

Electromagnetic Flow meter

LDG

Preface

- The purpose of this document is to provide information on the use of the product.
- The information in this document is for reference only and does not constitute a warranty.
- The information in this document is subject to change without notice.

Note

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Version

STK-K-LDG-N5-20-04

U-WDC-MYEN4

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Chapter 1

1.1

1.1.1

SUPMEA

가가

1.1.2

1.1.3

가

가

()

/

1.1.4

가

가 , 가

,

/

/

가

가

1.1.5



!



!



!

1.2



!

가

가

Chapter 2

2.1



Tips !

가



Note !



Note !

(1)

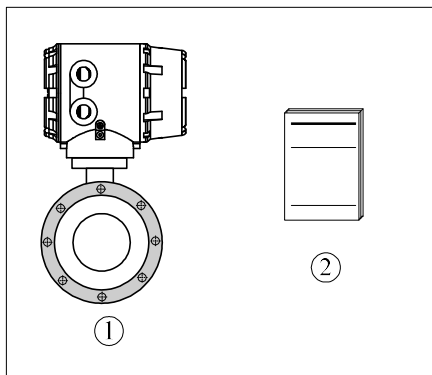


Figure 3

① Compact type electromagnetic flowmeter

② User manual

(2)

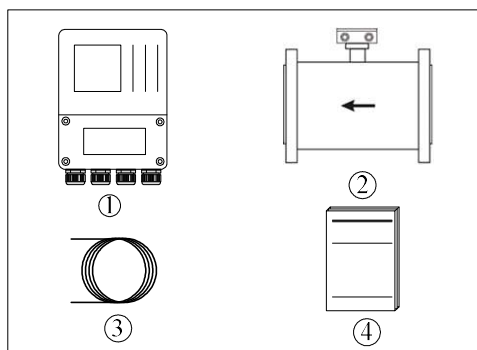


Figure 2

- ① Remote type flowmeter signal converter
- ② Remote type electromagnetic flowmeter sensor
- ③ Signal cable
- ④ User manual

2.2

4

" " " "

가

()

$$E=K\times B\times V\times D$$

Where: E—Induced electromotive force

K—Meter constant

B—Magnetic induction density

V—Average flow speed in cross-section of measuring tube

D—Inner diameter of measuring tube

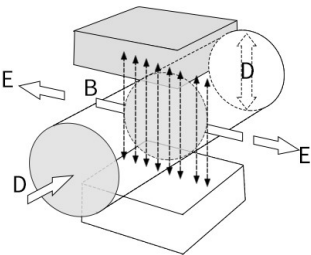


Figure 4

(5us/cm)

2.3

. (5)

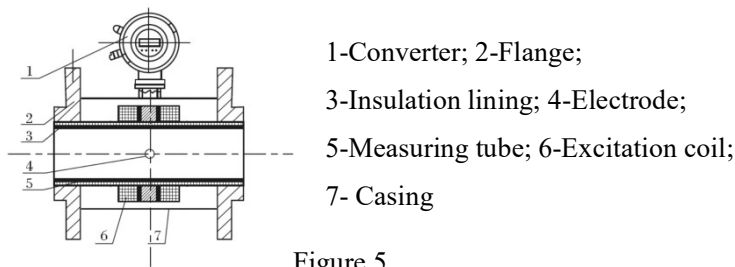


Figure 5

(excitation)

(1) (Converter) : (excitation)
(4~20mA)

(2) :

(3) (Lining) :

(4) (Electrode) :

1-2

(5) : 가

(6) (Excitation) :

(7) :

2.5

가 / ,
5 μ S/cm
1~2
50 μ S/cm
가

(1)

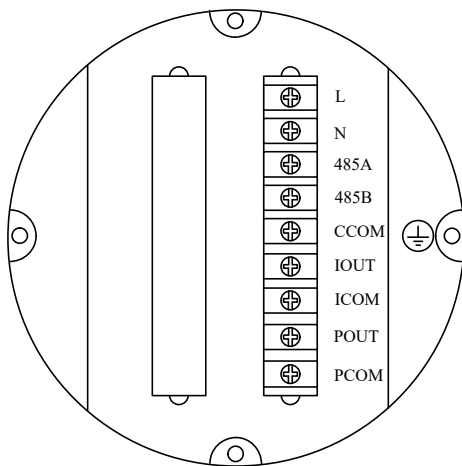


Figure 10

L, N:	220V ac
IOU, ICOM:	4~20mA
POUT, PCOM:	/ /
485A, 485B:	RS485
CCOM:	RS485



(2)

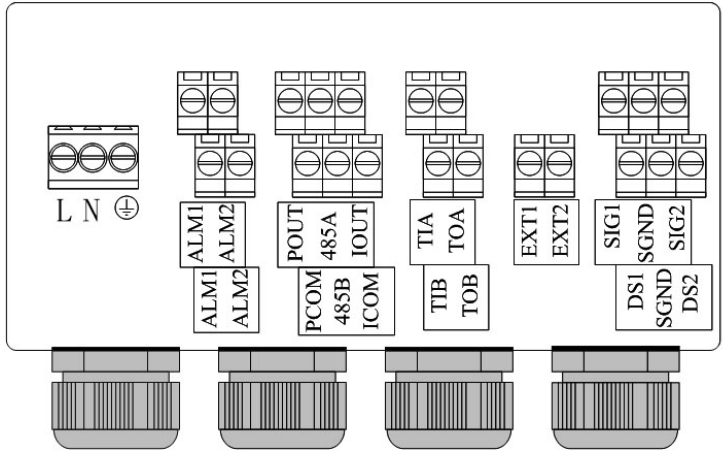


Figure 8

L, N:

220V ac



ALM1, ALM2:

POUT, PCOM:

/

485A, 485B:

RS485

IOUT, ICOM:

4~20mA

TIA, TIB:

(PT1000)

TOA, TOB:

(PT1000)

EXT1, EXT2:

(Excitation)

SIG1, SIG2, SGND:

(Electrode)

DS1, DS2:

(Electrode)

2.6



가

PA 2017F709-33	MAGNETIC FLOWMETER
Model:	Flow range:
Nominal diameter:	Coefficient:
Max working pressure:	Working temp:
Accuracy:	Ingress Protection:
Power supply:	Lining:
Electrode:	Serial No.:
Manufacture date:	Tel:
Factory:	

Figure 11

Chapter 3

3.1



Note !
가



Note !



Note !

3.2

- (1)
- (2)
- (3)

3.3

- (1)

가

가 가

IP68

IP65

(2)

(3)

(4)

가 5 (5D)

가 3 (3D)
(12 13)

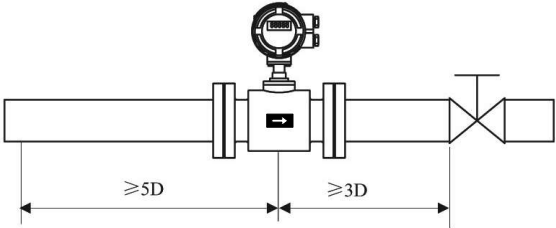


Figure 12

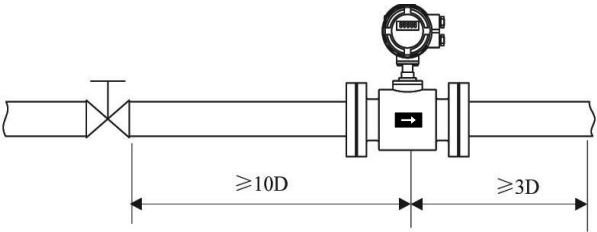


Figure 13

(5)

가

14

가

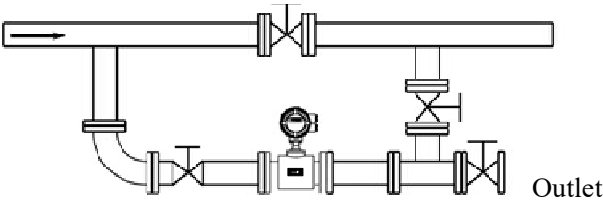


Figure 14

3.4

(1)

15

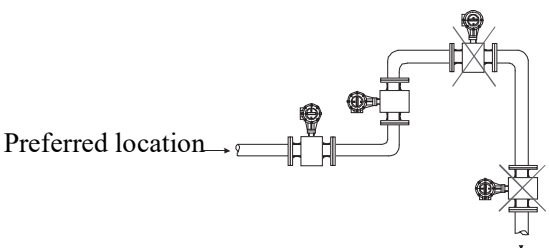


Figure 15

가 , 가 가 ,

(2)

가 가 , 가 가 ,

(3)

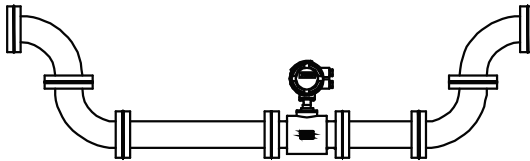


Figure 16

가

가

가

(4)

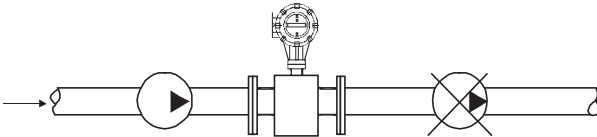


Figure 17

(5)

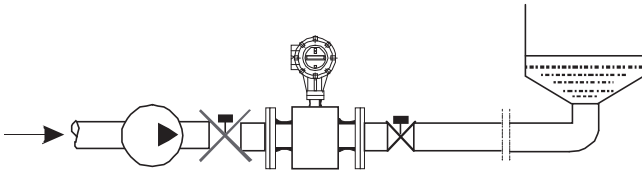


Figure 18

(6) 가 가

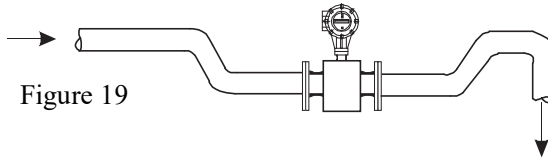


Figure 19

(7) 가 5m

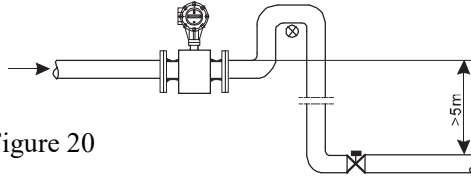


Figure 20

(8) 가

(9) 가
가

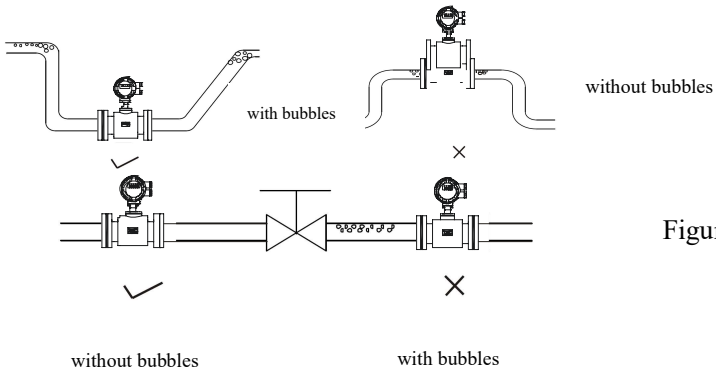


Figure 21

(10)

가

가
가

30

(11)

3.5

3.5.1

- (1) ,
50mm , 가 1.5mm
65~300mm , 가 2mm ,
350mm , 가 4mm .
- (2) ()

3.5.2

- (1)

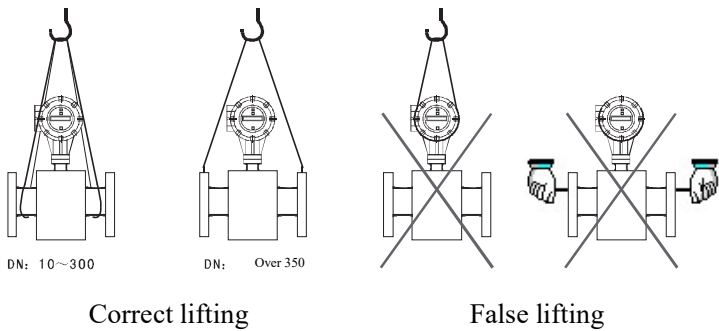


Figure 22

(2)

가

(

가

)

(3)

3.5.3

(1)

(2)

(3)

(4)

(IP68)

(5) 가

가

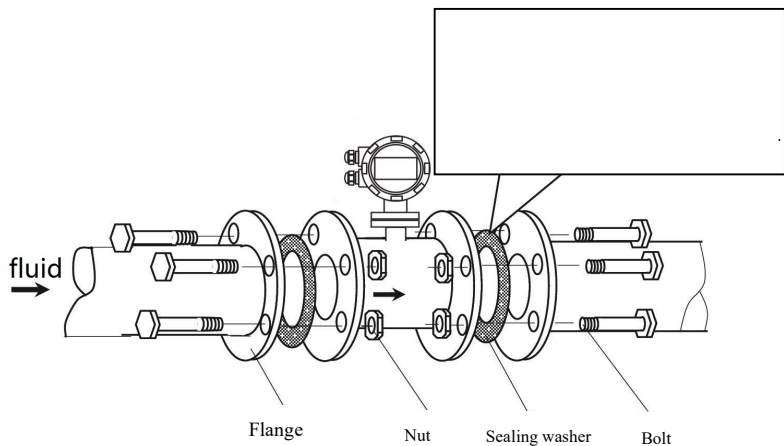
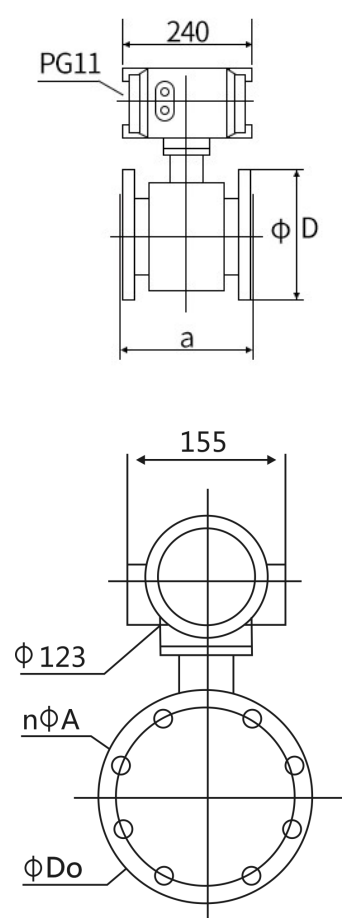


Figure 23

3.6

Table 1

 Figure 24	DN	a	D	Do	n*A	Pressure
	10	200	90	60	4*14	1.6 mpa
	15	200	95	65	4*14	
	20	200	105	75	4*14	
	25	200	115	85	4*14	
	32	200	140	100	4*18	
	40	200	150	110	4*18	
	50	200	165	125	4*18	
	65	200	185	145	8*18	
	80	200	200	160	8*18	
	100	250	220	180	8*18	
	125	250	250	210	8*18	
	150	300	285	240	8*22	
	200	350	340	295	12*22	1 mpa
	250	450	405	355	12*22	
	300	500	445	400	12*22	
	350	550	505	460	16*22	
	400	600	565	515	16*26	
	450	600	615	565	20*26	
	500	600	670	620	20*26	
	600	600	780	725	20*30	
	700	700	895	840	24*30	
	800	800	1015	950	24*34	
	900	900	1115	1050	28*34	
	1000	1000	1230	1160	28*34	0.6 mpa
	1200	1200	1405	1340	32*34	
	1400	1400	1630	1560	34*36	
	1600	1600	1830	1760	34*40	
	1800	1800	2045	1970	42*44	
	2000	2000	2265	2180	48*48	
	2200	2200	2405	2390	48*52	

Chapter 4

4.1



Danger !



Note!

4.2



Danger !



Danger !



Danger !



Warning !

(1)

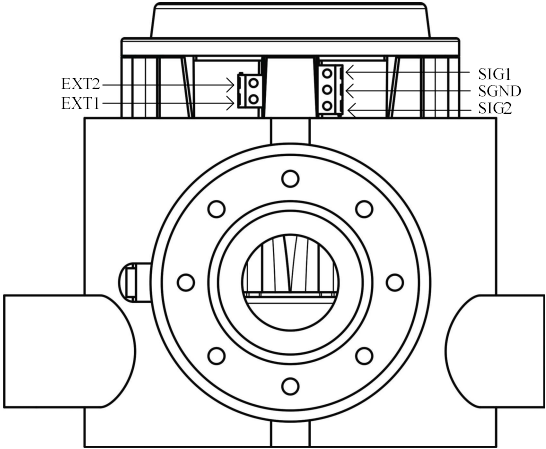


Figure 28

Connection description

- ① Excitation Coil: (Excitation)

- ② Signal Line: (Electrode)
(Electrode)

(2)

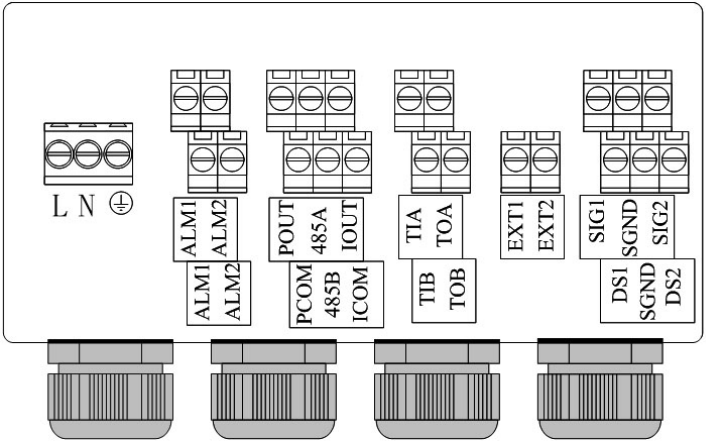


Figure 25

Terminal description

- ① EXT1, EXT2: (Excitation)
- ② SIG1, SIG2 : (Electrode)
- ③ SGND : (Electrode)
- ④ DS1, DS2: (Electrode)

4.3



Danger !

Shells

가

가

4.4



Danger!

가

(1) 220VAC power supply

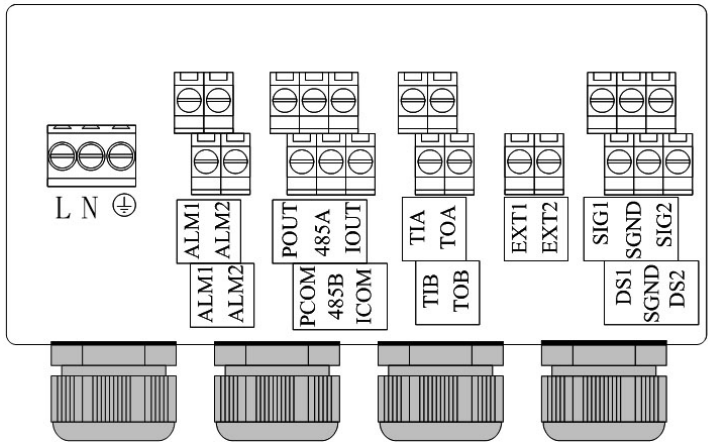


Figure 29



Tips!

100VAC -240VAC, 50Hz-60Hz

- ① L: 220Vac (Phase)
- ② N: 220Vac (Neutral)
- ③ ⚡:



Danger !

가

220Vac

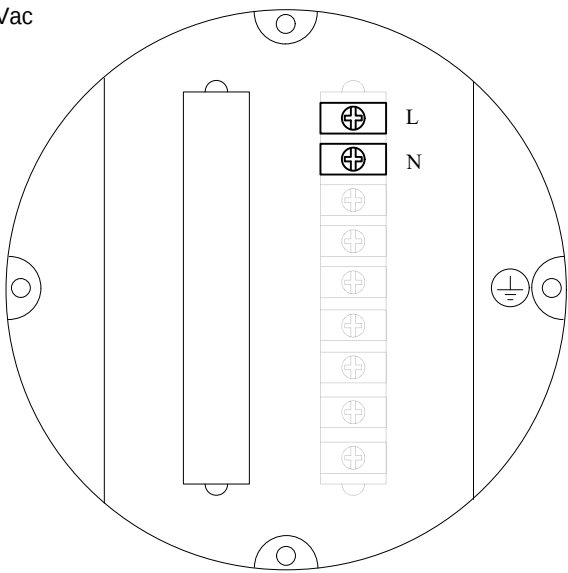


Figure 33



Note!

Allowance range : 100VAC -240VAC, 50Hz-60Hz

- ① L: AC phase line
- ② N: AC neutral line
- ③

4.5



Warning !

(1)

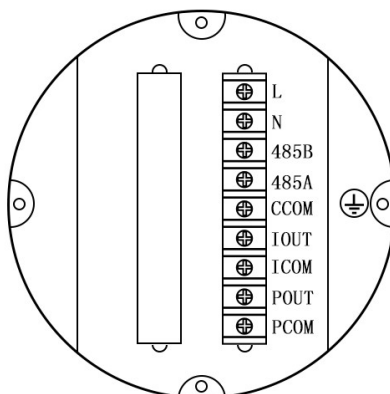


Figure 35

Current Output

- ① IOUT、ICOM: 4~20mA (IOUT = + / ICOM = -)
- ② Active mode: $RL \leq 750\Omega$ under load; $I_{max} \leq 22mA$
- ③ Current flow percent

Communication output

- ① 485A, 485B : RS485
- ② CCOM : RS485
- ③ : MODBUS-RTU

Pulse, frequency output and relay out

- ① (Pulse) : POUT, PCOM
- ② Active mode: High 24V, 5mA drive current
- ③ : , > 1000Vdc
- ④ Scale
 - : 2KHz (0~5kHz 가)
 - : (가)
 - : 0.1ms~100ms
 - : 1:1 ; Fmax ≤ 5000 cp/s
- ⑤

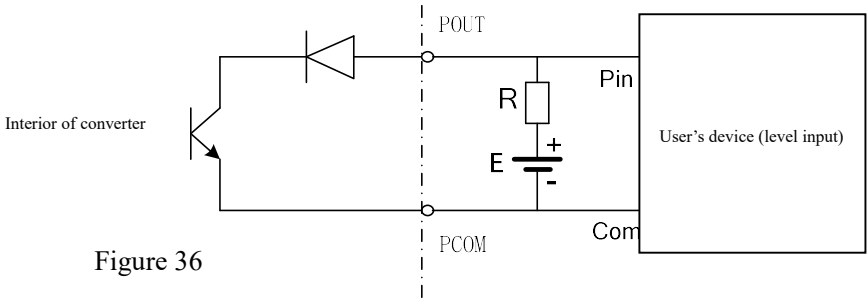


Figure 36

가 : OC , 가 .

: "E" 2K, 0.5W 24Vdc

R .

(2)

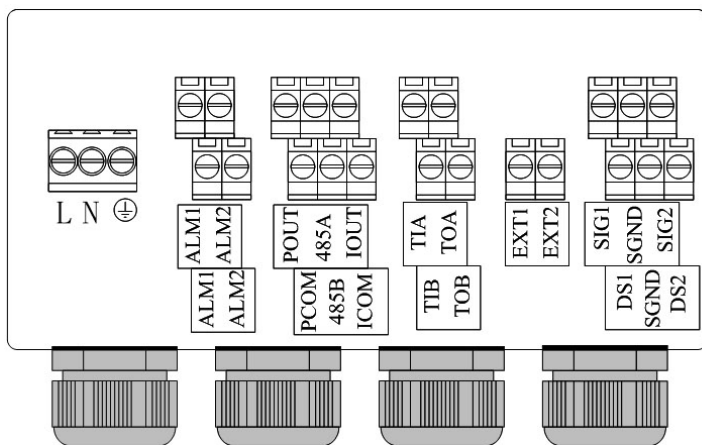


Figure 39

Current output

- ① IOUT、ICOM: 4~20mA (IOUT = + / ICOM = -)
- ② Active mode: $R_L \leq 750\Omega$ under load; $I_{max} \leq 22mA$
- ③ Current flow percent

Communication output

- ① 485A, 485B : RS485
- ② CCOM : RS485
- ③ : MODBUS-RTU

Pulse, frequency output and relay out

- ① (Pulse) : POUT, PCOM
- ② (Relay) : ALM1, ALM2
- ③ Active mode: High 24V, 5mA drive current
- ④ : , > 1000Vdc
- ⑤ Scale
 - : 2KHz (0~5kHz 가)
 - : (가)
 - : 0.1ms~100ms
 - : 1:1 ; Fmax ≤ 5000 cp/s
- ⑥

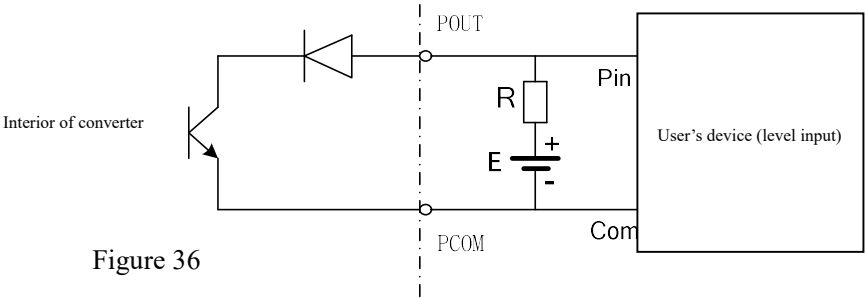


Figure 36

가 : OC , 가 .

: "E" 2K, 0.5W 24Vdc

R .

Chapter 5

5.1

- ① 가
- ②
- ③
- ④

5.2

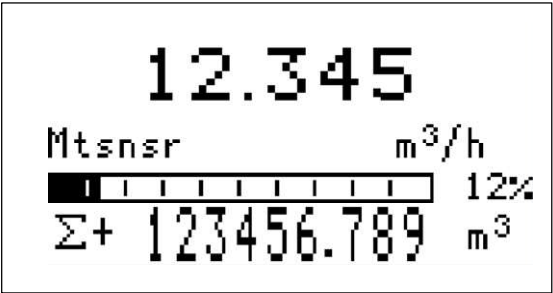


Figure 41 Startup interface

Chapter 6

6.1

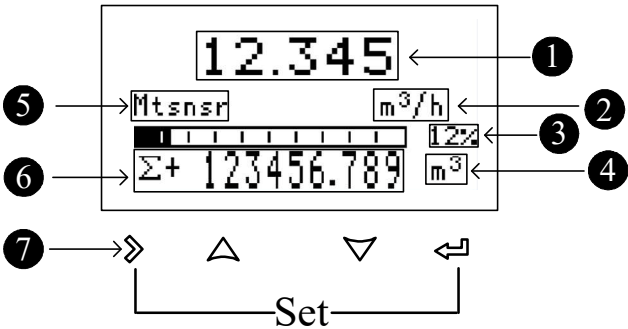


Figure 42

(1)

(2)

(3)

(4)

(5)

(6)

-

Σ + : "+"

Σ - : "-"

Σ :

V :

MT :

(7)

:

/

Table 2

Mark				
>	-		-	Data right shift
□	Switch accumulative amount	Switch menu subclass	confirmation	Confirm data
↑↓	-	-	selection	Change data
>+□	Enter menu	Exit menu	-	-

6.3

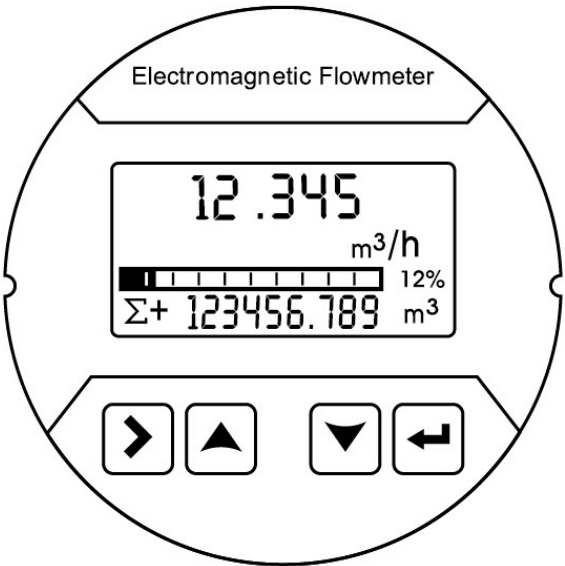


Figure 44

6.4

» «

"300000"

Table 3

NO.	Parameter	Setting mode	Parameter range	Default
1	Sensor drift diameter	Option	3-2000	50
2	Flow range	Figure	0-99999	35.000
3	Sensor coefficient	Figure	0-99999	1.000
4	Zero correlation	Figure	0-99999	0.0
5	Accumulation reset	Figure	Y、 N	N
6	Flow remove	Figure	0-99%	1%
7	Time constant	Figure	0-99S	2s

6.5

Table 4

NO.	Parameter	Setting mode	Password level	Parameter range	Default
1-Flow					
1-0	Flow range	Figure	User	0-99999	35.000
1-1	Flow unit	Option	User	L、 m ³ 、 Kg、 M、 t/s、 min、 h	m ³ /h
	L , m ³ Volume : 가 Kg, t Mass : "1-2" 가				
1-2	Fluid density	Figure	User	0.000-99.000	1.000
	QM= ρ VM : g/cm ³ 가 Volume				
1-3	Time constant	Figure	User	0-99S	2s
1-4	Flow remove	Figure	User	0-10%	1%
	Volume "0" "0"				

1-5	Flow direction	Option	User	Positive, Negative	Positive
	가				
1-6	Mode selection	Option	User	Positive, negative and bidirection	Bidirecti on direction
	"Bidirection" "Positive" "Nagative"				
1-7	Peak inhibition activate	Option	User	Y, N	N
	"N" , "1-8", "1-9" 가 "1-8" , "1-9"				
1-8	Peak inhibition coefficient	Figure	User	0.01-0.8m/s	0.8
	()				
1-9	Peak inhibition time	Option	User	0-3s	1
	()				
1-10	Flow correction permission	Option	Manufacturer	Y, N	N
	4 , (0.5m/s) , 4 4				

	Correction point 1 ≥ Correction point 2 ≥ Correction point 3 ≥ Correction point 4 ≥ 0 1 ≥ 2 ≥ 3 ≥ 4 ≥ 0 가 1 > 2 = 1 x 2 > 3 = 2 x 3 > 4 = 3 x 4 > ≥ 0 = 4 x Modified point 1 > Modified point 2 > Modified point 3 > Modified point 4 > 0 1 ≥ 2 ≥ 3 ≥ 4 ≥ 0 1.0000 1 가 1				
1-11	Flow correction point 1	Figure	Manufacturer	0.0-99.999	0
	1,				

1-12	Flow correction coefficient 1	Figure	anufacture	0.0-99.999	1.000
	1,				
1-13	Flow correction point 2	Figure	Manufacturer	0.0-99.999	0
	2,				
1-14	Flow correction coefficient 2	Figure	Manufacture	0.0-99.999	1.000
	2,				
1-15	Flow correction coefficient 3	Figure	Manufacturer	0.0-99.999	0
	3,				
1-16	Flow correction coefficient 3	Figure	Manufacturer	0.0-99.999	1.000
	3,				
1-17	Flow correction coefficient 4	Figure	Manufacturer	0.0-99.999	0
	4,				
1-18	Flow correction coefficient 4	Figure	Manufacturer	0.0-99.999	1.000
	4,				
2-Current output					

No.	Type	Option	Password level	Parameter range	Default
2-0	Reverse output allowed	Option	User	Y, N	N
	, 4~20mA * Pulse / frequency :				
2-1	Adjust K	Figure	User	0-99999	1.000
	"K" : I = Kx + B				
2-2	Adjust B	Figure	User	0-99999	0.000
	"B" : I = Kx + B				
2-3	Output current	Display	User	4.00-20.00	--
	(mA)				
3- Pulse/frequency/alarm output					
3-0	Pulse output type	Option	User	Frequency, pulse, alarm	Frequen cy
	, equivalent,				
3-1	Transistor state	Option	User	High/low level	High level
	, ,				
3-2	Max. frequency	Figure	User	0-5000	2000
	: , 가				
3-3	Pulse value(L/P)	Option	User	0.001-999.999	1.0
	가 : equivalent , 가				
4-Accumulation					
4-1	Accumulation clearance	Option	Manufacturer	Y, N	N
4-2	Positive	Figure	Manufacturer	0-999999999	0

	accumulation integer				
4-3	Positive accumulation decimal	Figure	Manufacturer	0.0-0.999	0.0
4-4	Negative accumulation integer	Figure	Manufacturer	0-999999999	0
4-5	Negative accumulation decimal	Figure	Manufacturer	0.0-0.999	0.0
5- Alarm contacts (3-0 set to show the configuration at alarm output)					
No.	Type	Option	Password level	Parameter range	Default
5-0	Alarm 1 transistor state	Option	User	High/Low lever	High level
5-1	Alarm1 output allowed	Option	User	Y/N	N
	1 N , 가				
5-3	Allow alarm1 empty pipe	Option	User	Y/N	N
	1 N , 1 N , 가				

5-4	Allowed alarm1 exceeds upper limit	Option	User	Y/N	N
	1 가 7-1 N , 가				
5-5	Allowed alarm1 exceeds lower limit	Option	User	Y/N	N
	1 가 7-2 N , 가				
7-Alarm setup					
No.	Type	Option	Password level	Parameter range	Default
7-0	Max. flow value alarm	Figure	User	0-999.9%	100%
7-1	Min. flow value alarm	Figure	User	0-999.9%	0%
7-2	Alarm hysteresis	Figure	User	0-99.9%	1%
	: : 가 +				
7-3	Display alarm permission	Option	User	Y/N	N

	가				
8-System					
8-0	Language	Option	User	Chinese/ English	English
8-1	Display accuracy	Figure	User	0-4	2
8-2	Contrast	Figure	User	0-100%	50%
8-3	Modbus address	Figure	User	1-247	8
	MODBUS RTU RS485 Address				
8-4	Baud rate	Option	User	1200、2400、 4800、9600、 19200、38400、 57600	9600
	RS485				
8-5	Even-odd check	Option	User	NONE/ODD/ EVEN	NONE
8-7	User password	Figure	User	00000-999999	000000
	Ex-factory password : 200000				
9-Empty Pipe parameters					
9-0	Empty pipe threshold value	Figure	Manufacturer	0-100%	50%
9-1	Actual electrical conductivity	Display	Manufacturer		

	equivalent				
	가 : 가 가 가>200 , 가 가 > 1200 (, 가 20m .)				
9-2	Empty pipe check permission	Option	Manufacturer	Y, N	Y
	/				
9-3	Empty pipe detection upper limit	Figure	Manufacturer	0-9999	1200
	가 가 , 가 9-1 9-3				
9-4	Empty pipe detection lower limit	Figure	Manufacturer	0-9999	200
	가 가 , 가 9-1 9-4				
10-Sensor					
10-0	Sensor coding	Figure/ mark	Manufacturer	16 digitals	
10-1	Factory ID number	Figure	Manufacturer	6 digitals	
10-2	Nominal drift	Option	Manufacturer	3-2000	50

	diameter				
10-3	Zero adjustment	Option	Manufacturer	-9.99-9.99mv	0.00mv
	가 (30) 가 () +/- 0.1 가 .				
10-4	Sensor coefficient	Figure	Manufacturer	0-99999	
10-5	Cali coefficient	Figure	Manufacturer		
	EX-				
10-6	Zero correction	Figure	Manufacturer	0-99.999	
	(0.3m/s)				
10-7	Excitation mode	Option	Manufacturer	3.125Hz、 6.25 Hz、12.5 Hz、25 Hz	6.25Hz
	(Excitation) 3.125Hz 、6.25Hz、12.5Hz、25 Hz Option 1: 3.125Hz Option 2: 6.25Hz				
10-9	Gain selection	Option	Manufacturer	1/3/9	3
	(gain) : 가 Gain magnitude: 1, 3, 9				

6.6

6.6.1



: 200000 ()
: 100000 ()
: 300000 ()

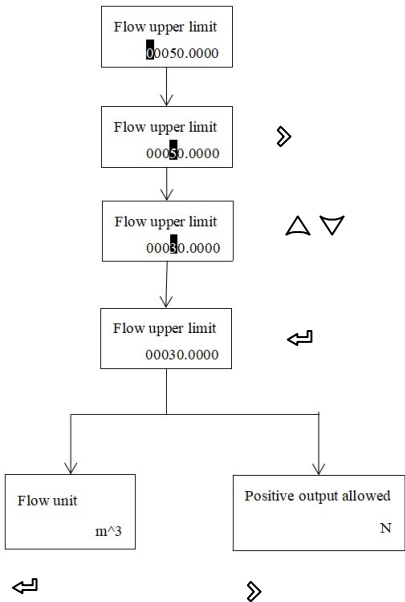


Figure 45

6.6.2

 $\Sigma +:$
$$V :$$
 $\Sigma -:$

MT :

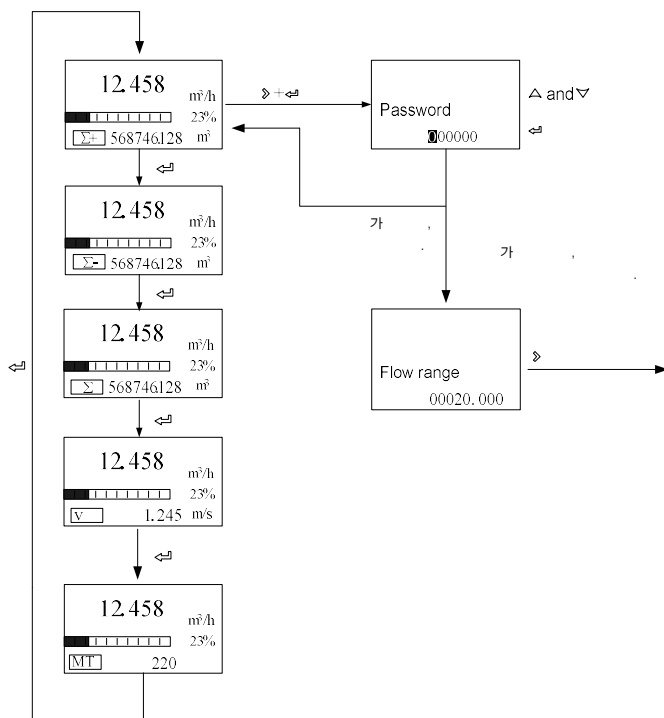
 $\Sigma :$ 

Figure 46

6.6.3

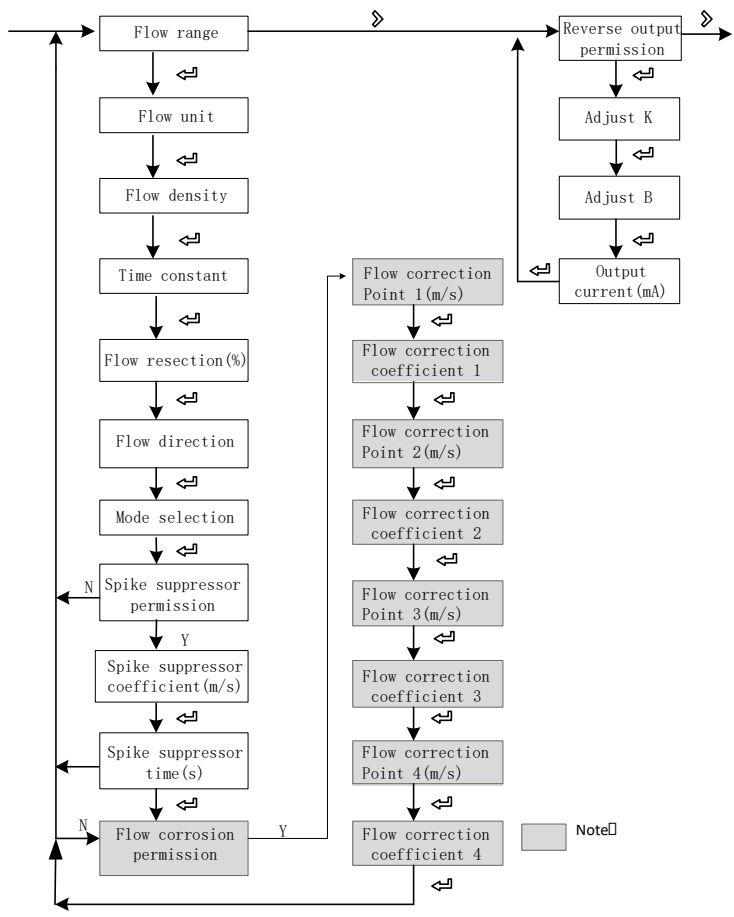


Figure 47

6.6.4

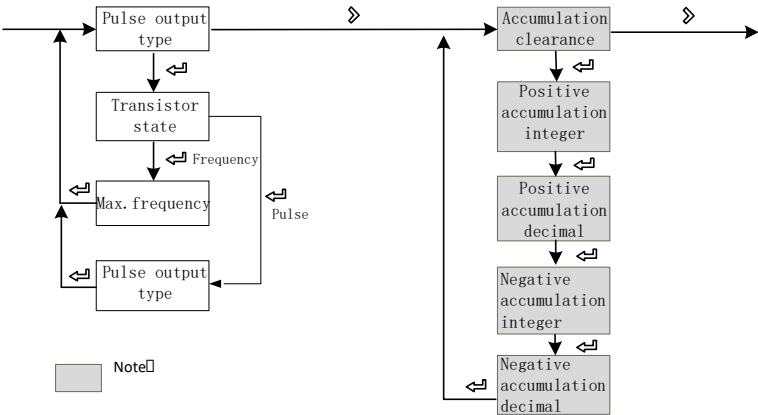


Figure 48

6.6.5

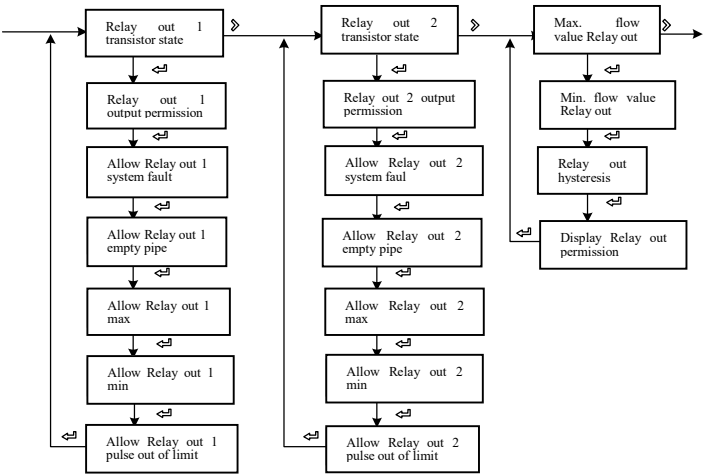


Figure 49

6.6.6

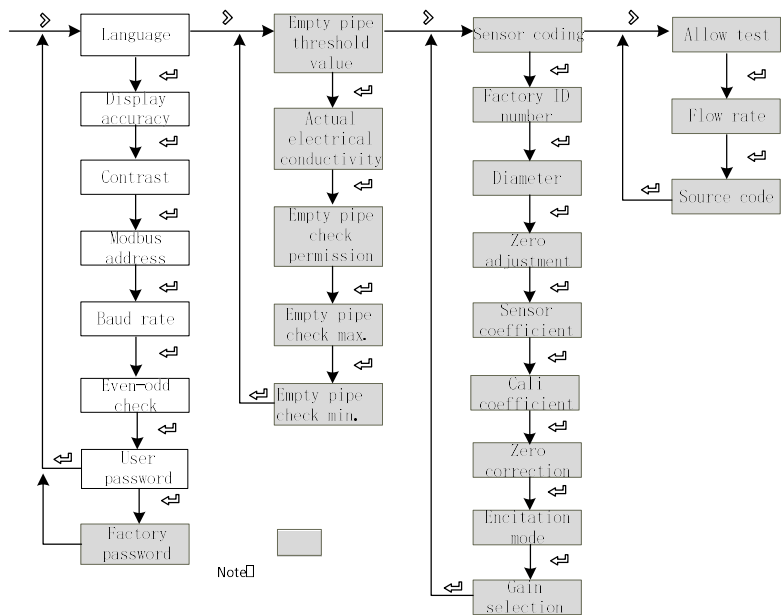


Figure 50

6.7

6.7.1

374

- (1) Instantaneous flow calibration 1%
- (2) Frequency/current standard table method 0.5%
- (3) Weighing method calibration 0.3%

6.7.2

(1)

①

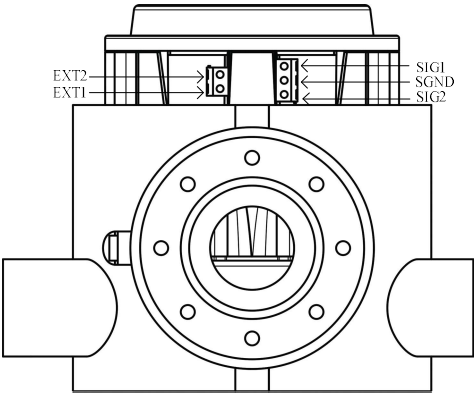


Figure 51

Excitation line :

EXT1 :

EXT2 :

Signal line :

SIG1 :

SIG2 :

SGND :

② Remote type

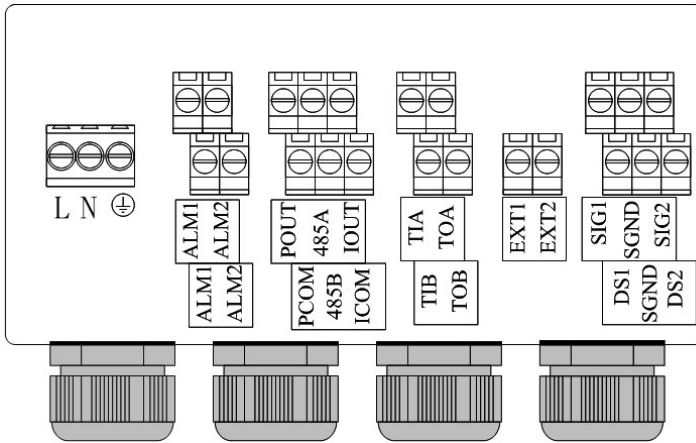


Figure 53

Excitation line :

EXT1 :

EXT2 :

Signal line :

SIG1 :

SIG2 :

SGND :

DS1 : SIG1

DS2 : SIG2

(2)

①

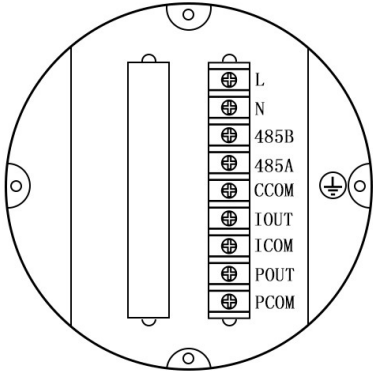


Figure 54

- ① Corresponding terminal is POUT, PCOM
- ② POUT is pulse signal and PCOM is signal ground.

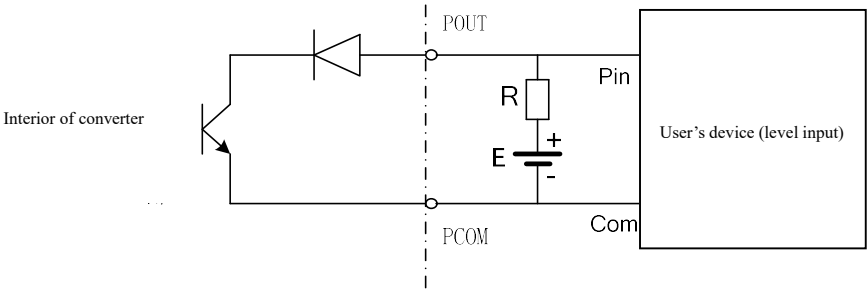


Figure 55

(Level input)

:	OC	:
:	E 2K, 0.5W 24Vdc	R

②

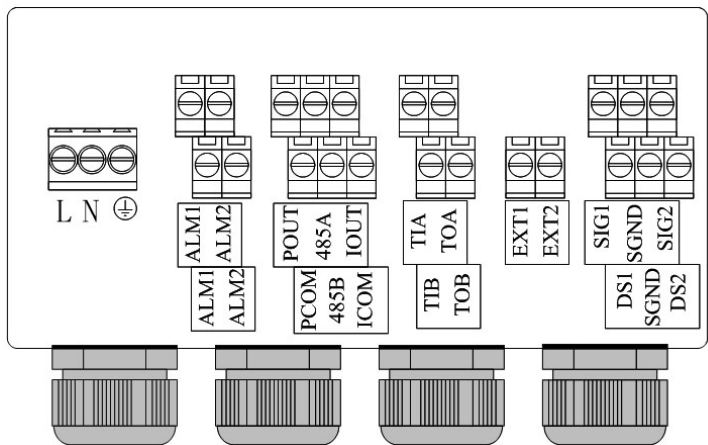


Figure 56

- ① Corresponding terminal is POUT, PCOM
- ② POUT is pulse signal and PCOM is signal ground.

Wiring schematic diagram

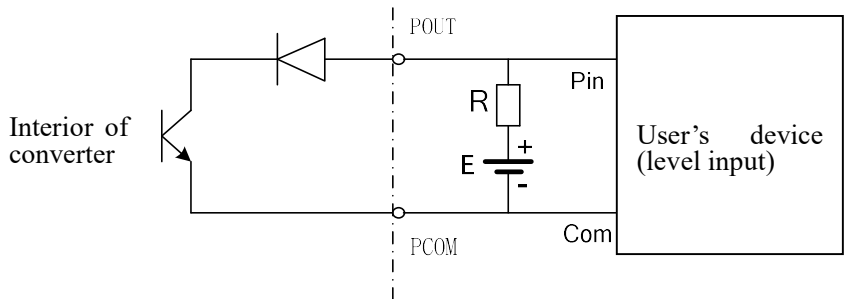


Figure 57

(Level input)

:	OC	:
:	E 2K, 0.5W 24Vdc	R

(3)

(0.5m/s ,)

① , 가 .

(2) 가 10 가
30

③ 0.1mV 가

 $\pm 0.1\text{mV}$

④

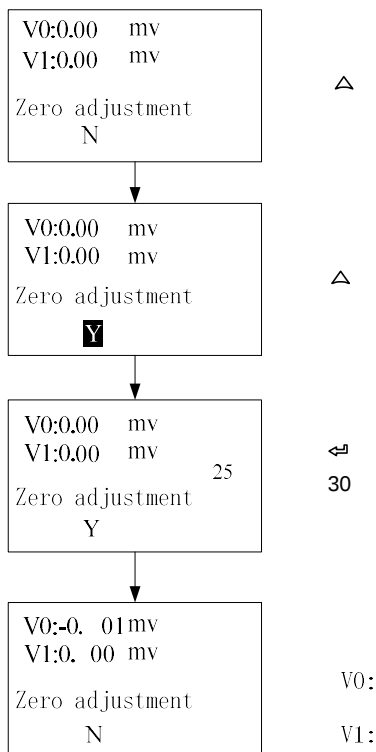


Figure 60

(4)

① (50% ,)

② .

③ K $K = Q_{\text{standard table}} / Q_{\text{check table}}$

④ K 10 .

Chapter 7

7.1

가 가

System
information

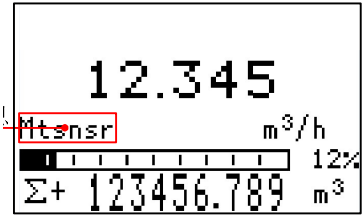


Figure 61 Display Position in Measuring Picture

Table 5 System Information Sheet

Display	Alarm content
Mtsnsr	가
Hi	
Lo	
Pls	가
AD_Hi	가 AD
Rng	
Rng_Hi	AD
Pls_Hi	가 가

7.2 / /

7.2.1 가

가

For example:

: 0.1L/p
: 3.6 m3/h
: 3.6 x 1000/3600/0.1 = 10

Notes:

: 0.4L/p
: 3.6 m3/h
: 3.6 x 1000/3600/0.4 = 2.5

, 2.5 10 가

가

Pls

가 가

가

가 가

가가

7.2.2

Note : 5000Hz

7.2.3

) , , PLC, DCS
: 4~20mA
, 4mA , 20mA

$$I_{\text{Real time}} = \frac{Q_{\text{Real time}}}{Q_{\text{max}}} 16.00 + 4.00$$

Unit: mA

Notice:

- Q :
- Q Max :
- I :

7.3 RS485

RS485

04 Read Holding Registers MODBUS-RTU

7.3.1

Table 6

Parameter	Type	Address	Explanation
Instantaneous flow rate	float	100	
Instantaneous flow velocity	float	102	
Flow percentage	float	104	50 stands for 50%
Electric conductivity	float	106	
Forward flow accumulation of integer	ulong	108	

Forward flow accumulation of decimal	ulong	110	The decimal part magnifies by 100 times, 123 stands for 0.123
Reverse flow accumulation of integer	ulong	112	
Reverse flow accumulation of decimal	ulong	114	The decimal part magnifies by 1,000 times 123 stands for 0.123

Note: Float/ulong/long type data, Communication transmission is in byte order 2-1-4-3; ushort type data transmission is in accordance with 2-1.

7.3.2

Mailing address: 1-247

Default address: 8

Baud rate: 1,200; 2,400; 4,800; 9,600; 19,200; 38,400; 57,600;

The default baud rate: 9600

Check: no check, odd parity, parity;

Default no check;

For 32-bit data (long plastic or floating point) arranged in the communication frame;

Example: Long integer 16909060(01020304H): 03 04 01 02

Floating number 4.00(40800000H): 00 00 40 80

7.3.3

Communications Example:

Forward flow rate accumulate readout

Send message: 08 04 00 6B 00 04 80 8C

Return message: 08 04 08 00 6C 00 00 00 7B 00 00 D6 8E (The cumulative integer: 108, Cumulative decimal: 0.123, Accumulation: 108.123)

Chapter 8

8.1

Table 7 Measuring System

Execution Standard	JB/T9248-2015	
Measuring principle	Faraday's law of electromagnetic induction	
Function	Instantaneous flow rate, flow velocity, mass flow (when the density is constant), real-time measurement and flow accumulation	
Module configuration	Measurement system is made up of signal converter and measurement sensor.	
Converter		
Compact Type	IP65	
Remote Type	IP65	
Measurement sensor		
Nominal Diameter	DN15-DN450	
Flange	In line with GB/T9119-2000 standard carbon steel (Optional stainless steel flanges), other standard flange can be customized	
Pressure rating (High pressure can be customized)	DN15 - DN50, PN<4.0MPa	
	DN65 - DN150, PN<1.6MPa	
	DN200 – DN600, PN<1.0MPa	
	DN700 – DN2000, PN<0.6MPa	
Lining Material	Chloroprene rubber(CR), Polytetrafluoroethylene (PTFE/F4), Fluorinated ethylene propylene (FEP/F46), Teflon(PFA)	
Electrode Material	316L Stainless Steel, Hastelloy C, Hastelloy B, Ti, Ta, Pt	
IP Rate	IP68	IP67
Medium temperature	-25 – 180℃	-10 – 80℃
Buried depth	Less than 5 meters (only IP68 protection of remote type sensor)	
Immersion depth	Less than 3 meters (only IP68 protection of remote type sensor)	
Sensor cable	Only for remote type, the standard 10m cable; other cables suggest custom no longer than 20 meters.	

Table 8 Communications

Serial communications	RS-485
Output	Current (4-20 ma) , Pulse , frequency , State switch
Function	ATC recognition, electrode contamination

Table 9 Display User Interface

Graphic display	Monochrome LCD, white backlight; Size: 128*64 pixels
Display function	2 measurement value pictures (measurements, condition, etc
Language	Chinese/ English

Unit	You can configure the menu to select the unit, see "6.3 Configuration details" and "flow units 1-1" and "4-0 Accumulation Unit" section.
Operating unit	Three Mechanical keys (Compact Type) or four touch key (Remote Type)

Table 10 Measurement Accuracy

Max measuring error	Measurement value $\pm$ 0.3% (Flow speed 1m/s) ; $\pm$ 2mm/s (Flow speed<1m/s)
Repetitiveness	0.2%

Table 11 Operating Environment

Temperature	
Environment	-10°C - 55°C for Compact-Type Flowmeter -10°C - 60°C for Converter of Remote-Type Flowmeter -10°C - 55°C for Converter of Remote-Type Flowmeter
Storage	-40°C - 65°C

Table 12 Electric Conductivity

Water	Min. 20 μ S/cm (Actual electric conductivity should be greater than 50 μ S/cm)
Others	Min. 5 μ S/cm (Actual electric conductivity should be greater than 50 μ S/cm)

Table 13 Materials

Sensor housing	Carbon steel
Converter	Standard die cast aluminum

Table 14 Electrical Connections

Power supply	100-240VAC, 50/60Hz, 22VDC—26VDC
Power consumption	Max 15VA
Signal cable	Apply only to remote type
Shielded cable	Signal section , wire : 0.5mm ² Cu /AWG20

Table 15 Output

Current output		
function	Measurement of volume and quality (in the case of constant density)	
Setting	scope	4-20mA
	Max	20mA
	Min	4mA
Internal voltage	24VDC	
loading	≤750Ω	
Pulse and frequency output		
function	Set up Pulse and frequency output	
Pulse output	basis	Output pulse width: 0.25ms ~100ms Duty cycle: 50% (Pulse frequency ≥5Hz) F _{max} ≤ 5000 cp/s

Chapter 8 Technical parameters

	setting	0.001L – 1m³
frequency	Max	F _{max} ≤ 5000Hz
	setting	0-5000Hz
passive	U _{Outer} ≤ 36VDC	
Status output		
function	Output as alarm	
passive	U _{Outer} ≤ 36VDC	

8.2

Table 16 Corrosion Resistance of Electrode Material (Only for Reference)

Material	Corrosion Resistance
Molybdenum-containing stainless steel (0Cr18N12Mo2Ti)	가 : 가 / , , , , 가 : , , , ,
Hastelloy B	가 : , 70% 가 :
Hastelloy C	가 : , 가 :
Ti	가 : , , , 가 : ,
Ta	가 : 175 , 가 : , ,

:
,
가

8.3

Table 17 Flowmeter

Nominal Diameter (mm)	Flow range (m3/h)		
10	0.02827-0.25	0.3-1.6	2.0-3.3924
15	0.0636-0.6	0.8-3.0	4.0-7.632
20	0.131-1.0	1.2-5.0	6.0-13.6
25	0.176-1.6	2.0-8.0	10-21
32	0.2895-2.5	3.0-12	16-35
40	0.4524-4.0	5.0-20	25-45
50	0.707-6.0	8.0-40	50-85
65	1.195-10	12-60	80-143
80	1.81-16	20-120	160-217
100	2.83-25	30-160	200-339
125	4.42-40	50-250	300-530
150	6.36-60	80-400	500-763
200	11.3-100	120-600	800-1357
250	17.7-160	200-800	1000-2120
300	25.45-250	300-1200	1600-3054
350	34.6-300	400-1600	2000-4157
400	45.2-400	500-2000	2500-5429
450	57.3-500	600-2500	3000-6871
500	70.7-600	800-3000	4000-8482
600	102-800	1000-4000	5000-12216
700	139-1200	1600-5000	6000-16620
800	181-1600	2000-6000	8000-21720
900	229-1600	2000-8000	10000-27480
1000	283-2000	2500-10000	12000-33924
1200	407-2500	3000-12000	16000-48833
1400	554-3000	4000-16000	20000-66468
1600	723-4000	5000-20000	27000-86815

8.4

Reduction formula: Flow Q = flow velocity V× π × (DN/2) ²,Unit: m/s and m³/h

Table 18

Velocity (m/s) Flow (m ³ /h) Nominal Diameter(mm)	0.1	0.2	0.4	0.5	1	10	12	15
DN10	0.02827	0.0565	0.1131	0.1414	0.2827	2.827	3.39	4.24
DN15	0.0636	0.127	0.25	0.318	0.636	6.362	7.632	9.54
DN20	0.131	0.226	0.45	0.566	1.131	11.31	13.572	16.965
DN25	0.176	0.35	0.71	0.8835	1.767	17.67	21.204	26.505
DN32	0.2895	0.58	1.16	1.448	2.895	28.95	34.74	43.425
DN40	0.4525	0.90	1.81	2.62	4.524	45.24	54.208	67.86
DN50	0.707	1.414	2.83	3.535	7.069	70.69	84.83	106
DN65	1.195	2.39	4.78	5.973	11.946	119.5	143.35	179.2
DN80	1.81	3.62	7.24	9.048	18.1	181	217.2	271.5
DN100	2.83	5.65	11.31	14.14	28.27	282.7	339.24	424.05
DN125	4.42	8.84	17.67	22.09	44.18	441.8	530.16	662.7
DN150	6.36	12.7	25.5	31.81	63.62	636.2	763.44	954.3
DN200	11.3	22.6	45.2	45.55	113.1	1131	1357.2	1696.5
DN250	17.7	35.4	70.7	88.36	176.7	1767	2110.4	2650.5
DN300	25.45	51	102	127.24	254.5	2545	3054	3878.5
DN350	34.64	69	139	173.2	356.4	3464	4156.8	5196
DN400	45.24	90	181	226.2	452.4	4524	5428.8	6786
DN450	57.3	114	229	286.3	572.6	5726	6871.2	8589
DN500	70.7	141	283	353.4	706.9	7069	8484.8	10603.5
DN600	102	203	407	508.9	1018	10179	12216	15270
DN700	139	277	554	692.7	1385	13854	16620	20775
DN800	181.0	362	723	905	1810	18096	21720	27150
DN900	229.0	458	916	1145	2290	22902	27480	34350
DN1000	283	565	1131	1414	2827	28274	33924	42405
DN1200	407	814	1628	2034.7	4069.4	40694	48832.8	61041
DN1400	554	1108	2216	2769.5	5539.4	55390	66468	83085
DN1600	723	1447	2894	3617.3	7234.6	72346	86815.2	108519

8.5

- (1) :
- (2) : 20
- (3) : 0.1MPa
- (4) : 5D / 2D

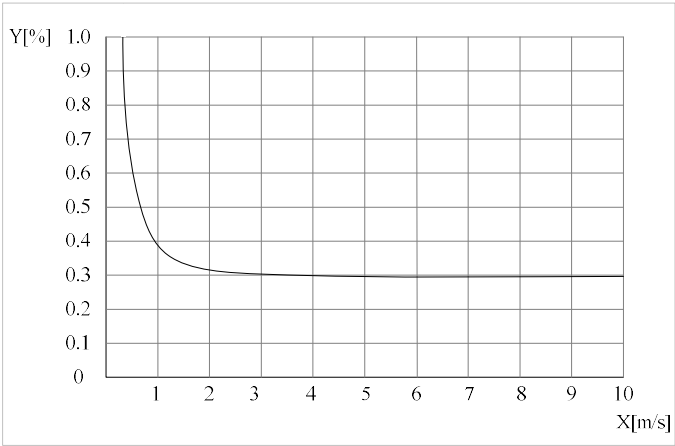


Figure 62

- ① X (m/s) :
- ② Y (%) :

Supmea

Supmea Automation Co.,Ltd.