ALIA VTX

Vortex Flowmeter

AVF7000 Series

Operator Manual

CE

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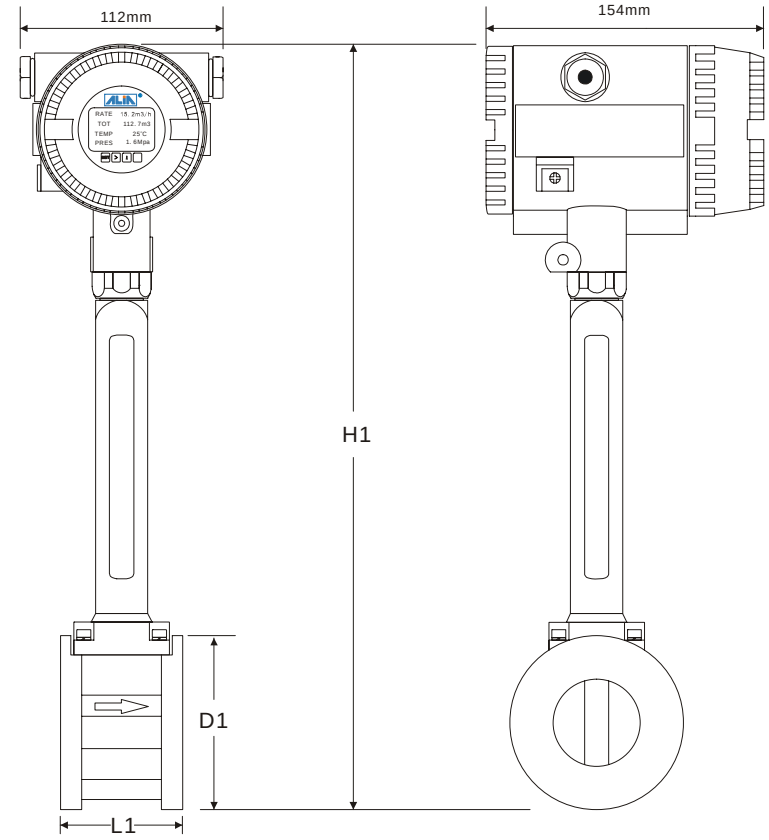
1. Flowmeter Check

A. First check the package if it is good or damage, if broken hard you should notify the meter transport department or contact the customer service center of Alia immediately
B. Open the package and check for meter and all parts attachment if it is good or damage and shortage
C. Read the operating instruction in detail and comprehends all contents, if any part of that you do not understand full, fax technical service department of Alia
D. Make sure that the specification of the meter you received is conformed to the operating condition
E. Power on the meter in house, observe the LCD display if it is on normal
F. Select proper meter install site, make sure to meet the installing condition
G. Meter be moved to the field and be mounted on the pipe according to the installing requirements
H. Wiring the power cable, special to care of the shield braid of the cable connected to the grounding terminal of the converter.
I. Power on the meter in field, first observe if there is any leakage around the meter (care of the personal safety), then the display if it appears any changes of transient flow rate, if it is not, check it as step above carefully, particular to the wiring, power supply, shield braid grounding, the specification of the meter and meter surrounding, or contact technical service center of local agency.

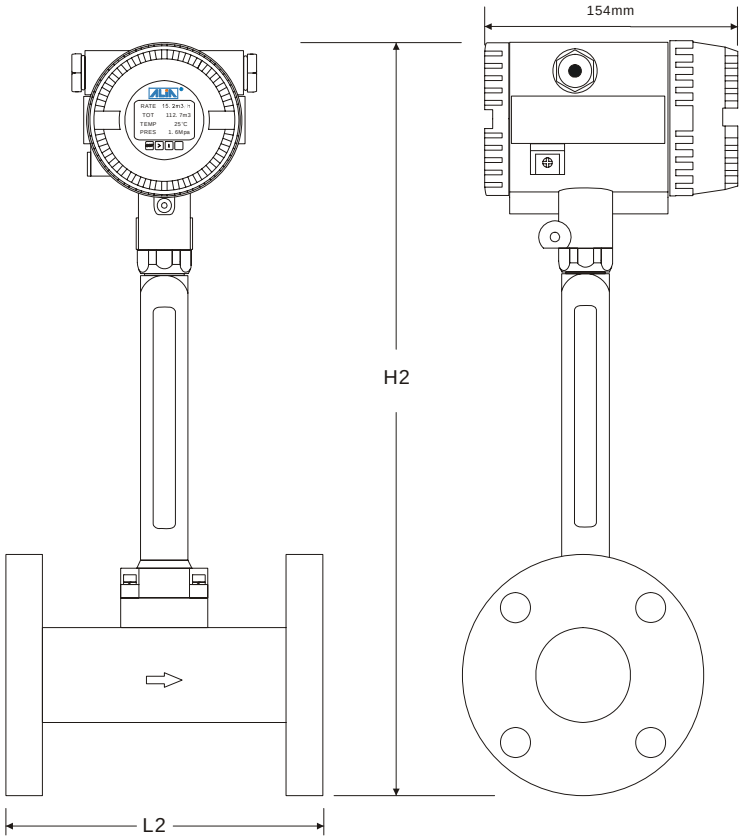
2. Specification

- Size (mm) : 10,15,20,25,32,40,65,80,100,125,150,
  200,250,300,350,400,450,500 mm
- Measuring Range : Steam – 1.6 to 540,000 Kg/Hr
  Gas - 3 to4 6,000 m3/Hr
  Liquid - 0.3 to 4950 m3/Hr
- Material : Stainless Steel 304 / 316
- Accuracy
  Liquid : +/- 0.7%
  Gas/Steam : +/- 1.0%
- Repeatability : +/- 0.2%
- Connection : Flange / Wafer
- Flange Type : JIS 10K / JIS 20K / JIS 40K
  ANSI 150# / ANSI 300# / ANSI 600#
  DIN PN 10 / PN 16 / PN25 / PN 40
- Wafer Type : 40,65,80,100,125,150, 200,250
  without Temperature / Pressure Sensor
- Temperature : -40 ~ +280℃ （Standard Type)
  -4 ~ +420 ℃ (Explosion proof Type)
- Ambient Temperature : -20 ~+60℃
- Pressure : 78 Kg/cm2 (Max.)
- Protection : IP 65.
  Explosion Proof Exd IIC T6
  Intrinsically safe Exia IIC T4
- Local display : 4 Line LCD
  4 digit Flowrate
  8 digit Totalization
- Output : 4~20 mA (2wire)
  Load : 600 Ω
- Pulse Output : Standard Pulse Output
  Output Range : 3 to 30VDC, 20mA Max.
- Communication : RS485
- Data storage : Operation Parameter, Totalization Figures are stored by EEPROM.
- Housing Material : Aluminum Alloy
- Cable Entry : 2x0.5mm2
- Power Supply : 12~36 VDC
- Key Pad : 4 keys from internal for Programming and display contro
- Option
  Pressure Transmitter Pressure Compensation
  Signal Input 0~30 mV DC
  Temperature sensor Temperature sensor
  Signal Input PT100（3 Wire）

3. Diameter



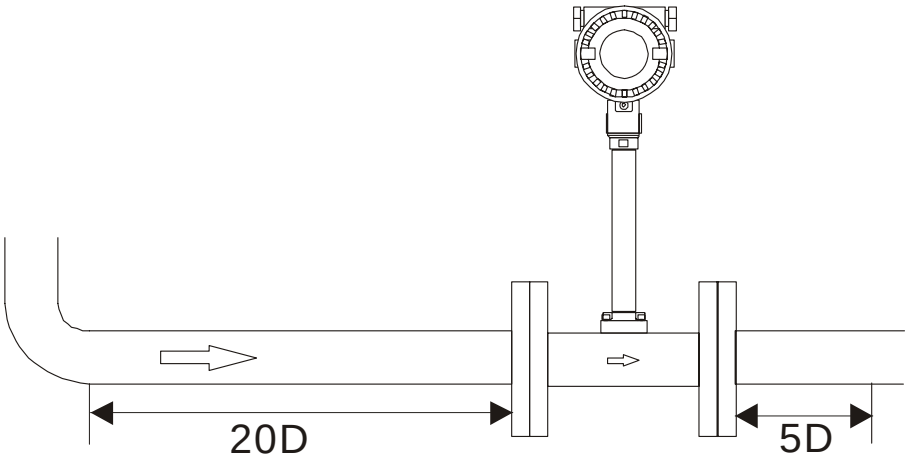
Normal Size		Dimensions (mm)		
mm	Inch	L1	D1	H1
40	1-1/2"	70	85	415
50	2"	70	99	425
65	2-1/2"	70	118	440
80	3"	70	132	460
100	4"	70	156	480
125	5"	70	184	500
150	6"	70	211	530
200	8"	98	248	578
250	10"	114	298	628

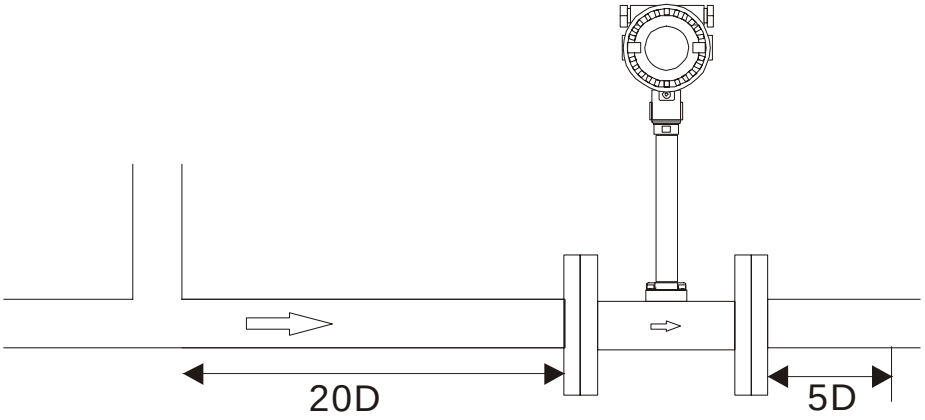


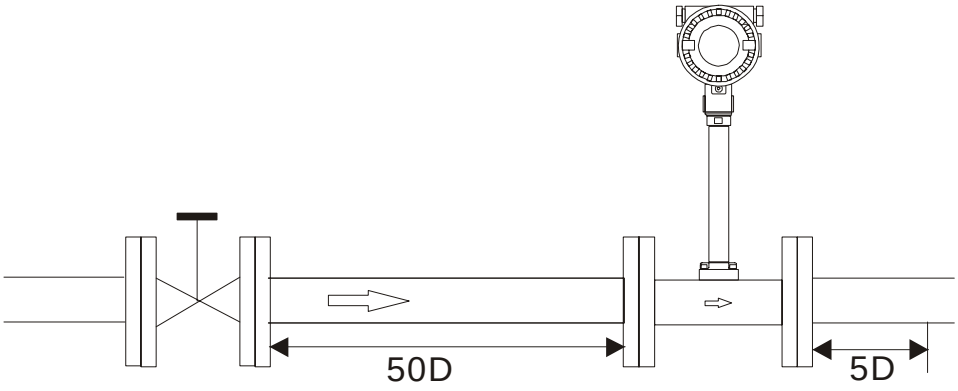
Normal Size		Dimensions (mm)	
mm	Inch	L2	H2
10	3/8"	200	428
15	1/2"	200	430
20	3/4"	200	435
25	1"	200	440
32	1-1/4"	200	452
40	1-1/2"	200	468
50	2"	200	480
65	2-1/2"	200	502
80	3"	225	515
100	4"	250	534
125	5"	275	564
150	6"	300	593
200	8"	350	647
250	10"	400	700
300	12"	450	750
350	14"	500	805
400	16"	550	861
450	18"	600	910
500	20"	650	965

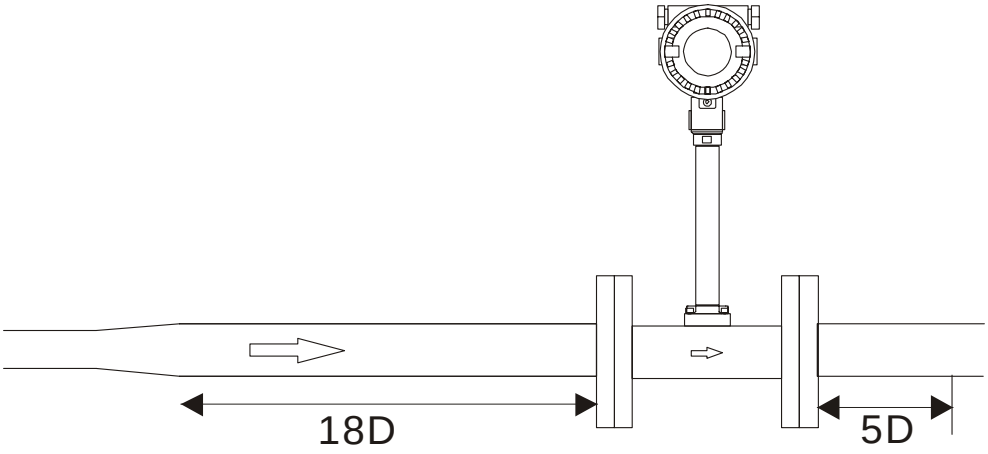
4. Installation

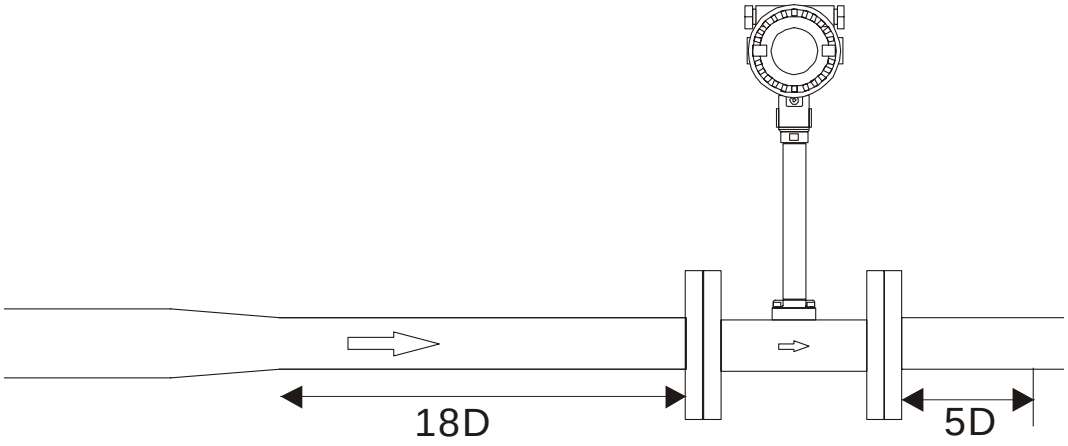
Vortex Flowmeter Pipe installed location is very important, it concerned to measuring accuracy, please left the multiple space in the upstream and downstream of the straight pipe as you can, if the pipe is confirmed with not enough straight pipe, please install 2/3 of total straight pipe length on the upstream, 1/3 on downstream, but the Flowmeter can't matched factory accuracy. Example





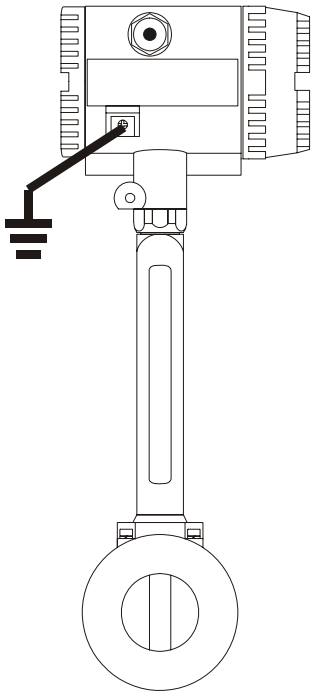


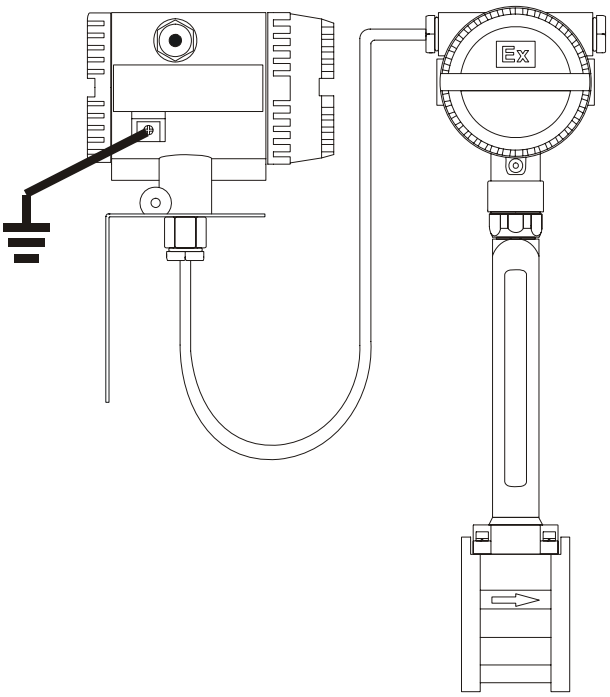




● Grounding measure

AVF7000 requested the perfect grounding, to erase the interference, the grounding as follow, only need to put the converter housing connected with grounding. Sensor don't need to connected grounding again..
Grounding point, ex.: Stairs, metal fence…etc.



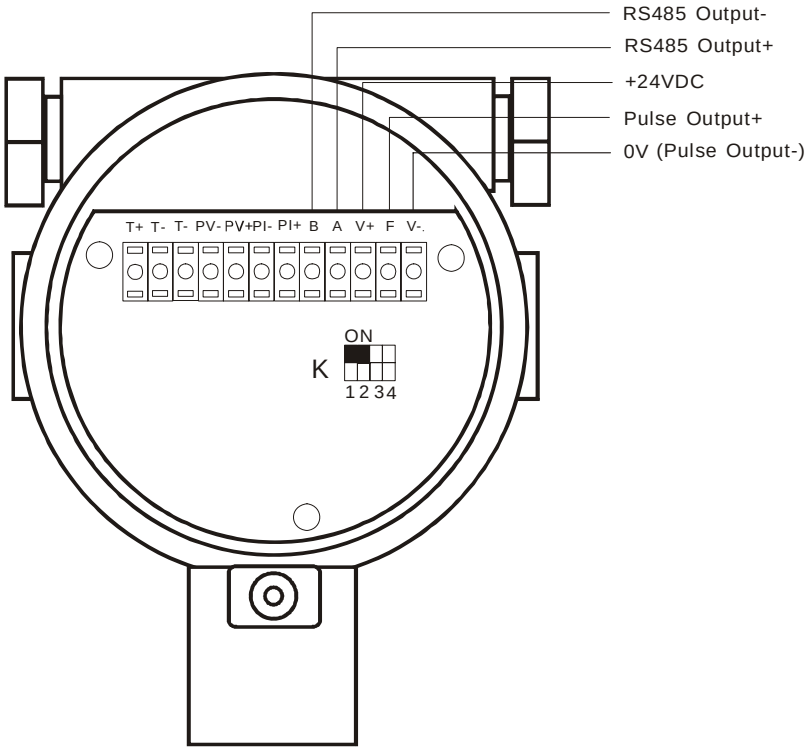


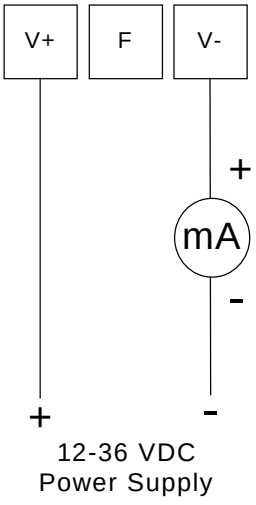
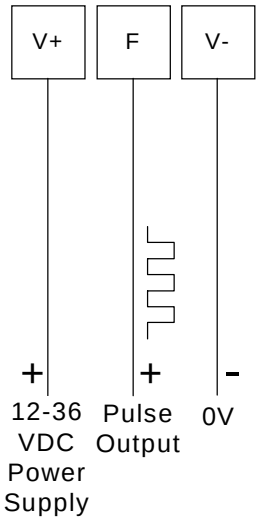
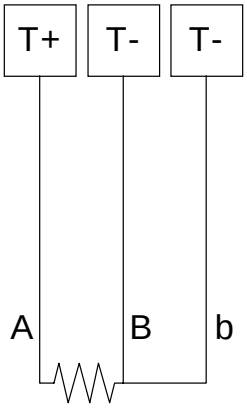
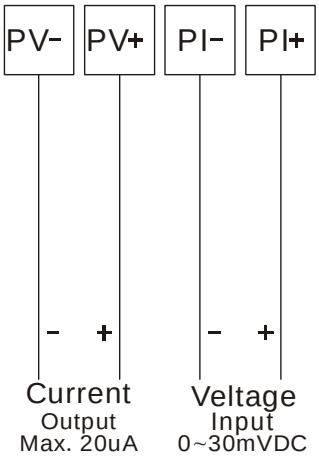
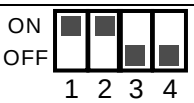
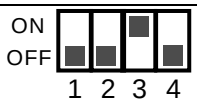
5. Wiring Chart

This meter uses two wires to transmit 4-20 mA output signal to other external equipment, power supply 11 ~ 36VDC, the maximum loading resistance for output circuit is 600Ω(including resistance of cable wire)

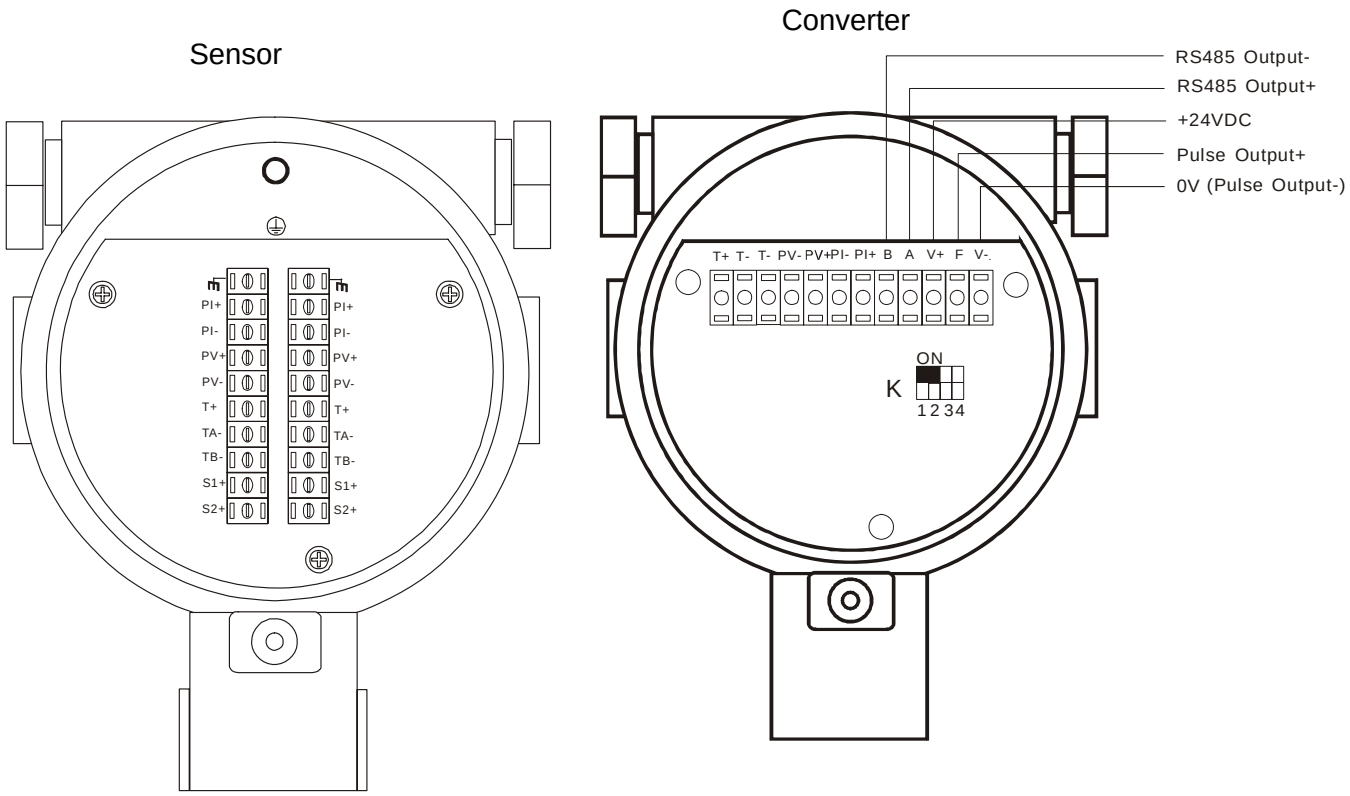
In general condition, 600V PVC isolating wire or cable be used as connecting wire. The two core shielding wire (RWP2x0.5mm) be used in the place where electricity noise occurred easily, the out layer of shielding wire should be connected to the grounding screw in the house of amplifier fixedly. Uses appropriate cable to conform with the operating temperature if the temperature is too high or low.

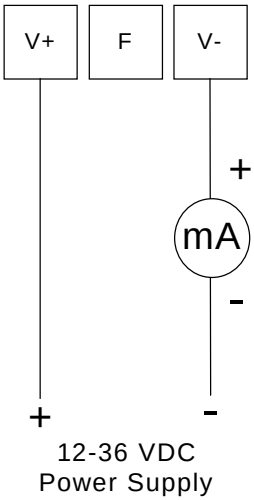
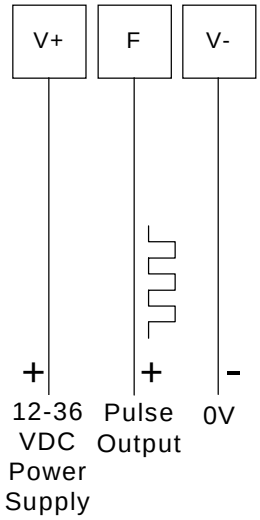
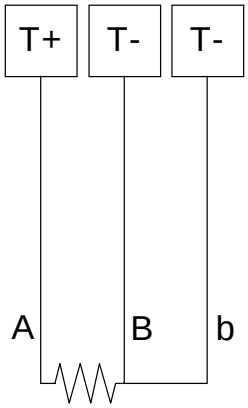
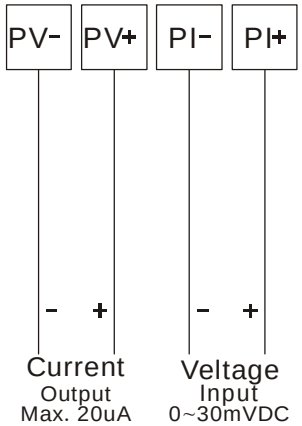
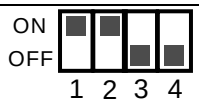
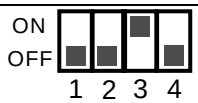
5.1 compact version



4-20 mA Output	Pulse Output	Sensor Input	
		Temperature	Pressure
			
		PT100 Ω RTD (3 Wire)	Pressure Transmitter 4 Wire

5.2 separate version



4-20 mA Output	Pulse Output	Sensor Input	
		Temperature	Pressure
			
		PT100 Ω RTD (3 Wire)	Pressure Transmitter 4 Wire

6. Panel Display

7. Function

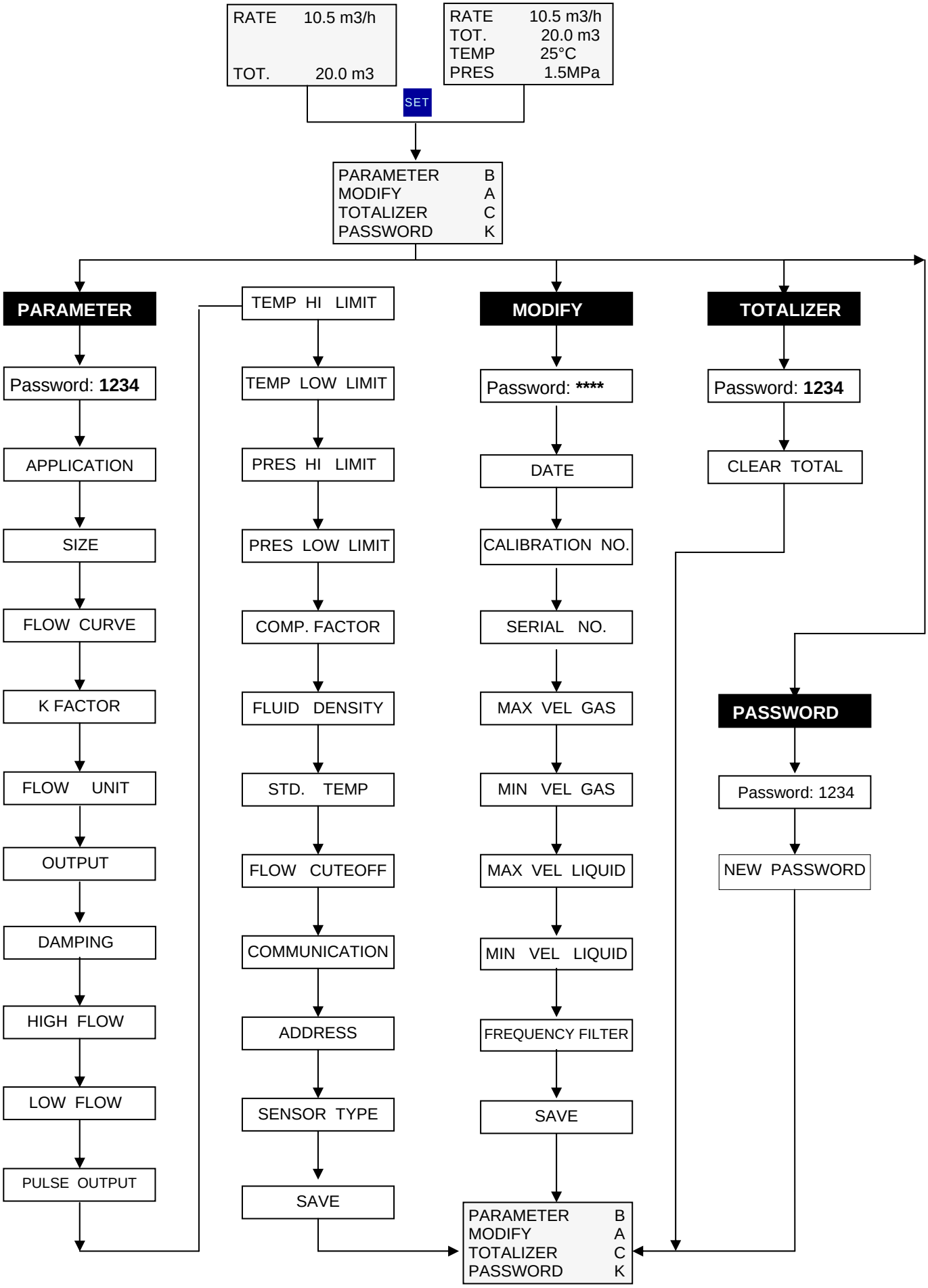
7.1 Button Function

Key Name	Button	Measure state Function	Parameter Setting State Function
Setting	SET	Go to the parameter setting mode	Save the parameter setting so far, and go to next parameter.
Move	>	Select the contents selected	Move
Up	∧	Change the contents selection	Revised the present display
Calibration	CAL	Go to the calibration parameter setting	Save the calibration setting at present, and go to next parameter.

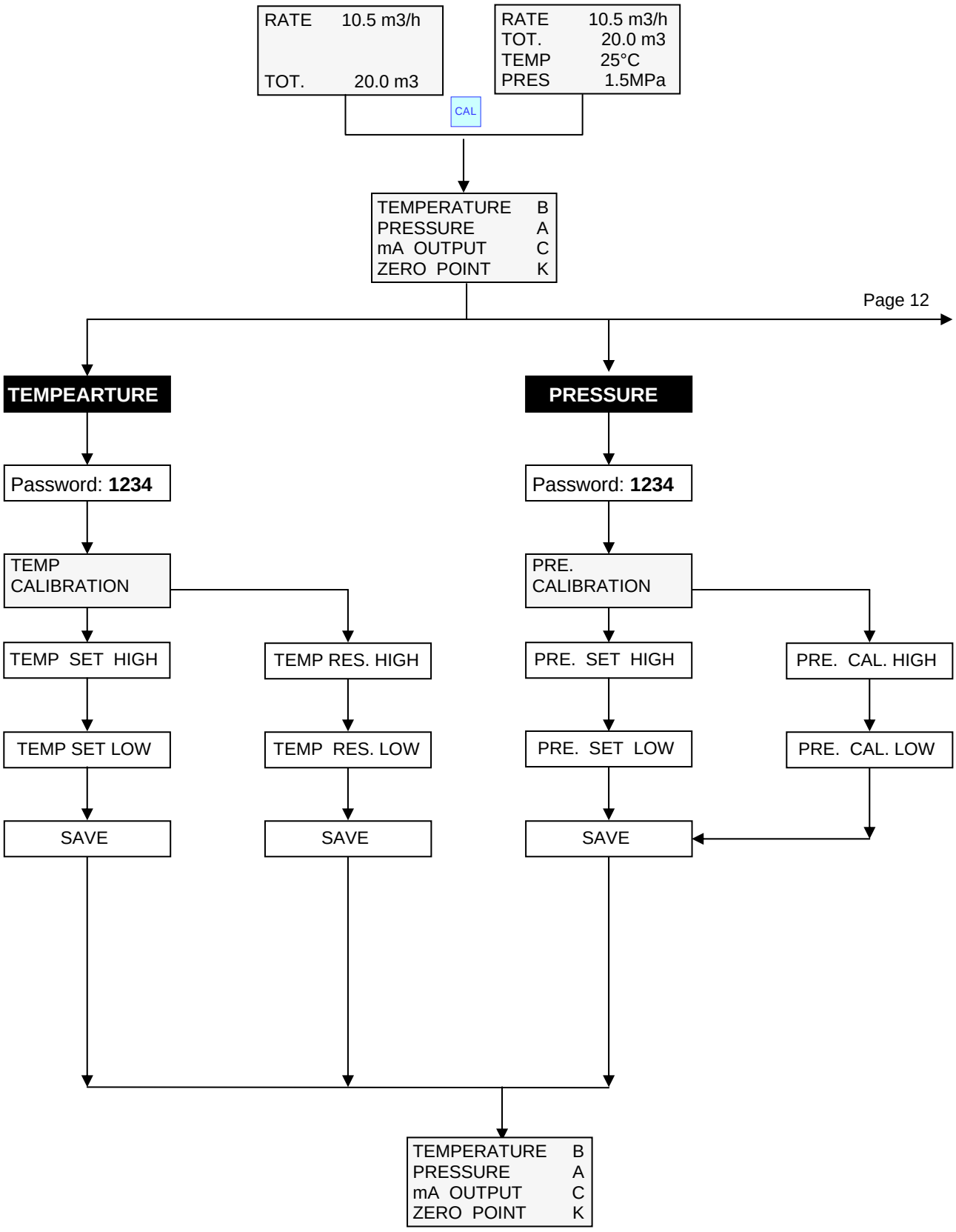
7.2 Display Function

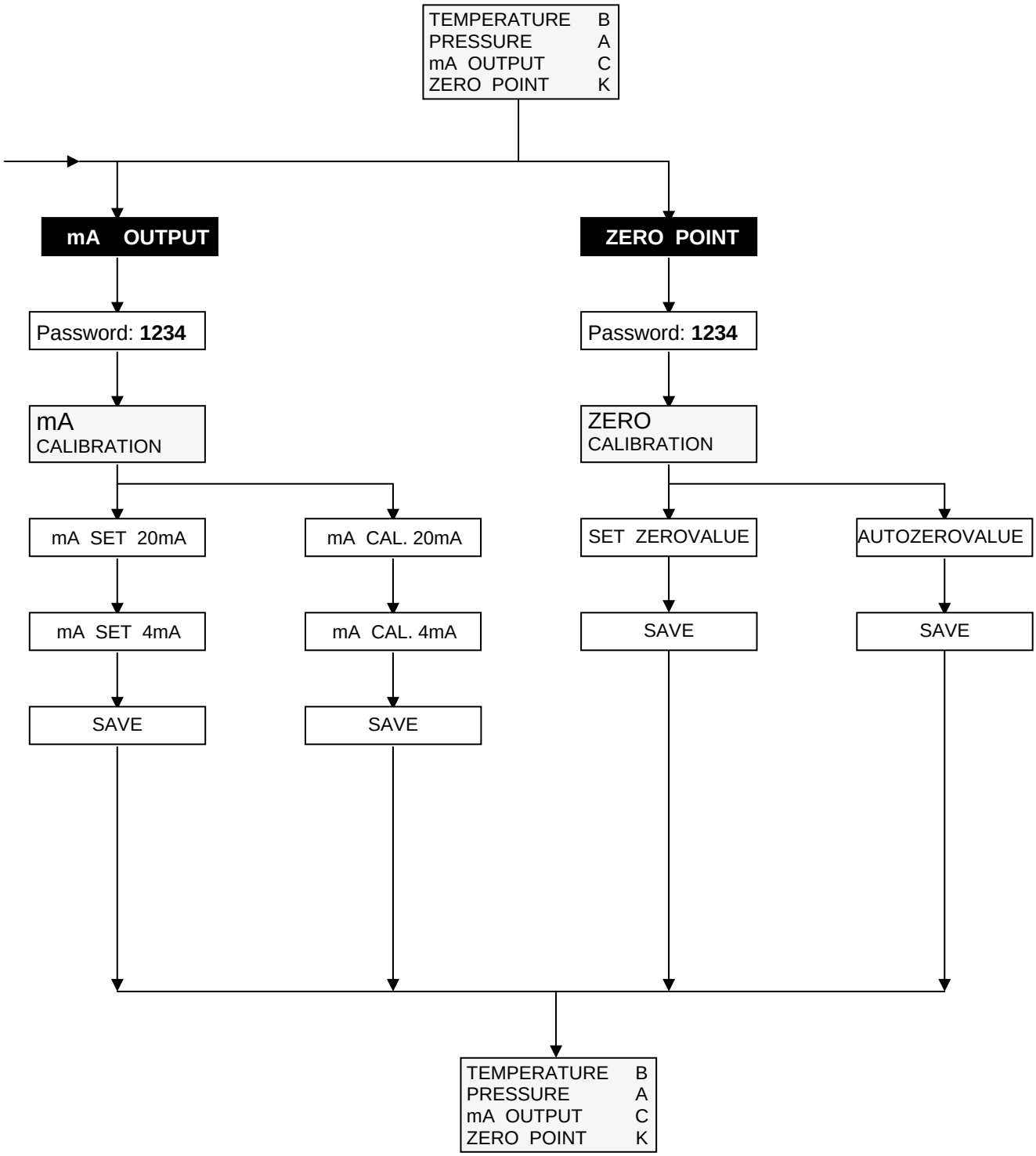
RATE 10.5 m3/h TOT. 20.0 m3	Display without Temp./ Pressure compensation If choose the application of “1. Gas” or “2. Liquid ”, only 2 lines will display, That is flowrate and totalizer.
↓ >	
OUT 12.5mA DEN ----kg/m3 E.T. 23.1°C IN 88hz	Row 1 : output content. If choose current output, it shows the output current value; If choose pulse output, it shows frequency output value. Row 2 : fluid density. Row 3 : PCB temperature. Row 4 : frequency sensor sampled.
RATE 10.5 m3/h TOT. 20.0 m3 TEMP 25°C PRES 1.5MPa	Display without Temp./ Pressure compensation If choose the application of “1. Gas” or “2. Liquid ”, only 2 lines will display, That is flowrate and totalizer.
↓ >	
OUT 12.5mA DEN ----kg/m3 E.T. 23.1°C IN 88hz	Row 1 : output content. If choose current output, it shows the output current value; If choose pulse output, it shows frequency output value. Row 2 : fluid density. Row 3 : PCB temperature. Row 4 : frequency sensor sampled.

8. General Parameter Operation chart



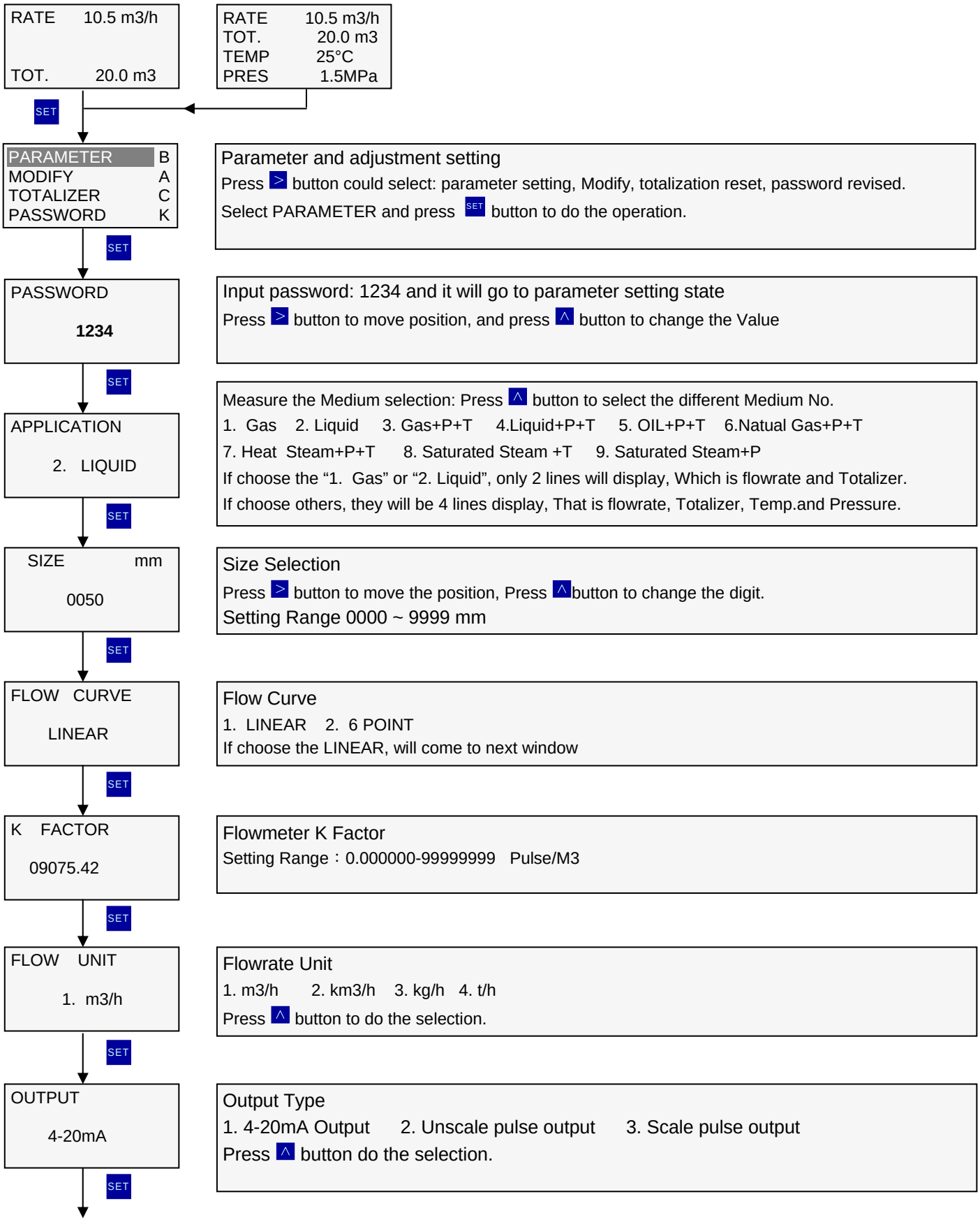
9. Calibration Parameter Operation Chart

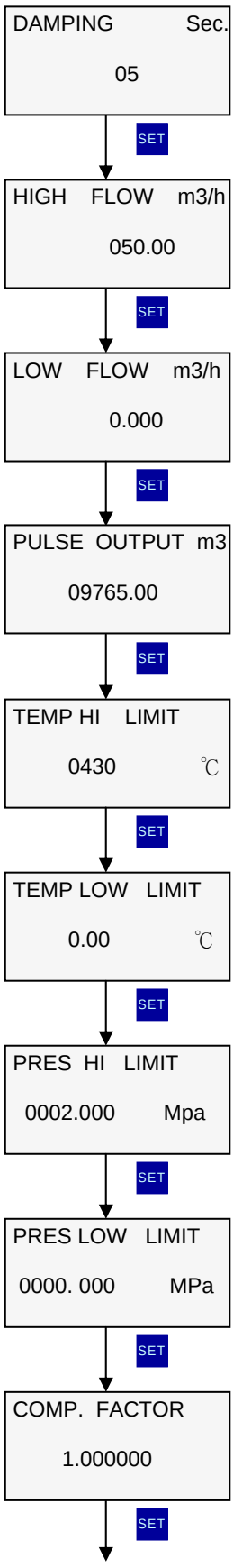



TEMPERATURE B
PRESSURE A
mA OUTPUT C
ZERO POINT K
mA OUTPUT
ZERO POINT
Password: 1234
Password: 1234
mA
CALIBRATION
ZERO
CALIBRATION
mA SET 20mA
mA CAL. 20mA
SET ZEROVALUE
AUTOZEROVALUE
mA SET 4mA
mA CAL. 4mA
SAVE
SAVE
SAVE
SAVE
SAVE
TEMPERATURE B
PRESSURE A
mA OUTPUT C
ZERO POINT K

10. General Parameter Setting

10.1 Parameter and Adjustment information setting





Reaction Time
Setting Range：01-99 seconds
Press > button to move the position, press ^ button to change the digit.

Flowrate Up Limit
Setting Range：0.000000-99999999 m3/h

Flowrate Lower Limit
Setting Range：0.000000-99999999 m3/h

Pulse Output
Setting Range：0.000000-99999999 Pulse/M3

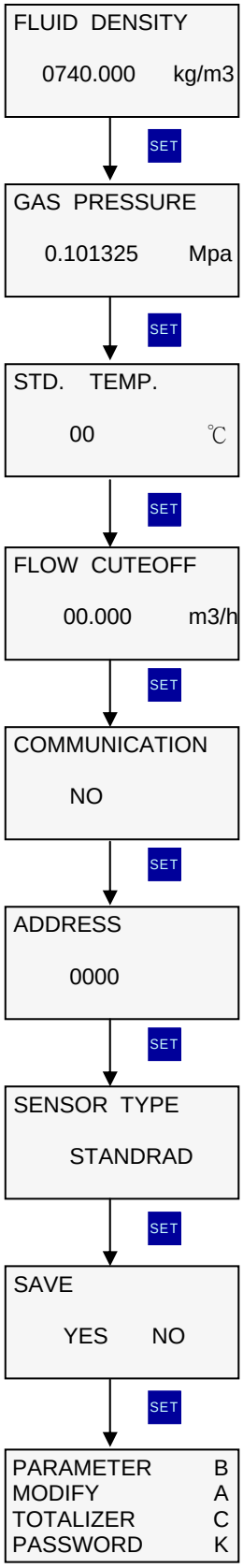
Temp. Up Limit
Setting Range：-999 -+9999 ℃
When Temp. High and low limit are the same, it's stable Temper

Temp Lower Limit
Setting Range：-999 -+9999 ℃
When Temp. High and low limit are the same, it's stable Temperature.

Pressure high Limit
Setting Range：-98888-+99999999 Mpa
When pressure high and low limits are the same, it's stable pressure.

Pressure Low Limit
Setting Range：-98888-+99999999 Mpa
When pressure high and low limits are the same, it's stable pressure.

Compress Factor
Setting range：0.000000~99999999
Original setting digit：1.000000



Density Setting

Setting Range：0.000000~99999999 kg/m3

Fluid density setting only for Engineering Unit are Kg/H or T/H

ATM Pressure

Setting Range：0.000000-99999999 Mpa

Local Pressure original setting value：0.101325 Mpa

Standard Temperature

Setting Range：00-99 ℃

Local pressure original setting value：00

Low Flowrate Cut Off

Setting Range：0.000000-99999999

When it's lower than the setting value, it won't display, Normally setting the Max. flowrate is 5%

Communication mode

1. No 2. RS-485 3. RS-232

Communication Address

Setting Range：0000-9999

Sensor Type

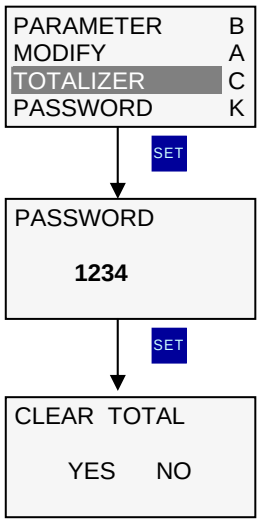
1. Standard Type 2. Special 3. Insert Type

Parameter Save

Select whether to save the parameter setting, and turn back to main function

Press SET for 3 second, then loose, and turn back to main function

10.2 Tantalization Zero Clearing



Parameter and adjust information setting main function

Press > button could select: parameter setting, Modify, totalization reset, password revised.

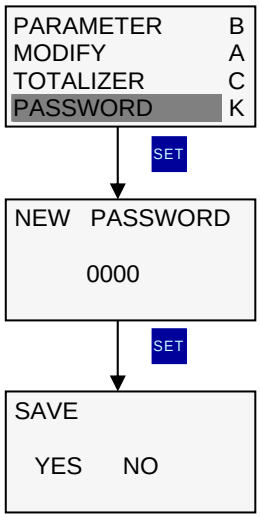
Select TOTALIZER and press SET button to do the operation.

Input Password：**1234** and it will go to totalization zero clearing operation

Totalization Zero Clearing

Select if it needs Totalization Zero Clearing

10.3 Password Revised



Parameter and adjust information setting main function

Press > button could select: parameter setting, Modify, totalization reset, password revised.

Select PASSWORD and press SET button to do the operation.

Password Revised

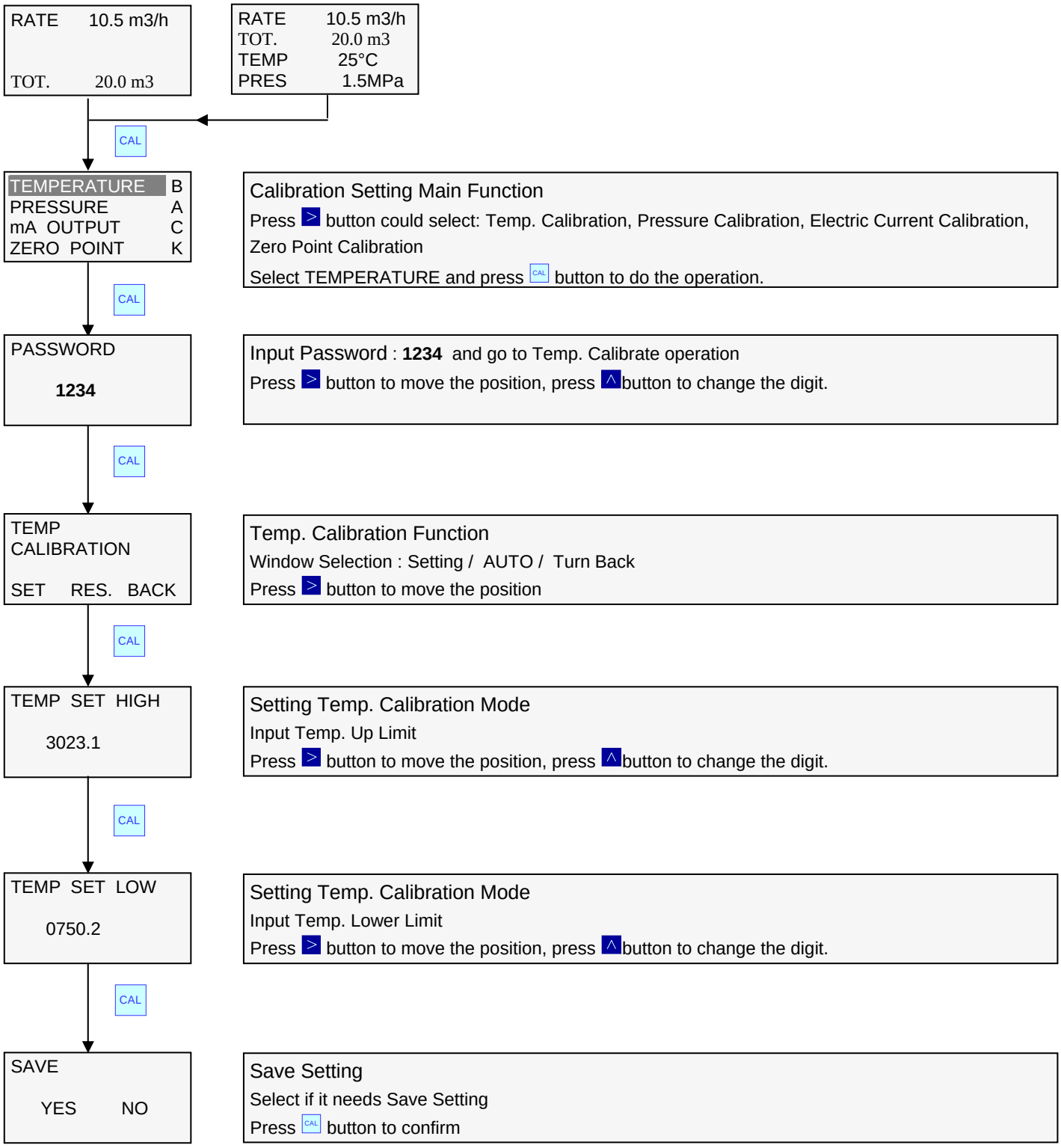
Revised to new password

Save Parameter

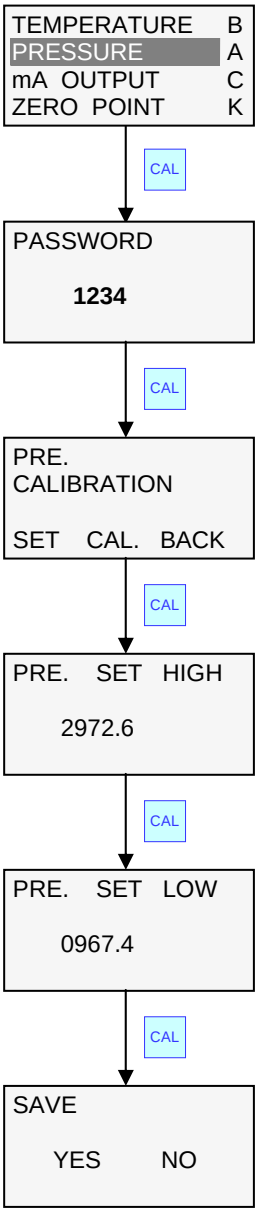
Select if it needs Save Parameter Setting, and go back to Main Function

11. Calibration Parameter Setting

11.1 Temp. Calibrate Operation



11.2 Pressure Calibrate Operation



Calibration Setting Function

Press > button could select: Temp. Calibration, Pressure Calibration, Electric Current Calibration, Zero Point Calibration.

Select PRESSURE and then press CAL button to do the operation.

Input password : 1234 and it will go to pressure calibrate operation

Press > button to move the position, press ^ button to change the digit.

Pressure Calibration Mode

Window selection: Setting / Calibration / Turn back

Press > button to move the position

Setting Pressure Calibration Up Limit

Input Pressure High Limit

Press > button to move the position, press ^ button to change the digit.

Setting Pressure Calibration Lower Limit

Input Pressure Low Limit

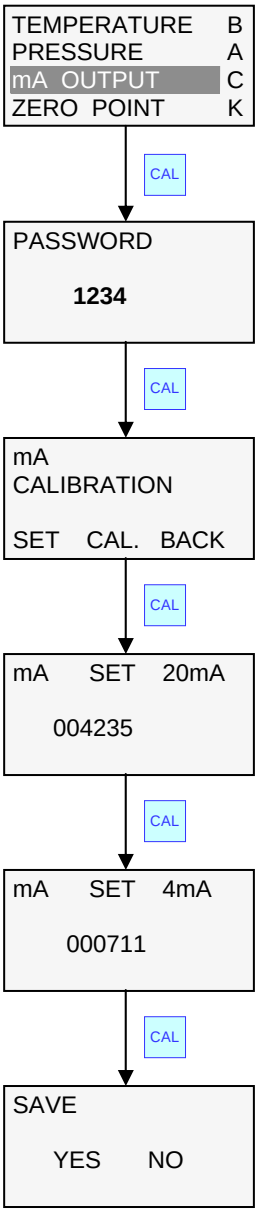
Press > button to move the position, press ^ button to change the digit.

Save Setting

Select if it needs Save Setting

Press CAL button to confirm

11.3 Electric current output calibration



Calibration Setting Function

Press > button could select: Temp. Calibration, Pressure Calibration, Electric current calibration, Zero point calibration.

Select mA OUTPUT and press CAL button to do the operation.

Input Password : 1234 and it will go to the electric current calibrate operation

Press > button to move the position, press ^ button to change the digit.

Electric Current Calibration

Window Selection : Setting, AUTO, Turn back

Press > button to move the position,

Adjust 20mA Output

20 mA electric current output value amended, if mA output value too low, please increase the value, if the value too high, please decrease the value.

Press > button to move the position, press ^ button to change the digit.

Adjust 4mA Output

4 mA electric current output value amended, if mA output value too low, please increase the value, if the value too high, please decrease the value.

Press > button to move the position, press ^ button to change the digit.

Save Setting

Select if it needs Save Setting

Press CAL button to confirm

11.4 Zero Point Calibration Operate

TEMPERATURE B PRESSURE A mA OUTPUT C ZERO POINT K CAL	**Calibration Setting Main Function** Press > button could select: Temp. Calibration, Pressure Calibration, Electric current calibration, Zero point calibration. Press ZERO POINT and then press CAL button to do the operation.
PASSWORD **1234** CAL	Input password: **1234** and it will go to the Zero calibrate operation Press > button to move the position, press ^ button to change the digit.
ZERO CALIBRATION MENU AUTO BACK CAL	**Zero Point Calibration** Window Selection: By manual / Auto / Turn back. Press > button could select. **If choose the MENU, will come to next window. Then set zero manually.**
SET ZERO VALUE 4 CAL	**Zero Point Calibration by manual** Zero Point Adjust Range: :0 - 7 Press ^ button to change the digit.
SAVE YES NO	**Save Setting** Select if it needs Save Setting Press CAL button to confirm

● Zero Adjustment

When sensor installed in the pipe, the pipe with no flowrate, and shows the low flow rate in display, then please does the Zero Adjustment.

Situation 1: Zero Adjustment could through the shortcut key of electrical board as follow.

Press the ZERO button about 5 seconds, the light is turned on, then loosen the button, when light about 5 seconds ,it start glitter, and will enter into zero adjustment status, the glittering time about 3 seconds, the zero adjustment is completed once the light turn off.

Situation 2: Through the window to do the zero adjustment. It will search the zero position. Please check 11.4 Zero Point Calibration Operate. When you finished the auto zero adjustment, the small flowrate still exist, please press CAL button at Zero Point Calibration selected MENU (hand zero adjustment), if the value is 3,please add the zero point value. Change to 4, whether the status improved, if it still exists, please adds one more point. The bigger the value is, the better the anti-interference. But when the value too big, it will cause no signal, please select carefully.