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Electromagnetic Flow Meter (15/25 Pipe Diameter)



FLOW MEASUREMENT FIELD

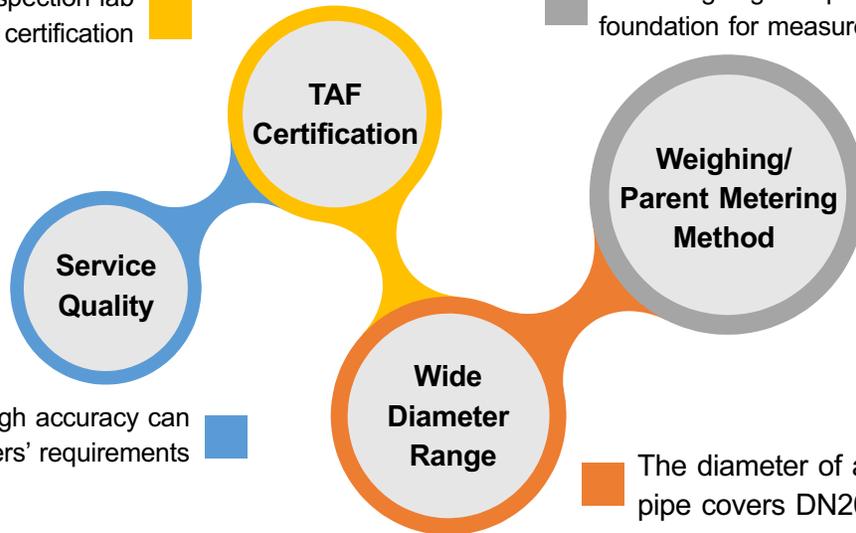
FineTek is the only inspection institution that owns a Class 2 flow test laboratory in Taiwan. With the most professional R&D and Design Team, it can design and develop high-accuracy electromagnetic flow meters. Moreover, it conducts calibration in Class 1 Flow Laboratory of the National Measurement Laboratory (ITRI Measurement Center), so as to guarantee the flow accuracy on the measurement field.

FineTek's flow laboratory has received certification from the Taiwan Accreditation Foundation and conforms to the regulations of international organizations such as ILAC and APALC. It has the complete ability of uncertainty testing and rating for flow test.



Flow inspection lab with TAF certification

Take weighing and parent metering as the foundation for measurement calibration



High quality and high accuracy can meet the customers' requirements

The diameter of applicable pipe covers DN20~ DN300



FLOW MEASUREMENT FIELD



PUMP equipment
(The maximum horsepower
is 110KW per unit)



Weighing equipment



Control room & Graphical HMI



Piping system I
(Max capacity for four meters calibration
simultaneously in above system.)



Piping system II
(Maximum diameter is 300mm)

1. 測試項目 (Testing Item): 流量校準
2. 測試日期 (Testing Date): 2023/08/02
3. 測試地點 (Testing Place): 2F
4. 測試結果 (Result):

環境溫度 (Environment Temperature): 25.1°C
相對濕度 (Relative Humidity): 65%

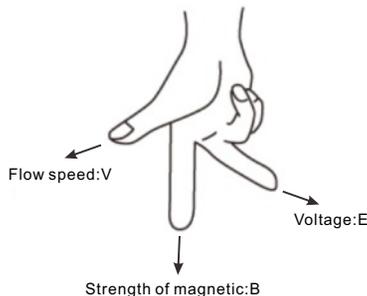
GE-16041175

電子秤編號 (Scale No.)	測試流量 (m³/h)	流速 (m/s)	管徑 (mm)	安裝位置 (Installation Position)	流計分析 (Flowmeter Analysis)		溫度 (Temperature)	濕度 (Humidity)
					相對偏差 (Relative Error)	測量誤差 (Measurement Error)		
3000 kg 8519602027	234.47	0.98	300	0.0000	0.0000	0.05%	0.01%	25.08
3000 kg 8519602027	127.24	0.50	300	0.0000	0.0000	0.05%	0.01%	25.08
3000 kg 8519602027	76.36	0.30	300	0.0000	0.0000	0.05%	0.01%	25.08

The exclusive report
(Each flow meter has its
own calibration report)

ELECTROMAGNETIC FLOW METER

EPD electromagnetic flow meter is a high-accuracy flow meter manufactured based on the latest international technology. It is widely applied in papermaking, chemical industry, metallurgical industry, drainage, waste water treatment, liquid high-pressure metering, medical care, food, and environmental protection industries. It is used to measure the non-magnetic liquid and plasma in the enclosed pipe.



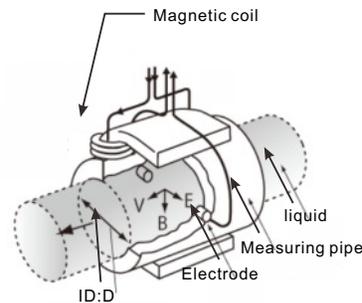
WORKING PRINCIPLE

The working principle of the electromagnetic flow meter is based on the Faraday law of electromagnetic induction. When the conducting liquid flows in the orthogonal direction of the magnetic line direction, it will cut the magnetic lines and generate induced voltage, which shows linear relationship with the flowing speed. Thus, the fluidic volume flow can be calculated.

EPD electromagnetic flow meter is mainly composed of the sensor and transmitter. The measuring tube of the sensor is equipped with the excitation coils upward and downward. The transmitter supplies the excitation current, which generates the magnetic field which goes through the measuring tube once it is powered on. A pair of induction electrodes installed on the inner side of the measuring tube comes in contact with the liquid to guide the induced voltage to the sensor.

APPLICATIONS

- Waste water treatment
- Tapped water purification
- Sewerage
- Sea water desalination module
- Dyeing machines
- Solar energy and PCB wet processing
- Food manufacturing
- Pharmaceutical machines



FEATURES

Low impact on environmental matter

- The measurement results are not affected by the change in liquid density, viscosity, temperature, pressure and conductivity.
- It can be widely applied in the conducting liquids that may contain fiber, solid granules and suspended matters.
- Enclosure protection rating: IP67/NEMA 4X

Wide measurement range & high efficiency

- The wide measurement turndown ratio can be reach 1:100, which can be set randomly and achieve high accuracy for small flow measurement.
- Highly-integrated backlit display of two rows, dual isolation, parameter setting, menu-type operation, memory function, reliable programming, password lock and access, small signal elimination, non-linear correction and two-way measurement.
- Various outputs: Current output 4~20mA, frequency output 2~8KHz and RS485 communication.

Multiple self-diagnosis function

- Power-saving and low fault rate: The measuring tube is without baffle and movable parts, so it won't cause pressure loss and jam.
- Smart self-detection and self-diagnosis function, as well as various alarms

The low installation cost

- It is easy-to-install with low requirements for the straight tube section (Front 5D and rear 2D)
- 2-wire analog output

Available for records for parameter modifications, boot/ shut down device(Optional)

Authority management is available in menu (Option)

SPECIFICATION

Item	EPD30 Standard type(15/25 pipe diameter)
Display	LCM 128*64 pixel backlit type
Buttons	Tri-button operation
Communication interface	RS-485 (Modbus) (Optional support for ZigBee Pro wireless transmission)
Accuracy	±0.5% of reading@1m/s(0.2% optional)
Medium temperature	- 20 ~ 150°C(PFA Lining)
Ambient temperature	- 40 ~ 70 °C ¹
Fluidic conductivity	> 5 uS/cm
Measuring scope	0.1m/s ~ 10m/s
Current output accuracy	0.1% of Pulse Output Accuracy Temperature coefficient (100 ppm/°C)
Operating pressure	16 Kg/cm ² (Please contact FineTek if pressure requested more than 16 Kg/cm ²)
Current output mode	Proactive
Analog output	4 ~ 20 mA
Maximum load of current output	< 700W
Alarming current	3.6mA or 22 mA
Frequency output scope	2 ~ 8 KHz
Pulse width	Automatic (pulse width 50%)
Pulse mode	NPN transistor output 32vdc/200mA
Time constant	1~100 s
Control output (DO)	NPN transistor output 32vdc/200mA ; 2-CH
Control input (DI)	Dry contact ON< 200Ω ; 1,000Ω< OFF ; 1-CH
Data logger(Optional)	500 items. With calendar (Internal battery: Lift time>6 month)
Baud rate	1200 ~ 57600 bps
Protection rating	IP67 / NEMA 4X
Enclosure material	Aluminum alloy
Input power	AC100~240V or DC 24V
Power consumption	< 10W
Wire inlet specification	M20 x 1.5*2
Excitation mode	Pulse DC
Vibration regulation	IEC 60068-2-3
EMC regulation	IEC/EN 61326-1 Class A table2

¹ It can't display when LCM is lower than -20°C.

MATERIAL SELECTION

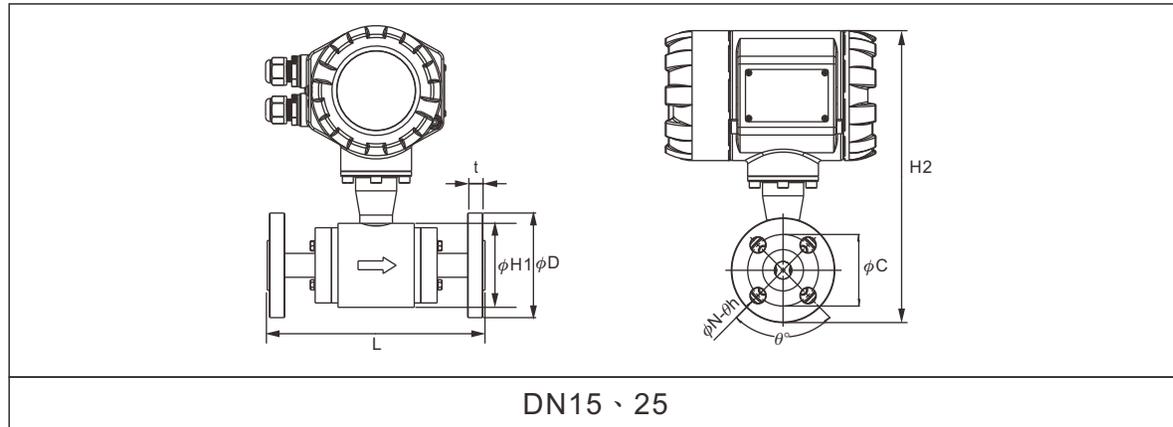
※Electrode material

Electrode material	Anti-corrosion property
Stainless steel (316L)	It is applied in water, sewage and organic and non-organic corrosive medium.

※Lining material

Lining material	Main properties	Application scope
PFA	<ol style="list-style-type: none">1. Stable chemical properties, resistant to various acid, alkane, and salt solutions and various organic solvents. It is not tolerant to the corrosion of ClF_3, high-temperature OF_3 and high-speed liquid oxygen and ozone.2. The anti-abrasion property is average.	<ol style="list-style-type: none">1. $-20\sim 150^\circ\text{C}$2. Strong corrosive medium such as concentrated acid and alkane.

APPEARANCE AND DIMENSION AND FLANGE CONNECTION DIMENSION STANDARD TYPE



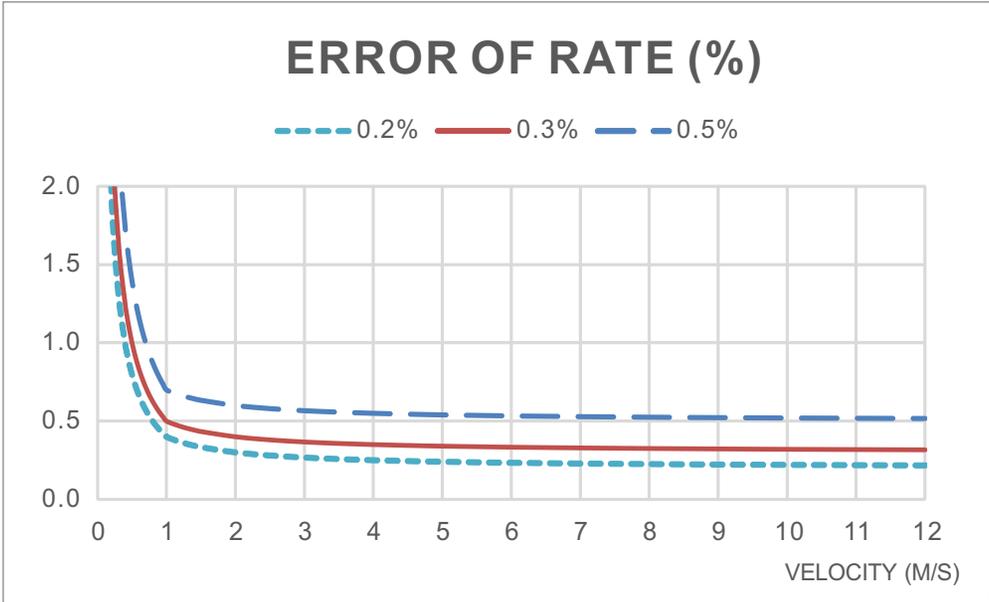
Connection specification		JIS 10K		JIS 20K		ANSI 150 Lbs		ANSI 300 Lbs	
Nominal diameter(mm)		15	25	15	25	15	25	15	25
Lining material		PFA							
Length	L	200	200	200	200	200	200	200	200
External diameter	φD	95	125	95	125	89	108	95	124
PCD	φC	70	90	70	90	60.3	79.4	66.7	88.9
Flange thickness	t	12	14	14	16	11.1	14.3	14.3	17.5
Inclined angle of screw hole	θ°	45	45	45	45	45	45	45	45
Diameter of screw hole	θh	15	19	15	19	16	16	15.9	19
Quantity of screw holes	N	4	4	4	4	4	4	4	4
Height of sensor casing	H1	76	89	76	89	76	89	76	89
Total height	H2	268	289	268	289	265	281	269	289
Weight(Kg)	—	1.55	3.75	1.89	3.99	0.89	3.19	2.09	4.39

Connection specification		DIN PN40	
Nominal diameter(mm)		15	25
Lining material		PFA	
Length	L	200	200
External diameter	φD	95	115
PCD	φC	65	85
Flange thickness	t	16	16
Inclined angle of screw hole	θ°	45	45
Diameter of screw hole	θh	14	14
Quantity of screw holes	N	4	4
Height of sensor casing	H1	76	89
Total height	H2	268	284
Weight(Kg)	—	1.89	3.99

PIPE DIAMETER, FLOW RANGE AND ACCURACY SELECTION

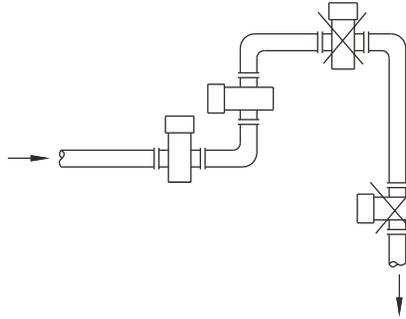
Pipe diameter (mm)	Flow range (m ³ /h)	
	Flowing speed 0.1~1.0m/s	Flowing speed 1.0~10m/s
15	0.06~0.64	0.64~6.4
25	0.17~1.77	1.77~17.7

Accuracy class & tolerance



INSTALLATION INSTRUCTIONS

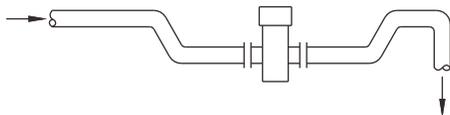
1. The flow meter must be free from strong electromagnetic field. The magnetic intensity of the flow meter installation site must be smaller than 400A/m (It should not be installed near large motors or transformers).
2. It should be installed at the lower point and the vertically upward point of the horizontal pipe. Don't install it at the highest point and the vertically downward point of the pipe.



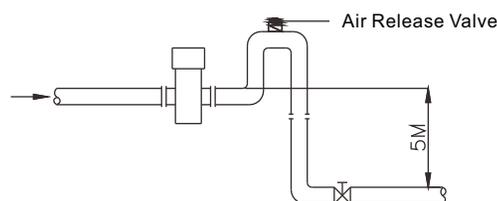
3. It should be installed at the rising point of the pipe.



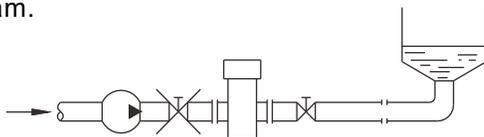
4. It should be installed at the lower point of the pipe when it is installed on the pipe with opening for drainage.



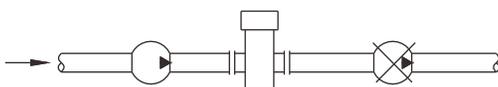
5. If the pipe gap exceeds 5m, the air release valve should be installed at the downstream of the sensor. The downstream of the sensor should have some back pressure.



6. The control valve and cut valve should be installed at the downstream of the sensor rather than the upstream.



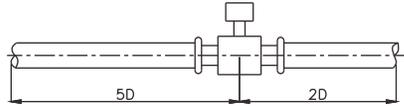
7. The sensor should be installed at the pump outlet rather than the inlet.



8. The fluidic must flow towards the arrow direction of the flow meter.
9. The axial line of the measuring electrode must be approximate to the horizontal direction (The angle of from the horizontal direction).
10. The measuring pipe must be completely filled with liquid.

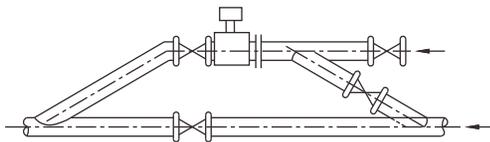
INSTALLATION INSTRUCTIONS

11. The straight tube section is required to be at least 5D (internal diameter of the flow meter) on the front side, and at least 2D on the rear side.



12. When measuring the mixture of different media, the distance between the mixing point and the flow meter must be 30D at least.

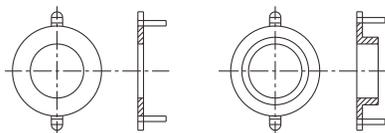
13. For convenient cleaning and maintenance of the flow meter, a bypass pipe must be installed.



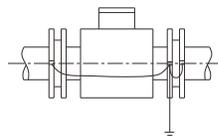
14. When installing the sensor, it should ensure that the measuring pipe and the process pipe must be on the same axial line. For the flow meter with the pipe meter of 50mm or below, the axial line deviation should not exceed 2mm. For those of DN65~DN150, the axial line deviation should not exceed 3mm. For those of \geq DN200, the axial line deviation should not exceed 4mm.

15. The shim installed between the flanges should have excellent anti-corrosion property. The shim should not intrude in the pipe, which will affect the fluidic in the pipe.

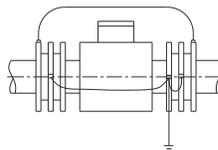
16. The sensor and transmitter should be equipped with high-quality independent grounding wire (The section area of the copper core is 1.6mm²). The grounding resistance should be $<10\Omega$. If the grounding is poor, it won't work normally. The grounding ring is needed if the pipe connecting with the sensor is insulating, and the material of the grounding ring should be the same as that of the electrode. If the test medium is abrasive, the neck grounding ring should be selected.



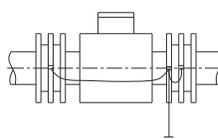
- 16.1 It is for installing the flow meter on the metal pipe not coated with insulating layer internally.



- 16.2 When installing the flow meter on the protective pipe of the cathode, the pipe with the protection of electrolytic corrosion generally has insulating walls and protruding sides. Thus, during installation, the grounding ring and the flanges on the pipe should be insulating.



- 16.3 When installing the flow meter on the plastic pipe or the pipe with insulating coating material, paints or lining, grounding rings on both ends of the sensor should be installed.



MODEL NUMBER / ORDER CODE COMPARISON TABLE

ORDERING INFORMATION

EPD1 0 0 0 0 -A ^⑩□ ^⑪□ ^⑫□ ^⑬□ ^⑭□ ^⑮□ MC 1 4 MC A ^⑳□ ^㉓□ F 0 0 0 0

⑩ ⑪ ⑫ Pipe diameter

015: 15mm
025: 25mm

⑬ ⑭ ⑮ Connection specification

C48: ANSI B16.5 Class 150
C49: ANSI B16.5 Class 300
A42: JIS B2220 10K
A45: JIS B2220 20K
D60: DIN 2501 PN40

⑯ ⑰ Connection material

MC: SUS316L

⑱ ⑲ Lining material

14: PFA

⑳ ㉑ Electrode material

MC: SUS316L

㉓ Power supply

A: 100~240Vac,50/60Hz
D: 24Vdc
N: 100~240Vac,50/60Hz with date logger
R: 24Vdc with date logger

㉔ Accuracy

F: 0.5%

SETTING VALUES

Main Menu	Sub Menu	Unit	Default	Setting Range
Fast Set(0)	Device Tag Num (1.1)			
	Zero Adj. (2.1)			
	Flow Span (1.5)			
	Flow Unit (1.4)			
	Low cutoff (2.4)			
	Damping Time (3.1)			
	Pulse Out Unit (3.3)			
	Total Reset (1.9)			

The parameter is linking from standard menu

Main Menu	Sub Menu	Unit	Default	Setting Range
Basic Set(1)	Device Tag Num (1.1)	none	00001	00001~65535
	Measure Type (1.2)	-	Water	Water
	Tube Size (1.3)	mm	actual	10,15,25,32,40,50,65,80,100 125,150,200,250,300,350,400,450,500
	Flow Unit (1.4)	-	m ³ /h	L/(s,min,h),m ³ /(s,min,h),gal/(s,min,h),kg/(s,min,h), \bar{m}^3 /(s,min,h) (Flow rate* Liquid density = weight) "L/s", "L/m", "L/h", "m ³ /s", "m ³ /m", "m ³ /h", "gal/s", "gal/m", "gal/h", "kg/s", "kg/m", "kg/h", "Tn/s", "Ton/m", "Ton/h", "m/d"
	Flow Span (1.5)	=Flow Rate Unit	(5m/s)* (Diameter/2) ² *pi* Unit of Flow Forward	(0.1 ~ 10.0m/s)*(Diameter mm/2) ² * pi * Unit of Flow Forward
	Direction (1.6)	dir	Forward	Forward,Reverse
	Total Unit (1.7)	-	m ³	Liter,gal,m ³ ,kg,Ton
	Total Mode (1.8)	none	Forward	Forward,Reverse,Bi-direction
	Total Reset (1.9)	none	Cancel	Cancel,Accept

Main Menu	Sub Menu	Unit	Default	Setting Range
Advanced Set(2)	Zero Adj. (2.1)	m/s	actual	-0.5000~+0.5000
	K-Factor (2.2)	none	1.000	0.000~3.000
	Density (2.3)	g/cm ³	1.0000	0.0001~9.9999
	Low cutoff (2.4)	%	0.5	0.00~100.00
	Fwd. Init. (2.5)	=Total Unit	0	0~9999999999
	Rev. Init.(2.6)	=Total Unit	0	0~9999999999

SETTING VALUES

Main Menu	Sub Menu	Unit	Default	Setting Range
	Damping Time (3.1)	second (s)	3	0~100
	Pulse Out Mode (3.2)	none	Pulse NO	Pulse NO, Pulse NC, Frequency
	Pulse Out Unit (3.3)	Unit/pulse	0.1 L	0.001~100(L,gal,m ³ ,g,kg,Ton) m ³ /pulse,gal/pulse,m ³ /pulse g/pulse,kg/pulse,Ton/pulse
	Max. Freq. (3.4)	Hz,kHz	2K	1~8K (00.000)
I/O Signal Set (3)	Curr. Mode (3.5)	none	4-20	4-20,0-20
	4mA Fine-Tune (3.6)	count	0	-5000~5000
	20mA Fine-Tune (3.7)	count	0	-5000~5000
	Input1 Func. (3.8)	N/A	None	None, Total Reset
	Input1 Type (3.9)	N/A	NO	NO,NC
	Filter Variation (3.10)	m/s	1	0.000~10.000
	Filter Weight (3.11)	%	10	0~100
	Median Filter(3.12)	%	Enable	Disable,Enable

Main Menu	Sub Menu	Unit	Default	Setting Range
	Max. Flow (4.1)	Flow Rate Unit	Max.	Max. Flow Rate
	Min. Flow (4.2)	Flow Rate Unit	Min.	Min. Flow Rate
	Empty Tube Set (4.3)	N/A	Disable	Enable, Disable
	Output 1 Func. (4.4)	N/A	Max. Flow Rate	Max. Flow Rate, Min. Flow Rate, Empty Tube, System Alarm
Alarm Set (4)	Output 1 Type (4.5)	N/A	No	NO,NC
	Output 2 Func. (4.6)	N/A	Min. Flow Rate	Max. Flow Rate, Min. Flow Rate, Empty Tube, System Alarm
	Output 2 Type (4.7)	N/A	No	NO,NC
	Curr. Func. (4.8)	N/A	None	Empty Tube, System Alarm
	Alarm Curr. (4.9)	mA	3.6	3.6,3.8,20.5,22
	Temp. Alarm. (4.10)	N/A	1	0:OFF, 1:ON

SETTING VALUES

Main Menu	Sub Menu	Unit	Default	Setting Range	
System Set (5)	Language (5.1)	N/A	N/A	English	English, 繁中, 简中
	System Info.(5.2)	Tube Status	N/A	Actual	(Normal, Empty)
		Act. Flow Speed	m/s	Actual	N/A
		Resistance	kΩ	Actual	N/A
		Status Code	N/A	Actual	0000 0000 ~ FFFF FFFF
	Self-Test (5.3)	N/A	N/A	Cancel	Normal, Circuit Fail ,Excitation Fail, Amb. Temp, Electrode Coating
	Analogy Input (5.4)	4mA Display	N/A	0000	0~9999
		20mA Display.	N/A	1000	0~9999
		4-20mA Unit	N/A	Kpa	None, Kpa, Mpa, Psi, Bar, °C, °F
		Dot	N/A	1	0~3
	ModBus Comm. (5.5)	Modbus ID(2.13.1)	N/A	1	1~255
		BaudRate(2.13.2)	BPS	9600	1200,2400,4800,9600,19200 38400,57600
		Data bit(2.13.3)	N/A	8	8
		Parity(2.13.4)	N/A	none	none,odd,even
	Recovery Default (5.6)	Stop bit(2.13.5)	N/A	1	1,2
		Recovery Default (5.6)	N/A	Cancel	Cancel, Accept
		Mains Frequency (5.7)	N/A	Hz	50
LCM Contrast Brightness(5.8)	N/A	%	50	10~100	
Manu Password (5.9)	User Password(5.9.1)	N/A	00000	0~99999	
	Admin Password(5.9.2)	N/A	00000	0~99999	

Main Menu	Sub Menu	Unit	Default	Setting Range
Simulation (6)	Flow Speed (6.1)	m/s	0	-10 ~ 10
	Flow Rate (6.2)	Flow Rate Unit	0	0~max.
	Output Curr. (6.3)	mA	4mA	3.6~22
	Output Freq. (6.4)	Hz(pulse/sec)	2	8000
	Output1 Status (6.5)	N/A	OFF	ON/OFF
	Output2 Status (6.6)	N/A	OFF	ON/OFF
	Input1 Status (6.7)	N/A	Actual	ON/OFF
	Input Curr. (6.8)	N/A	Actual	0~24mA

Main Menu	Sub Menu	Unit	Default	Setting Range
System Log (7)	Date Set (7.1)	N/A	actual	year : 17~99, month : 01~12, day : 01~31
	Time Set (7.2)	N/A	actual	hour : 00~23, minute : 00~59, sec : 00~59
	Log data clear (7.3)	N/A	Cancel	Cancel, Accept
	System Log Info (7.4)	N/A	actual	N/A

Main Menu	Sub Menu	Unit	Default	Setting Range
Infomation (8)	F.W. Version(8.1)		actual	

※Sub menu 1.3、1.9、2.2、2.5、2.6、5.6、5.9、7.3, only the admin can change.

APPLICATION DEMO



Incinerator



Food & Beverage



Electronics

TUCHENG PLANT/YILAN PLANT



EPD APPLICATION / ORDER FORM

Company Profile

Company Name: _____ Contact Person: _____

E-mail: _____ Phone: _____ Tax: _____

Application

Medium: _____ Temperature: _____ Sanitary Degree Request: Yes NO

Conductivity: _____ Viscosity: _____

Diameter of Tube (DN) : _____ Accuracy Request(%): _____ Ambient Temp.: _____

Normal Flow Rate(m³/h): _____ Max. Flow Rate(m³/h): _____ Min. Flow Rate(m³/h): _____

Connection Spec: _____ Connection Material**: _____

Pressure(Kg/m³): _____ Max. Static Pressure(Kg/m³): _____ **SUS304, SUS316, SUS316L

Lining Material*: _____ Electrode Material***: _____

* PTFE · NBR · Neoprene

***SUS316 · Hastelloy Alloy · Titanium · Tantalum

Power: 110Vac 220Vac 24Vdc

Output: 4-20mA/Pulse(freq) RS-485/Modbus

Grounding: NO YES

Installation Direction: Horizontal Vertical

Vibration Inside Tube: NO YES

Strong Magnetic Nearby: NO YES

Explosion Proof: NO YES

Explosion Proof Code: _____

Global Network



■ Head Quarter

● Taiwan

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TEL: 65-6452-6340
EMAIL: info.sg@fine-tek.com

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