ELETTA
MESSTECHNIK

Manual EMF Series
Electromagnetic Flow Meters

EMFA2E21

Content **Page**

1. General Information

This manual will assist you in installing, using and maintaining the Eletta flow meter. It is your responsibility to make sure that all operators have access to adequate instructions about safe operating and maintenance procedure.

For your safety, review the major warnings and cautions below before using your equipment.

Use only fluids that are compatible with the housing material and wetted components of your meter.

When measuring flammable liquids, observe precautions against fire or explosion.

When handling hazardous liquids, always follow the fluids manufacturer's safety precautions.

When working in hazardous environments, always apply appropriate safety precautions.

During meter removal, fluids may spill. Follow the fluids manufacturer's safety precautions for clean up of minor spills.

When tightening the meter, use a wrench only on the wrench flats.

For best results, calibrate the meter at least 1 time per year.

1.1. Product Description

Electromagnetic flow meters are intended for fluid measurement in most industries including water, wastewater, food and beverage, pharmaceutical and chemical.

The Eletta electromagnetic flow meter consists of two main components:

1) The Detector, which includes the flow tube, isolating liner and measuring electrodes, and
2) The Converter, which is the electronic device responsible for signal processing, flow calculation, display and output signals.

The materials of construction of the wetted parts (liner and electrodes) should be appropriate for the specifications on the intended use. Review of the compatibilities of the specifications is recommended.

Eletta's electromagnetic flow meters are factory tested and calibrated. A calibration certificate is included in the shipment of each meter.

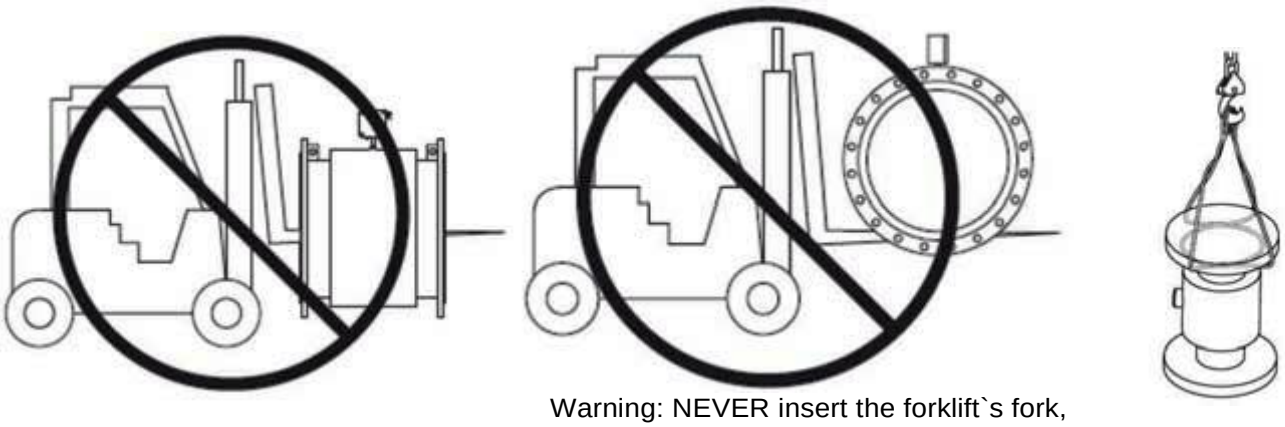
1.2. Unpacking and Inspection

Upon receipt, check your meter for visible damage. The meter is a precision measuring instrument and has to be handled carefully. Remove the protective plugs and caps for a thorough inspection, If any items are damaged or missing, contact us.

Make sure the flow meter model meets your specific needs. For your future reference, it might be useful to record this information on nameplate in the manual in case it becomes unreadable on the meter.

1.3. Transport and Handling

Do not lift the detector from the Converter housing, the junction box or the connecting cable. The use of lifting lugs for larger sizes is recommended. Very large meter sizes are packed and crated with the meter laying on its side for shipping safety and stability reasons. In order to lift the meter in vertical position, it's recommended to use a sling rigged method as shown below.



Warning: NEVER insert the forklift`s fork, chains, wire slings or any other sharp object inside the flow tube for lifting or handling purpose. This could permanently damage the isolating liner and could render the meter inoperable.

If using a forklift, do not lift the detector on its body between the flanges. The housing could be accidentally dented and permanent damage could be caused to the internal coil assemblies.

2. Technical Data

2.1. Measuring system

Measuring principle	Faraday's law
Application range	Electrically conductive fluids
Primary measured value	Flow velocity
Secondary measured value	Volume flow

2.2. Design

Fully welded maintenance-free sensor

Flange version with full bore flow tube

Large diameter range from DN25 -DN3000 with rugged liners approved for drinking water

Industry specific insertion lengths

Modular construction: The measurement system consists of a flow sensor and a signal converter. It is available as compact and as remote version.

Compact version power supply: 110-VAC Power, 18-36V DC Power, Battery Power

Remote version power supply: 110-240VAC Power, 18-36VDC Power, Battery Power

Measurement range: -12 ... +12 m/s

2.3. Measuring Accuracy

Reference conditions	Flow conditions similar to EN 29104
	Medium: Water
	Electrical conductivity: ⩾300 μs/cm
	Temperature: +10...+30℃ (+50℉, , , +86℉)
	Inlet section: ⩾ 5DN
	Operating pressure: 1 bar(14.5 psig)
Flow Meter Accuracy	Standard: ±0.5% of rate
	Optional: ±0.2% of rate

2.4. Operating conditions

Process temperature	Hard rubber liner: -5 … +60°C Polypropylene liner: -5 ... +90°C PTFE liner: -5 … +120°C
Ambient temperature	-20 ... +60°C (Protect electronics against self-heating with ambient temperatures >55°C)
Storage ternperature	-20 ... +70°C
Pressure	PN16
Pressure drop	negligible
Fluid	Physical condition: conductive liquids
Electrical conductivity	5 µSiemens/cm
Permissible gas content (volume)	<=5%
Permissible solid content (volume)	<=70%

2.5. Installation conditions

Take care that the flow sensor is always fully filled.

For detailed information see chapter 4. "Cautions for Installation".

Flow direction forward and reverse. Arrow on flow sensor indicates positive flow direction.

Inlet run	5DN
Outlet run	2DN

2.6. Materials (also see Chapter 3, Models and Selection)

Sensor housing	Sheet steel, Polyurethane coated
Measuring tube	Austenitic stainless steel
Flanges	Carbon steel; Polyurethane coated Option: stainless steel
Liner	DN10-DN40: F46 DN50-DN300: PTFE or Hard Rubber >DN300: Hard Rubber

Connection box (only remote versions): polyurethane coated die-cast aluminium

Measuring electrodes: Standard: Stainless steel 316L

Option: Hastelloy C, Titanium, Tantalum

Grounding rings Standard: Stainless steel

Grounding electrodes (option) Same material as measuring electrodes

Measurable Flow Range

Generally, the Flow Meter is calibrated between 0.3-6m/s if there is not special request

3. Models and Selection

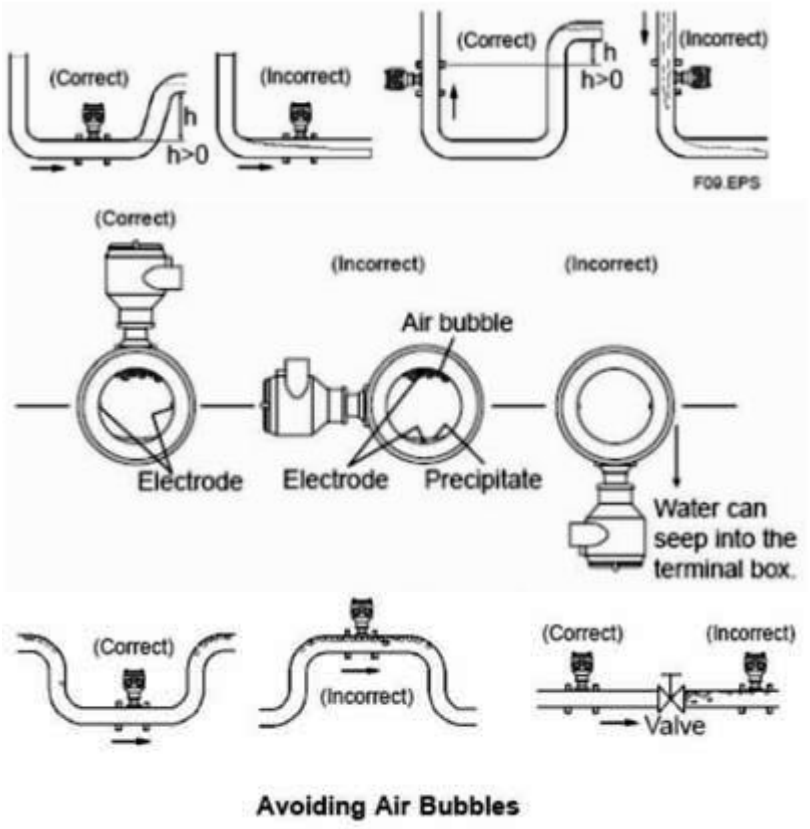
Diameter		Flow Rate (m^3/h)		
		V=0.3m/s	V=6m/s	V=10m/s
mm	Inch	Min	Calibrated	Max
6	1/4"	0.03	0.6	1
10	3/8"	0.1	1.7	3
15	1/2"	0.2	4	6
20	3/4"	0.3	7	11
25	1"	0.5	11	18
32	1-1/4"	0.9	17	29
40	1-1/2"	1	27	45
50	2"	2	42	71
65	2-1/2"	4	72	120
80	3"	5	109	181
100	4"	8	170	283
125	5"	13	265	442
150	6"	20	382	636
200	8"	34	679	1131
250	10"	53	1060	1767
300	12"	76	1527	2545
350	14"	104	2078	3465
400	16"	136	2714	4524
450	18"	171	3435	5726
500	20"	212	4241	7069
600	24"	305	6107	10179
700	28"	415	8310	13850
800	32"	542	10860	18100
900	36"	662	13740	22900
1000	40"	848	16962	28270

4. Cautions for Installation

4.1 Mounting Positions

Pipes must be fully filled with liquids. It is essential that pipes remain fully filled at all times, otherwise flow rate indications may affected, and measurement errors may be caused.

Avoid Air Bubbles. If air bubbles enter a measurement pipe, flow rate indications may be affected and measurement errors may be caused.



Avoiding Air Bubbles

If the electrodes are vertical to the ground, air bubbles near the top or precipitates at the bottom may cause measurement errors.. Ensure that the terminal box is mounted above the piping to prevent water from entering them.

Avoid all pipe locations where the medium is pulsating, such as in the outlet side of piston or diaphragm pumps.

Avoid locations near equipment producing electrical interference such as electric motors, transformers, variable frequency etc.

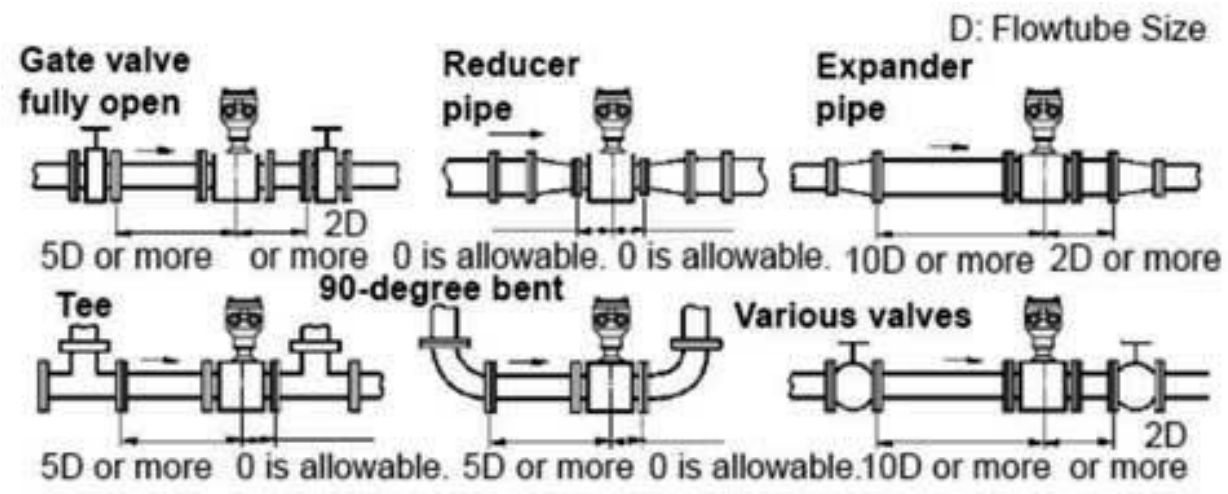
Install the meter with enough room for future access for maintenance purposes.

The magnetic meter isolating liner, whether if it is PTFE or rubber, ls not intended to be used as gasket material. Standard gaskets (not provided) should be installed to ensure a proper hydraulic sealing. When installing the gaskets, make sure they are properly centered to avoid flow restriction or turbulence. Do not use graphite or any electrically conductive sealing compounds to hold the gaskets in place during installation. This could affect the reading accuracy of the measuring signal.

Take precautions against direct sunshine and rain when the meter is installed outside.

4.2. Required Lengths of the Straight Runs

For optimum accuracy, it is required to provide sufficient inlet and outlet straight pipe runs. An equivalent to 5 diameters of straight pipe is required on the inlet side, and 2 diameters on the outlet side. There are no special requirements for standard concentric pipe reducers. See diagram 1 for required straight runs.



When the meter contains removable cover plates, leave the cover plate installed unless accessory modules specify removal. Don't remove the cover plates when the meter is powered, or electrical shock and explosion hazard can be caused.

4.3 Grounding

In this section, the term “grounding” will be defined as the arrangement of process wetted metal materials (piping, grounding rings, grounding electrodes), cabling (grounding straps, grounding wires), and connections to stable references (often, but not always earth ground) required to achieve satisfactory operation of a magnetic flowmeter. As such, it applies to instrumentation aspect of grounding, rather than to "safety grounding”.

Proper installation and grounding of the flowmeter is important for accurate, reliable measurement performance. Stray AC or DC currents, through the fluid or instrument can produce noise signals that may in turn interfere with the relatively low flow signals generated in today's modern pulsed DC magmeters.

Manufacturers provide a variety of elements (ground straps, ground electrodes, ground rings) and directions for the standard grounding of the magmeter.

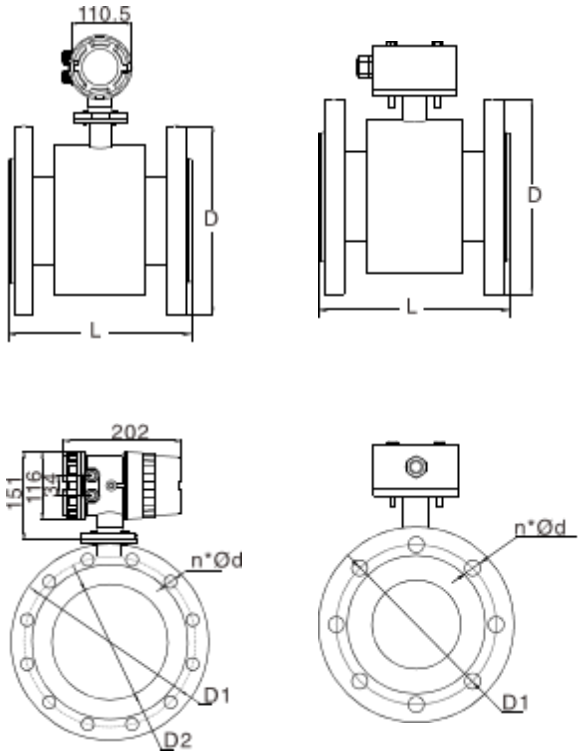
Applications exist in which the user cannot, or should not make use of the traditional grounding connection to adjacent piping or to earth ground. These flow measurement applications are frequently encountered in electrolytic processes. In this case, the fluid passing through the magmeter flow tube may be at a potential significantly higher or lower than earth ground, and a connection to earth ground may be detrimental to the performance and even the reliability of the magmeter. These applications are typically compounded by the use of non-conductive or lined pipe and may feature acid or caustic flows which may necessitate the use of expensive wetted electrodes and grounding materials such as titanium, platinum, or tantalum.

4.4 Connections

Use a gasket between the meter flange and mating flange Determine the material of the gasket based on the operating conditions and type of fluid.

Do not overtighten the flange bolts. This may cause the gaskets to be compressed into the flow stream and may decrease the accuracy of the meter.

Installation dimensions:



Flange DIN PN16						
Diameter (mm)	B Type L (mm)	T Type L (mm)	D (mm)	D1 (mm)	D2 (mm)	n*ød
10	160/120	120	90	60	41	4*14
15	160/200	200	95	65	45	4*14
20	165/200	200	105	75	58	4*14
25	200	200	115	85	68	4*14
32	200	200	140	100	78	4*18
40	200	200	150	110	88	4*18
50	200	200	165	125	102	4*18
65	250	200	185	145	122	4*18
80	250/200	200	200	160	138	8*18
100	250/200	250	220	180	158	8*18
125	250	NA	250	210	188	8*18
150	300	NA	285	240	212	8*22
200	350	NA	340	295	268	12*22
250	450	NA	405	355	320	12*22
300	500	NA	460	410	375	12*22

5. Electrical Wiring

5.1. Safety Instructions

All work on electrical connections may only carried out when the power disconnected.

Observe the national regulations for electrical installations!

Observe the local health and safety regulations. Any work done on the electrical components of the measuring device may only be carried out by properly trained specialists.

Look at the device`s product plate to ensure that the device is delivered according to your order.

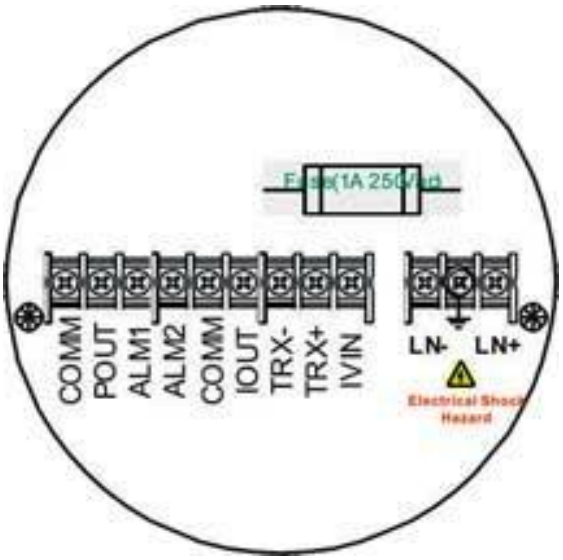
Check for the correct supply voltage shown on the nameplate.

Use suitable cable entries for the various electrical cables.

The sensor and the converter are configured together in the factory. Therefore, please connect the devices in pairs. Ensure that the sensor constant GK are identically set.

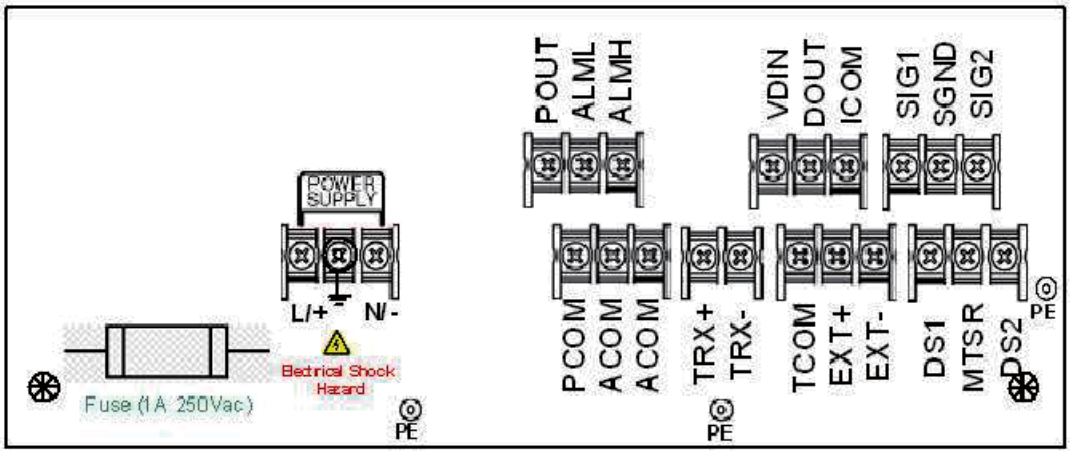
5.2 Terminal Configuration Diagram

5.2.1 Compact Converter Terminal Configuration



POUT	Frequency (Pulse) Output for Bi-Directional Flow
ALM1	Alarm Upper Limit
ALM2	Alarm Lower Limit
COMM	Frequency, Pulse and Current Common (GND)
COMM	Frequency, Pulse and Current Common (GND)
IOUT	Current Output of Flow Rate
IVIN	24VDC Power Supply for 2-Wire 4-20mA Output
TRX+	+ Communication RS485 (+)
TRX-	- Communication RS485 (-)
LN+	L: Live Wire of 110-240VAC +: 24VDC +
LN+	L: Naught Wire of 110-240VAC -: 24VDC -

5.2.2. Remote Converter Terminal Configuration



Pulse Output	POUT	Frequency Pulse Output for Bi-Directional Flow
	PCOM	Pulse Output Ground
Alarm Output	ALMH	Alarm Upper Limit
	ACOM	Alarm Output Ground
RS485 (optional)	TRX+	Communication RS485+
	TRX-	Communication RS485-
Analog Current Outpu	VDIN	24VDC Power Supply for 2-Wire 4-20mA Output
	IOUT	Analog Current Output
	ICOM	Analog Current Output Ground
Power Supply	L/+	L: Live Wire 110-240VAC; +:24VDC +
	N/-	N: Naught Wire 110-240VAC; -24VDC -
Signal from Sensor	SIG1	Signal 1
	SGND	Signal Ground
	SIG2	Signal 2
	TCOM	Reserved
	EXT+	Exciting Current +
	EXT-	Exciting Current -
	DS1	Shielded Exciting 1
	MTSR	Reserved
	DS2	Shielded Exciting 2

6. Programming and Setup

Magnetic flow meters are designed exclusively to measure the flow and conductivity of electrically conductive, liquid media.

Your flow meter is supplied ready for operation. The factory settings for the operation data have been made in accordance with your order specifications.

6.1. Description of Outputs

6.1.1. Digital Frequency Output

Frequency Output Range	1 to 5000 Hz
Output Electric isolate	Photoelectric isolate > 1000V
Frequency Output Capacity	Field-effect transistors Output Maximum Voltage: 36V DC Maximum Current: 250 mA

6.1.2. Digital Pulse Output

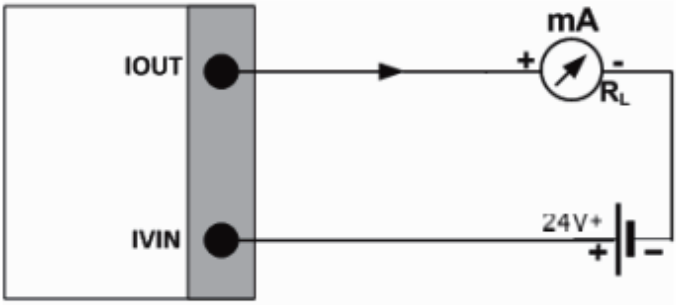
Pulse Output Range	1 to 100 Pulse/s
Pulse Output Value	0.001-1.000 m3/cp; 0.001-1.000 Liter/cp
Pulse Output Capacity	Field-effect transistors Output Maximum Voltage: 36V DC Maximum Current: 250 mA

6.1.3. Alarm Output

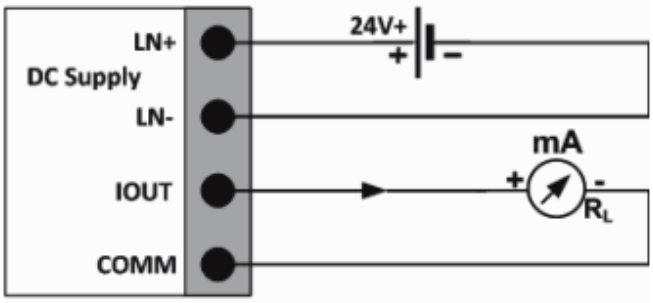
Alarm Output Junction	ALMH: Upper Limit; ALML: Lower Limit
Alarm Output Capacity	Field-effect transistors Output Maximum Voltage: 36V DC Maximum Current: 250 mA

6.2. Output Connection

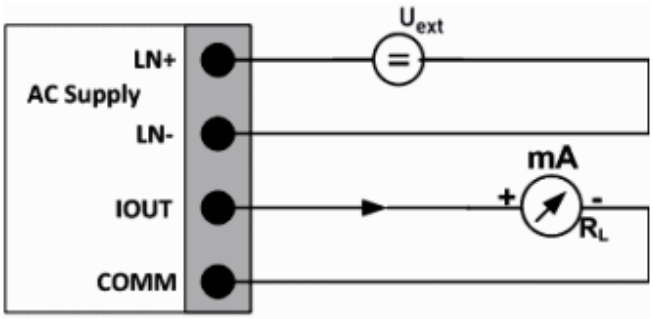
6.2.1. Current Output



Current Output – Two Wire Connection

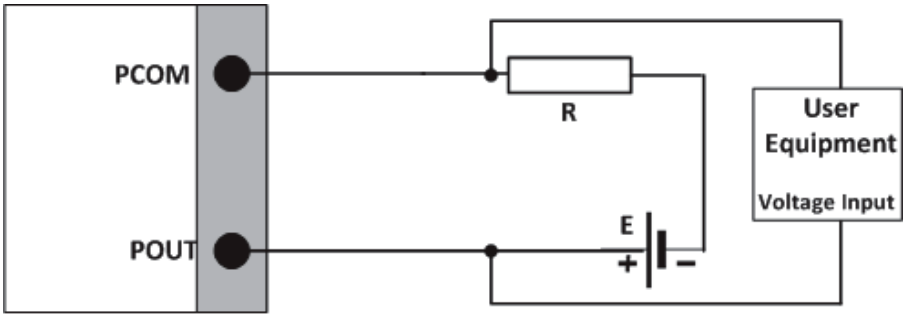


Current Output – Four Wire Connection (Isolated)



Current Output – Four Wire Connection (Isolated)

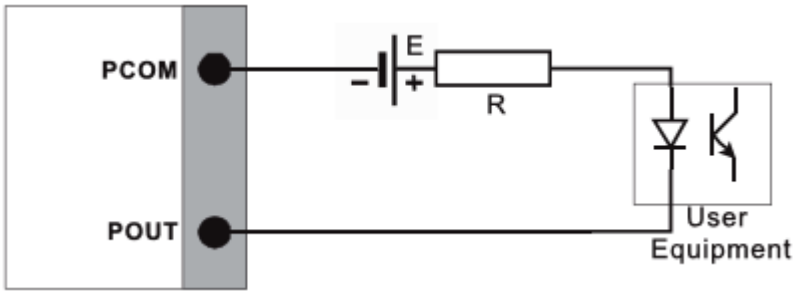
6.2.2. Digital Voltage Output



Digital Voltage Output

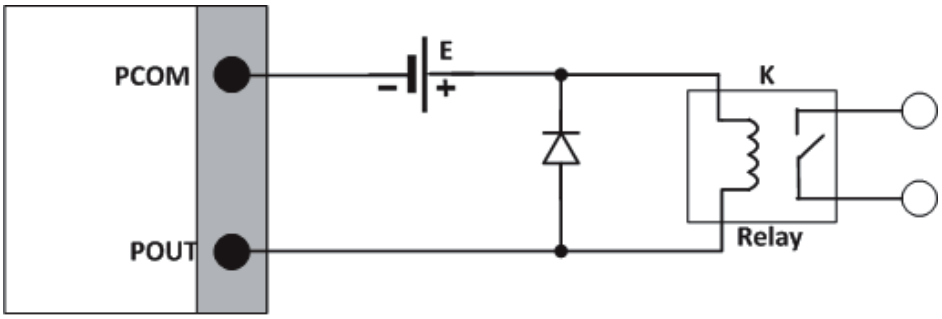
6.2.3. Digital Voltage Output to Photoelectric Coupling

Generally, photoelectrical coupling current is 10mA. When E/R=10mA, E= 5-24VDC



6.2.4. Digital Output to Relay

Generally, E (Vollage) of lhe relay is 12V or 24V; D is exlended diode, rnost middle relays have this diode inside. lf not, user should connect one outside.



Digital output TO Realy

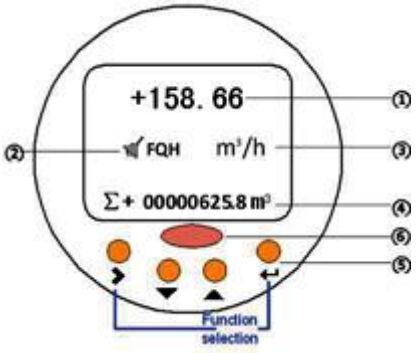
Table of digital output parameter: POUT

Parameter	Test Condition	Mini	Typical	Max	Unit
Voltage	IC=100 mA	3	24	36	V
Current	Vol=1.4V	0	300	350	mA
Frequency	IC=100 mA Vcc=24V	0	5000	7500	Hz
High Voltage	IC=100 mA	Vcc	Vcc	Vcc	V
Low Voltage	IC=100 mA	0.9	1.0	1.4	V

7.0 Operation and Setup

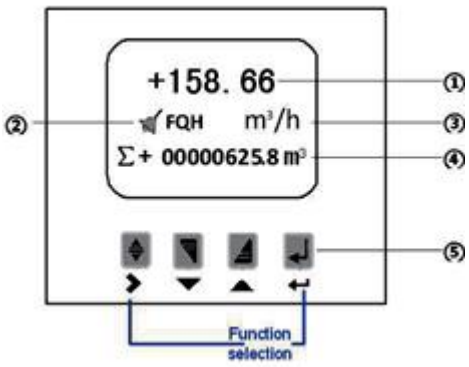
7.1. Display and Keys

7.1.1. Compact Version



①	Flow Rate
②	Alarm Symbol and Message: FQH; FQL; FGP; SYS
③	Flow Rate Unit
④	Flow Velocity; Percentage; Positive, Negative or Net Total (Switchable)
⑤	Keys (See table below for function and representation in text)
⑥	Infrared Sensor (not present in all signal converter versions)

7.1.2. Remote Type



①	Flow Rate
②	Alarm symbol and Message: FQH; FQL; FGP; SYS
③	Flow Rate Unit
④	Flow Velocity; Percentage; Positive, Negative or Net Total (Switchable)
⑤	Keys (See table below for function and representation in text)

Key	Measuring mode	Menu mode	Sub-menu or Function mode	Parameter and data mode
› + ↵	Function Selection (1)Parameters Set (2)Clr Total Rec: Reset Totaliser (3)Fact Modif Rec: Check the modification record			
↵ (Enter Key)	Enter the function selection	Return to the measuring mode but prompt whether the data should be saved	Press 1 time, return to menu mode, data saved	Return to sub-menu or function, data saved
	At any modes, press and hold "Enter" for 3 seconds to return to measuring mode			
▼ or ▲	Switch between display pages: Flow velocity, Percentage, Positive Total, Negative Total, NetTotal	Select menu	Select sub-menu or function	Use cursor highlighted to change number, unit, setting and to move the decimal point
› + ▲ or › + ▼	Adjust LCD Contrast			For numerical values, move cursor one position to the right or left
It returns to the measuring mode automatically after 3 minutes without any action under parameter setting mode.				

7.2. Function Selection Menu

At measuring mode, press > + ↵ can lead to function selection menu including three sub-menu.

Key (Measuring mode)	Function Selection	Description
> + ↵	(1)Parameters Set	Choose this menu and one page with password protect can be displayed.Input the correct password and press > + ↵ to enter the parameters set.
	(2)Clr Total Rec	Choose this menu and one page with password protect can be displayed.Input the correct password and press > + ↵ to perform the total flow reset. *Note:factory default password is "10000";change this password when get the flowmeter to avoid unintended reset on total flow.*
	(3)Fact Modif Rec	Track the modification record on factor

7.3. Parameters Setting

Press > and Enter, this leads to functions election menu and the first menu is "Parameters Set", press Enter to confirm this menu. Enter the password and press > + Enter.

There are 54 menus totally in "Parameters Set" and users can access and modify these menus depending on the input password grade. See table for more information on the password grade:

Password Grade	Password	Login Privileges	Mean Access
Grade 1	00521	Read Only	Menu 1 to 54
Grade2	03210	Read and Edit	Read: Menu 1 to 54 Edit: Menu 1 to 24
Grade3	06108	Read and Edit	Read: Menu 1 to 54 Edit: Menu 1 to 25
Grade4	07206	Read and Edit	Read: Menu 1 to 54 Edit: Menu 1 to 38
Grade5	Please consult your local representative	Read and Edit	Read: Menu 1 to 54 Edit: Menu 1 to 52

Specific Menu – Parameters Set

Menu	Parameter Name	Setting Method	Grades	Range
M1	Language	Select Parameter	2	English
M2	Comm Address	Input Value	2	0-99
M3	Baud Rate	Select Parameter	2	600-14400
M4	SNSR Size	Select Parameter	2	3-3000
M5	Flow Unit	Select Parameter	2	l/h, l/min, l/s, m³/h, m³/min, m³/s
M6	Flow Range	Input Value	2	0-99999
M7	Fleo RSPNS	Select Parameter	2	1-50
M8	Flow Direct	Select Parameter	2	Rlus/Reverse
M9	Flow Zero	Input Value	2	0- +/-9999
M10	Flow Cutoff	Input Value	2	0-599,99%
M11	Cutoff Ena	Select Parameter	2	Enable/Disable
M12	Total Unit	Select Parameter	2	0,001m³-1m³, 0,001l-1l
M13	SegmaN Ena	Select Parameter	2	Enable/Disable
M14	Analog Type	Select Parameter	2	0-10mA/4-20mA
M15	Pulse Type	Select Parameter	2	Frequen/Pulse
M16	Pulse Fact	Select Parameter	2	0,001m³-1m³, 0,001l-1l
M17	Freque Max	Select Parameter	2	1-5999 Hz
M18	MTSNSR Ena	Select Parameter	2	Enable/Disable
M19	MTSNSR Trip	Input Value	2	59999%
M20	Alm Hi Ena	Select Parameter	2	Enable/Disable
M21	Alm Hi Val	Input Value	2	0-599,99%
M22	Alm Lo Ena	Select Parameter	2	Enable/Disable
M23	Alm Lo Val	Input Value	2	0-599,99%
M24	Sys Alm Ena	Select Parameter	2	Enable/Disable
M25	Clr Sum Key	Input Value	3	0-99999
M26	Snsr Code 1	User Set	4	Finished Y N
M27	Snsr Code 2	User Set	4	Product Number
M28	Field Type	Select Parameter	4	Type 1,2,3
M29	Sensor Fact	Input Value	4	0-5,9999
M30	Line Crc Ena	Select Parameter	4	Enable/Disable
M31	Linearity CRC1	User Set	4	Set Velocity
M32	Linearity Fact 1	User Set	4	0-1,9999
M33	Linearity CRC2	User Set	4	Set Velocity
M34	Linearity Fact 2	User Set	4	0-1,9999
M35	Linearity CRC3	User Set	4	Set Velocity
M36	Linearity Fact 3	User Set	4	0-1,9999
M37	Linearity CRC4	User Set	4	Set Velocity
M38	Linearity Fact 4	User Set	4	0-1,9999
M39	Fwd Total L	Correctable	5	00000-99999
M40	Fwd Total Hi	Correctable	5	00000-9999
M41	Rev Total Lo	Correctable	5	00000-99999
M42	Rev Total Hi	Correctable	5	00000-9999
M43	PlsntLmtEna	Select Parameter	5	Enable/Disable
M44	PlsntLmtVal	Select Parameter	5	0,01-0,800ms
M45	Plstn Delay	Select Parameter	5	400-2500ms
M46	Password 1	User Correct	5	00000-99999
M47	Password 2	User Correct	5	00000-99999
M48	Password 3	User Correct	5	00000-99999
M49	Password 4	User Correct	5	00000-99999
M50	Analog Zero	Input Value	5	0,0-1,9999
M51	Anlg Range	Input Value	5	0,0-3,9999
M52	Meter Fact	Input Value	5	0,00-5,9999
M53	Meter Code 1	Factory Set	6	Production Date Y/M
M54	Meter Code 2	Factory Set	6	Product Serial Number

7.4. Parameter Function Table

Menu	Function	Settings/Description
M1	Language	English/Chinese Language selection
M2	Comm Address	RS485 Value: Integer 01-++ Device Address for RS485 (if present)
M3	Baud Rate	Select: 600, 1200, 2400 ,4800 ,9600, 19200
M4	SNSR Size	Selsnor Size, select according to Nameplate
M5	Flow Unit	Selectable flow unit
M6	Flow Range	max. flow rate parameter. A change will affect parameter M10 and current output value
M7	Fleo RSPNS	Damping time/time constant. Default value: 3 seconds. Setting a large value can enhance the stability of the flow display and digital output, which is suitable for accumulative total from pulse output. A small value means a fast response rate which is suitable for production control
M8	Flow Direct	Defines polarity of flow direction. Plus/Forward according to the direction arrow or Rerverse/Backwards in the opposite direction of the arrow
M9	Flow Zero	Zero calibration. First row - small words: FS new zero calibration value. Second row - large words: zero point correction. To ensure the accuracy, FS should be 0. Change the value at the second row tro ensure FS is 0. ONLY perform "Flow Zero" if pipe is filled full static fluid.
M10	Flow Cutoff	Sets output value of all values to "0" (low flow cutoff). For example: Flow Cutoff value = 20%. Then the min flow rate is 20% of the max flow rate (the value in M6). This function is only effective if M11 isn set to ENABLE
M11	Cutoff Ena	Selectable: Enable -Disable the switch on M10 (flow cutoff)
M12	Total Unit	Selectable m^3 or liter values, 9 digits. This parameter can control the resolution for the totalizer
M13	SegmaN Ena	Switch to control outputs of reverse flow. Current or pulse output. Only effective for reverse flow if M13 is enabled. For example: If M13 is disabled, then there is no output shown, even if there is reverse flow in the pipe.
M14	Analog Type	Selectable 4-20mA or 0-10mA. Select the correct current mode according to the application
M15	Pulse Type	Selectable: frequency/pulse for frequency or pulse output
M16	Pulse Fact	The scaled pulse output value for each pulse. ONLY effective if M15 is selected as "Pulse". For eample: M16="0,1l" means that each pulse is 0,1l. Max pulse output: 100 pulses/s
M17	Freque Max	Value: 1-5000Hz. Max. frequency is corerexponding to M6 flow range
M18	MTSNSR Ena	Empty pipe detect. Only valid if M18 = enable
M19	MTSNSR Trip	First row: neasured conductivity value (V1). Second roe: the value V2 that can trigger the empty pipe alarm. Generally, Set V2 as 3-5 times of V1. Flow indication, Pulse and Current utput are zero, when pipe is empty. Set this parameter when the pipe is full.
M20	Alm Hi Ena	Upper flow limit alarm is only valid if M20 is ENABLE
M21	Alm Hi Val	Upper Flow limit Alarm. Only triggered when M20 = Enable and flow rate >M21 * M6
M22	Alm Lo Ena	Low flow limit alarm is only valid if M22 = ENABLE
M23	Alm Lo Val	The value to trigger the low flow limit alarm. Only triggered when M22=ENABLE and flow rate >M10 * M6
M24	Sys Alm Ena	System Exciting alarm only valid if M24=ENABLE
M25	Clr Sum Key	Reset Totalizer password. Please set M25 first, and use this password to perform reset according to Function Selection Menu
M26	Snsr Code 1	Sensor production date can be set to track whether the sensor factor is correct
M27	Snsr Code 2	Sensor serial number
M28	Field Type	Selectable: 1/16, 1/20, 1/25. Three values of exciting frequency. Typically, use 1/16 for small sensor sizes and the others for large sensor sizes.
M29	Sensor Fact	Input Measuring Sensor Constant: GK. User can get this factor from the calibration certificate.
M30	Line Crc Ena	Used to control the correction function for the linearity. Enable: Use the linearity correction; Disable: linearity correction is not used, even if M31 to M38 are set.

Menu	Function	Settings/Description
M31	Linearity CRC1	Correction Point 1: the velocity of point1
M32	Linearity Fact 1	The correction factor for point 1
M33	Linearity CRC2	Correction Point 1: the velocity of point2
M34	Linearity Fact 2	The correction factor for point 2
M35	Linearity CRC3	Correction Point 1: the velocity of point3
M36	Linearity Fact 3	The correction factor for point 3
M37	Linearity CRC4	Correction Point 1: the velocity of point4
M38	Linearity Fact 4	The correction factor for point 4
M39	Fwd Total Lo	Set value for total flow: For maintenance or replacement, the previous total flow value should be set. Change of M39-M42 can accomplish that function. Set value 00000-99999, low byte of positive total flow
M40	Fwd Total Hi	Set value 00000-99999, high byte of positive total flow
M41	Rev Total Lo	Set value 00000-99999, low byte of negative total flow
M42	Rev Total Hi	Set value 00000-99999, high byte of negative total flow
M43	PlsntLmtEna	Peak Suppression Function: enable - peak supression on, disable: peak suppression off. For paper, pulp and slurry etc, "Peak Interference" can occur, when the solid contents scrub or strike the electrodes. Peak suppression can restrain this interference via the settings of M43-M45.
M44	PlsntLmtVal	Determines the change rate of peak interference, based on the percentage of flow velocity. 10 grades: 0,01m/s (grade 1), 0,02m/s (grade 2), 0,03m/s, 0,05m/s, 0,08m/s, 0,1m/s, 0,2m/s, 0,3m/s, 0,5m/s, 0,8m/s (grade 10). The sensitivity of peak suppression is highest for grade 1.
M45	Plstn Delay	Determines the time delay to suppress Peak Interference in milliseconds
M46	Password 1	Can be changed using grade 5 password to enter parameter settings
M47	Password 2	Can be changed using grade 5 password to enter parameter settings
M48	Password 3	Can be changed using grade 5 password to enter parameter settings
M49	Password 4	Can be changed using grade 5 password to enter parameter settings
M50	Analog Zero	Factory use only. Zero point calibration for current output, to set zero point to 0mA/4mA
M51	Anlg Range	Factory use only. Full scale calibration for current output, to set full scale to 10mA/20mA
M52	Meter Fact	Factory use only.
M53	Meter Code 1	Production date
M54	Meter Code 2	Serial number

8. Alarm information

The converter has a self-diagnose function. This signal shows at the left of the LCD display:

Alarm messages:

FQH	Upper Flow Limit Alarm
FQL	Low Flow Limit Alarm
FGP	Empty Pipe Alarm
SYS	System Alarm

9. Troubleshooting

Symptom	Probable Cause	Solution
No Display	1. No power	Apply correct power
	2. Fuse blown	Replace a fuse with same parameter
	3. Contrast of LCD is too low	Increase the contrast
Empty Pipe Alarm	1. Fluid is not full filled the pipe	Increase the flow rate
	2. Electrode was polluted	Clean the electrode if voltage of DS1 and DS2>1V
	3. Fluid's conductivity is too small	If connect three terminals SIG 1, SIG 2, SGND and the alarm disappears, which means the fluid's conductivity is small. Replace other kind of flowmeter
Flow rate indication is unstable	1. Grounding issue	Make sure meter is properly grounded to a good earth ground
	2. Air	Make sure fluid does not contain air bubbles
	3. Converter location-outside electrical interference	Make sure Converter is not too close to sources of electrical interference

Symptom	Probable Cause	Solution
Measurement is not accurate	1. Parameter wrong	Check the parameters (Transmitter, K-factor and size)
Flow rate indication is unstable	2. Pipe is not fully filled	Check if meter is fully filled
	1. Grounding issue	(1) Make sure meter is properly grounded to a good earth ground (2) Please use ground ring when the pipe is not conductive, such as PVC or other plastic pipe
	2. Air	Make sure fluid does not contain air bubbles
	3. Converter location outside electrical interference	Make sure converter is not too close to sources of electrical interference
No Display	1. No power	Apply correct power
	2. Incorrect power	Check power supply
	3. Wiring connections	Check power input/output connections
	4. Fuse blown	Replace fuse

10. Contact

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