KC-8860 Electromagnetic Flowmeter Converter

User's Manual

KC-8860 Series

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KC-8860 Electromagnetic Flowmeter Converter Instruction Manual

1. The product function introduction

1.1 Basic function

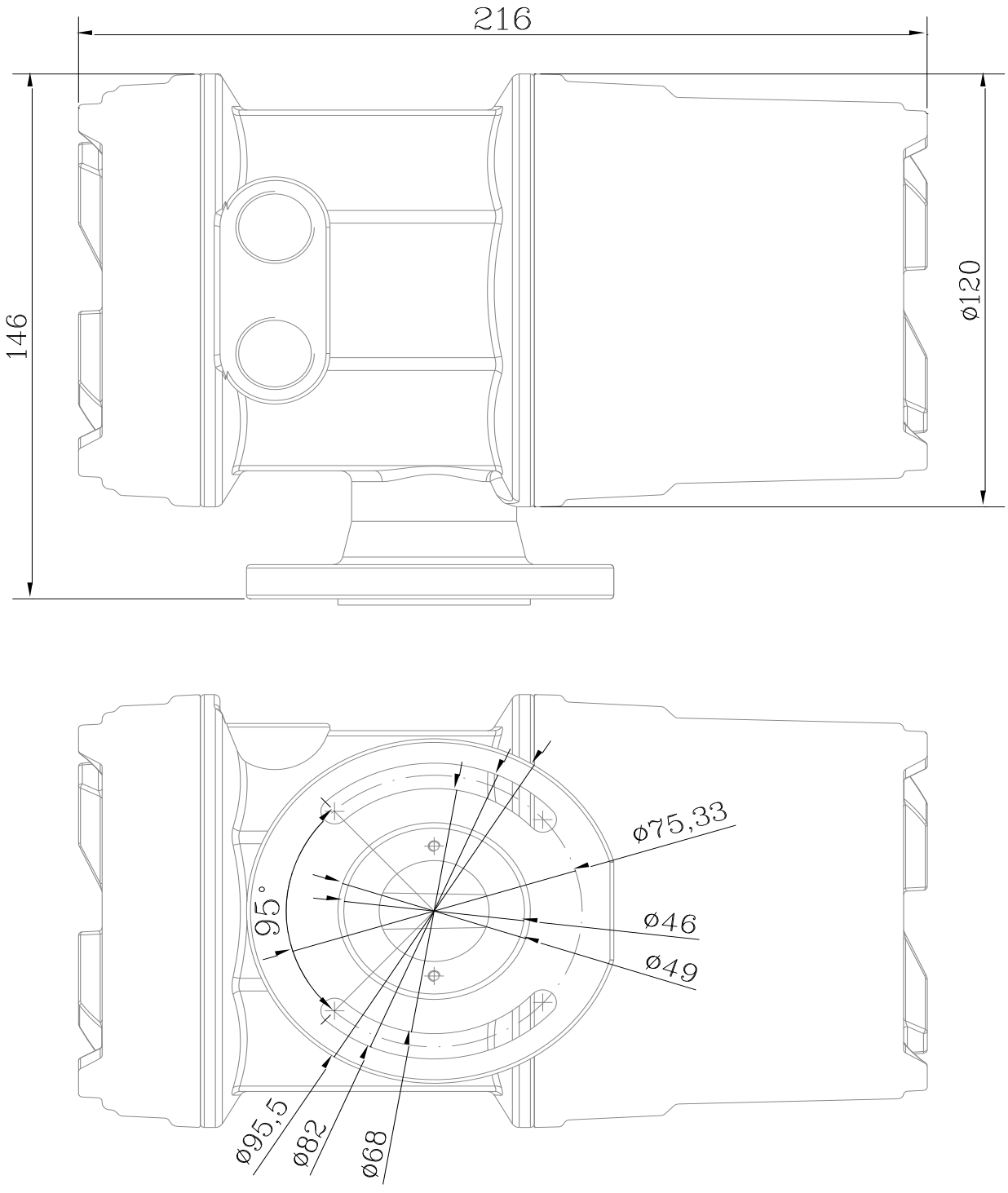
- Executive Standard: JB/T9248-1999 GB 3836.1-2010
  GB 3836.2-2010 GB 3836.4-2010
- Current speed range：0.03m/s~12m/s
- Repeatability: ±0.1%
- Display
  English displaying mode can display the instantaneous flow, the percentage of flow, the total forward flow and reverse flow
- Output signal:
  Analog output:4~20mA Load resistance:<750Ω
  Frequency: 0~5kHz 24V
  Pulse
  RS485 communication
  HART（selectable）
- Excitation mode
  Three amplitude low frequency excitation
  High frequency excitation
- Excitation Frequency
  1/16、1/8、1/4、1/2 can be set
- Excitation Electricity
  160mA or specified
- Time Constant
  0.1~99.9 Second can be set
- Ex-proof Mark
  Exd[ia]iaIICT5

1.2 Normal operating conditions

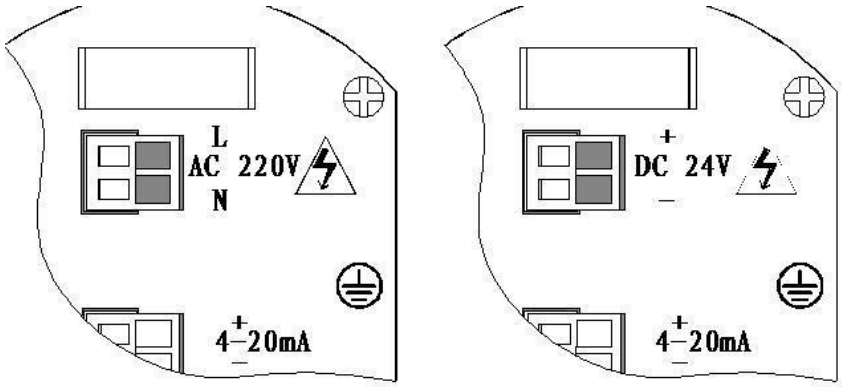
- Ambient Temperature Ranges: -20℃~+55℃
- Relative Humidity:5%~90%
- Power supply: 85~265AC or 18~36VDC Active
- Power consumption：<10W

2. KC-8860 Exterior Size and Power Connection Instruction

2.1 Exterior Size



2.2 KC-8860 Power Supply Connection



AC Power Supply Interface　　DC Power Supply Interface

Note: When connect power wires, please confirm the power supply type first. Please never insert AC power to DC converter. If connection wrong,it'll permanent damage the converter!

KC-8860 Power Connection Instruction

NO.	Mark	Function	Remark
L	L	AC 85~265v Power supply	L is for Ac220v Power supply
N	N	AC 85~265v Power supply	N is for Ac220v Power supply
+	+	DC 18~36v Power supply+	DC 24v +
-	-	DC 18~36v Power supply-	DC 24v -

2.3 Output Signal Terminal Connection

2.3.1 Current Output

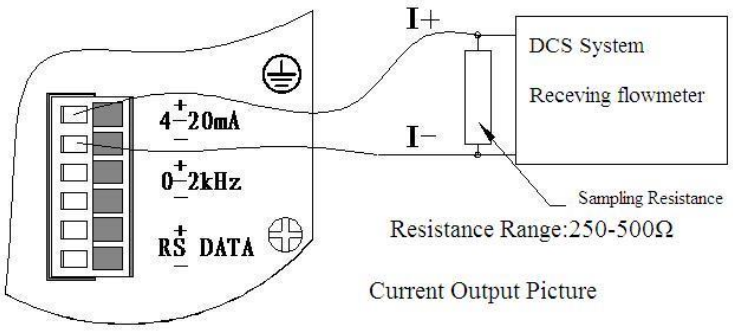
Instruction：

a) Analog output signal connection：4~20mA，Max load resistance:500Ω

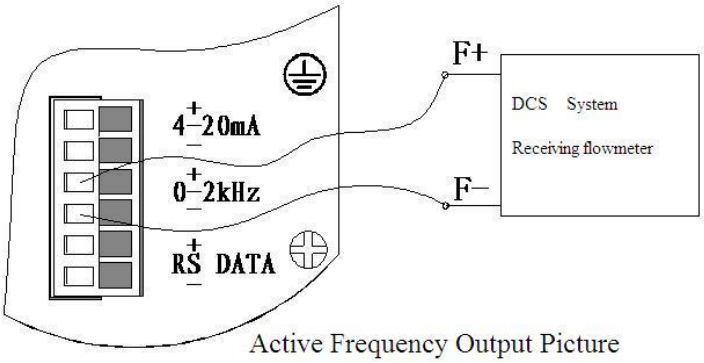
b) Pulse Output Connection: Frequency:0~5kHz，V value:24V,　Load current:50mA

Note1: When connect output signal wire, please note the function of insertion cable. (eg.Electricity Frequency or Communication).Please definitely distinguish the output type (eg. Active output or Passive output)

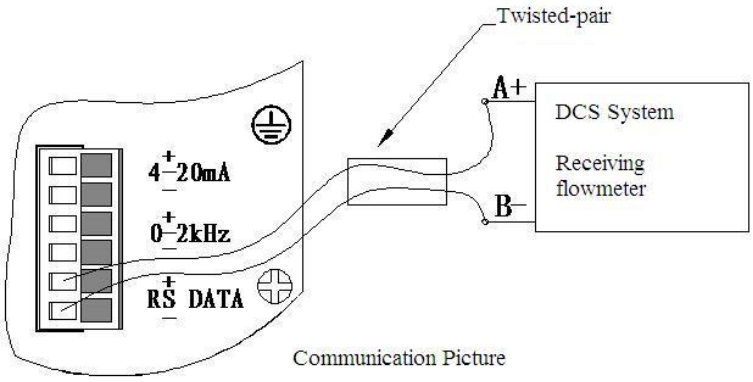
Note2:When connection the wire,please never connect the power to the output terminal.Or else it may permanent damage the converter!



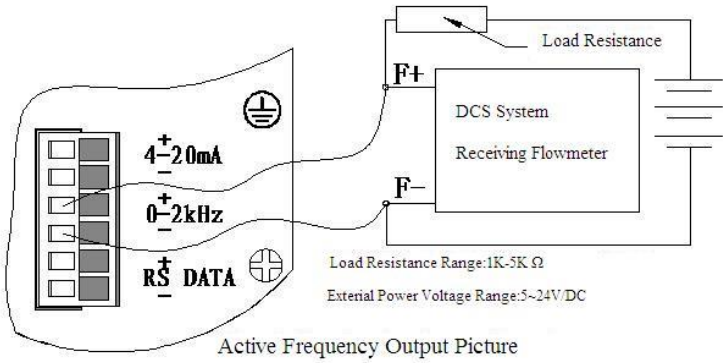
Current Output Picture



Active Frequency Output Picture



Communication Picture

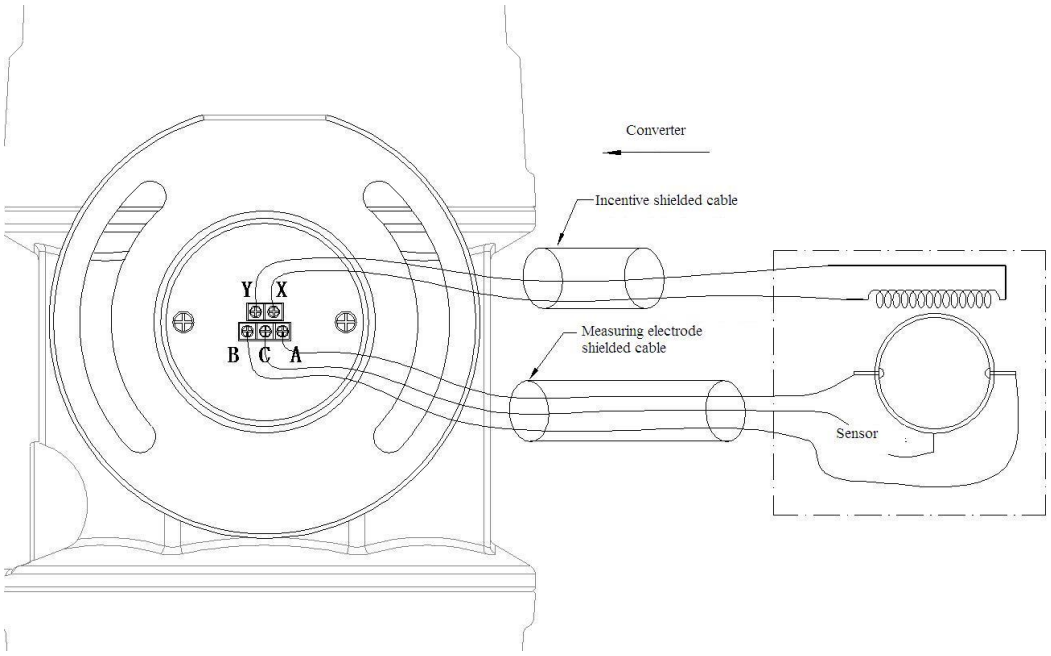


Active Frequency Output Picture

CFM Power Connection Terminal Instruction

NO.	Mark	Function	Remark
1	+	4~20mA Output +	Load Resistance≤500Ω When use Hart communication,please use Exterior Power 24VDC
2	-	4~20mA Output -	
3	+	Frequency or Pulse Output +	The Amplitude of Frequency or Pulse output is +24v，Load current ≤50mA
4	-	Frequency or Pulse Output -	
5	+	RS-485 Data +	
6	-	RS-485 Data -	

2.3.2 Sensor Signal Connection：

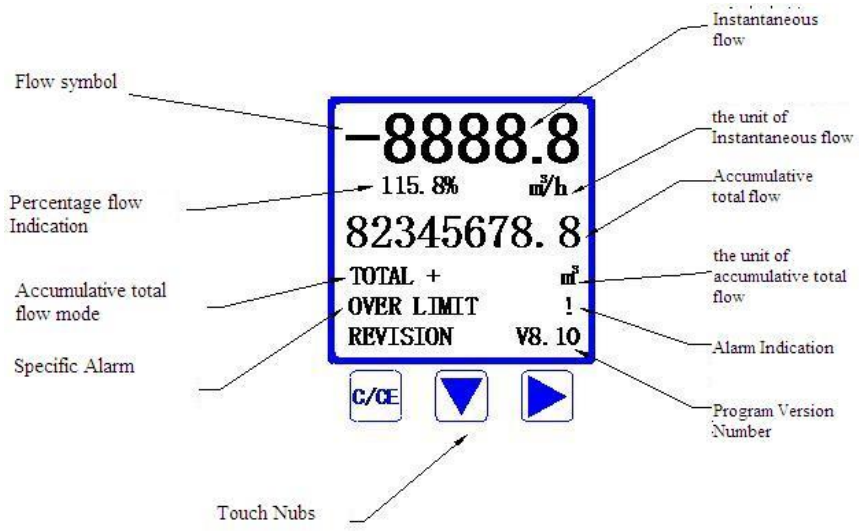


Note:When connect sensor signal,please don't mixed the signal wire A B C and the Excitation wire X Y. If connection wrong,it'll damage the converter permanent.

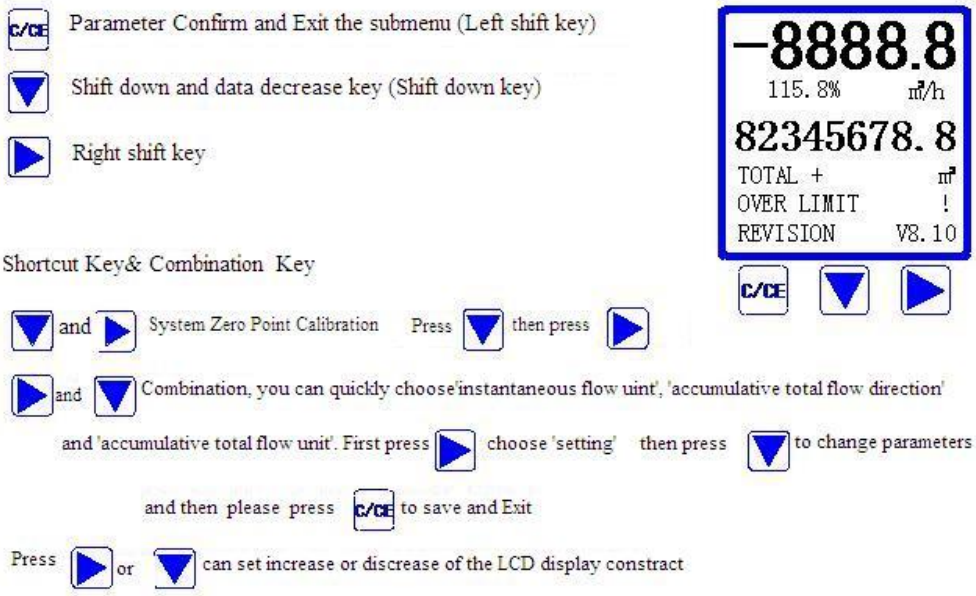
CFM Excitation and Input Signal Connection Terminal Instruction

NO.	Mark	Function	Remark
1	X	Excitation X	Load Resistance 10~100Ω
2	Y	Excitation Y	
3	A	Input signal A	
4	C	Input signal common terminal	
5	B	Input signal B	

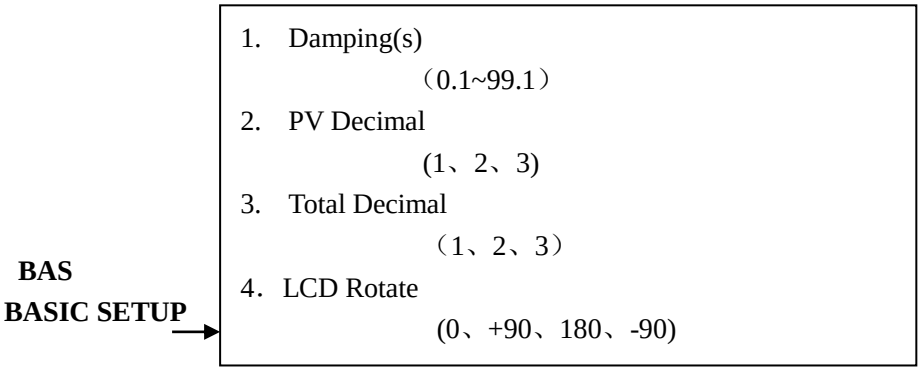
3.Operation Converter

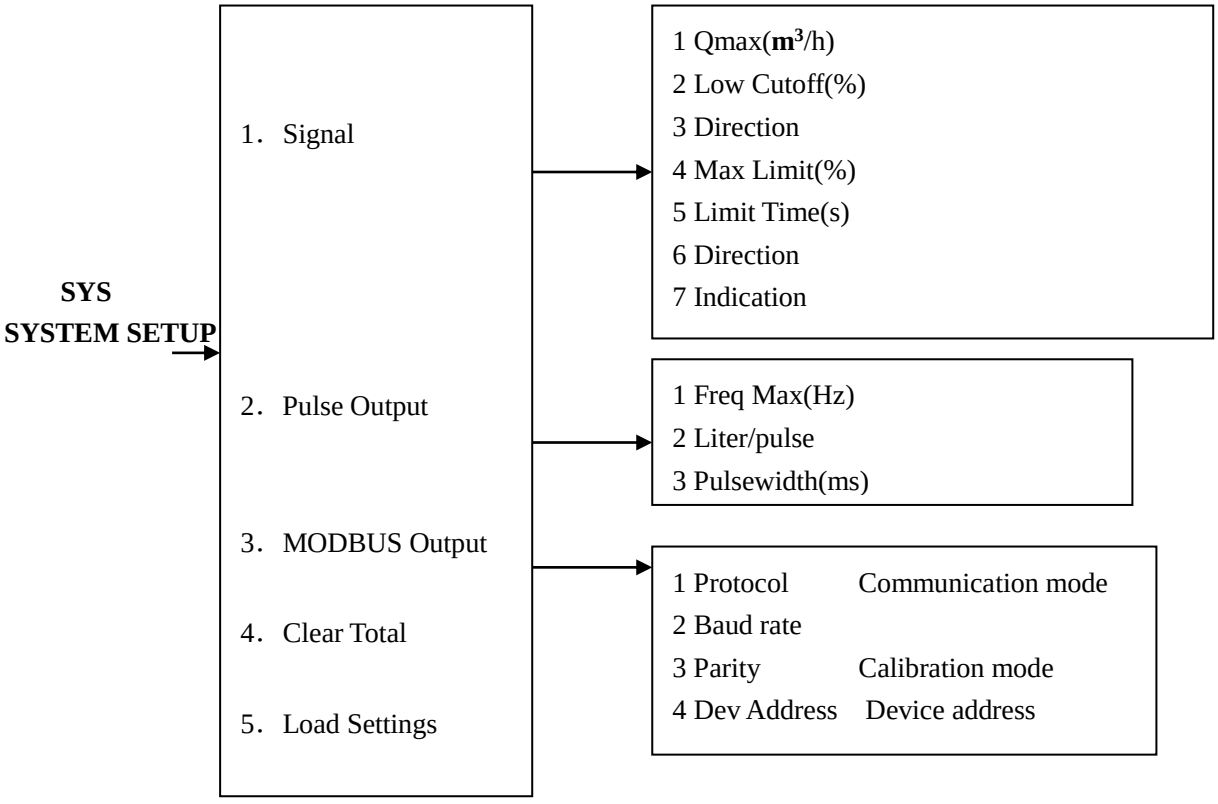


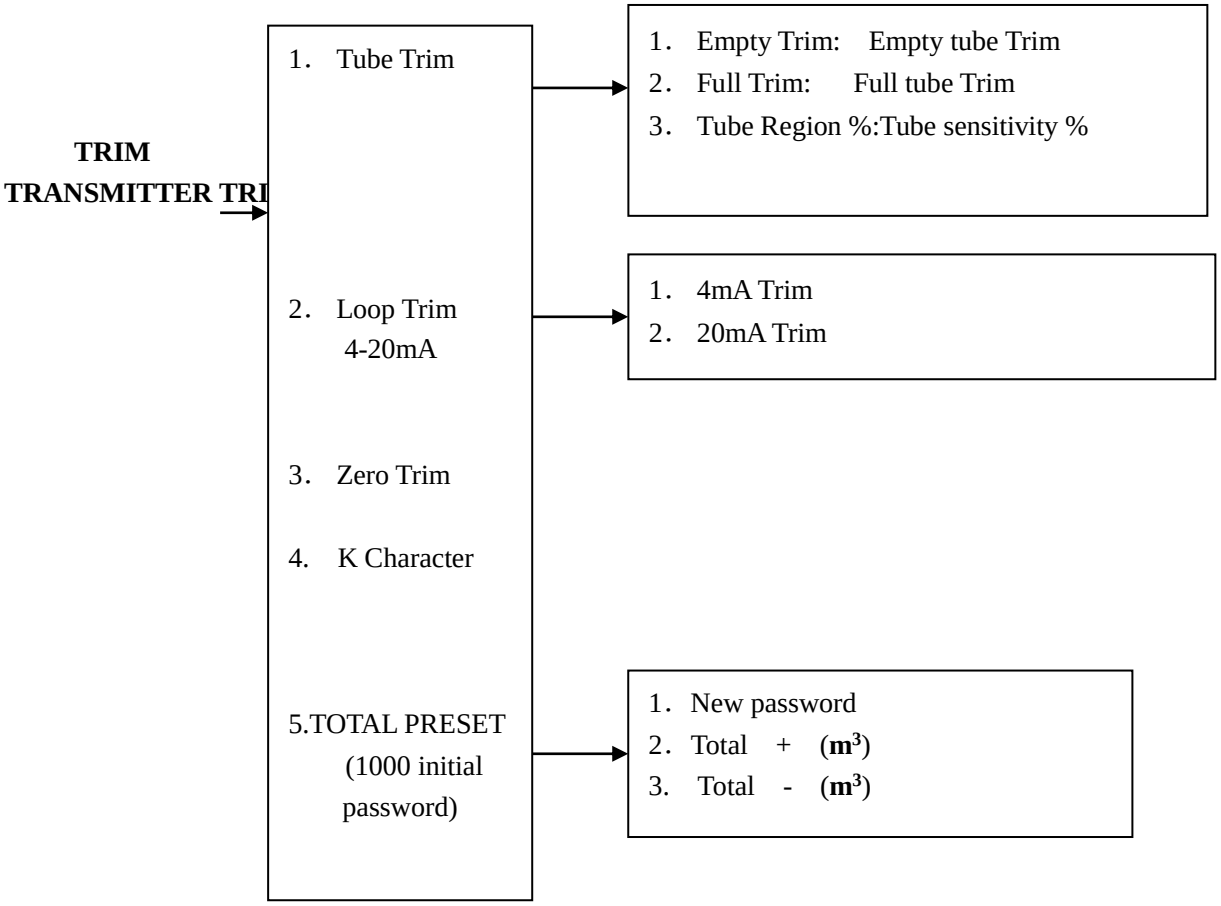
3.1 Key and Display

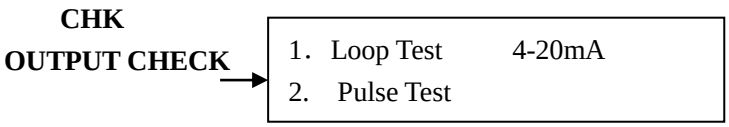


3.2 Menu Structure



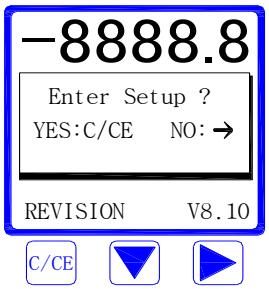



TRIM
TRANSMITTER TRI
1. Tube Trim
2. Loop Trim
4-20mA
3. Zero Trim
4. K Character
5.TOTAL PRESET
(1000 initial
password)
1. Empty Trim: Empty tube Trim
2. Full Trim: Full tube Trim
3. Tube Region %:Tube sensitivity %
1. 4mA Trim
2. 20mA Trim
1. New password
2. Total + (m3)
3. Total - (m3)


CHK
OUTPUT CHECK
1. Loop Test 4-20mA
2. Pulse Test

3.2.1 Select Menu

3.2.1.1 Parameter Set in Measuring Mode



- Press "**C/CE**" key,it'll show as picture in right
- Choose"C/CE"to enter the menu:

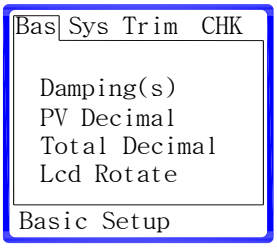
  （BAS）

  （SYS）

  （TRIM）

  （CHK）
- Press"→" to ESC.

3.2.1.2 (BAS) Menu



- Damping(s)

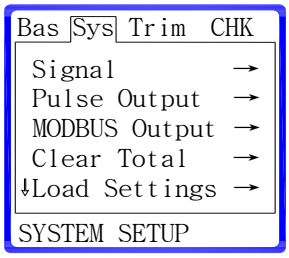
  （0.1~99.1）
- PV Decimal

  (1、2、3)
- Total Decimal

  （1、2、3）
- LCD Rotate

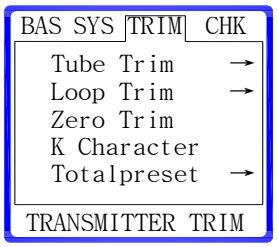
  (0、+90、180、-90)

3.2.1.3（SYS）Menu



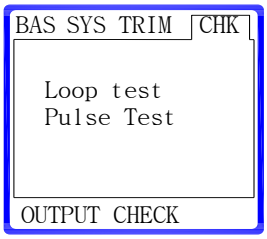
- Signal
- \ Pulse Output
- MODBUS Output
- Clear Total
- Load Settings

3.2.1.4（TRIM）Menu



- Tube Trim
- Loop Trin
- Zero Trim
- K Character
- TOTALPRESET

3.2.1.5（CHK）Menu



- Loop Test
- Pulse Test

4. Parameter Set and Use

4.1.Zero Trim

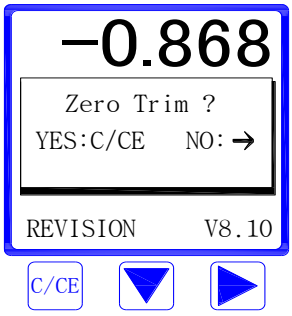
When use electromagnetic flowmeter, should do Zero Trim in order to get accurate measure result.

"Zero Trim" means to adjust the working Zero point when set current actual flow as Zero. While doing Zero Trim, please make sure the medium is static and full of the measuring tube.

4.1.1Quick Zero Trim

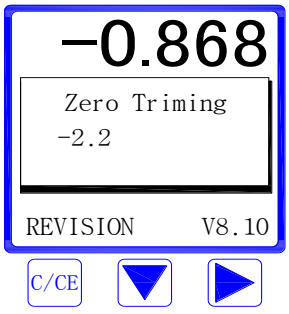
- Condition:the measuring tube is full of medium and medium is static
- Press "↓"and then"→"，the converter come to Zero Trim Program

  LCD display as:

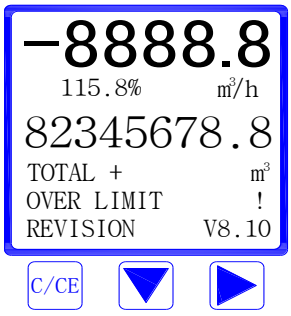


- If Press"→"，Converter will cancel Zero Trim Mode and exit to Measuring Mode.

  If Press"**C/CE**",Converter come to Zero Trip Mode and will display as:



- After Zero Trim,Converter will automatically come back to Measure Mode.



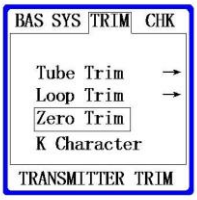
4.1.2 Zero Trim in the process of flowmeter calibration

- Condition:the measuring tube is full of medium and medium is static

  First come to ‘Zero Trim”：

- Press“C/CE”，then also press“C/CE”，
  enter set up as Picture 1 in right：

- Press“→”，choose“TRIM”
  Press“↓”to“Zero Trim”as picture 2
  Press“→” as picture 3



Zero Trim

Zero Trim

- Press“→”or “↓”，choose “yes”
  Press“→”enter to picture 4

Zero Trim Picture 4

- Press“C/CE”，come to“Zero Trim”double confirm as picture 5
  If press“→”，will exit“Zero Trim”.
  “Zero Trim”double confirm interface as picture 5
  Choose“C/CE”,will execute “Zero Trim”
  Choose“→”will exit “Zero Trim”

Zero Trim
Picture 5

- Execute“Zero Trim” as Picture 6
  After adjust zero point,converter
  Will come back to measure mode.

Zero Trim
Picture 6

4.2 Fast Setting

■ Flow Unit

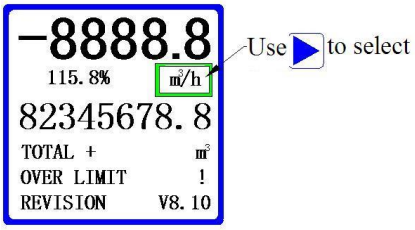
Parameter type： Choose

Default Value： m^3/h

Range： L/s L/m L/h m^3/s m^3/m m^3/h G/s G /m G/h

Press ▶ to choose'setting',

Press ▼ to choose flow unit then press C/CE to exit



（2） Total flow Unit

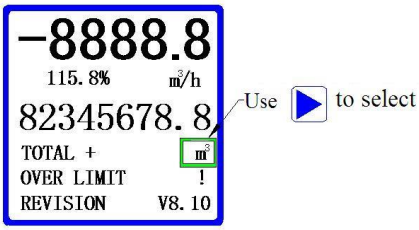
Parameter type： Choose

Default Value： m^3

Range： L m^3 G

Press ▶ to choose'setting'

Press ▼ to choose flow unit then press C/CE to exit



（3） Accumulative total flow Direction

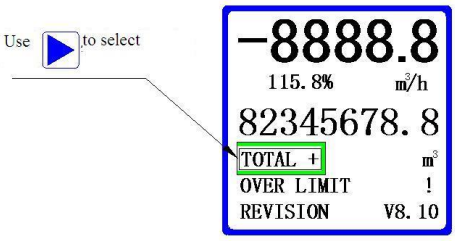
Parameter type： Choose

Default Value： TOTAL+

Range： TOTAL+、TOTAL-

Press ▶ to choose'setting'

Press ▼ to choose flow unit then press C/CE to exit



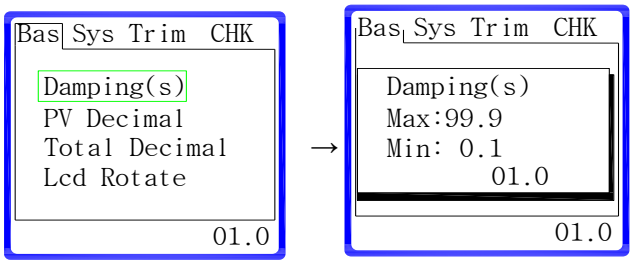
4.3 (BAS) Setting

4.3.1 Damping(s)

■ Parameter type：fix-point decimal

Default value：1.0

Range： 99.9 – 0.1



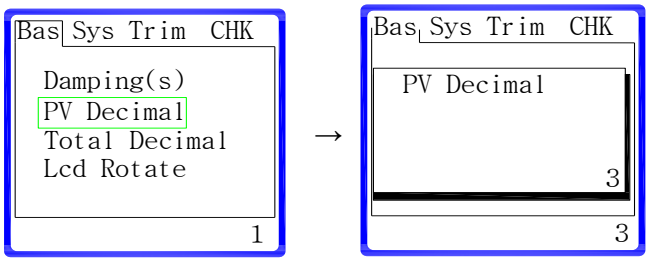
Press ▶ to choose 'setting'Press ▼ to change damping time， Press C/CE to exit.

4.3.2 PV Decimal

■ Parameter type：Choose

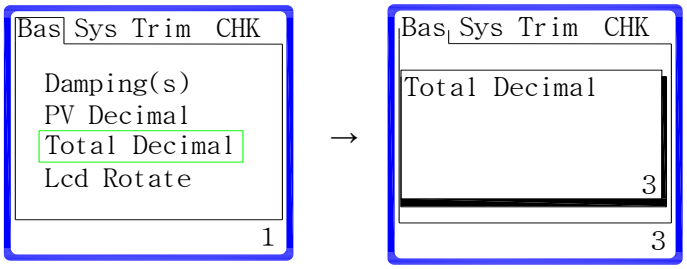
Default value：1.0

Range： 1、2、3



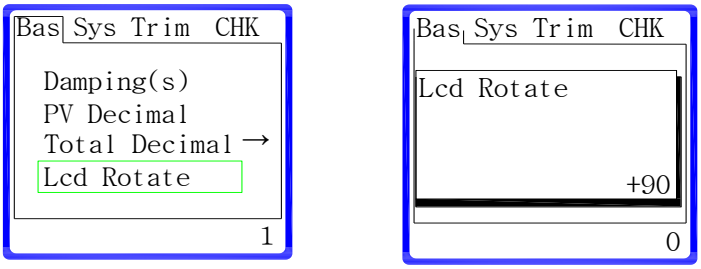
4.3.3 Total decimal

- Parameter type：Choose
  Default value：1.0
  Range：　　1、2、3



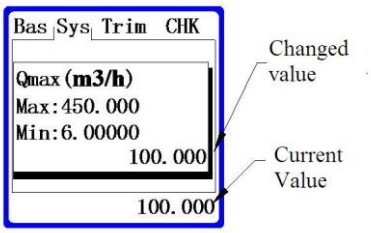
4.3.4 LCD Rotate

- Parameter type：Choose
  Default valule：0
  Range：　+90、180、-90



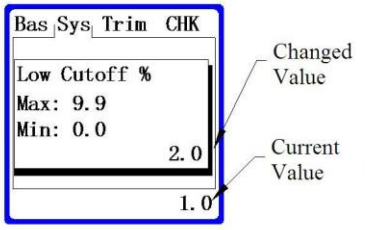
4.4　(SYS)Setting

4.4.1　Qmax（m3/h）



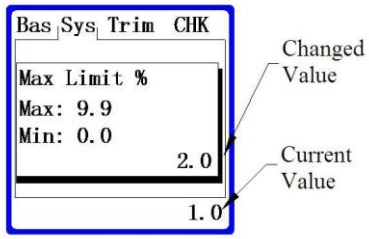
- Parameter type：Floating-point Decimal
  Default value：100.0
  Range：　m – n
  Scale flow range max m:　flow rate at 15m/s in current diameter
  Scale flow range min n:　flow rate at 0.1m/s in current diameter
  m　= (D*D) / 23.6　　D—diameter(mm)
  n　= (D*D) / 3540.0
  Scale flow means when flow achieve setting value,current output is 20mA, pulse output is the setting value in 'Pulse output'. If change this parameter, it'll impact the current output and pulse output.

4.4.2　Low Cutoff (%)



- Parameter type：　Fix-point decimal
  Default value：　0.0
  Range：　　9.9 – 0.0
  e.g: if scale flow=100m3/h
  　　Low cutoff=1.0%
  Then, when instantaneous flow<1m3/h,it'll be cutoff

4.4.3　Max Limit (%)

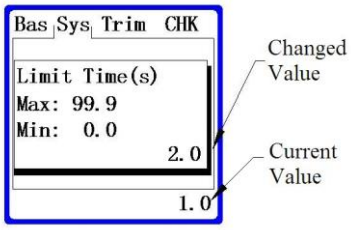


- Parameter type：　Fix-point decimal
  Default value：　0.0
  Range：　　9.9 – 0.0

\

e.g: if setting value is 1%,the display and output value will compress fluctuation value to 1% in the limit time period.

4.4.4 Limit Time(s)



Parameter type： Fix-point decimal

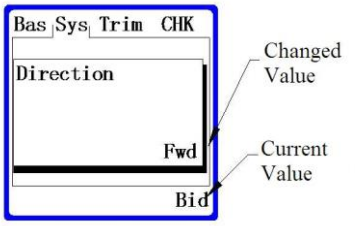
Default value： 00.0

Range： 99.9 – 0.0

eg: if setting value is 7s，the display and output

Will compress fluctuation value to max limit 1% within 7s.

4.4.5 Direction



Parameter type： Choose

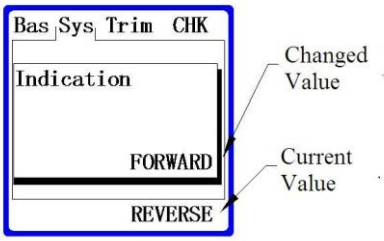
Default value：Forward

Range： Forward Reverse

If set as forward,, reverse flow will not be calculate and display

If set as bi-direction,forward flow and reverse flow will both be calculate and display.

4.4.6 Indication



Parameter type： Choose

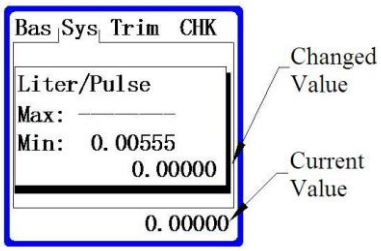
Default value：Forward

Range： Forward Reverse

If set as forward, reverse flow will be calculate and display as forward direction.

If set as reverse,forward flow will be calculate and display as reverse direction.

4.4.7 Pulse Output



4.4.7.1 Freq Max（Hz）

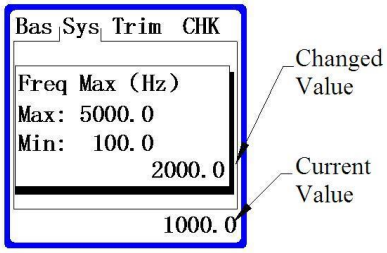
- Parameter type： fix-point decimal

Default value： 2000.0

Range： 5000.0 – 100.0

Current Frequency(Hz) = (Current flow(m3/h)/scale flow(m3/h))*Frequence max(Hz)

4.4.7.2 Liter/Pulse



- Parameter type： floating-point decimal

Default value： 0.0

Range： m – 0.00555

$$\text{Output frequency(Hz)} = \frac{\text{Current flow(m3/h) / 3.6}}{\text{Pulse(L/P)}} = \frac{\text{current flow (L/s)}}{\text{Pulse(L/P)}}$$

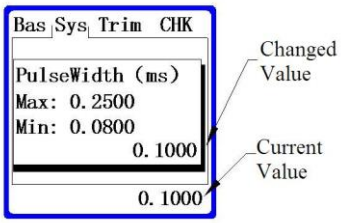
Frequency Range: 10000.0 – 0.006Hz

If exceed this period, it'll output the corresponding limit value.

When pulse = 0.0 ,frequency output depends on "frequency max"setting

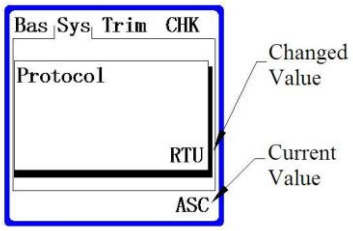
When pulse >0.0, frequency output depends on "Liter/Pulse" setting

4.4.7.3 Pulse Width（ms）



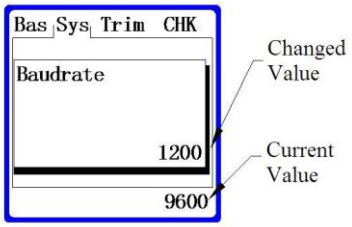
- Parameter type： floating-point decimal
  Default value： 0.0000
  Range： 0.1000 – 0.0000
  If is default value,output pulse duty-cycle is 1:1.

4.4.8 Modbus Output



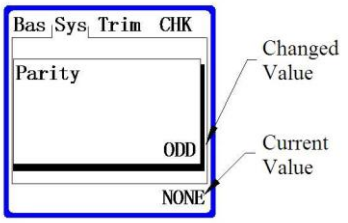
4.4.8.1 Protocol

- Parameter type： Choose
  Default value：RTU
  Range： RTU、ASC



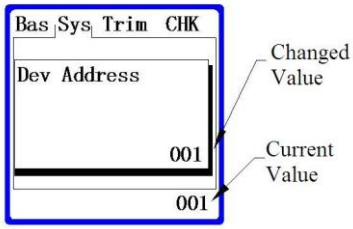
4.4.8.2 Baud rate

- Parameter type： Choose
  Default value： 9600
  Range：1200 2400 4800 9600 communication rate



4.4.8.3 Parity

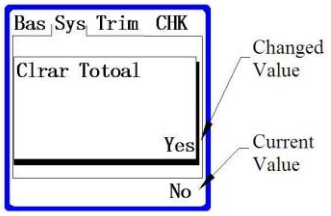
- Parameter type： Choose
  Default value： None
  Range： None/ODD/Even



4.4.8.4 Dev Address

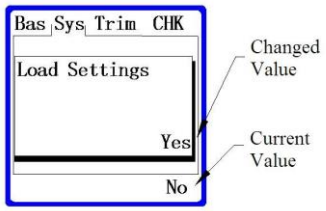
- Parameter type： Number
  Default value： 001
  Range： 999 – 001

4.4.9 Clear Total



- Parameter type： Choose
  Default value： No
  Range： No Yes
  This setting will make forward and reverse total flow return to zero.

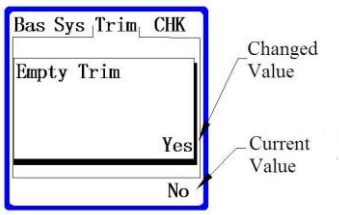
4..4.9(Ⅱ)Load settings



- Parameter type： Choose
  Default value： No
  Range： No Yes
  If choose yes, it'll restore factory parameter settings.

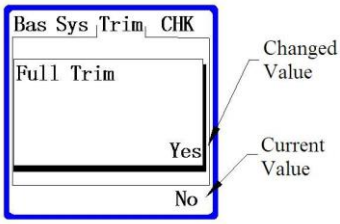
4.5 TRIM

4.5.1 Tube Trim



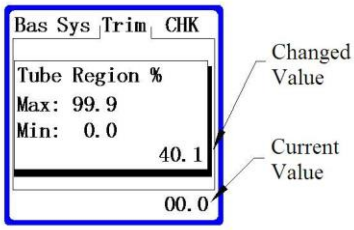
4.5.1.1 Empty Trim

- Parameter type： Choose
  Default value： No
  Range： No Yes
  Make sure measuring tube is empty. When execute this function, flowmeter will automatically record the characteristic value in empty tube.



4.5.1.2 Full TRIM

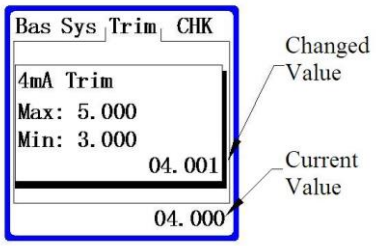
- Parameter type： Choose
  Default value： No
  Range： No Yes
  Make sure measuring tube is full. Execute this function, flowmeter will automatically record the characteristic value in full tube.



4.5.1.3 Tube Region (%)

- Parameter type： fix-point decimal
  Default value： 0.0
  Range： 99.9－0.0
  The value of Tube Region is bigger means that empty tube region is more sensitive.

4.5.2 Loop Trim

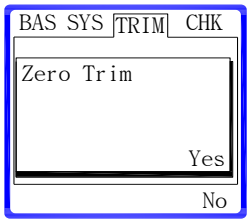


4.5.2.1 4mA Trim

- Parameter type： fix-point decimal
  Default value： 4.0000
  Range： 5.000 – 3.000
  When execute this function, and use accurate ampere meter to measure 4-20mA output. Input the reading value to the converter, and converter will automatically achieve trim work.

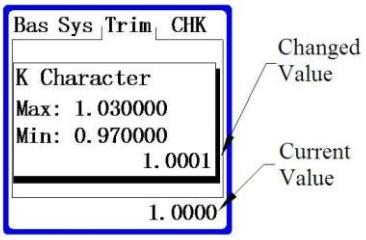
4.5.2.2 20mA Trim

The same as 4.5.2.1



4.5.3 Zero Trim

- Parameter type： Choose
  Default value： No
  Range： No Yes
  Make sure the measuring tube is full and medium is static.After fully preheat, execute this function then the flowmeter will automatically do Zero Trim.



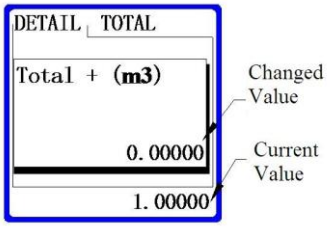
4.5.4 K Character

- Parameter type： fix-point decimal
  Default value： 1.0000
  Range： 0.970000 ~ 1.030000

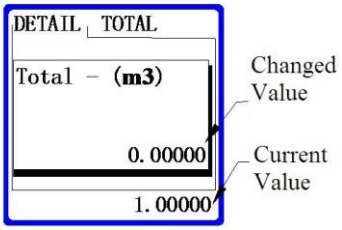
4.5.5 TOTAL

This function is used to modify the accumulative total flow.

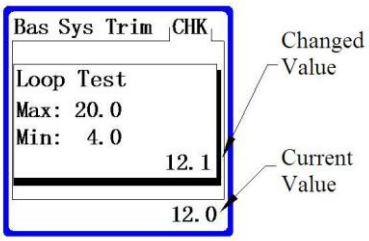
4.5.5.1 Total +（m3/h)



4.5.5.2 Total -（m3/h)

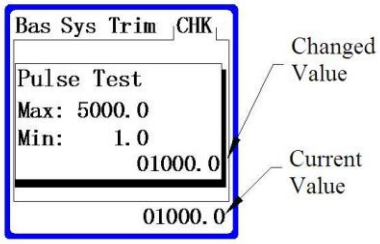


4.6 CHK



4.6.1 Loop Test

- Parameter type： fix-point decimal
  Default value： 12.0
  Range： 20.0 – 4.0
  Execute this function and use accurate ampere meter to measure 4~20mA current output.
  Change present set value in the allowed range to test the deviation between output value and set value.



4.6.2 Pulse Test

- Parameter type:fix-point decimal
  Default value：1000.0
  Range： 5000.0 – 1.0

Execute this function and use accurate cymometer to measure frequency output.
Change present set value in the allowed range to test the deviation between output value and set value.

5. Self-diagnosis Information and fault handling

Electromagnetic flowmeter converter have self-diagnosis function. It can provide correct alarm information by itself for most general fault except power supply and hardware circuit fault. Fault Information will display in the bottom right of the LCD screen.

5.1 Fault handling

5.1.1 No display on the screen

a） Check whether the power supply is switched on
b） Check whether the power fuse is intact
c） Check whether the power supply voltage is conform to the requirements
If above information is normal, please contact with manufacturer.

5.1.2 Excitation Alarm

a) Check whether the Excitation line X and Y are open circuit
b) Check whether the Excitation coil resistance is normal, or else it means that converter may has fault.

5.1.3 Empty Alarm

a) Check if the liquid medium is full of measuring tube
b) Use wire to make signal input terminal A,B and C short circuit. At this moment if ‘Empty Alarm’ indicate revocation, it means that converter is normal. This fault may caused by low

conductivity of measuring medium or the setup error of empty tube threshold value and empty tube measuring range.

c) Check whether signal line connection are correct

d) Check whether sensor electrodes are normal

5.1.4 Inaccuracy

a) Check whether the liquid is full of the measuring tube

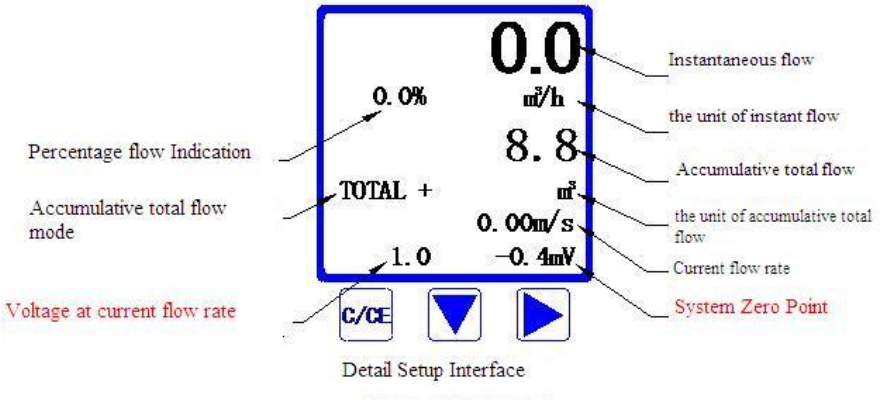
b) Check whether the signal line connection are normal

c) Check whether the sensor coefficient,zero point is normal or Calibration setting is normal.

6. Password Setup

■ Enter Detail Setup Interface

1. Long Press“C/CE”for more than 5 seconds,then enter detail setup interface:



Detail Setup Interface

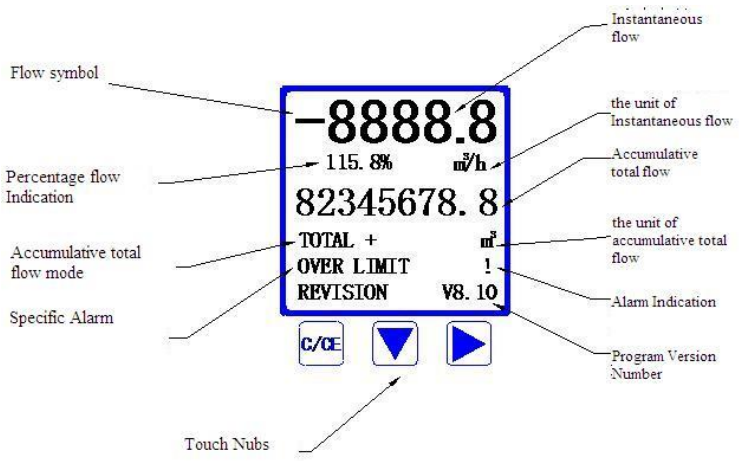
2. Press the second key , then press to choose YES to enter DETAIL SETUP Interface.

■ Change Password

1. Press to enter “NEW PASSWORD”

2. Press to change the password. *Note:Ex-factory password is 4000.*

3. Press to save the settings.

- Return to the normal measure interface

After “Save Settings”,long press C/CE for more than 5 seconds to return to the normal measure Interface as below: