ISO 9001 Quality Control system Certificate
1999. 06	Acquired EN837-1 (CE) for Pressure Gauge
2004. 11	Acquired IECEX Explosion Proof Certificate for Thermocouple, RTD and Switch
2006. 01	Acquired 3-A symbol marking by 3-A Sanitary Standards, Inc.
2006. 08	Acquired certificate of ATEX (CE Marking) for Thermocouple and RTD
2007. 12	Company Name change to "Wise Control Inc."
2009. 12	Acquired certificate of KEMA for Temperature sensor
2011. 09	Acquired of Quality system certificate (KEPIC-EN , KEPIC-MN)
2012. 11	Acquired ISO 14001 Eco-management System
2013. 01	Acquired of Quality system certificate for Manufacturing of Class 1,2,3 Fabrication for Parts and Appurtenances
2013. 01	Acquired of Quality system certificate for Manufacturing of Class 1,2,3 Fabrication for Parts and Appurtenances
2015. 12	Acquired of TRCU(Technical Reulation of Customs Union) for Pressure, Termowell, RTD, Thermocouple, and Level Gauge
2018. 09	Acquired of NEP (New Excellent Product) for Wireless Leak Detector

Electromagnetic Flowmeters
Combined type
Model : F950

Spec. sheet no. FD09-03

Description

The Electromagnetic Flowmeter can be used to accurately measure the flowrate of liquids, paper pulp, slurry and mineral slurry which has an electrical conductivity greater than 10 μs/cm.
F950 is a flow measurement system in a compact design which integrates the primary and signal converter.

Sensor & Transmitter

Grounding Ring (Accessory)

Applications

- Facilities in water supply, sewerage, agricultural water, industrial water and waste water
- Petrochemical, alkali salt, chemicals and coolant process.
- Circulating water like cement sludge, coal sludge
- Spoke water, waste water, coolant in pulp, paper mill
- Coolant, seawater circulating, in ship building factories

Specification

Type
Combined type

Size
15 ~ 1,000A (⅜"~40")

Process connection
Flange type [ANSI, ASME, DIN, JIS, KS, ETC.]

Measuring range
0.2 - 10 m/s

Accuracy
±0.5 % F.S (15 ~ 800A)
±1.0 % F.S (900A ~ : It needs for site calibration.)

Lining
Standard : Hard rubber (0 ~ 60 °C)
Option : Teflon (-10 ~ 160 °C) Max. 600A

Ambient temperature
-10 ~ 60 °C

Conductivity
Standard : ≥ 10 μs/cm
Option : ≥ 5 μs/cm

Power supply
Standard : AC 85 ~ 250 V, 50 ~ 60 Hz
Option : DC 24 V [2-Wire Loop Power]

Power consumption
Max. 15 VA

Display
LCD Display with back light
Flowrate : 5-Digit Display
Total : 9-Digit Display

Output
Analog : DC 4 ~ 20 mA (Isolated) - Active
Pulse : Open collector pulse
Communication : RS485

Protection class
Standard : Weather Proof - IP66
Option : Ex-Proof (Ex d IIC T5_IP66)

Special feature
Self check
Empty pipe
Enable to reverse flow direction
Data logging
Error message

Main order — Ordering information

1. Base model

F950	Electromagnetic flowmeter Combined type

2. Meter size

A	15A (½")	**O**	350A (14")
B	20A (¾")	**P**	400A (16")
C	25A (1")	**Q**	450A (18")
D	32A (1¼")	**R**	500A (20")
E	40A (1½")	**S**	550A (22")
F	50A (2")	**T**	600A (24")
G	65A (2½")	**U**	650A (26")
H	80A (3")	**V**	700A (28")
I	100A (4")	**W**	750A (30")
J	125A (5")	**X**	800A (32")
K	150A (6")	**Y**	900A (36")
L	200A (8")	**Z**	1000A (40")
M	250A (10")	**1**	Other
N	300A (12")		

3. Connection flange

A	ANSI 150 Lb	**H**	KS 10K
B	ANSI 300 Lb	**I**	KS 16K
C	ASME 150 Lb	**J**	KS 20K
D	ASME 300 Lb	**K**	DIN PN 10
E	JIS 10K	**L**	DIN PN 16
F	JIS 16K	**M**	DIN PN 20
G	JIS 20K	**O**	Other

Sample ordering code

1	2	3	4	5	6	7
F950	**I**	**A**	**1**	**1**	**1**	**1**

4. Electrode material

1	Titanium
2	316L SS
3	Hastelloy-C
4	Platinum Iridium
5	Tantalum
6	Other

5. Ground ring material

1	None
2	316L SS
3	Hastelloy-C
4	Platinum Iridium
5	Titanium
6	Tantalum
7	Other

6. Lining material

1	Hard rubber (Flange : A105)
2	PTFE (Flange : A182 F304)
3	Other (Hard Rubber w/Flange : A182 F304 PTFE w/Flange : A182 F316, etc.)

7. Protection class

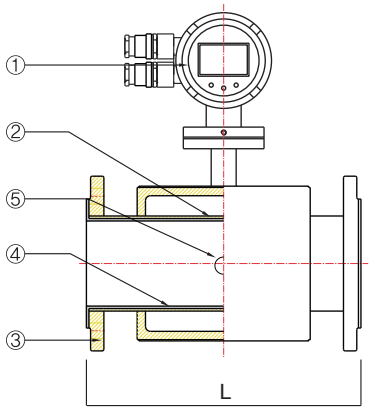
1	Weather Proof : IP66
2	Ex-Proof : Ex d IIC T5 (IP66)

*** Example Specification**

1	Connection : 4" ANSI 150Lb RF
2	Electrode Material : Titanium
3	Ground Ring : None
4	Lining Material : Hard Rubber (Flange : A105)
5	Weather Proof : IP66

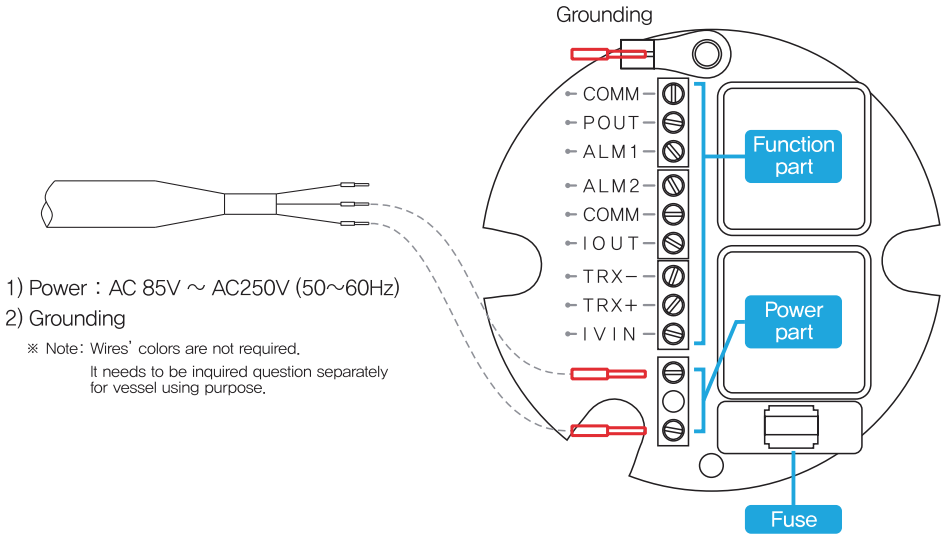
Standard material

No.	Description	Material
1	Head	Cast Aluminium
2	Body	304SS
3	Flange	Standard : Carbon steel Option : 304SS, etc.
4	Lining	Standard : Hard Rubber Option : Teflon
5	Electrode	Standard :Titanium Option : 316L SS Hastelloy-C Platium Iridium Tantalum



Wiring

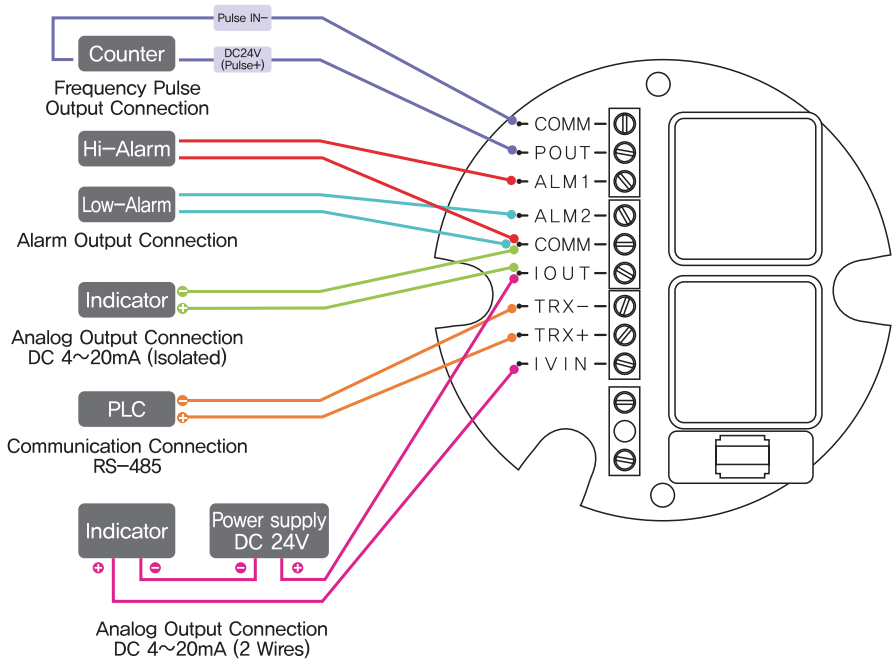
Description for PCB connection functions	
COMM	Frequency and Pulse
POUT	Frequency (Pulse) Output for Bi-directional Flow
ALM1	Alarm Output for Upper Limit
ALM2	Alarm Output for Low Limit
COMM	Current and Alarm Common
IOUT	Current Output for Flux (Two Routes Out) Isolated
TRX-	- Communication Signal Input
TRX+	+ Communication Signal Input
IVIN	External DC Power 24 V
LN-	Power Supply (AC Power)
LN+	Power Supply (AC Power)



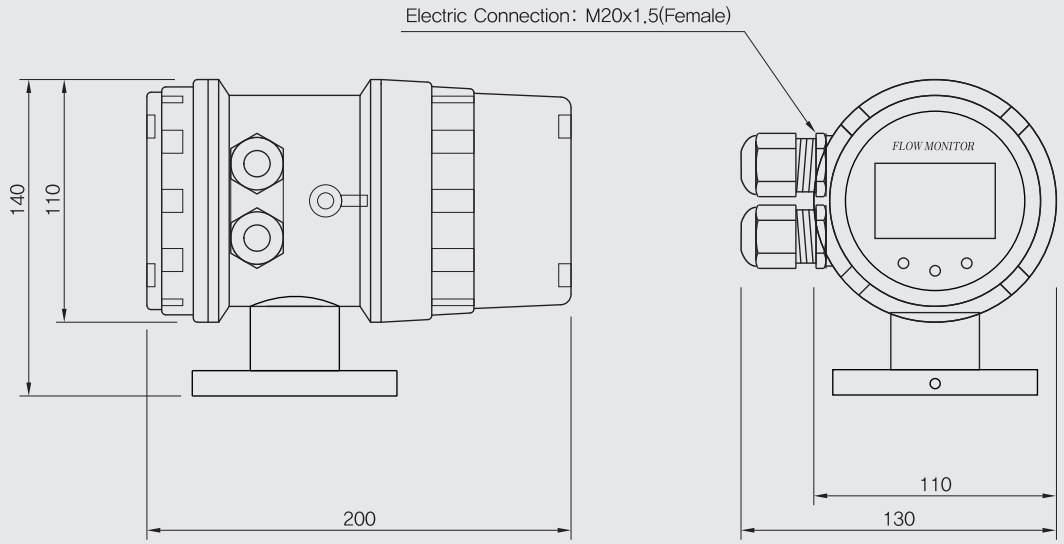
1) Power : AC 85V ~ AC250V (50~60Hz)
2) Grounding

※ Note: Wires' colors are not required.
It needs to be inquired question separately for vessel using purpose.

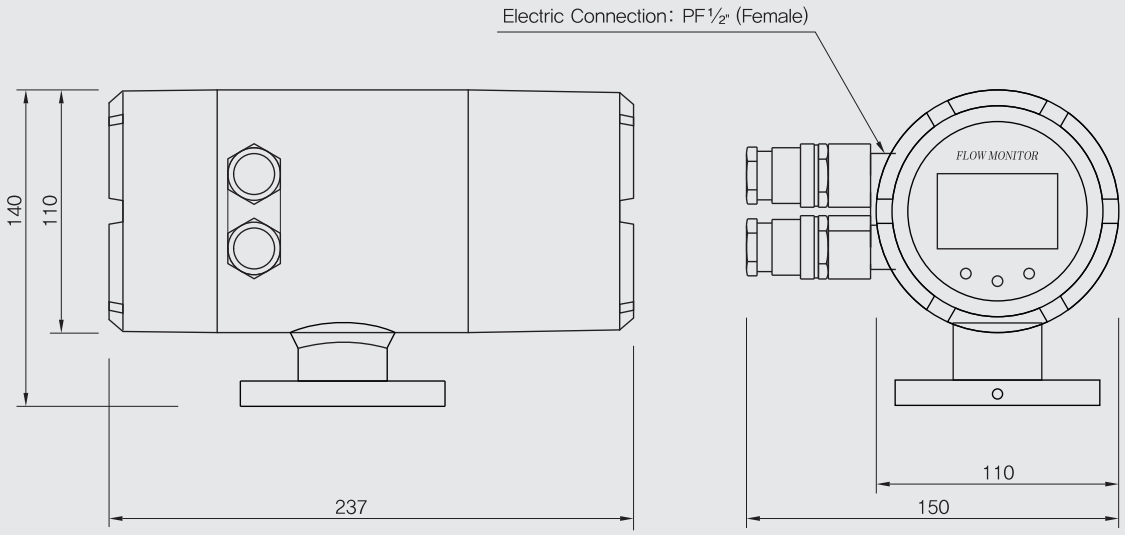
Controller wiring connection function



Dimension



Normal combined type



Ex-proof combined type

Electromagnetic Flowmeters
Separated Type
Model : F951

Spec. sheet no. FD09-04

Description

The electromagnetic flowmeter can be used to accurately measure the flowrate of liquids, paper pulp, slurry and mineral slurry which has an electrical conductivity greater than 10 μs/cm.
F951 is a flow measurement system consists of a flowmeter primary and remote mounted converter.

Converter

Ground Ring
(Accessory)

Applications

- Facilities in water supply, sewerage, agricultural water, industrial water and waste water
- Petrochemical, alkali salt, chemicals and coolant process.
- Circulating water like cement sludge, coal sludge
- Spoke water, waste water, coolant in pulp, paper mill
- Coolant, seawater circulating, in ship building factories

Specification

Type
Separate type

Size
15 ~ 1,000A (½ ~ 40")

Process connection
Flange type [ANSI, ASME, DIN, JIS, KS, ETC.]

Measuring range
0.2 ~ 10 m/s

Accuracy
±0.5 % Full scale (15 ~ 800A)
±1.0 % Full scale (900A ~ : It needs for site calibration.)

Lining
Standard : Hard rubber (0 ~ 60 °C)
Option : Teflon (-10 ~ 160 °C) Max. 600A

Ambient temperature
-10 ~ 60 °C

Conductivity
Standard : ≥ 10 μs/cm
Option : ≥5 μs/cm

Power supply
Standard : AC 85 ~ 250 V, 50 ~ 60 Hz
Option : DC 24 V [2-wire Loop power]

Power consumption
Max. 15 VA

Display
LCD Display with back light
Flowrate : 5-Digit Display
Total : 9-Digit Display

Output
Analog : DC 4 ~ 20 mA (Isolated) - Active
Pulse : Open collector purse
Communication : RS485

Protection class
Weather Proof : IP67

Special feature
Self check
Empty pipe
Enable to reverse flow direction
Data logging
Error message

Electrode signal cable
Standard length : 5 M
Option : Max. 30 M

Main order — Ordering information

1. Base model

F951	Electro-Magnetic flowmeter Separated type

2. Meter size

A	15A (½")	**O**	350A (14")
B	20A (¾")	**P**	400A (16")
C	25A (1")	**Q**	450A (18")
D	32A (1¼")	**R**	500A (20")
E	40A (1½")	**S**	550A (22")
F	50A (2")	**T**	600A (24")
G	65A (2½")	**U**	650A (26")
H	80A (3")	**V**	700A (28")
I	100A (4")	**W**	750A (30")
J	125A (5")	**X**	800A (32")
K	150A (6")	**Y**	900A (36")
L	200A (8")	**Z**	1000A (40")
M	250A (10")	**1**	Other
N	300A (12")		

3. Connection flange

A	ANSI 150 Lb	**H**	KS 10K
B	ANSI 300 Lb	**I**	KS 16K
C	ASME 150 Lb	**J**	KS 20K
D	ASME 300 Lb	**K**	DIN PN 10
E	JIS 10K	**L**	DIN PN 16
F	JIS 16K	**M**	DIN PN 20
G	JIS 20K	**O**	Other

4. Electrode material

1	Titanium
2	316L SS
3	Hastelloy-C
4	Platinum Iridium
5	Tantalum
6	Other

5. Ground ring material

1	None
2	316L SS
3	Hastelloy C
4	Platinum Iridium
5	Titanium
6	Tantalum
7	Other

6. Lining material

1	Hard rubber (Flange : A105)
2	PTFE (Flange : A182 F304)
3	Other (Hard Rubber w/Flange : A182 F304, PTFE w/Flange : A182 F316, etc.)

7. Protection class

1	Weather Proof : IP67

8. Excitation and signal cable

1	5 M
2	10 M
3	20 M
4	Other (Max. 30 M)

Sample ordering code

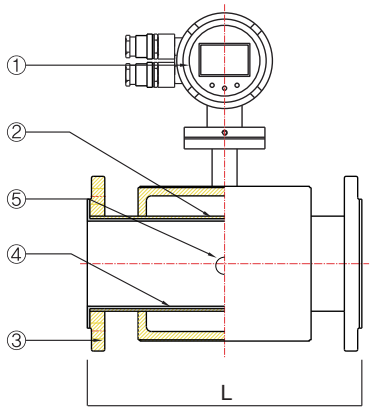
1	2	3	4	5	6	7	8
F951	**I**	**A**	**1**	**1**	**1**	**1**	**1**

*** Example Specification**

1. Connection : 4" ANSI 150Lb RF
2. Electrode Material : Titanium
3. Ground Ring : None
4. Lining Material : Hard Rubber (Flange : A105)
5. Weather Proof : IP67

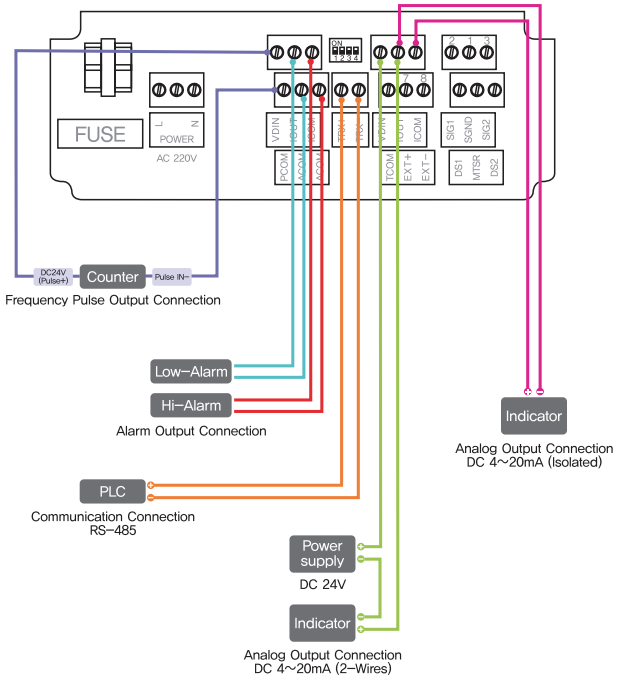
Standard material

No.	Part list	Material
1	Head	Cast Aluminium
2	Body	304SS
3	Flange	Standard : Carbon steel Option : 304SS, etc.
4	Lining	Standard : Hard Rubber Option : Teflon
5	Electrode	Standard : Titanium Option : 316L SS Hastelloy-C Platinum Iridium Tantalum

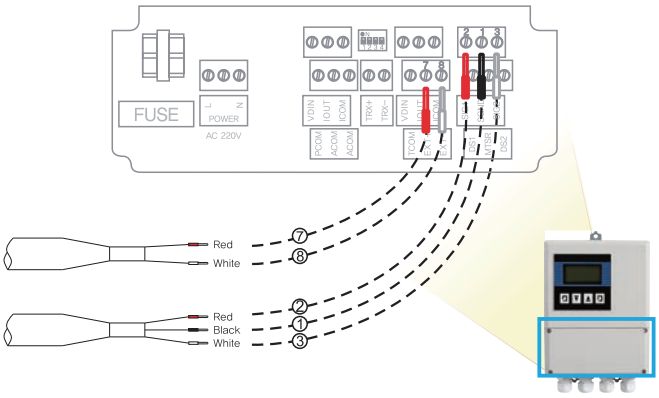


Wiring

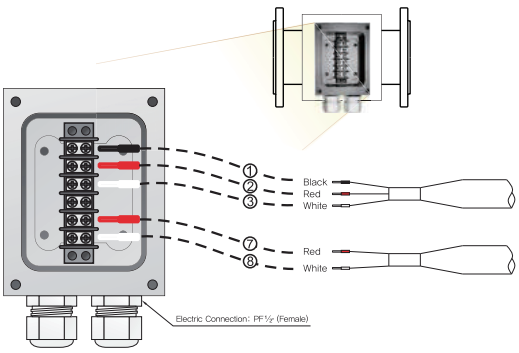
Controller wiring connection function



Wiring connection on sensor to converter

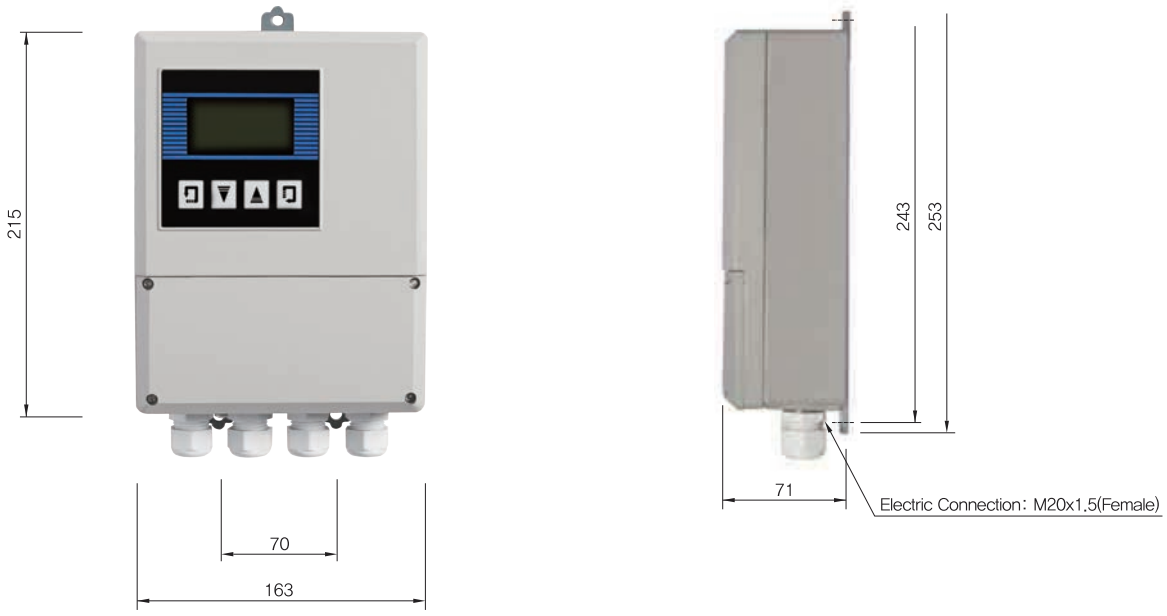


Wiring connection on sensor

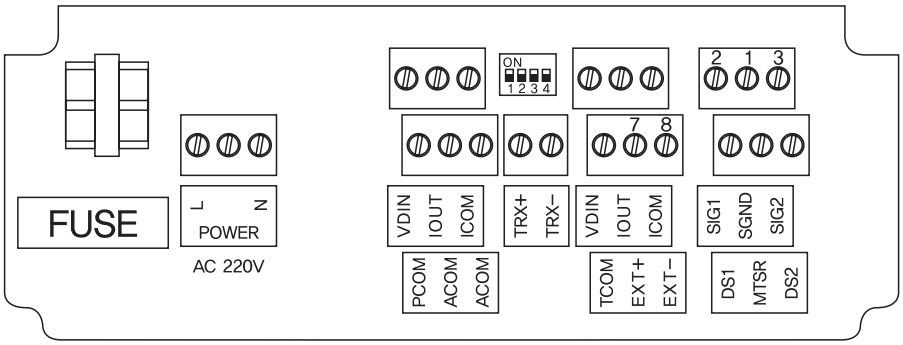


Dimension

Converter dimension



Converter wiring diagram



1) Power : AC 85 ~ 250 V (50 ~ 60 Hz) / DC 24 V
2) Aanlogue output : DC 4 ~ 20 mA (Isolated)
3) Pulse output : Open collector pulses
4) Alarm output : Hi and Low alarm output
5) Network function (Option) : RS-485

Principle of Electromagnetic Flowmeter

Principle of operation

The electromagnetic flowmeters are the ideal flowmeters for metering the flow of all liquids, slurries and sludges that have a specific minimum electrical conductivity. These flowmeters measure accurately, create no additional pressure drop, contain no moving or protruding parts, are wear free and corrosion resistant. Installations are possible in any existing piping system.
The electromagnetic flowmeters has proven itself over many decades and is the preferred flowmeter in the Chemical, Pharmaceutical and Cosmetic Industries. Municipal Water and Waste Water treatment facilities and in the Food and Paper industries.

Measurement operation

Faraday's Laws of induction form the basis form the basis for the electromagnetic flowmeter which states that a voltage is generated in a conductor as it moves through a magnetic field.
This principle is applied to a conductive fluid which flows through the meter tube perpendicular to the direction of the magnetic field. (see the figure 1.)

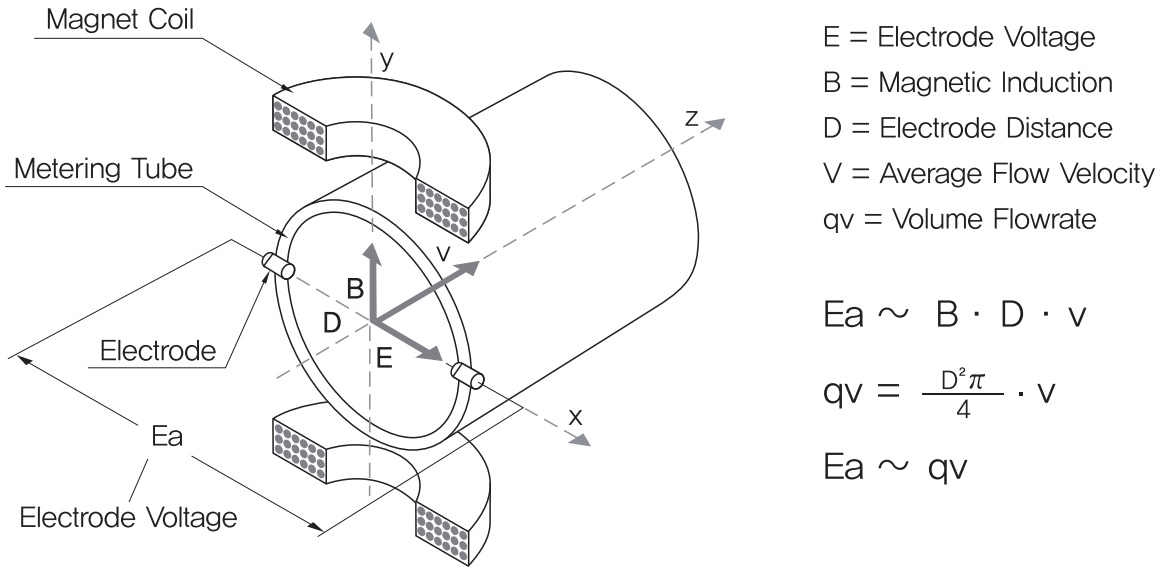


Figure 1. Basic operating principle of an Electromagnetic Flowmeter

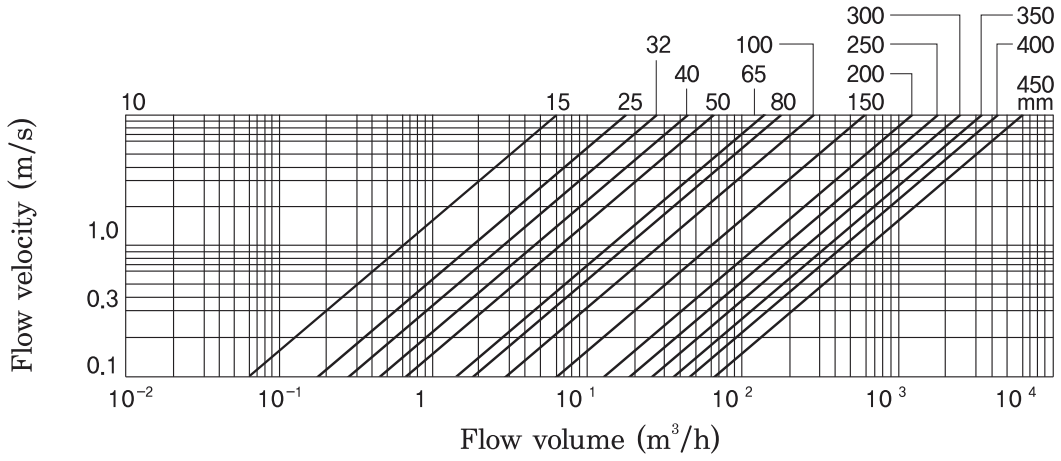
The voltage induced in the fluid is measured by two electrodes located diametrically opposite to each other.
This electrode voltage "Ea" is proportional to the magnetic induction "B", the electrode distance "D" and the average flow velocity "V". Nothing that the magnetic induction "B" and the electrode distance "D" are constant values indicates that a proportionality existes between the electrode voltage "Ea" and the average flow velocity "V".
From the equation for calculating the volume flowrate "Ea~qv", it follows that the signal voltage is linear and proportional to the volumetric flowrate.

Measuring range

In the normal industry application it is better to set the measured medium speed as 2~4m/s.
Under the special situation the minimum speed should be more than 0.2m/s and maximum speed less than 8m/s.
If there are solid granules in liquid the usual speed should be less than 3m/s for purpose to avoid the over-attrition between lining and electrical poles.
For viscid liquid the speed can choose as 2m/s the fast flow speed makes for the automatic elimination of obstructive substances glued on poles, therefore improve the inspection's preciseness.

Size (mm)	Flow range				Dimension "L" (mm)	Max. Working Pressure (bar)	Approx Weight (Kg)
	Minimum		Maximum				
	Velocity (m/s)	Flow rate (m³/h)	Velocity (m/s)	Flow rate (m³/h)			
15A		0.19		6.35			7
20A		0.34		11.29			7
25A		0.53		17.64			8
32A		0.87		28.91	200	40	8
40A		1.36		45.71			9
50A		2.12		70.58			10
65A		3.58		119.28			11
80A		5.43		180.68			13
100A		8.48		282.32	250		17
125A		13.25		441.12		16	20
150A	0.2	19.08	10.0	636.21	300		30
200A		33.91		1,129.27	350		41
250A		52.99		1,764.48	400		58
300A		76.30		2,540.86	500		70
350A		103.86		3,458.39			82
400A		135.65		4,517.08			106
450A		171.68		5,716.93	600	10	116
500A		211.95		7,057.94			130
600A		305.21		10,163.43			185
700A		415.42		13,833.55	700		230
800A		542.59		18,068.31	800		300
900A		686.72		22,867.71	900		380
1000A		847.80		28,231.74	1,000	6	480

Graph Illustration of diameter, Flow speed and Volume of flowmeter



Grounding

General information on ground connections

Observe the following items when grounding the device ;
- The flowmeter grounding is one of the most important things for flowmeter installation.
- For plastic pipes or pipes with insulating lining, the grounding is provided by the grounding ring.
- When stray potentials are present, install a grounding ring upstream and downstream of the flowmeter sensor.
- For measurement-related reasons the potential in the station ground and in the pipeline should be identical.

※ Important Notice

If the flowmeter sensor is installed in plastic or earthenware pipelines, or in pipelines with an insulating lining, transient current may flow through the grounding electrode in special cases.
In the long term, it may destroy the sensor, since the ground electrode will turn in degrade electrochemically.
In these special cases the connection to the ground must be performed using grounding plates.
Install a grounding ring upstream and downstream of the device in this case.

Metal pipe with fixed flanges

Use a copper wire (at least 2.5 mm²) to establish the ground connection between the sensor, the pipeline flanges and an appropriate grounding point.

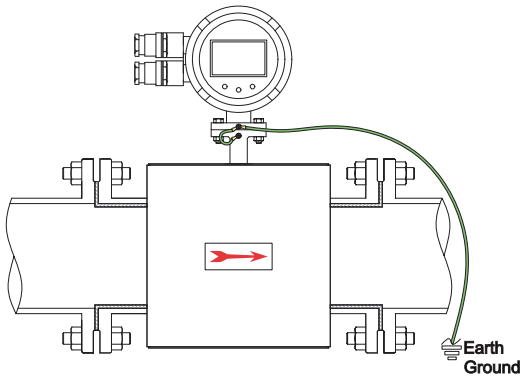


Figure 2. Metal pipe, without liner
(Over 50A sizes)

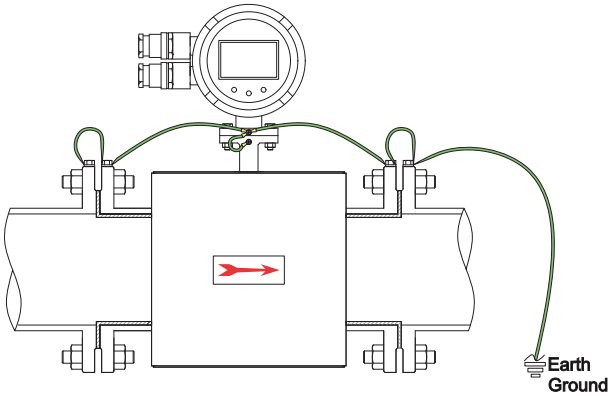


Figure 3. Metal pipe, without liner
(From 10 to 40A sizes)

Plastic pipes, non-metallic pipes or pipes with insulating liner

For plastic pipes or pipes with insulating lining, the ground for the measuring agent is provided by the grounding ring.
If grounding electrodes are used the grounding ring is not necessary.

a) Install the flowmeter sensor with grounding ring in the pipeline.
b) Connect the terminal lug for the grounding ring and grounding connection on the flowmeter sensor with the grounding strap.
c) Use a copper wire (min. 2.5 mm²) to link the ground connection to a suitable grounding point.
※ It is essential to use this grounding method in an electrolysis process at a plating factory.

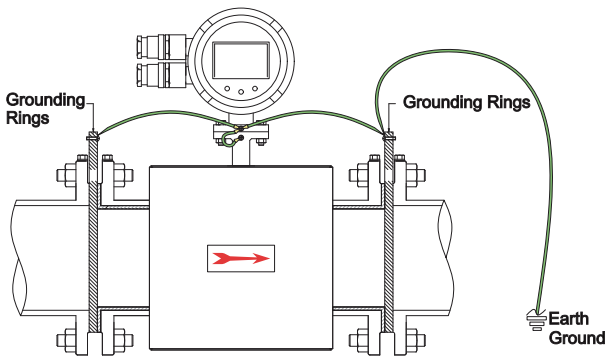


Figure 4. Plastic pipes, non-metallic pipes or pipes with insulating liner

Grounding

Ground for pipes with flexible connection

For pipes with flexible connection, it should be welded M16 or 1/4 sized bolts on both sides of the pipes as shown the figure 5 to get proper ground results.
Make sure to use a copper wire (min. 2.5 mm²) to link the ground connection to a suitable grounding point.

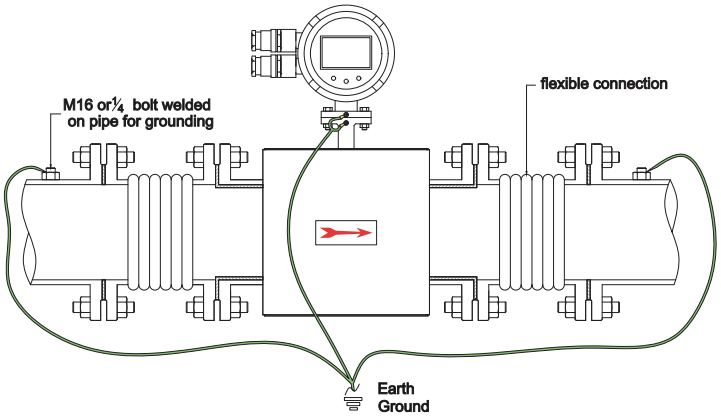
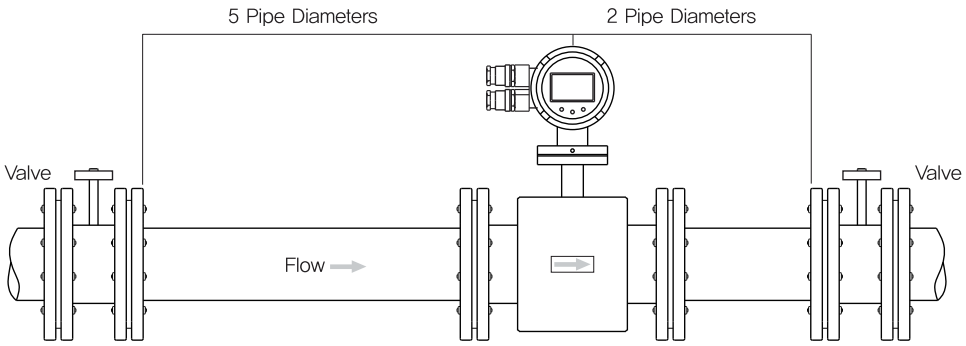


Figure 5. Ground for pipes with flexible connection

Piping installation

Upstream downstream piping installation methods (Standard)

To ensure specific accuracy over widely varying process conditions install the flowtube with a minimum of five straight upstream and two pipe diameters downstream from the electrode plan as shown below.

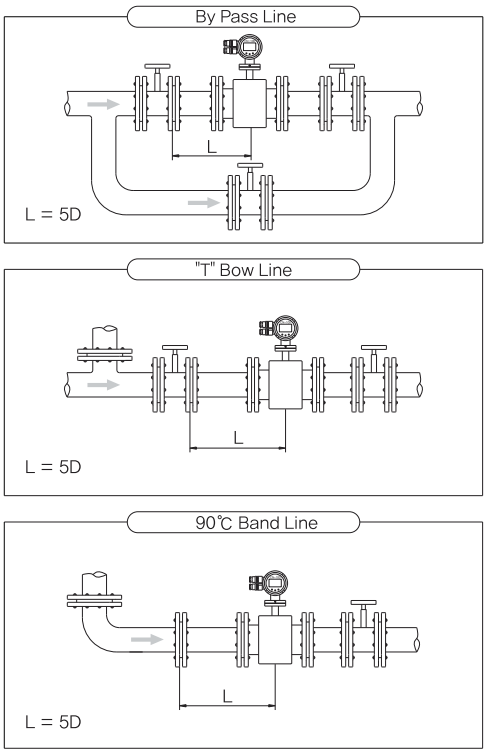


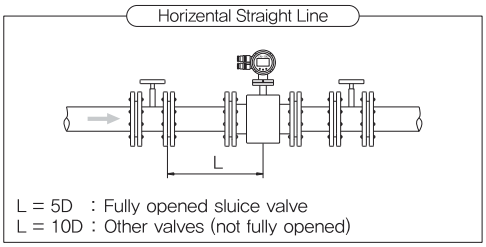
Upstream and Downstream straight pipe diameter

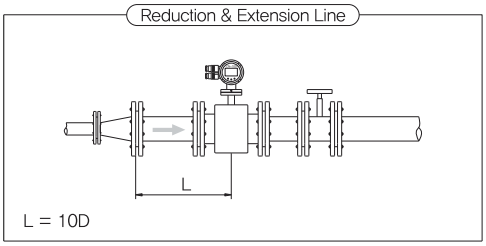
※ Note : It can be measured a correct flowrate only when a detector is full with fluid inside completely.
Make sure to operate it with fluid in full inside.

Required pipe length in piping connections

If various joints are used upstream of the detector outlet the straight pipe length as show in figure below is required.







※ Note

L : Required straight pipe length–straight pipe length plus half length of the detector.

D : Normal bore size (diameter)

The figure above required straight pipe length on the upstream side

Locations

YONGIN FACTORY

Pressure & Temperature Instruments

Established in 1965

HEAD OFFICE

Sales Division

Established in 2018

HWASUNG FACTORY

Level Gauge & Flow Elements

Established in 2012

BUCHEON FACTORY

Pressure Instrument

Established in 2008

PAJU FACTORY

Power Transmission Line Hardware

Established in 2002

COMPANY NAME	ADDRESS
YONGIN PLANT	(17097) 경기도 용인시 기흥구 덕영대로 2022 2022, Deogyeong-daero, Giheung-gu, Yongin-si, Gyeonggi-do, 17097, Republic of Korea Tel. 82-31-280-5000 Fax. 82-31-283-9800
HEAD OFFICE	(18503) 서울특별시 금천구 가산디지털1로 181 (가산동, 가산 W CENTER) 19층 19F, 181, Gasan digital 1-ro, Geumcheon-gu, Seoul, Republic of Korea Tel. 82-2-300-2300 Fax. 82-2-300-2301 http://www.wisecontrol.com
HWASEONG PLANT	(18542) 경기도 화성시 마도면 마도공단로 4길 5 5, Madogongdan-ro 4-gil, Mado-myon, Hwaseong-si, Gyeonggi-do, 18542, Republic of Korea Tel. 82-31-366-9237 Fax. 82-31-366-9238
BUCHEON PLANT	(14556) 경기도 부천시 소사구 조마루로385번길 122, 12층 122, Jomaru-ro 385beon-gil, Bucheon-si, Gyeonggi-do, Republic of Korea Tel. 82-32-351-5751~53 Fax. 82-32-351-5754
PAJU PLANT	(10858) 경기도 파주시 탄현면 한록산길 149 149, Hanroksan-gil, Tanhyeon-myeon, Paju-si, Gyeonggi-do, 10858, Republic of Korea Tel. 82-32-328-1571 Fax. 82-32-328-6530

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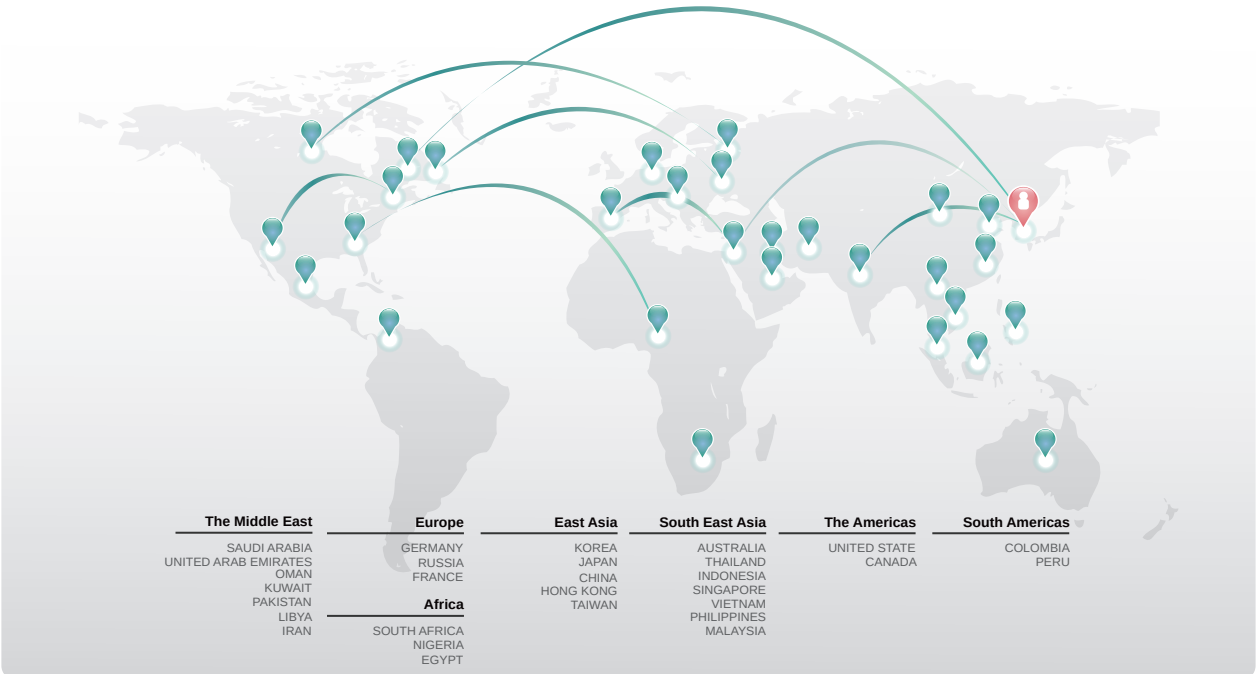

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