

MAG



ALIA TECHNOLOGY LLC

*Electromagnetic Flowmeter*

## Operation Manual

AMC2100 Series

AMC2200 Series

AMC3200 Series



CE

# Index

1. Sensor	2
1.1 AMF900 Flange Type	2
1.2 AMF500 Wafer Type	3
1.3 AMF301 Installation	3
1.4 AMF500 Installation	3
1.5 AMF601 Installation	4
1.6 AMF900 Installation	4
2. Installation Considerations	5
2.1 Installation Position	5
2.2 Avoid Magnetic Field Interference	5
2.3 Straight Pipe Distance	5
2.4 Installation Method	5
3. AMC2100, AMC2200 and AMC3200 Operation	7
3.1 AMC2100 Operation	7
3.1.1 Wiring Diagram of Power and Signal Output (either compact or remote)	7
3.1.2 Remote Wiring	8
3.1.3 AMC2100 Panel & Dimensions	8
3.2 AMC2200 Operation	9
3.2.1 Wiring Diagram of Power and Signal Output (either compact or remote)	9
3.2.2 Wiring Diagram for Remote Type	10
3.2.3 AMC2200 Panel & Dimensions	10
3.3 AMC3200 Operation	11
3.3.1 Wiring Diagram of Power and Signal Output (either compact or remote)	11
3.3.2 Wiring Diagram for Remote Type	12
3.3.3 AMC3200 Panel & Dimensions	12
3.4 Measurement Mode	13
3.5 Examples	13
3.6 Totalizer Reset	14
3.7 Zero Trim	14
3.8 Operational Flowchart	15
3.9 User Operation	18
3.10 System Mode	22
3.11 Advanced Mode	23
3.11.1 Trim Settings	23
3.11.2 Converter Settings	27
3.11.3 Special	28
3.11.4 Bluetooth Settings	28
3.12 Batch Control	29
4. AMC2200 and AMC3200 APP Software	32
5. Common Alarm Code	41
6. AMC2200 and AMC3200 APP Download Link	41

# 1. Sensor

Electromagnetic flowmeter is made up with sensor and converter. Either for compact or remote version, Sensor's specifications vary as below:

## 1.1 AMF900 Flange Type

Size: 10A-2000 mm (3/8"A-80")

Liner: Neoprene

Polyurethane

FEP

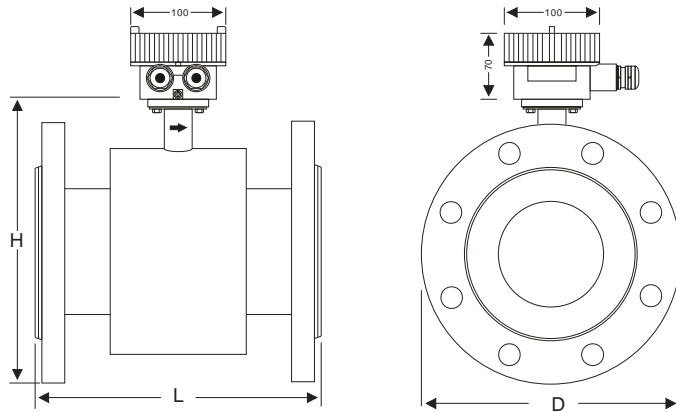
PTFE

PFA

Protection Class: IP68

Max.Temp.: 180 °C

Process Connection: Flange End



Size (mm)	Standard Pressure kgf/cm <sup>2</sup>	Liner Material				Dimensions (mm)			Weight kg
		FEP / PFA	Neoprene	Polyurethane	PTFE	L	D	H	
10A	40	⊙			⊙	120	90	145	3.5
10		⊙			⊙	120			3.5
15		⊙			⊙	150	95	155	3.5
20		⊙			⊙		105	160	4.5
25		⊙		⊙	⊙		115	166	4.5
32		⊙		⊙	⊙		140	180	6.5
40		⊙		⊙	⊙		150	190	7.0
50		⊙		⊙	⊙		200	165	201
65		⊙		⊙	⊙	185		220	12
80		⊙		⊙	⊙	200		235	15
100	⊙	⊙	⊙	⊙	250	220		254	17
125	⊙	⊙	⊙	⊙		250	284	21	
150	⊙	⊙	⊙	⊙		300	285	314	28
200	10	⊙	⊙	⊙	⊙	350	340	369	36
250		⊙	⊙	⊙	⊙	400	395	430	49
300		⊙	⊙	⊙	⊙	450	445	480	61
350			⊙	⊙	⊙		505	540	79
400			⊙	⊙	⊙	500	565	600	99
450			⊙		⊙	600	615	640	121
500			⊙		⊙		670	700	143
600			⊙		⊙		780	800	187
700				⊙		700	895	910	260
800				⊙		800	1015	1020	342
900			⊙		900	1115	1120	420	
1000			⊙		1000	1230	1230	503	
1200	6		⊙		⊙	1200	1405	1405	666
1400			⊙		⊙	1400	1630	1630	1036
1600			⊙		⊙	1600	1830	1830	1333
1800			⊙		⊙	1800	2045	2045	1720
2000				⊙		2000	2265	2265	2190

### 1.2 AMF500 Wafer Type

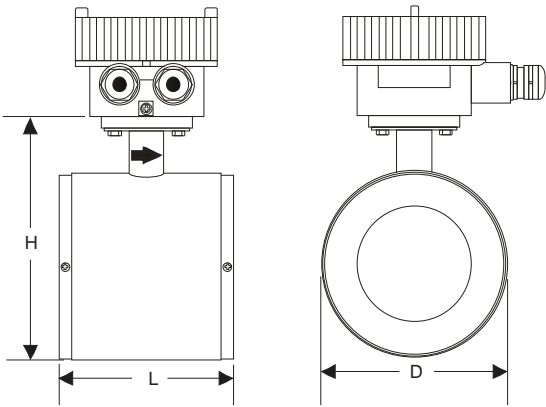
Size: 25-200 mm (1"-8")

Liner: FEP / PTFE

Protection Class: IP68

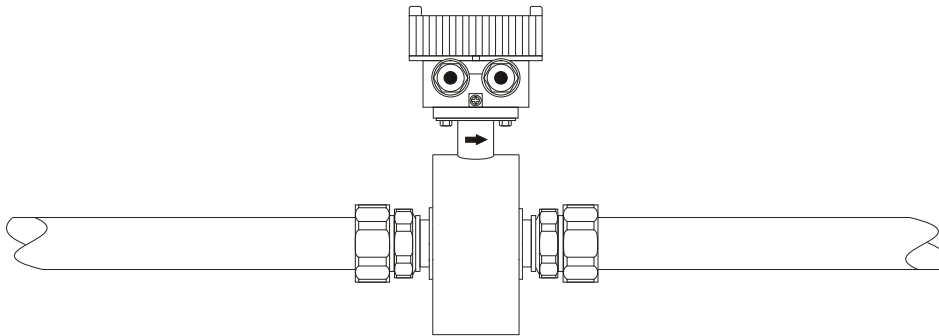
Max. Temp.: 180 °C

Process Connection: Wafer

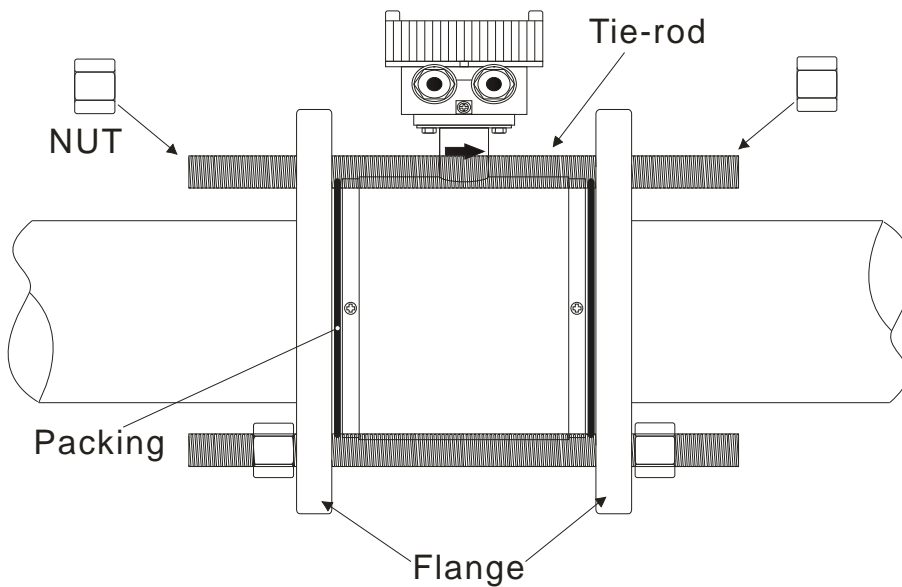


Size		Dimensions (mm)		
mm	Inch	L	D	H
25	1"	90	71	138
32	1-1/4"	100	80	147
40	1-1/2"		86	153
50	2"	115	100	167
65	2-1/2"	115	120	187
80	3"	130	131	198
100	4"	155	151	218
125	5"	155	181	248
150	6"	185	206	273
200	8"	215	261	328

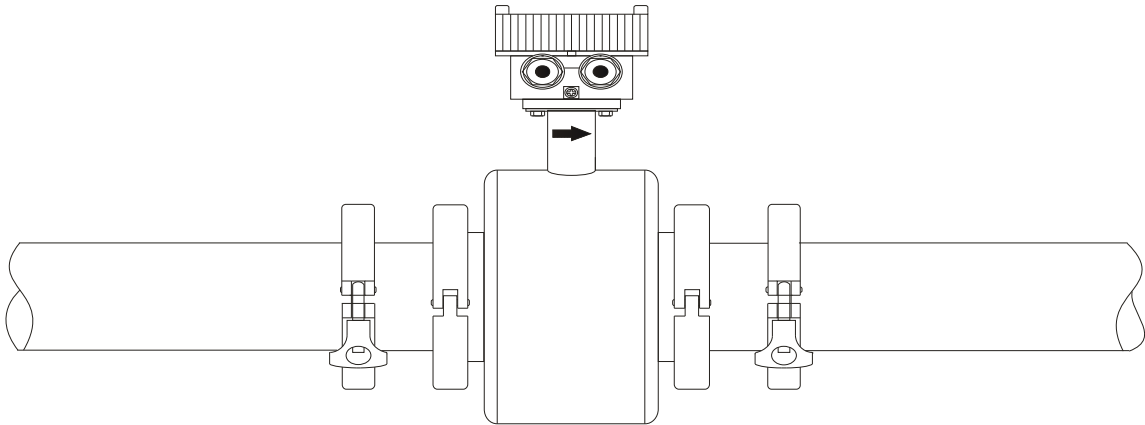
### 1.3 AMF301 Installation



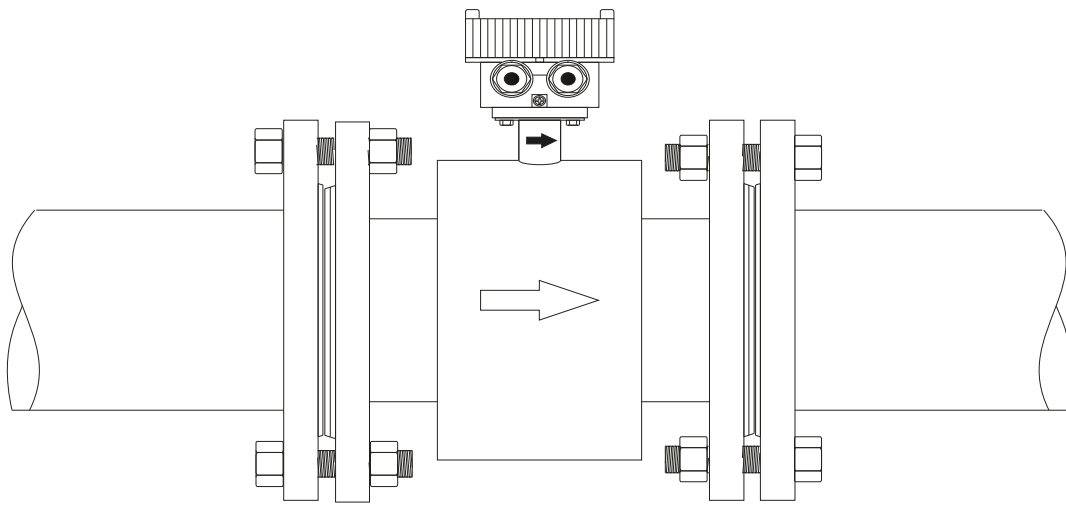
### 1.4 AMF500 Installation



## 1.5 AMF601 Installation



## 1.6 AMF900 Installation



### Note:

- 1) Pipe flange should be welded before flow meter's installation. Welding after flow meter's installation is prohibited. And the welding part of pipe flange should be flat, having no sharp residue. Otherwise liner will be damaged. After Flow meter is installed, if other places in pipe needs to be welded, flow meter's power must be shut down.
- 2) Usually there will be weld residues in newly installed pipe. Before installing the sensor, those residues should be cleaned off so as to avoid liner damage.
- 3) If pipe is not aligned well or sloped, there will be leakage or liner damage.

## 2. Installation Considerations

Before tube design, please take the following situations into consideration:

### 2.1 Installation Position

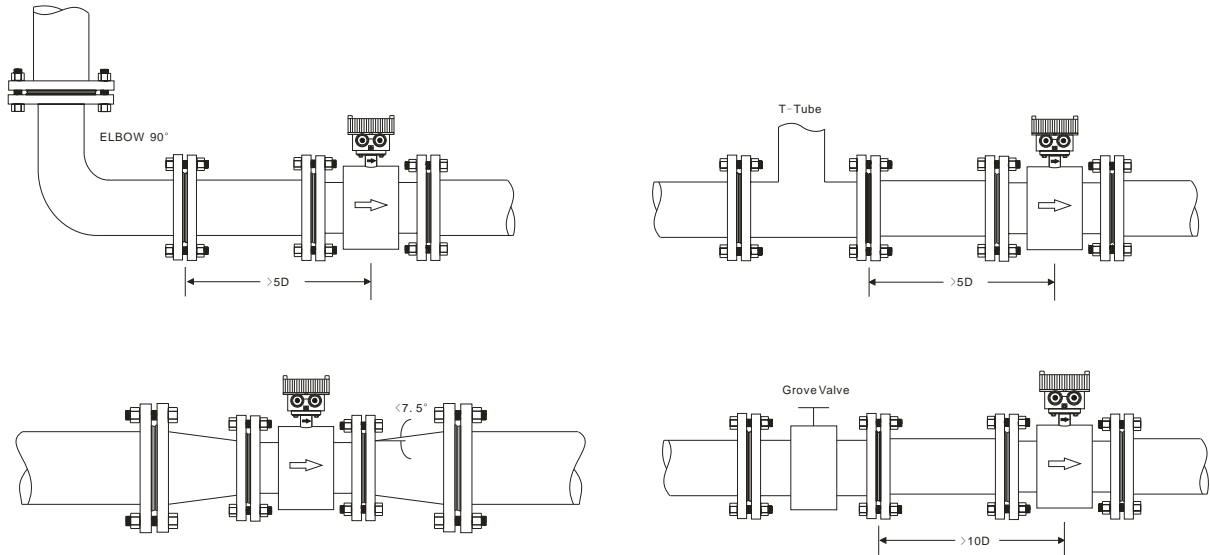
Please avoid sunlight when installing the flowmeter; the ambient temperature should be  $-25\sim 60$  Deg.C.

### 2.2 Avoid Magnetic Field Interference

Please do NOT install flow meter near devices such as motor-driven machine, transformer, frequency transformer etc as it will cause magnetic field interference.

### 2.3 Straight Pipe Distance

In order to guarantee EM Flow meter's accuracy, upstream and downstream should meet below requirements (Picture)

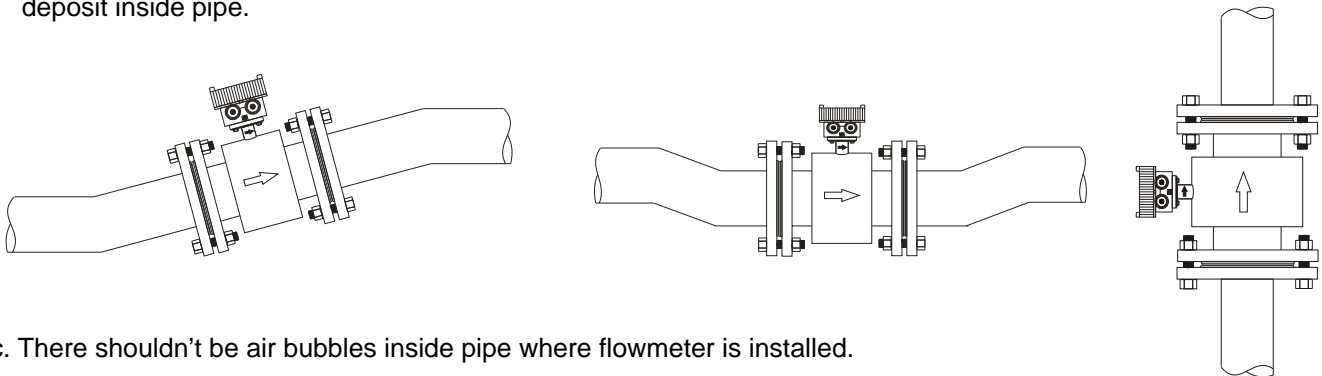


If upstream / downstream pipe is reduced, the reduced pipe's degree  $\theta$  should be less than 15.

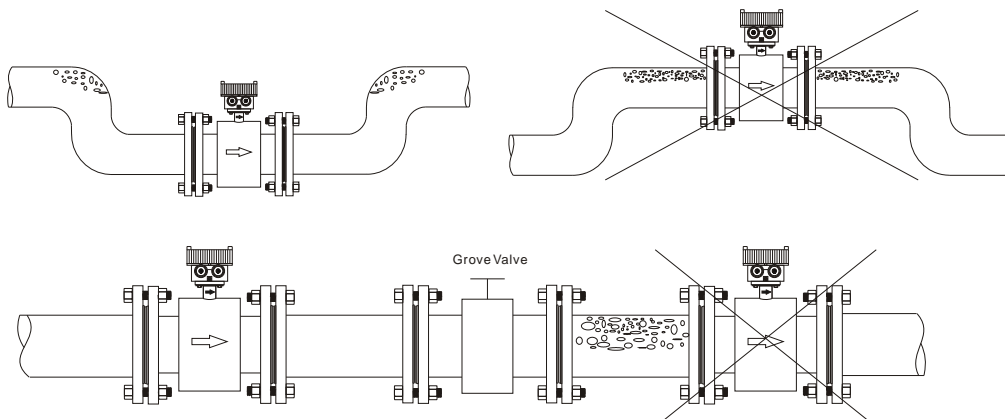
And upstream distance should be 5D-10D while downstream 2D-5D.

### 2.4 Installation Method

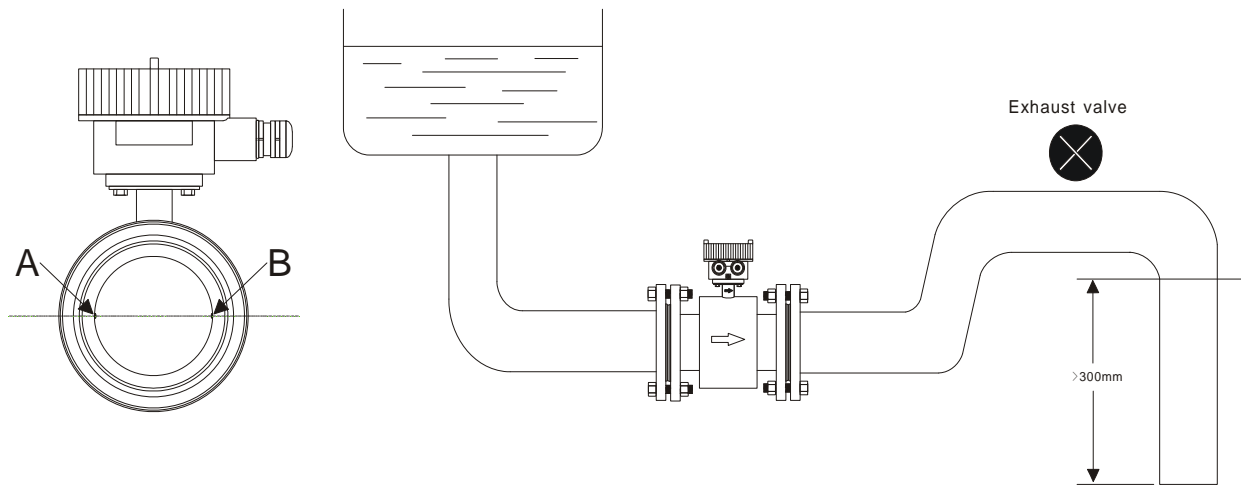
- Flowmeter can be horizontal, vertical or slant. Please make sure pipe is full either fluid is running or not.
- If there are particles inside fluid, it's recommended to try vertical installation (bottom to top) so as to avoid particles deposit inside pipe.



- There shouldn't be air bubbles inside pipe where flowmeter is installed.



d. Electrode position should parallel with ground. The electrodes' position (A.B) of EM Flowmeter which is horizontally-installed or slant-installed should match the 2 sides (right / left) of tube, and converter (wiring box) should be on the top of the tube.

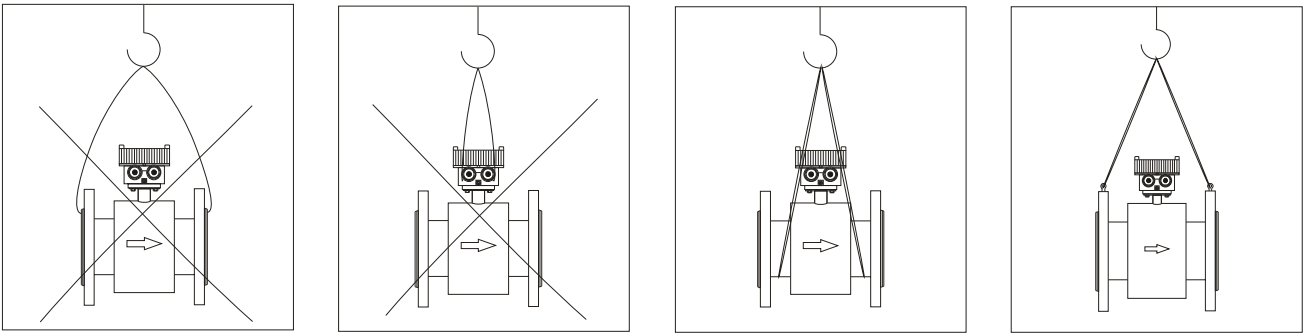


Horizontal installation, the electrode position A.B should on the right and left side.

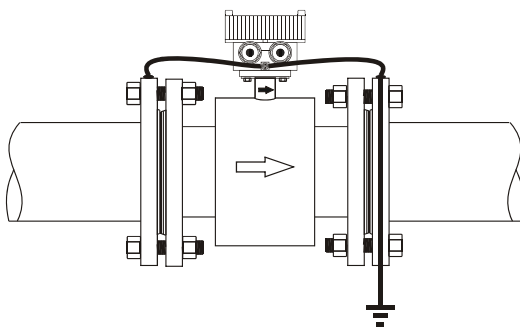
e. Transportation

Do NOT use rope to hang the flowmeter through its tube as it may cause inside Liner broken.

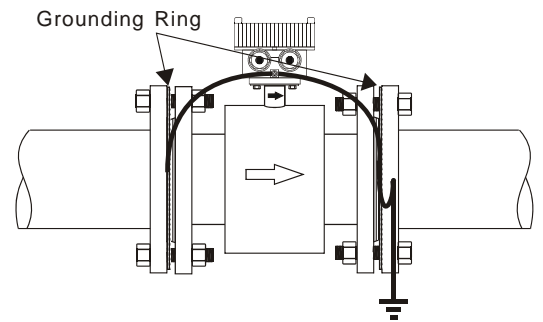
Do NOT use your hand or rope to hang the converter or junction box. As their material is tender aluminum, if flowmeter size is bigger than 80 mm, they can not stand such heavy weight.



f. Grounding measurement



Grounding resistance < 10 Ω  
General metal tube



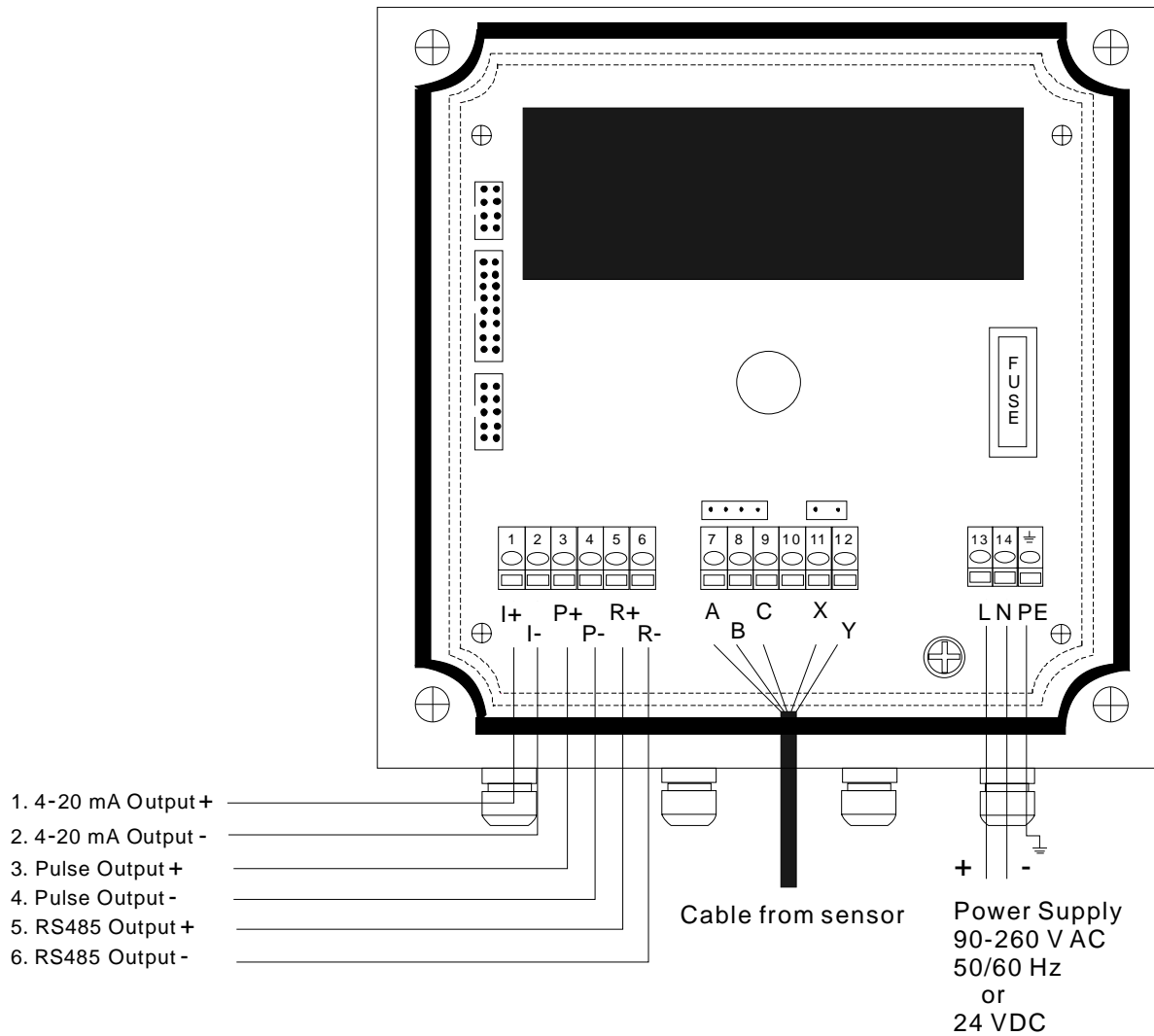
Grounding resistance < 10 Ω  
Non-metal tube (plastic tube Liner)

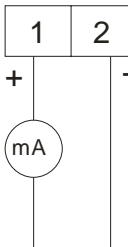
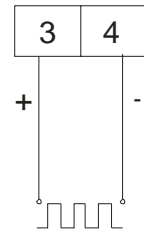
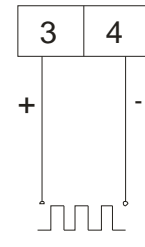
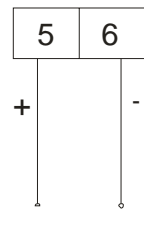
### 3. AMC2100, AMC2200 and AMC3200 Operation

#### 3.1 AMC2100 Operation

##### 3.1.1 Wiring Diagram of Power and Signal Output (either compact or remote)

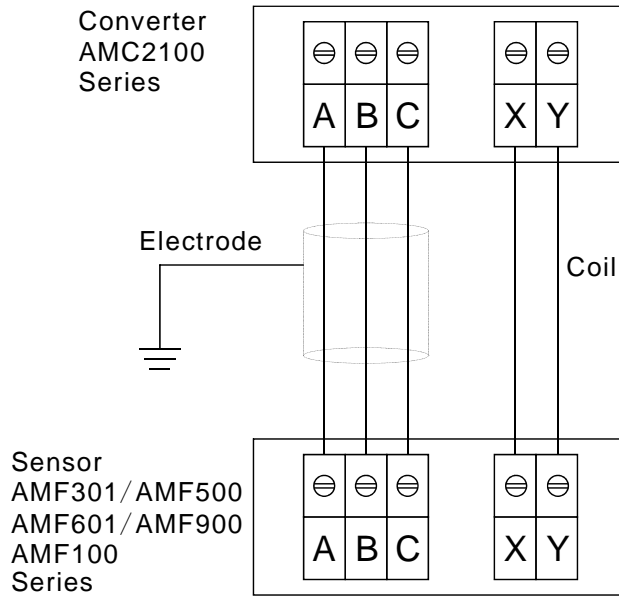
Open the 4 screws of the converter, and you can see terminal, decide if you need to connect according to your needs.



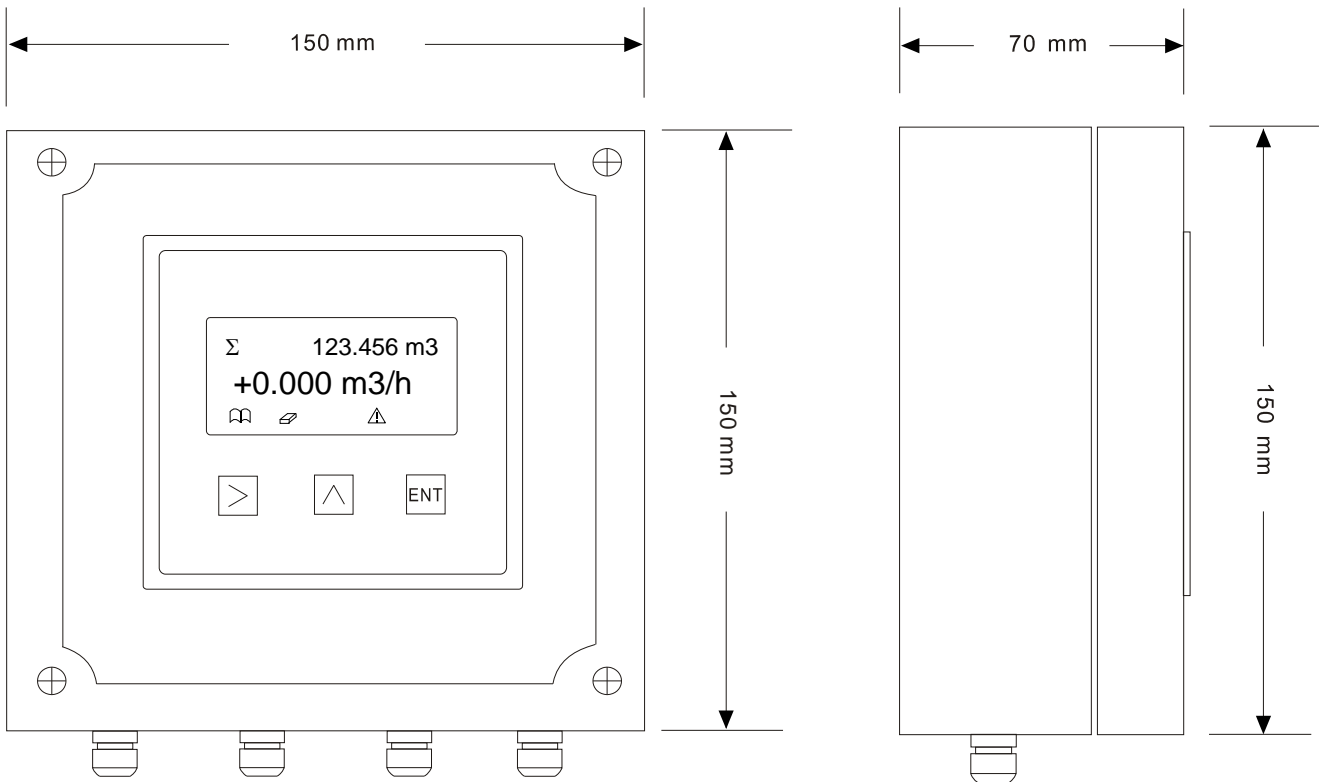
 <p>Output a load: 600 Ω</p>	 <p>Max. Outer Voltage: 30 VDC</p>	 <p>Output Voltage: 15 VDC Max.              Current: 10 mA</p>	 <p>MODBUS Protocol</p>
<p>4-20 mA Output              (HART Protocol)</p>	<p>1.Pulse (Frequency) Output              2.Batch Control</p>	<p>Active Pulse (Frequency)              Output              (0-2000 Hz)</p>	<p>RS485 Output</p>



### 3.1.2 Remote Wiring



### 3.1.3 AMC2100 Panel & Dimensions

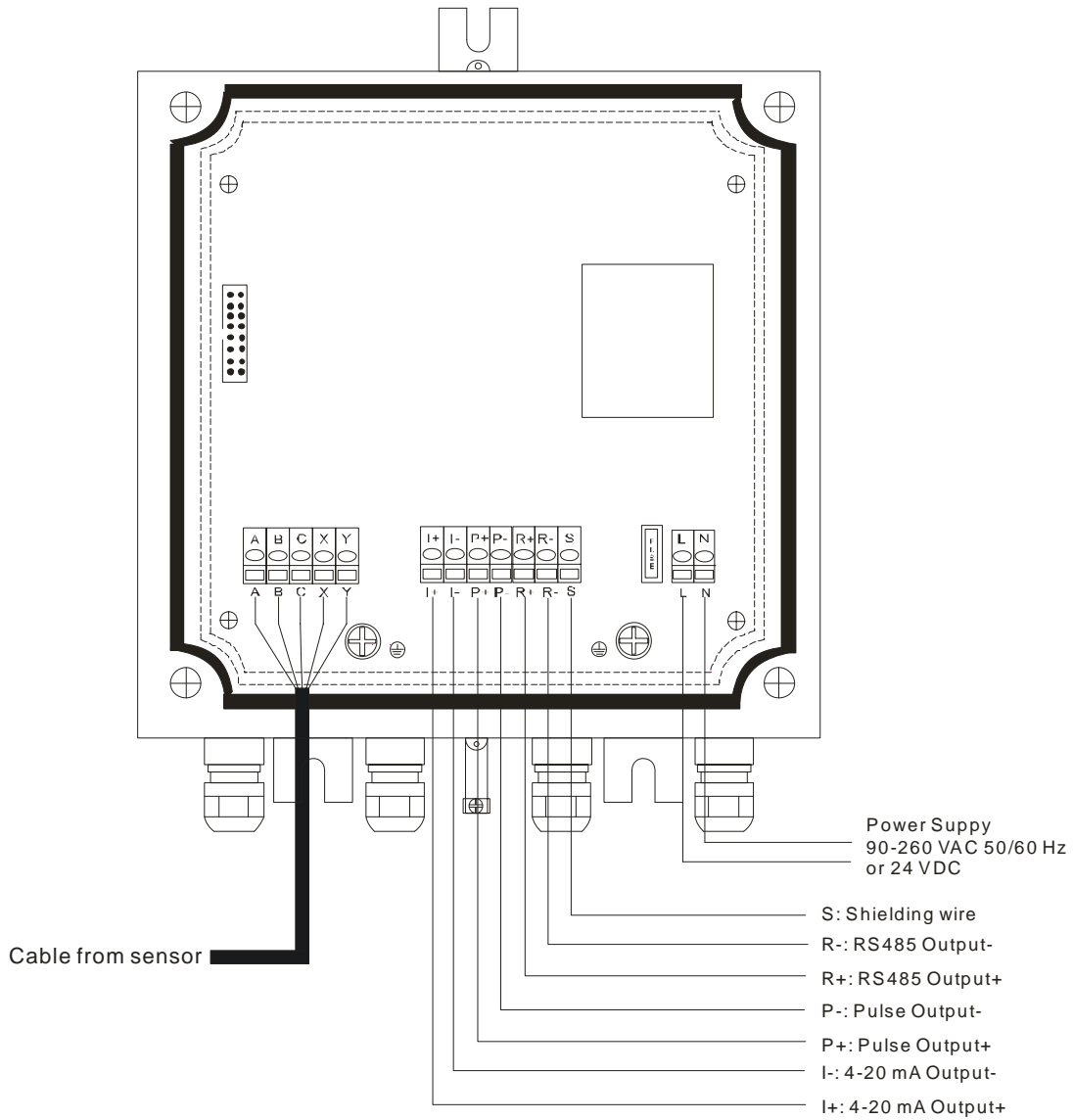


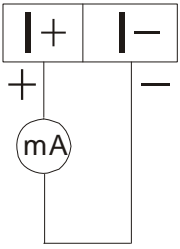
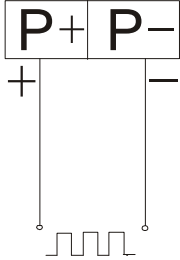
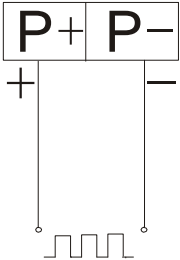
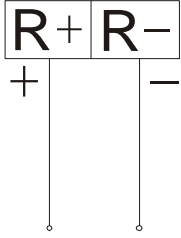
Name	Button	Functions Under Measurement	Functions Under Parameter Settings
Set	ENT	Press it to enter parameter settings mode	Save current settings and shift to next setting interface. Press and hold ENT key for 5 seconds to exit parameter settings and return to measuring interface.
Up	^	Press it to choose one of the four lines in screen	Move cursor up or down; change numerical value, decimal point and unit
Right	>	Press it to revise chosen content	Move cursor

### 3.2 AMC2200 Operation

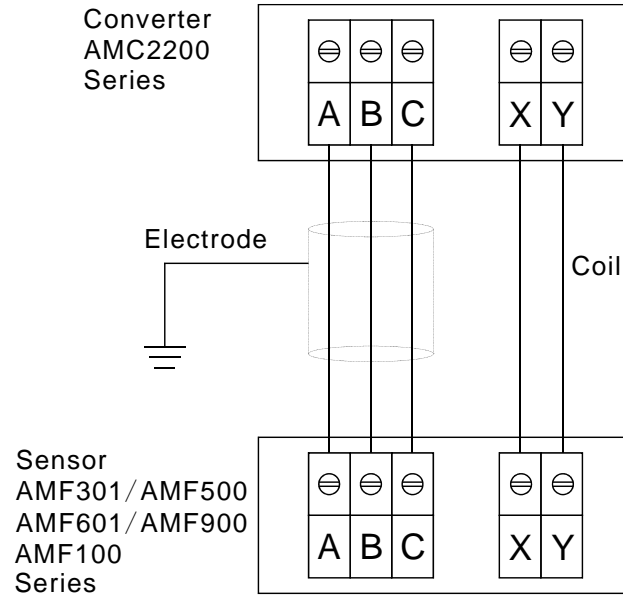
#### 3.2.1 Wiring Diagram of Power and Signal Output (either compact or remote)

Open the 4 screws of the converter, and you can see terminal, decide if you need to connect according to your needs.

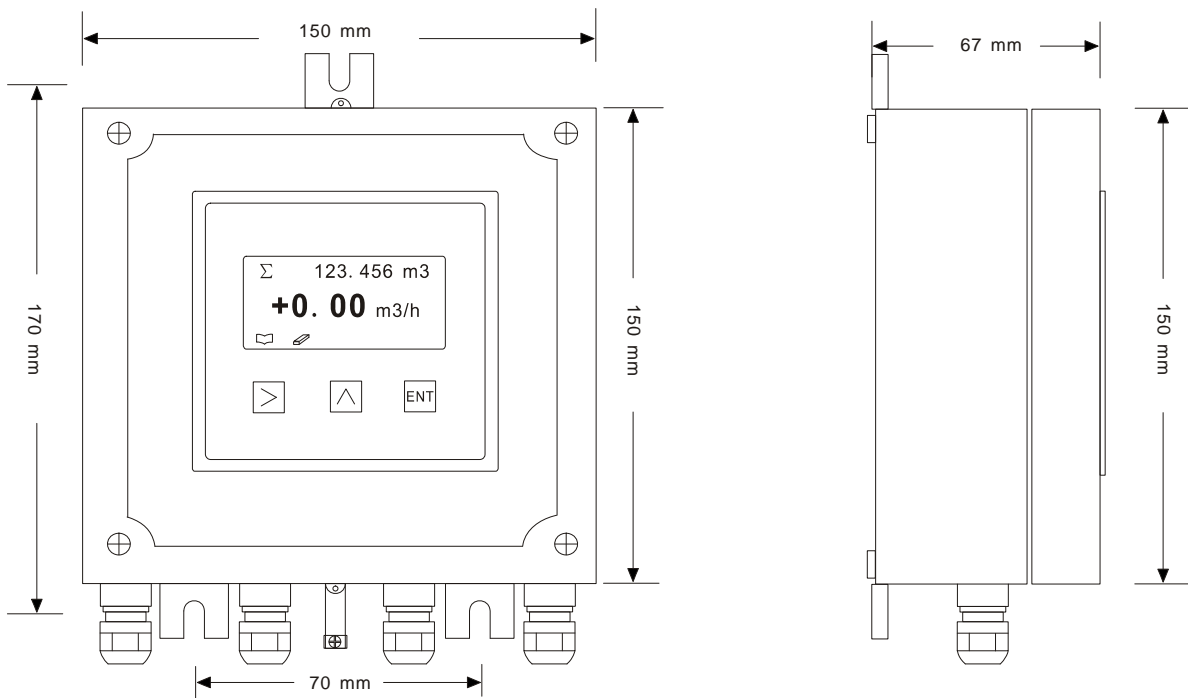


 <p>Max. Output Load: 600 Ω</p>	 <p>Max. Supply Voltage: 30 VDC Max. Current: 50 mA</p>	 <p>Output Voltage: 15 VDC Max. Current: 10 mA</p>	 <p>MODBUS Output</p>
<p>4-20 mA Output (Hart Protocol)</p>	<p>Passive Pulse (Frequency) Output (0-5000 Hz)</p>	<p>Active Pulse (Frequency) Output (0-2000 Hz)</p>	<p>RS485 Output</p>

### 3.2.2 Wiring Diagram for Remote Type



### 3.2.3 AMC2200 Panel & Dimensions

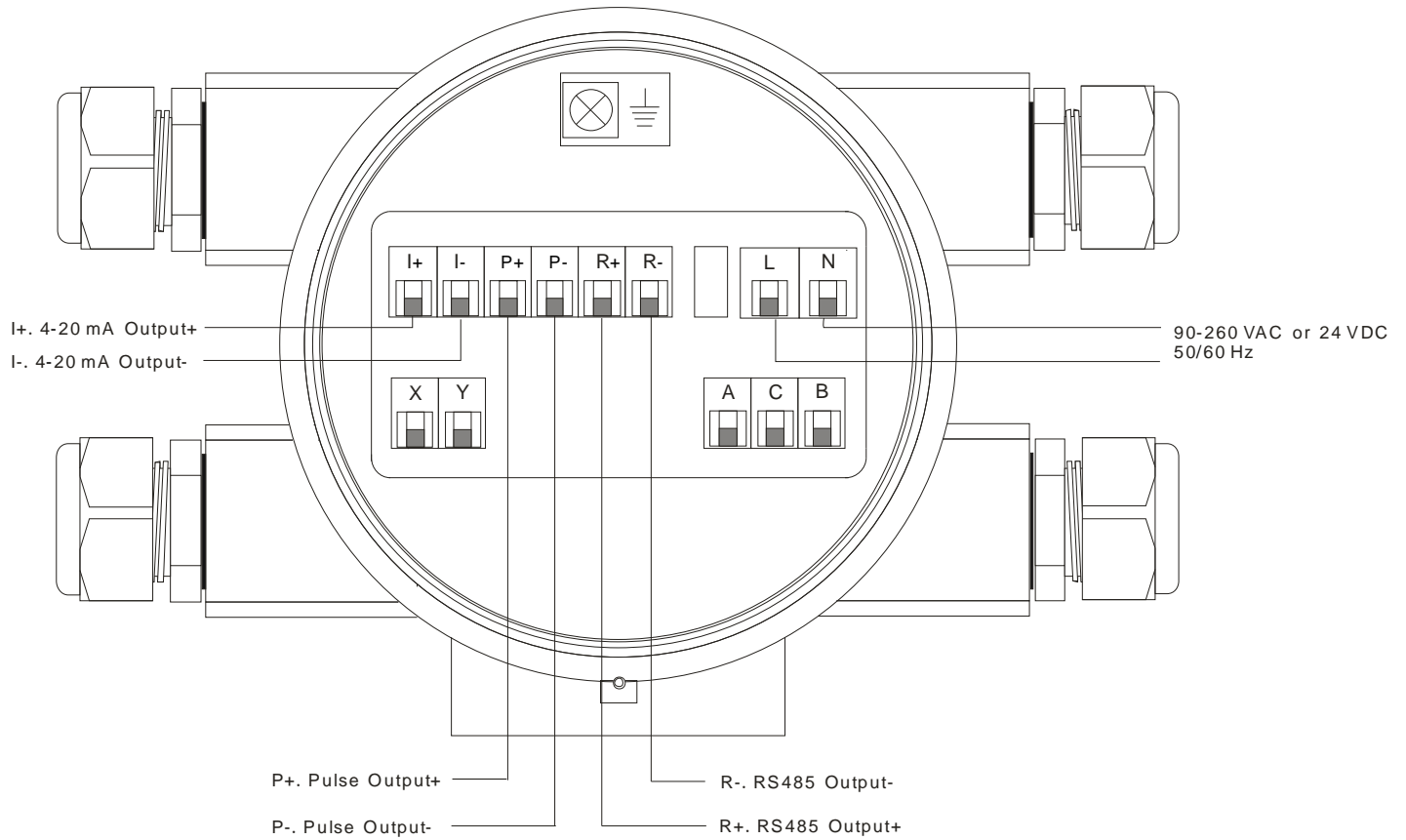


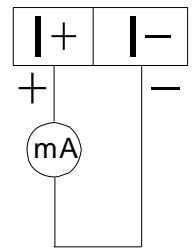
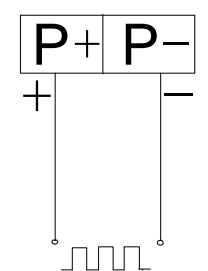
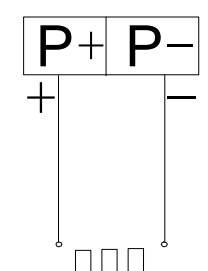
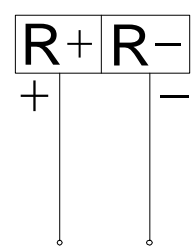
Name	Button	Functions Under Measurement	Functions Under Parameter Settings
Set	ENT	Press it to enter parameter settings mode	Save current settings and shift to next setting interface. Press and hold ENT key for 5 seconds to exit parameter settings and return to measuring interface.
Up	^	Press it to choose one of the four lines in screen	Move cursor up or down; change numerical value, decimal point and unit
Right	>	Press it to revise chosen content	Move cursor

### 3.3 AMC3200 Operation

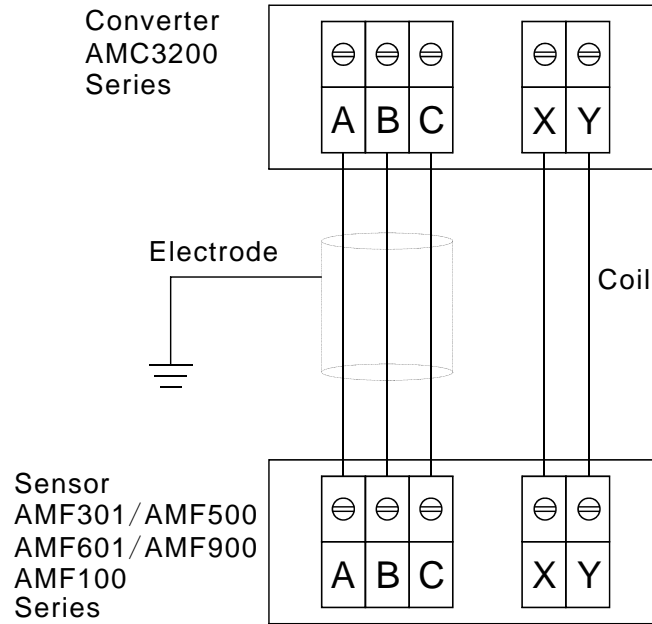
#### 3.3.1 Wiring Diagram of Power and Signal Output (either compact or remote)

Connect terminals one by one when back cover is opened.

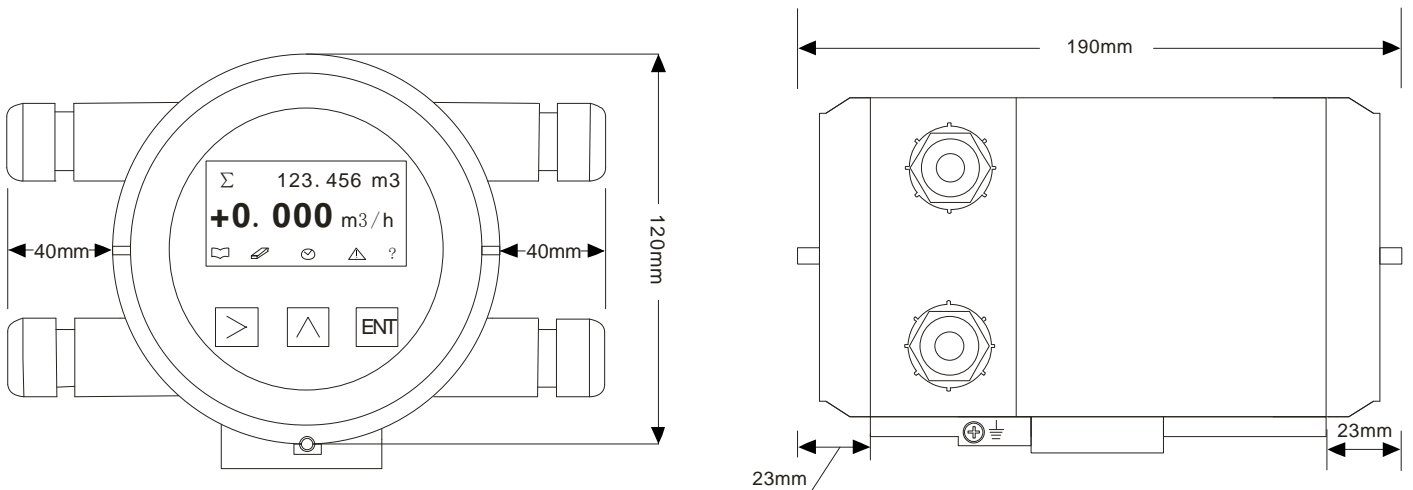


 <p>Max. Output Load: 600 Ω</p>	 <p>Max. Supply Voltage: 30 VDC Max. Current: 50 mA</p>	 <p>Output Voltage: 15 VDC Max. Current: 10 mA</p>	 <p>MODBUS Output</p>
<p>4-20 mA Output (Hart Protocol)</p>	<p>Passive Pulse (Frequency) Output (0-5000 Hz)</p>	<p>Active Pulse (Frequency) Output (0-2000 Hz)</p>	<p>RS485 Output</p>

### 3.3.2 Wiring Diagram for Remote Type



### 3.3.3 AMC3200 Panel & Dimensions



Name	Button	Functions Under Measurement	Functions Under Parameter Settings
Set	ENT	Press it to enter parameter settings mode	Save current settings and shift to next setting interface. Press and hold ENT key for 5 seconds to exit parameter settings and return to measuring interface.
Up	^	Press it to choose one of the four lines in screen	Move cursor up or down; change numerical value, decimal point and unit
Right	>	Press it to revise chosen content	Move cursor

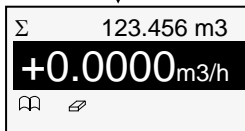
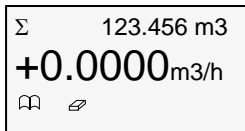
### 3.4 Measurement Mode

Converter will be in normal display when power up. The display contents are as follows:

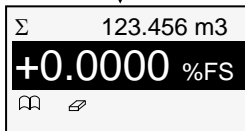
Position	Display	Symbols	Unit	Description
1 <sup>st</sup> Line	Totalizer	$\Sigma$	$m^3$ , L, ml, lgal, gal, Mgal, bbl, ft <sup>3</sup> , a-ft, t, kg, g, lb, ston, lton	$\Sigma = \Sigma+ (-) \Sigma-$
	Positive Totalizer	$\Sigma+$		
	Negative Totalizer	$\Sigma-$		
	Velocity		m/s	Display "-" when flow is reverse.
2 <sup>nd</sup> Line	Velocity		m/s	Display "-" when flow is reverse.
	Flow Rate		$m^3/hr$	Display "-" when flow is reverse.
	%Scale		FS%	Actual flow's scale percentage
	Current		mA	Actual flow's current
	Frequency		Hz	Frequency for full scale: 5000 Hz
	Totalizer	$\Sigma$		$\Sigma = \Sigma+ (-) \Sigma-$

### 3.5 Examples

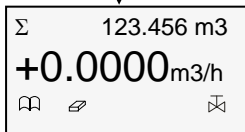
To change the unit  $m^3/hr$  as % in first line, please do as follows.



Under normal display interface, hold  $\Delta$  until number in second line is chosen.



Press  $\square$  to change  $m^3/hr$  as %FS.



If batch control is chosen in Alarm option,  $\boxtimes$  icon will be shown in the main display.

### 3.6 Totalizer Reset

Σ 123.456 m3  
+0.0000 m3/h  
⏏ ⏏

ENT

Σ 123.456 m3  
Σ1 123.450 m3  
Σ2 123.400 m3  
EXIT CLR

ENT

Clear Total  
NO YES

Under normal display interface, press  $\triangleright$  or  $\triangleleft$  key to choose  $\varnothing$  and enter trimming interface.

#### Trimming Window

Σ: present totalizer      Σ1: last totalizer      Σ2: totalizer before last  
Choose CLR to start trimming.

Choose YES and press ENT to confirm.

### 3.7 Zero Trim

If pipe is full and static, Zero Trim can be used to adjust flowmeter to Zero when deviation is produced by ground resistance. Procedures are as follow:

Σ 123.456 m3  
+0.0000 m3/h  
⏏ ⏏

ENT

Password  
2222

ENT

ZERO  
V0: +1.929mV  
V1: -1.929mV  
NO YES

ENT

Zero Trimming ...

ENT

Zero Trimming ...  
-0.624mV

ENT

ZERO  
V0: +0.189mV  
V1: -0.189mV  
NO YES

ENT

Σ 123.456 m3  
+0.0000 m3/h  
⏏ ⏏

Under normal display interface, hold ENT for 5 s and release to enter parameter setting interface.

#### Password

Input password 2222 and press ENT to confirm.

Press  $\triangleright$  or  $\triangleleft$  to choose YES and press ENT to confirm.

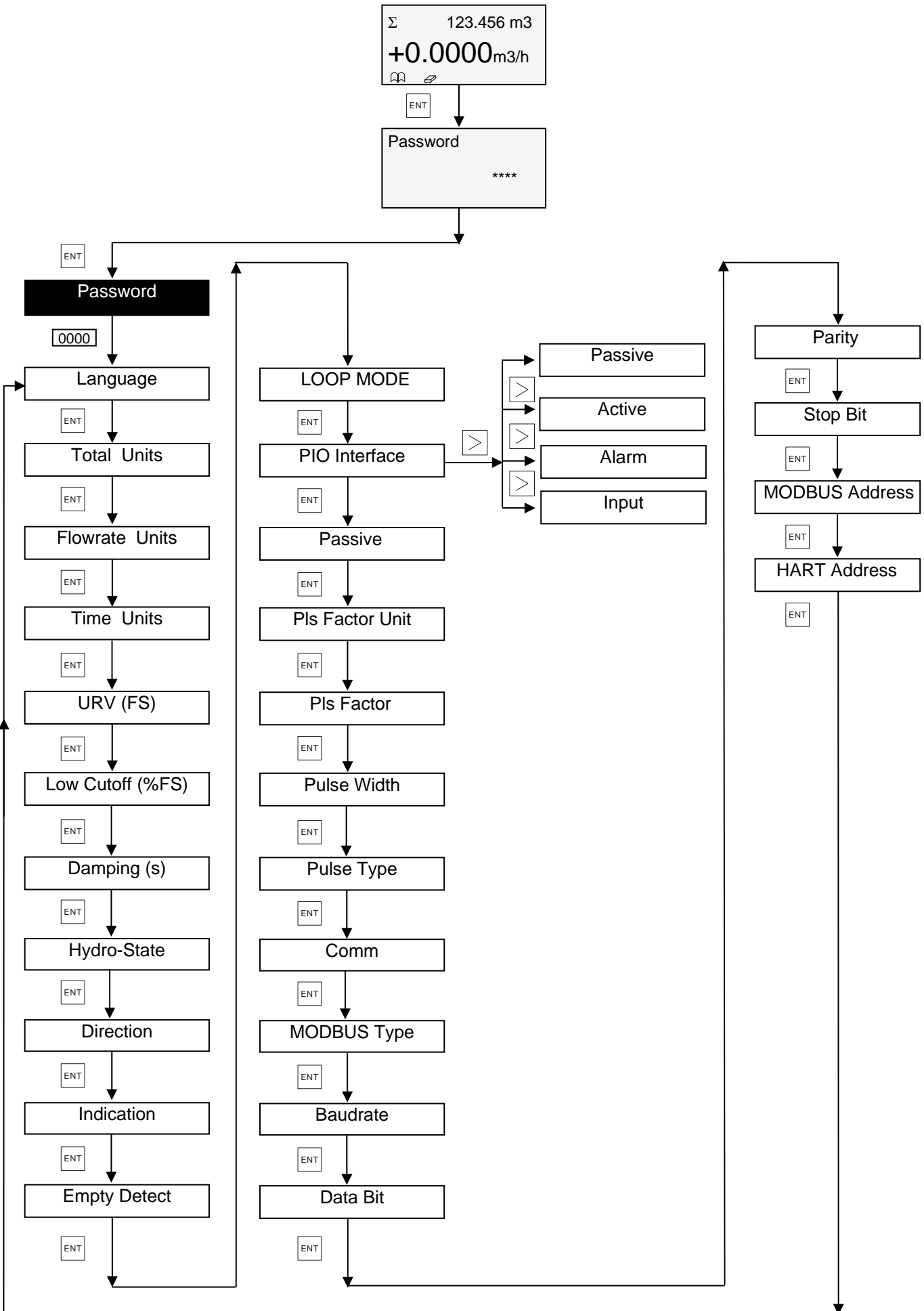
Zero Trimming...

Zero Trimming...

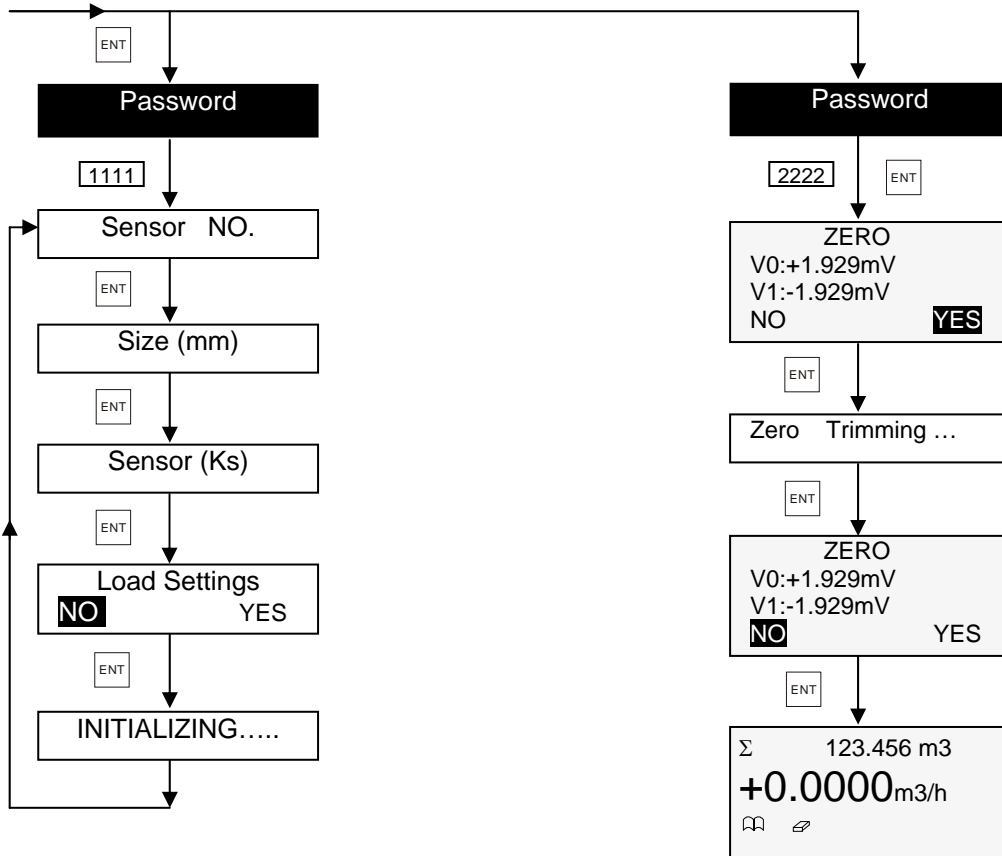
Choose NO and press ENT to return to normal display interface.

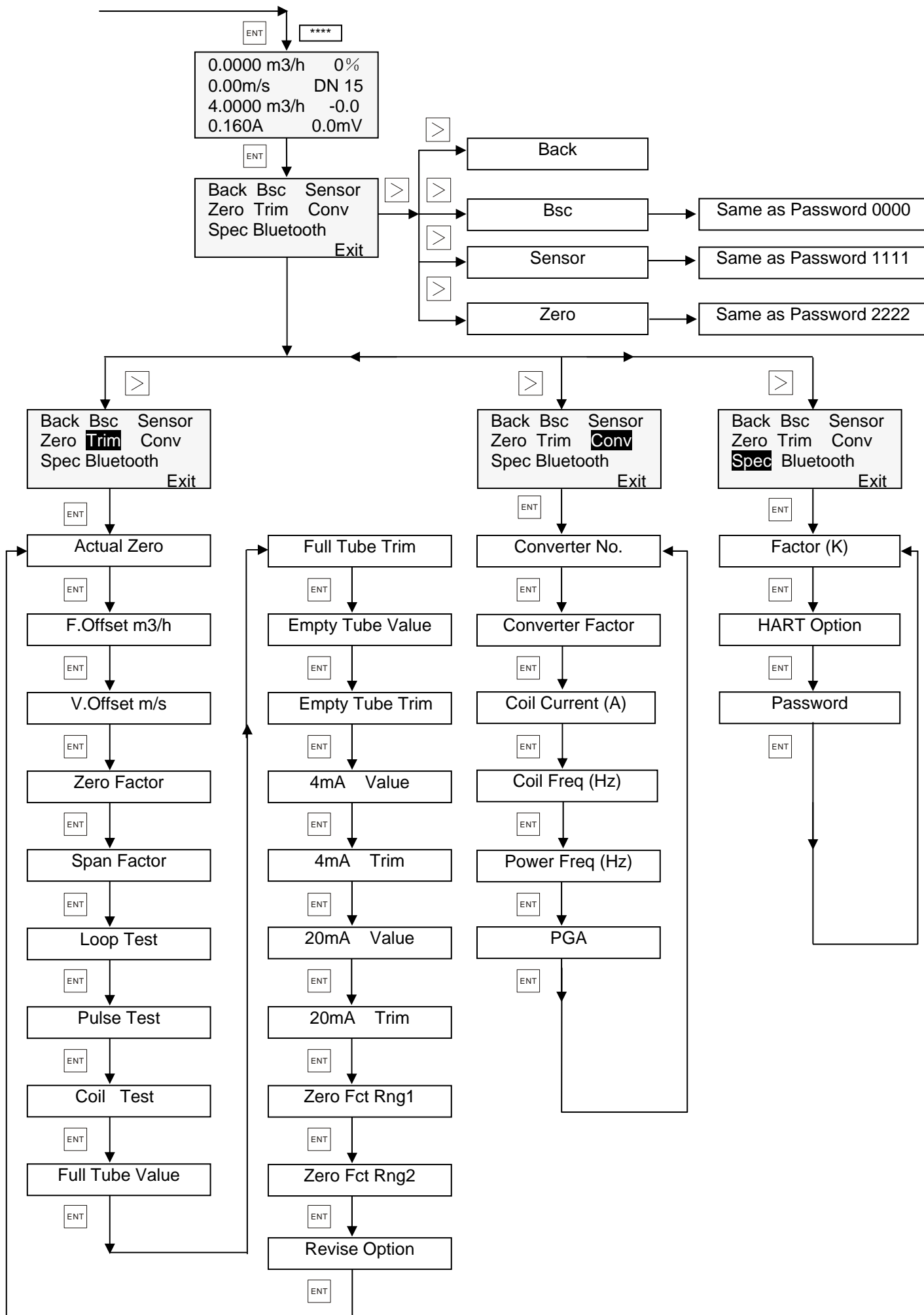
Normal display.

### 3.8 Operational Flowchart









### 3.9 User Operation

Σ 123.456 m3  
**+0.0000**m3/h

ENT

Password  
 0000

ENT

Language  
 简体 **ENGLISH**  
 繁體 ESPAÑOL

ENT

Total Units /h  
**m3** L mL  
 lgal gal Mgal  
 bbl ft3 ...

ENT

Flowrate Units /h  
**m3** L mL  
 lgal gal Mgal  
 bbl ft3 ...

ENT

Time Units m3  
 Sec min  
**hour** day

ENT

URV (FS) m3/h  
 70.0000

ENT

Low Cutoff (%fs)  
 1.0

ENT

Damping (s)  
 01

ENT

Hydro-State  
 Normal **Waved**

Under normal display interface, hold **ENT** for 5s and release to enter parameter setting interface.

**Password**  
 Input password 0000 and press **ENT** to confirm.

**Language**  
 Press **▷** or **◁** to choose language.

**Totalizer Units**  
 Press **▷** or **◁** to choose totalizer units.  
 0: m<sup>3</sup> 1: L 2: mL 3: lgal 4: gal 5: Mgal 6: bbl 7: ft<sup>3</sup> 8: a-ft 9: t  
 10: kg 11: g 12: lb 13: Ston 14: LTon

**Flowrate Units**  
 Press **▷** or **◁** to choose Flowrate units.  
 0: m<sup>3</sup> 1: L 2: mL 3: lgal 4: gal 5: Mgal 6: bbl 7: ft<sup>3</sup> 8: a-ft 9: t  
 10: kg 11: g 12: lb 13: Ston 14: LTon

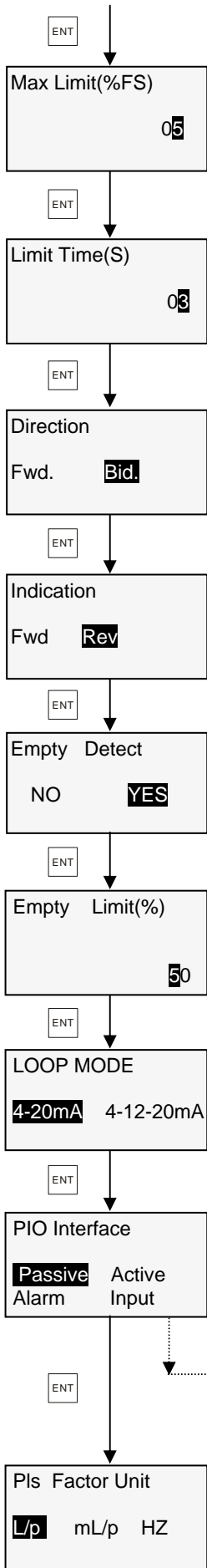
**Time Units**  
 Press **▷** or **◁** to change cursor, and press **ENT** to choose time units.

**Range Limit**  
 Set range limit, namely 4-20 mA. 20 mA corresponds to max. range and max. frequency output.  
 Press **▷** to move cursor, and press **◁** to change value.

**Low Cutoff**  
 Press **▷** to move cursor, press **◁** to change value. Choose proper low cutoff value.  
 Setting limit: 0.0%-9.9%. E.g., flow range is set to 100 m<sup>3</sup>/hr and low cutoff is set to 1%. If flow rate is lower than -1~1 m<sup>3</sup>/hr, it would be cutoff and converter shows 0 flow rate.

**Damping**  
 Press **▷** to move cursor, and press **◁** to change value.  
 Setting limit: 01-99 s, default value is 2 s.  
 You can set damping here when flow rate has a large fluctuation, the greater the damping, the slower the flow rate changes.

**Fluid State**  
 Press **▷** or **◁** to choose fluid state:  
 Normal and Waved.



**Max Limit (%FS)**  
 Press  $\leftarrow$  to move cursor and press  $\rightarrow$  to change value.  
 Range: 0-30% It means the max permitted fluctuation value of flow rate in each Limit Time.  
 If exceed this limit, it will be regarded as interference value.

**Limit Time (s)**  
 Press  $\leftarrow$  to move cursor and press  $\rightarrow$  to change value.  
 It's used to adjust limit time.

**Direction**  
 Press  $\leftarrow$  or  $\rightarrow$  to choose flow direction.  
 1. forward 2. bidirectional

**Indication**  
 Press  $\leftarrow$  or  $\rightarrow$  to choose flow indication.  
 1. forward 2. Reverse

**Empty Detection**  
 Press  $\leftarrow$  or  $\rightarrow$  choose Yes nor No.

**Empty Limit**  
 Press  $\leftarrow$  to move cursor, and press  $\rightarrow$  to change value.

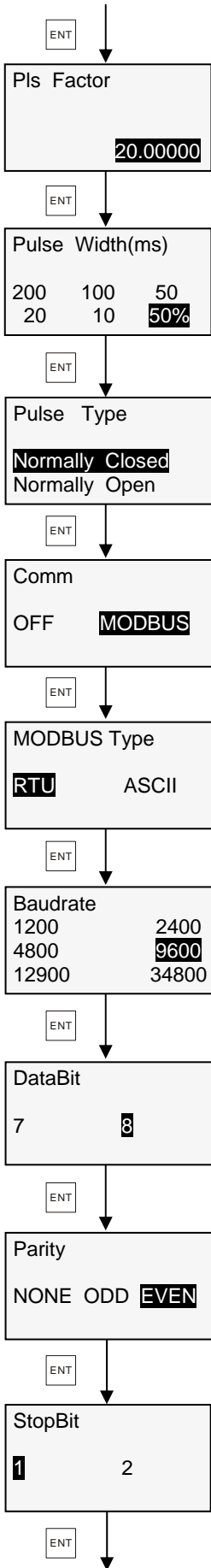
**LOOP MODE**  
 Press  $\leftarrow$  or  $\rightarrow$  to choose current output mode.  
 4-20 mA: the corresponding output flow range is 0-URV, e.g., URV is 50 m<sup>3</sup>/hr, the corresponding flow range is 0-50 m<sup>3</sup>/hr.  
 4-12-20 mA: the corresponding output flow range is -LRV~-0~+URV, e.g., URV is 50 m<sup>3</sup>/hr, the corresponding flow range is -50~-0~50 m<sup>3</sup>/hr.

**PIO Interface**  
 Press  $\leftarrow$  or  $\rightarrow$  to choose output type (P+ P-).  
 1. passive pulse 2. active pulse 3. alarm output 4. contact input

If user want to choose batch control in Alarm option.

Please see page 23 for its details.

**Pulse Factor Unit**  
 Press  $\leftarrow$  or  $\rightarrow$  to choose pulse factor unit.



**Pulse Factor**  
It's the factor of Liter quantity per pulse (Liter / Pulse).  
Press  $\rightarrow$  to move cursor and  $\triangleleft$  to change value.

**Pulse Width**  
Press  $\rightarrow$  or  $\triangleleft$  to choose pulse width.

**Contact Mode**  
Press  $\rightarrow$  or  $\triangleleft$  to choose:  
1. normally closed 2. normally open

**Communication**  
Press  $\rightarrow$  or  $\triangleleft$  to choose communication on or off.

**MODBUS Mode**  
Press  $\rightarrow$  or  $\triangleleft$  choose MODBUS mode.

**Baud Rate**  
Press  $\rightarrow$  or  $\triangleleft$  to choose baud rate.

**Data Bit**  
When MODBUS mode is chosen as RTU, data bit is defaulted as 8.

**Parity**  
Press  $\rightarrow$  or  $\triangleleft$  to choose parity.  
1. None 2. Odd 3. Even

**Stop Bit**  
Press  $\rightarrow$  or  $\triangleleft$  to choose stop bit.  
1. 1 2. 2

MODBUS Address  
001

ENT



HART Address  
00

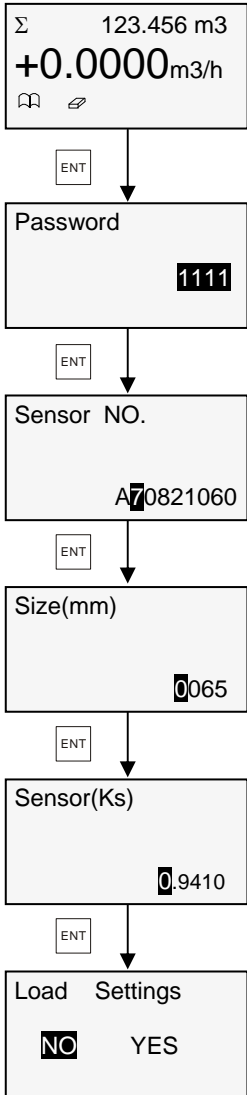
#### MODBUS Address

Press to move cursor, and to change value.  
Setting range: 0-247.

#### HART Address

Press to move cursor and to change address.  
Setting range: 0-15 This option is only available when there is HART function.  
**Press and hold key for 5 seconds, it will return to normal display.**

### 3.10 System Mode



Under normal display interface, hold **ENT** for 5 s and release to enter parameter setting interface.

**Password**  
Input password 1111.

**Sensor No.**  
Press **▶** to move cursor and **▲** to change value.

**Size**  
Press **▶** to move cursor and **▲** to change size. Please enter real size as size influences flow rate.

**Sensor Factor Ks**  
KS is factory calibrated factor, It's not allowed to be changed unless representative / original factory technician.  
Press **▶** to move cursor and **▲** to change value.

**Factory Reset**  
Press **▶** or **▲** to choose Yes or No.  
**Choose NO and hold ENT for 5 s to return to normal display.**

### 3.11 Advanced Mode

#### 3.11.1 Trim Settings

Σ 123.456 m3  
**+0.0000**m3/h

Under normal display interface, hold **ENT** for 5 s and release to enter parameter setting interface.

**ENT**

Password  
 \*\*\*\*

Password  
 Input system password: \*\*\*\*.

**ENT**

0.0000 m3/h 0%  
 0.00m/s DN 15  
 150.00 m3/h 0.46  
 0.160A 0mV

Display Window  
 1. flow rate 2. %range 3. velocity 4. size 5. range 6. zero mV 7. Excitation current 8. gain mV

**ENT**

Back Bsc Sensor  
 Zero **Trim** Conv  
 Spec Bluetooth  
 Exit

Options  
 Press **▷** or **◁** to choose options.  
 1. return 2. basic 3. sensor 4. zero 5. trim 6. converter 7. spec 8. Bluetooth

**ENT**

Back **Bsc** Sensor  
 Zero Trim Conv  
 Spec Bluetooth  
 Exit

See page **User Operation**

**ENT**

Back Bsc **Sensor**  
 Zero Trim Conv  
 Spec Bluetooth  
 Exit

See page **System Mode**

**ENT**

Back Bsc Sensor  
**Zero** Trim Conv  
 Spec Bluetooth  
 Exit

See **Zero Trim**

**ENT**

Actual Zero(mV)  
**+01.9286**

Zero Point  
 Please do not change it as it's the zero point after trimmed.

**ENT**

F.Offset m3/h  
**+0.0000**

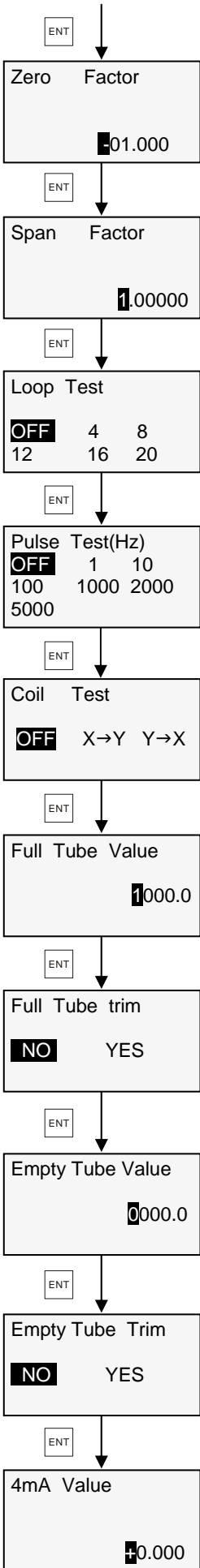
Flow Offset m<sup>3</sup>/hr  
 Press **▷** to move cursor and press **◁** to change value. It's used to correct flow rate.  
 Range: -9.99999~+9.99999 m<sup>3</sup>/hr

**ENT**

V.Offset m/s  
**+0.0000**

Velocity Offset m/s  
 Press **▷** to move cursor and press **◁** to change value. It's used to correct velocity, and flow rate will change with velocity.  
 Range: -1~+1 m/s





**Zero Correction Factor**  
 Press  to move cursor and  to change value. This is used for small flow rate (zero correction range 1 and zero correction range 2).

**Span Correction Factor**  
 Press  to move cursor and  to change value. This is used for linear correction of range. Please do not change it.

**Current Output Test**  
 Press  or  to choose analogue output.  
 OFF . 4 . 8 . 12 . 16 . 20

**Frequency Output Test**  
 Press  or  to choose frequency type.  
 OFF . 1 . 10 . 100 . 1000 . 2000 . 5000

**Excitation Test**  
 Voltage of X->Y/Y->X should be more than 24 VDC / -24 VDC. If less than 24 VDC, converter fails to work normally. Press  or  to choose options.  
 If choose X->Y, voltage will be 24-35 VDC; if Y->X, voltage will be -24~-35 VDC.

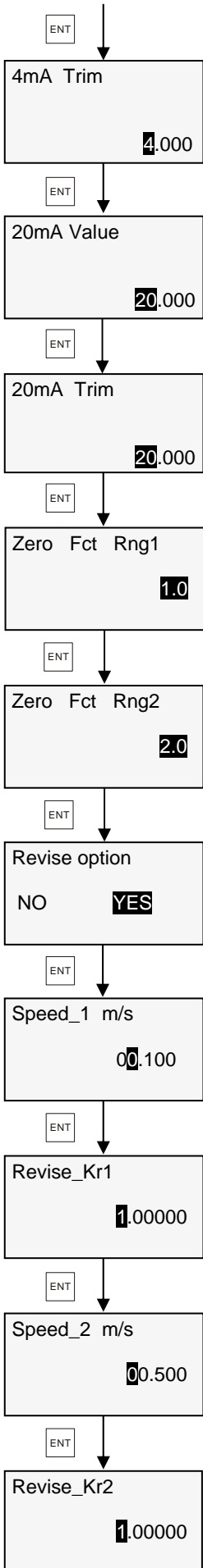
**Full Tube Value**  
 It's not allowed to be changed by anyone unless representative / original factory technician.  
 Press  to move cursor and  to change value.

**Full Tube Trim**  
 Press  or  to choose Yes or Not, do not change it at will.

**Empty Tube Value**  
 It's not allowed to be changed by anyone unless representative / original factory technician.  
 Press  to move cursor and  to change value.

**Empty Tube Trim**  
 Press  or  to choose Yes or No. Do not change it at will.

**4 mA Value**  
 Press  to move cursor and  to change value.  
 If 4 mA value has error, you may enter error to make it accurate. For example: if 4 mA value's error is +0.1 mA, input 0.1 mA in this window to trim 4 mA. Do not change it at will.



**4 mA Trim**  
 Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value.  
 Another way to trim 4 mA value is as follows: when 4 mA is measured as 3.9 mA, input 3.9 mA in this window to trim 4 mA. It's for the same purpose like the window above. Do not change it at will.

**20 mA Value**  
 Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value.  
 Please refer to the way of 4 mA Value, do not change it at will.

**20 mA Trim**  
 Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value. Please refer to the way of 4 mA Trim, do not Change it at will. **Hold ENT for 5 s to return to main window.**

**Zero Correction Range 1 Unit (m/s)**  
 Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value, then press ENT to confirm.  
 It's used to set small flow rate and influenced by zero factor.

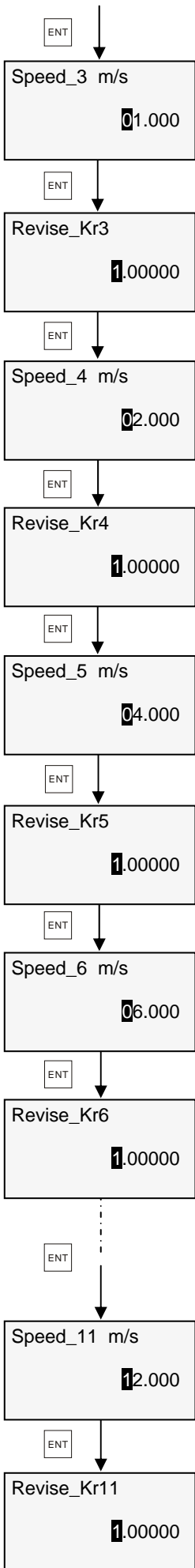
**Zero Correction Range 2 Unit (m/s)**  
 Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value, then press ENT to confirm.  
**Hold ENT for 5 s to return to main window.**

**Linear revision**  
 11point revision is used for trimming accuracy.  
 Choose YES to start linear revision.

**Linear revision**  
 11point revision is used for trimming accuracy.  
 Speed\_1 ~ Speed\_11 are revision velocity points, they can be set for revision.  
 Revise\_1 ~ Revise\_11 are flow factors of Speed\_1 ~ Speed\_11 to trim flow rate.  
 Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value. For operation details, please see example below.  
 Note: accuracy is standard, please do not do linear revision unless it's necessary; or you may contact ALIA technician for help.

**Example 1:** size: 50 mm (2"), calibrated flow rate: 0.5 m<sup>3</sup>/hr, 1 m<sup>3</sup>/hr, 2 m<sup>3</sup>/hr, 4 m<sup>3</sup>/hr  
 Here is the test result for these four points:

	Measure point 1	Measure point 2	Measure point 3	Measure point 4
Actual flowrate	0.5 m <sup>3</sup> /hr	1 m <sup>3</sup> /hr	2 m <sup>3</sup> /hr	4 m <sup>3</sup> /hr
Actual Velocity	0.071 m/s	0.142 m/s	0.283 m/s	0.566 m/s
Flowmeter flowrate	0.530 m <sup>3</sup> /hr	0.983 m <sup>3</sup> /hr	2.046 m <sup>3</sup> /hr	4.176 m <sup>3</sup> /hr
Flowmeter Velocity	0.075 m/s	0.139 m/s	0.289 m/s	0.591 m/s



Error of these four points:

- Point 1:  $0.5 / 0.530 = 0.943$ , new Revise value = 0.943
- Point 2:  $1 / 0.983 = 1.017$ , new Revise value = 1.017
- Point 3:  $2 / 2.046 = 0.978$ , new Revise value = 0.978
- Point 4:  $4 / 4.176 = 0.958$ , new Revise value = 0.958

	1	2	3	4
Speed	0.071	0.142	0.283	0.566
Revise	0.943	1.017	0.978	0.958

Then you have to input the following value:

Speed\_1=0.071, Revise\_1=0.943, Speed\_2=0.142, Revise\_2=1.017  
 Speed\_3=0.283, Revise\_3=0.978, Speed\_4=0.566, Revise\_4=0.958

After those inputs above, please do NOT change the following values:

Revise\_5, Revise\_6, Revise\_7, Revise\_8, Revise\_9, Revise\_10, Revise\_11,  
 Speed\_5, Speed\_6, Speed\_7, Speed\_8, Speed\_9, Speed\_10, Speed\_11.

**Example 2:** Size: 500 mm (20"), for example if a calibrated flow rate is 4000 m<sup>3</sup>/hr

Actual flow rate 4000 m<sup>3</sup>/hr, actual flow velocity 5.66 m/s,

Display flow rate 4012 m<sup>3</sup>/hr, display flow rate 5.677 m/s.

New Revise=4000/4012=0.997

As 5.66 m/s is between Revise\_5 (4 m/s) and Revise\_6 (6 m/s),  
 you may set as below:

Speed\_5=5.66, Revise\_5=0.997, Speed\_6 and Revise\_6: no change.

Or Speed\_6=5.66, Revise\_6=0.997, Speed\_5 and Revise\_5: no change.

### 3.11.2 Converter Settings

Back Bsc Sensor  
Zero Trim **Conv**  
Spec Bluetooth  
Exit

ENT

Converter NO.  
A0000000

ENT

Converter Factor  
0.35000

ENT

Coil current(A)  
0.1620

ENT

Coil Freq(Hz)  
3.125 6.25  
12.5 25

ENT

Power Freq(Hz)  
50HZ 60Hz

ENT

PGA  
x1. x2. x4. x8.

#### Converter

Press  $\leftarrow$  or  $\rightarrow$  to choose options and press ENT to enter chosen parameter settings.

#### Converter No.

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value; do not change it at will.

#### Converter Factor Kc

Kc is the calibration value of full tube. It's not allowed to be changed by anyone unless Representative / original factory technician.

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value.

#### Excitation Current Ic (A)

Ic is the factory calibration current, It's not allowed to be changed by anyone unless Representative / original factory technician.

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value.

#### Coil Frequency (Hz)

Press  $\leftarrow$  or  $\rightarrow$  to choose coil frequency, default value: 6.25.

#### Power Frequency (Hz)

Press  $\leftarrow$  or  $\rightarrow$  to choose power frequency.

#### Gain Settings

Press  $\leftarrow$  or  $\rightarrow$  to choose Gain Settings.

**Hold ENT for 5 s to return to main window.**

### 3.11.3 Special

Back Bsc Sensor  
Zero Trim Conv  
Spec Bluetooth  
Exit

ENT

Factor(K)  
0.9410

ENT

HART Option  
Disable Enable

ENT

Password  
0000

#### Spec

Press  $\leftarrow$  or  $\rightarrow$  to choose special option and press  $\text{ENT}$  to enter settings.

#### Factor (K)

This factor is the reciprocal value of sensor factor Ks. It's the factory calibration value. It's not allowed to be changed by anyone unless representative / original factory technician.

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value.

#### HART Function

Press  $\leftarrow$  or  $\rightarrow$  to enable or disable HART function, and then press  $\text{ENT}$  to confirm.

#### Password

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value. Press  $\text{ENT}$  to confirm. This is used to set HART communication password. **Hold  $\text{ENT}$  for 5 s to return to main window.**

### 3.11.4 Bluetooth Settings

Back Bsc Sensor  
Zero Trim Conv  
Spec Bluetooth  
Exit

ENT

BT Password  
0000

ENT

BT Name  
ALIA0000000000

ENT

BT Password  
0000

ENT

Back Bsc Sensor  
Zero Trim Conv  
Spec Bluetooth  
Exit

#### Bluetooth

Press  $\leftarrow$  or  $\rightarrow$  to choose Bluetooth option and press  $\text{ENT}$  to enter settings.

#### Bluetooth Password

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value. Press  $\text{ENT}$  to confirm. This is used to change Bluetooth password between converter and Bluetooth app. Do not change it at will.

#### Bluetooth Name

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change Bluetooth name. Press  $\text{ENT}$  to confirm. The modified Bluetooth name will take effect when the converter is powered on again.

#### Bluetooth Password

Press  $\leftarrow$  to move cursor and  $\rightarrow$  to change value. Press  $\text{ENT}$  to confirm. This is used to change Bluetooth password between converter and Bluetooth app. Do not change it at will.

**Hold  $\text{ENT}$  for 5 s to return to main window.**

#### Exit

Choose cursor to exit.

### 3.12 Batch Control

Σ 123.456 m3  
**+0.0000**m3/h

ENT

Password  
**0000**

ENT

Language  
 简体 **ENGLISH**  
 繁體 ESPAÑOL

ENT

Total Units /h  
**m<sup>3</sup>** L mL  
 lgal gal Mgal  
 bbl ft3 ...

ENT

Flowrate Units /h  
**m<sup>3</sup>** L mL  
 lgal gal Mgal  
 bbl ft3 ...

ENT

Time Units m3  
 Sec min  
**hour** day

ENT

URV (FS) m3/h  
**70.0000**

ENT

Low Cutoff (%fs)  
**1.0**

ENT

Damping (s)  
**01**

ENT

Hydro-State  
 Normal **Waved**

Under normal display interface, hold **ENT** for 5 s and release to enter parameter setting interface.

#### Password

Input password 0000 and press **ENT** to confirm.

#### Language

Press **▷** or **◁** to choose language.

#### Totalizer Units

Press **▷** or **◁** to choose totalizer units.

0: m<sup>3</sup> 1: L 2: mL 3: lgal 4: gal 5: Mgal 6: bbl 7: ft<sup>3</sup> 8: a-ft 9: t  
 10: kg 11: g 12: lb 13: Ston 14: LTon

#### Flowrate Units

Press **▷** or **◁** to choose Flowrate units.

0: m<sup>3</sup> 1: L 2: mL 3: lgal 4: gal 5: Mgal 6: bbl 7: ft<sup>3</sup> 8: a-ft 9: t  
 10: kg 11: g 12: lb 13: Ston 14: LTon

#### Time Units

Press **▷** or **◁** to change cursor, and press **ENT** to choose time units.

#### Range Limit

Set range limit, namely 4-20 mA. 20 mA corresponds to max. range and max. frequency output. Press **▷** to move cursor, and press **◁** to change value.

#### Low Cutoff

Press **▷** to move cursor, press **◁** to change value. Choose proper low cutoff value.

Setting limit: 0.0%-9.9%. E.g., flow range is set to 100 m<sup>3</sup>/hr and low cutoff is set to 1%. If flow rate is lower than -1 ~ +1 m<sup>3</sup>/hr, it would be cutoff and converter shows 0 flow rate.

#### Damping

Press **▷** to move cursor, and press **◁** to change value.

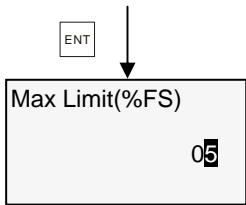
Setting limit: 01-99 s, default value is 2 s.

You can set damping here when flow rate has a large fluctuation, the greater the damping, the slower the flow rate changes.

#### Fluid State

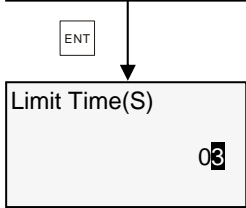
Press **▷** or **◁** to choose fluid state:

Normal and Waved.



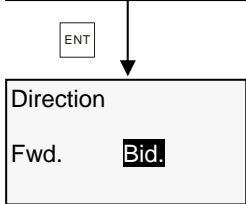
### Max Limit (%FS)

Press  $\leftarrow$  to move cursor and press  $\rightarrow$  to change value.  
 Range: 0-30% It means the max permitted fluctuation value of flow rate in each Limit Time.  
 If exceed this limit, it will be regarded as interference value.



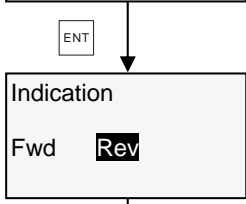
### Limit Time (s)

Press  $\leftarrow$  to move cursor and press  $\rightarrow$  to change value.  
 It's used to adjust limit time.



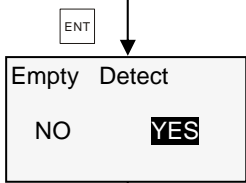
### Direction

Press  $\leftarrow$  or  $\rightarrow$  to choose flow direction.  
 1. Forward 2. Bidirectional



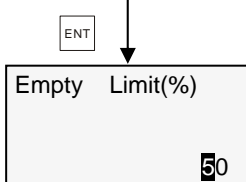
### Indication

Press  $\leftarrow$  or  $\rightarrow$  to choose flow indication.  
 1. Forward 2. Reverse



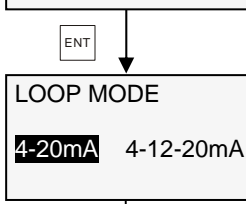
### Empty Detection

Press  $\leftarrow$  or  $\rightarrow$  choose Yes nor No.



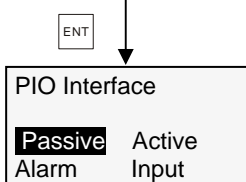
### Empty Limit

Press  $\leftarrow$  to move cursor, and press  $\rightarrow$  to change value.



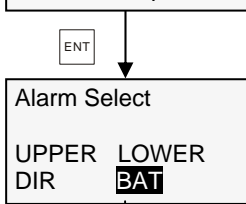
### LOOP MODE

Press  $\leftarrow$  or  $\rightarrow$  to choose current output mode.  
 4-20 mA: the corresponding output flow range is 0-URV, e.g., URV is 50 m<sup>3</sup>/hr, the corresponding flow range is 0-50 m<sup>3</sup>/hr.  
 4-12-20 mA: the corresponding output flow range is -LRV~0~+URV, e.g., URV is 50 m<sup>3</sup>/hr, the corresponding flow range is -50~0~50 m<sup>3</sup>/hr.



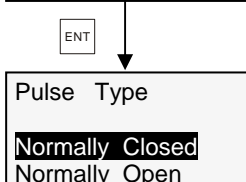
### PIO Interface

Press  $\leftarrow$  or  $\rightarrow$  to choose output type (P+ P-).  
 1. passive pulse 2. active pulse 3. alarm output 4. contact input



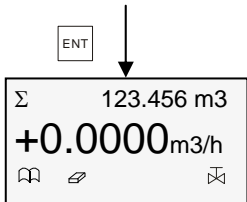
### Alarm Selection

Press  $\leftarrow$  or  $\rightarrow$  to choose "BAT".  
 1. Upper limit 2. Lower limit 3. Direction 4. Batch Control

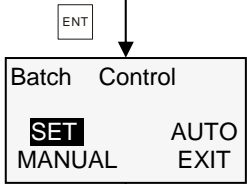


### Contact Mode

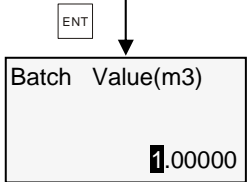
Press  $\leftarrow$  or  $\rightarrow$  to choose:  
 1. normally closed 2. normally open  
**Hold ENT for 5 s to return to normal display.**



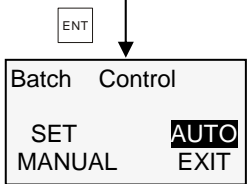
Press  $\rightarrow$  or  $\leftarrow$  to choose  $\boxtimes$  and then enter batch control.



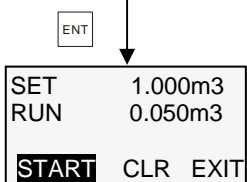
Batch Control  
Press  $\rightarrow$  or  $\leftarrow$  to choose SET option.



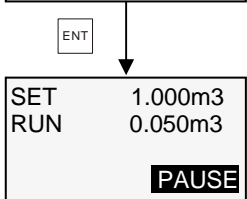
Batch Value (m<sup>3</sup>)  
Press  $\rightarrow$  to move cursor and  $\leftarrow$  to change value.



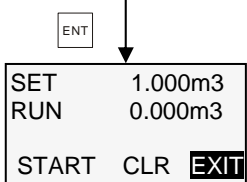
Batch Control  
Press  $\rightarrow$  or  $\leftarrow$  to choose MANUAL or AUTO mode.



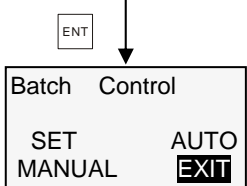
Batch Control  
Press  $\rightarrow$  or  $\leftarrow$  to choose START option.  
If choose CLR, actual flow rate will be cleared to zero.



Batch Control  
Press ENT to stop flow measuring.



Batch Control  
Choose START to continue the measuring that is suspended last time.  
Exit batch control.



Batch Control  
Press  $\rightarrow$  or  $\leftarrow$  to choose EXIT.  
Press ENT to return to normal display interface.

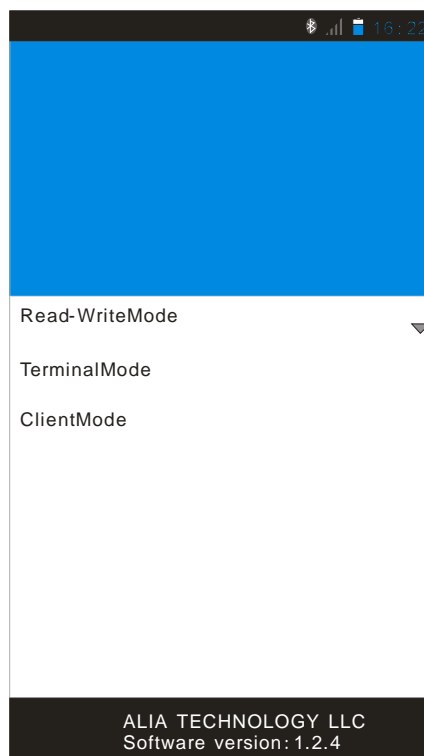


#### 4. AMC2200 and AMC3200 APP Software

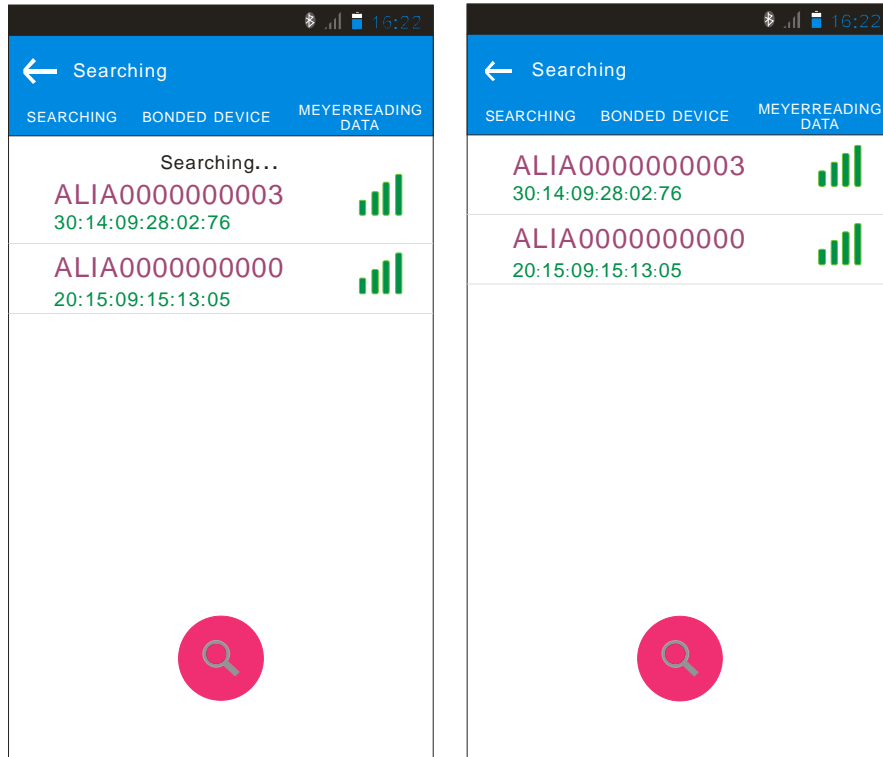
1. AMC2200 and AMC3200 converter and android phone (should be android system)
2. Operation procedures
  - ① Install the app on cell phone (android)
  - ② Enable Bluetooth after app is successfully installed.
  - ③ Enter the app as shown below:



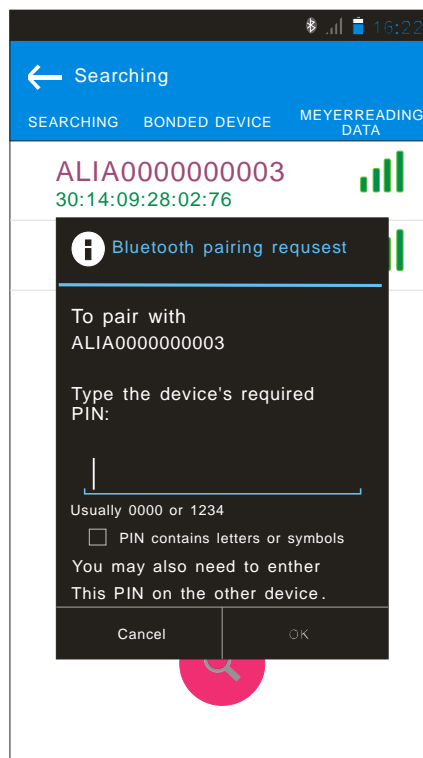
- ④ Three modes available:
  - Read-write mode: read and write any parameters in converter (default mode). If enter the wrong Bluetooth password, you will be prompted to enter in read-only mode.
  - Terminal mode: Use PC software to realize remote monitoring through IP address.
  - Client mode: Use APP to realize remote monitoring through IP address.



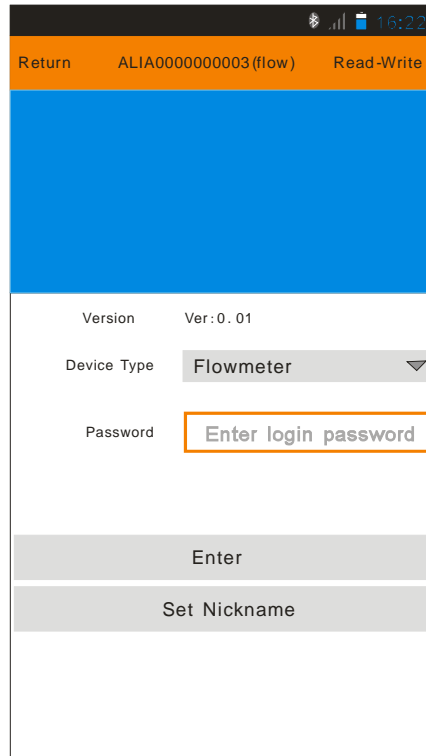
- ⑤ If parameters are to be changed, please choose read-write mode and then choose login. Cell phone will search device automatically. See pictures below.



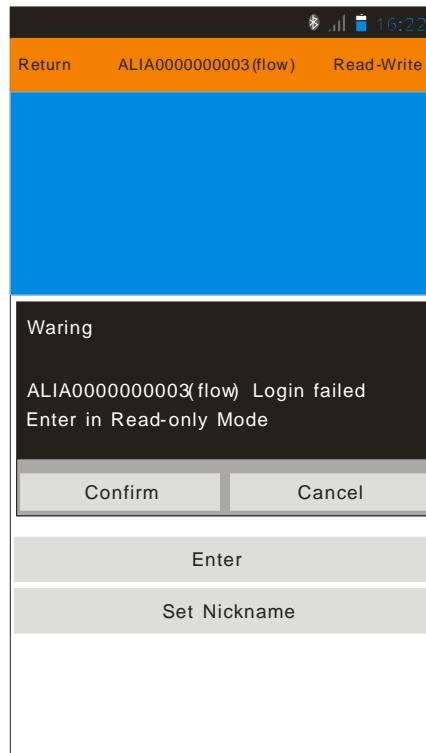
- ⑥ After converter's name is searched (such as ALIA0000000003), press it and enter PIN code 1234. This code is the Bluetooth identification between cell phone and converter and needs to be entered every time they connect. You don't have to enter the code if this interface does not appear. See picture below.



- ⑦ After entering system, you will see Bluetooth name in the middle of upper interface, mode in upper right interface, flowmeter version, password and nickname in bottom interface.  
Set Nickname: you can set a nickname for AMC, and this won't change the Bluetooth name. The nickname will be displayed only after Bluetooth name. For example, if you set AMC's nickname as "flow", the Bluetooth name will become ALIA0000000003 (flow). See picture below:



- ⑧ Only the input password is conformed to Bluetooth password can parameters be changed. Password is defaulted to be 0000. If you forget your password, please enter Bluetooth option of advanced settings in converter to check the Bluetooth password. If password is input wrong in APP, it will give a warning to enter read-only mode. See picture below:

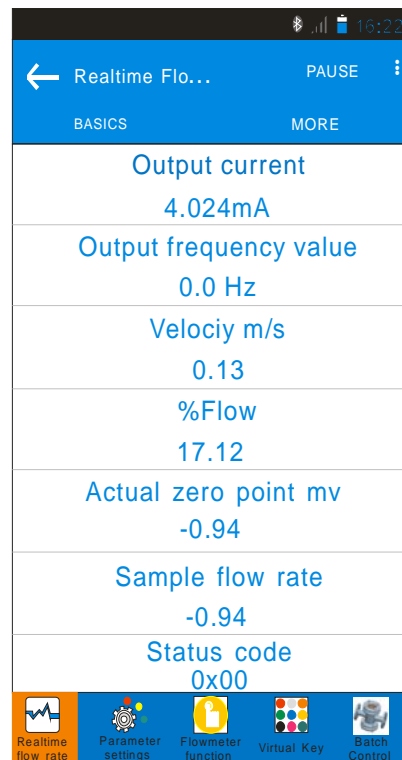
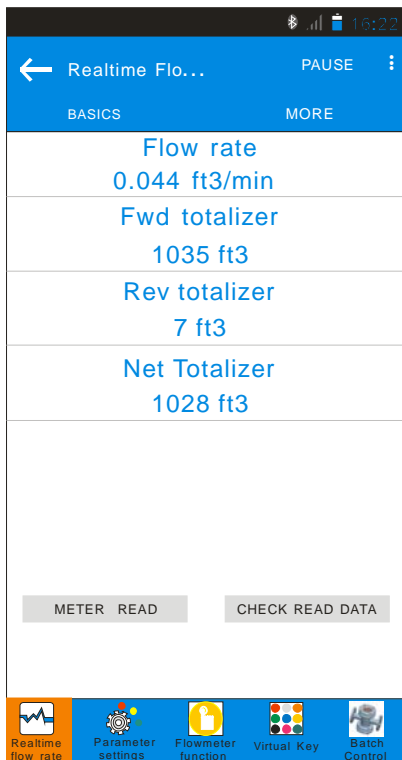


⑨ Once Bluetooth password is conformed, system will be as below:

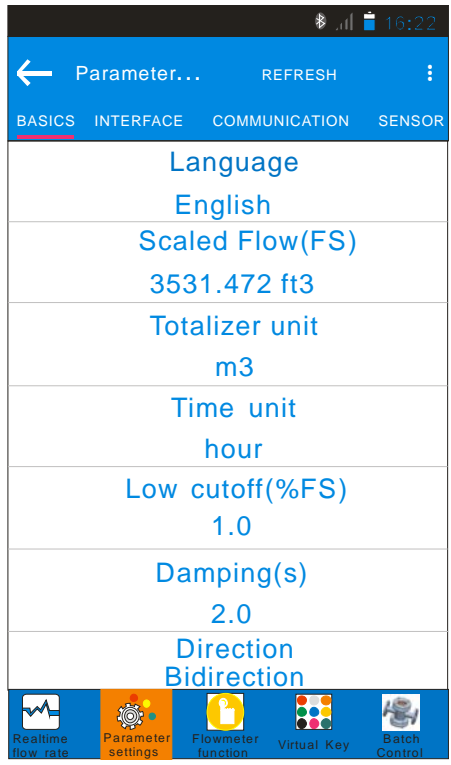


⑩ Menu (7 functions in bottom screen)

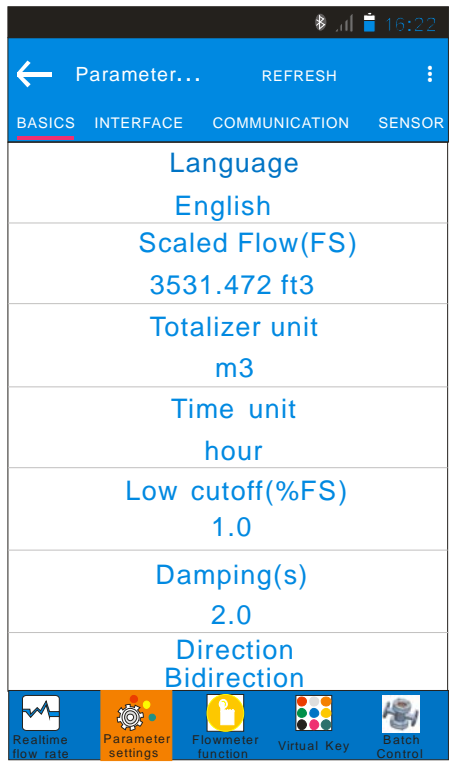
First function: Real-time flow rate. Slide to the left / right to shift interface so as to check real-time flow rate such as totalizer, flow rate, output current and output frequency. Data can be shared to your email or software through its billing function.



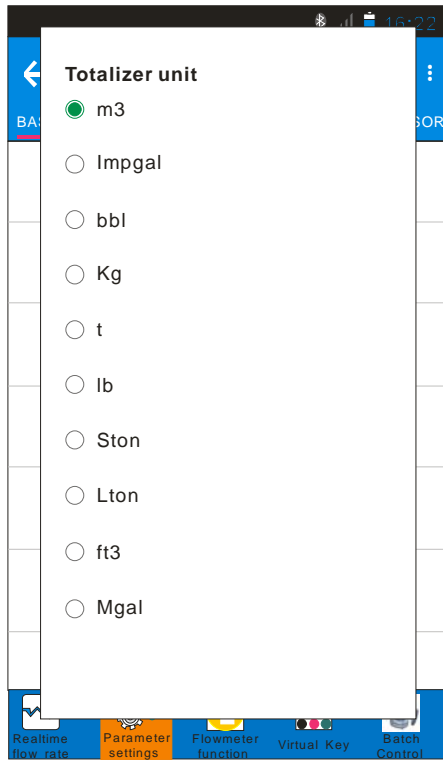
Second function: Parameter settings. 5 options inside: basics, interface, communication, sensor and converter. Or user can slide the screen to left / right to shift these options.



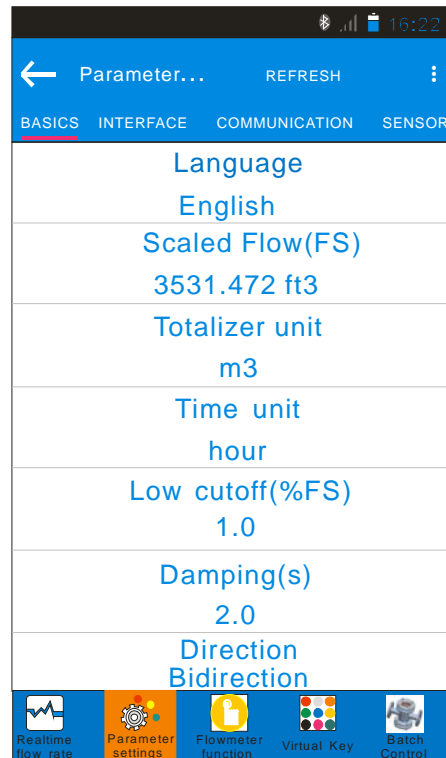
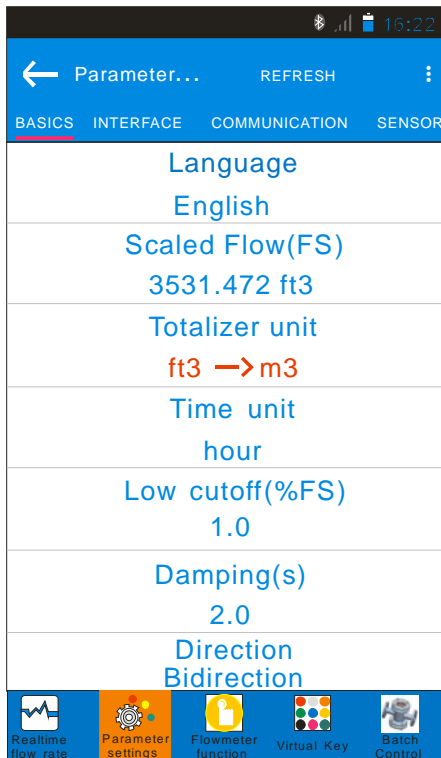
A. For example, if totalizer unit  $\text{ft}^3$  is to be changed to  $\text{m}^3$ :



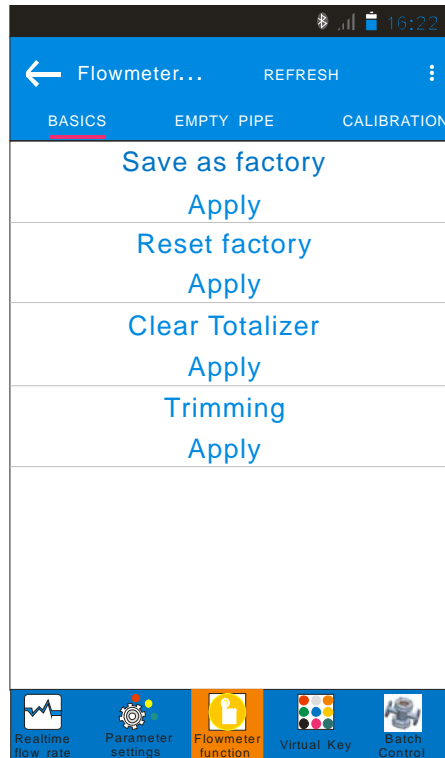
B. Press the column of "Totalizer unit" and change unit to m<sup>3</sup>:



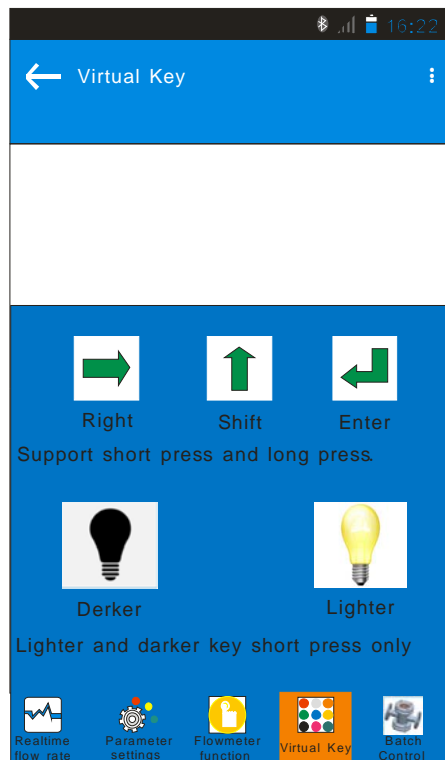
C. After pressing "confirm", screen will be shown as below. The unit before arrow is current unit while after is the changed m<sup>3</sup>. Click "set" to finish settings.



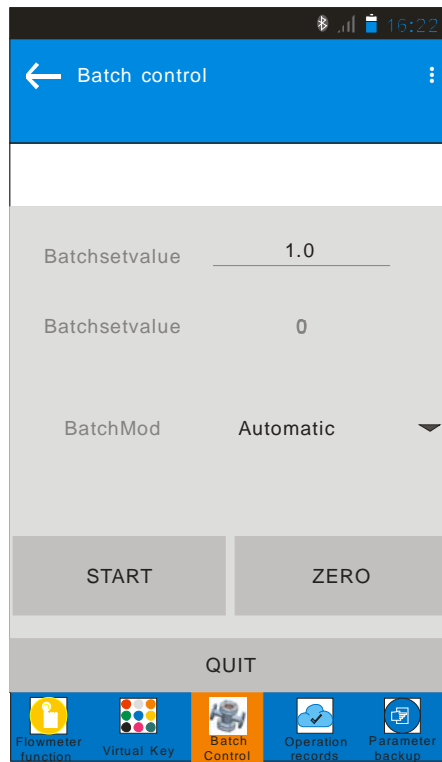
Third function: Flowmeter function. 3 options inside: Basics, Empty Pipe and Calibration. You can slide screen to the left / right to shift interface.



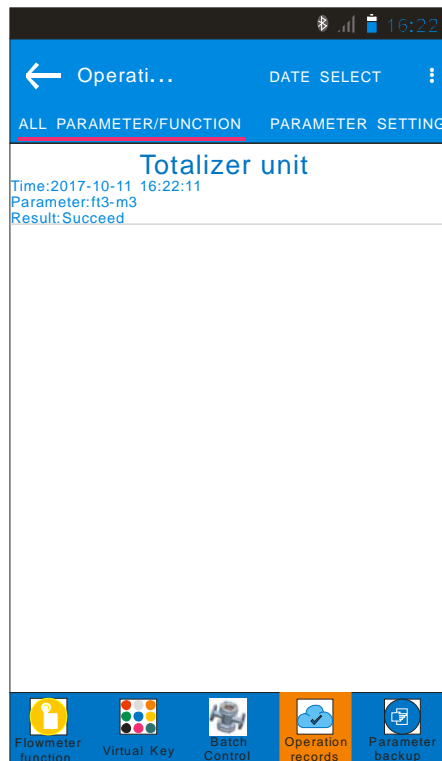
Fourth function: Virtual keys. 3 virtual keys and 3 keys on converter have the same functionality.



Fifth function: Batch control. You can set batch control here when converter is set to batch control.

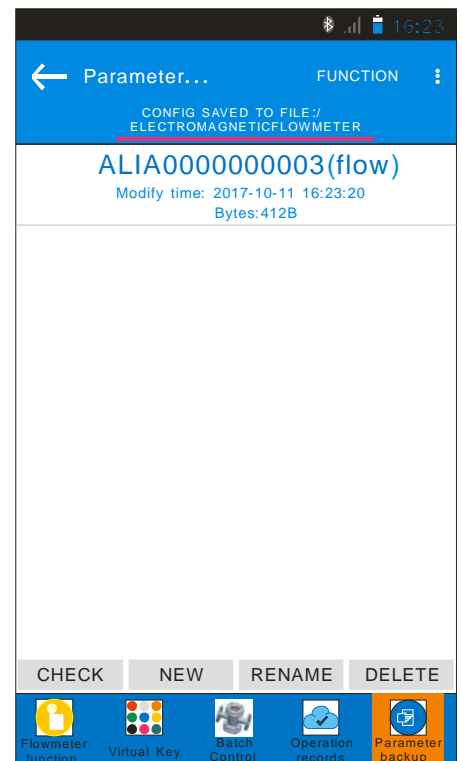
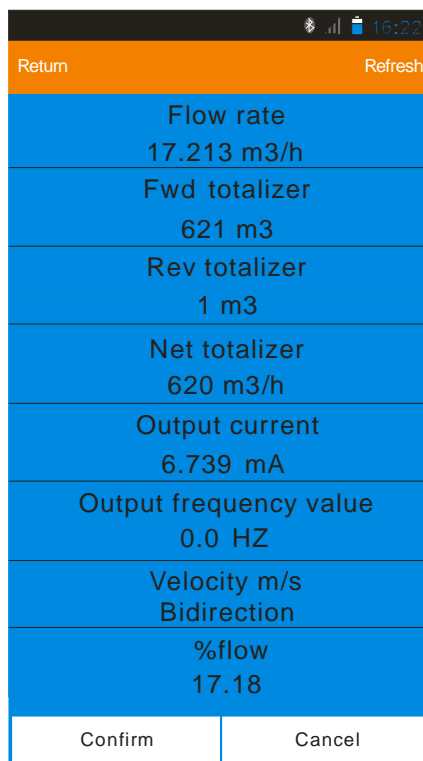
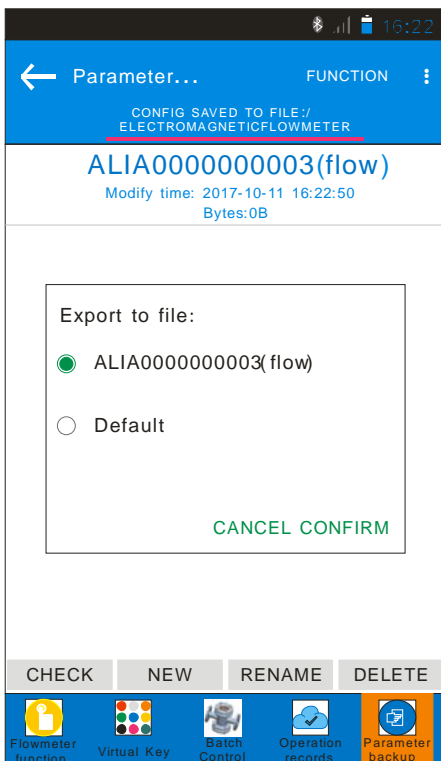
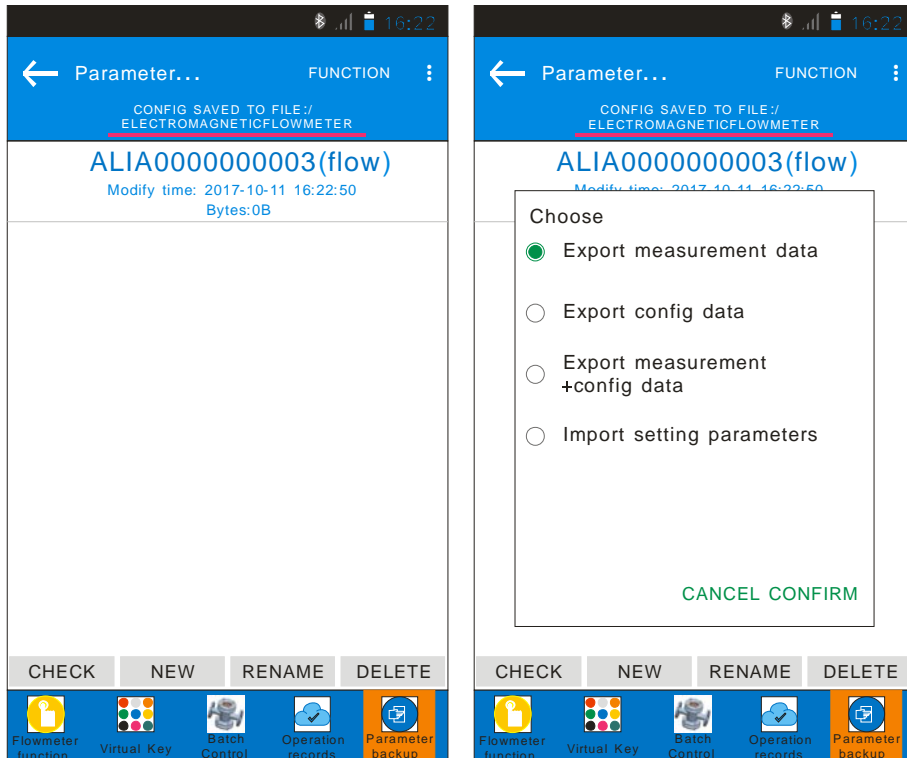


Sixth function: Operation records.





Seventh function: Parameter backup. Recreate a file and rename it. Press "Function" in upper part to choose: export measurement data, export config data, export measurement config data and import setting parameters.



## 5. Common Alarm Code

AMC3200 / AMC2100 Alarm Table			
Code	Content	Meaning	Solution
2	Overflow	Over range	Increase range
4	Over upper limit	More than setting upper limit	Turn off alarm output or increase alarm upper limit
6	Overflow, over upper limit	More than setting upper limit Over range	Increase range Turn off alarm output or increase alarm upper limit
8	Over low limit	Less than setting low limit	Turn off alarm output or decrease alarm low limit
10	Overflow, over low limit	Over range Less than setting low limit	Increase range Turn off alarm output or decrease alarm low limit
16	Empty pipe	Empty pipe alarm	Please check pipe and make sure it's full
128	Storage	EEPROM fault	Internal storage malfunctioned, send CPU board to ALIA for repair

AMC2200 Alarm Table			
Code	Content	Meaning	Solution
2	Scale	Over range	Increase range
4	High flowing	More than setting upper limit	Turn off alarm output or increase alarm upper limit
8	low flowing	Less than setting low limit	Turn off alarm output or decrease alarm low limit
10	Tube empty	Empty pipe alarm	Please check pipe and make sure it's full
80	Storage broken	EEPROM fault	Internal storage malfunctioned, send CPU board to ALIA for repair

## 6. AMC2200 and AMC3200 APP Download Link

Link 1: scan QR code to download.




Link 2: click the following link to download:  
[http://www.alia-inc.net/download/alia/amc3200/alia\\_AMC3200.apk](http://www.alia-inc.net/download/alia/amc3200/alia_AMC3200.apk)



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