



Metal Tube Variable Area Flowmeter Model AVF250 Series

Operation Manual



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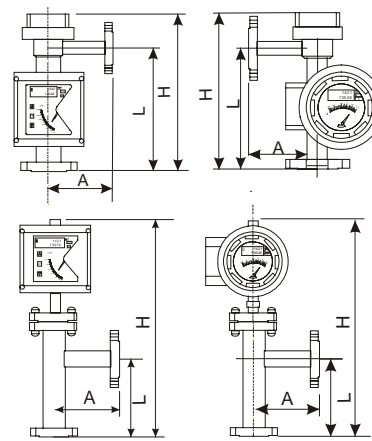
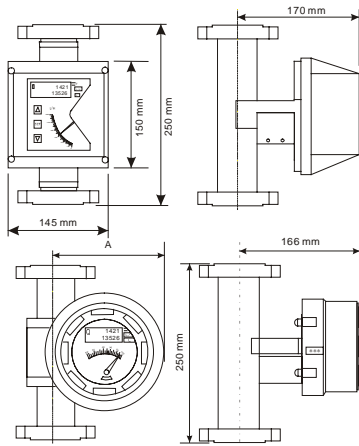
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1. Meter Inspection

- 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.

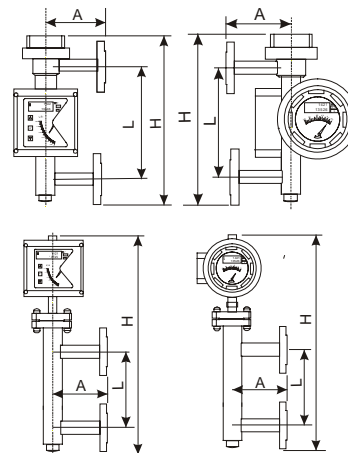
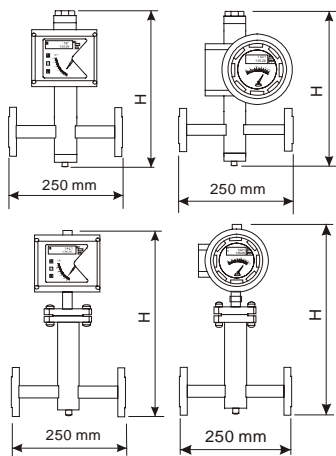
2. Specification

● Size (mm)	: 15,20,25,40,50,65,80,100,125,150,200	● Local display	: Mechanical Indicator(standard)
● Measuring Range	: Liquid - 1 ~ 200000 Liter/Hr Gas - 3 to 180,000 M3/Hr Steam - 6.4 to 267,000 Kg/Hr	Digit Display	: 4 digit flowrate 8 digit Tantalizer
● Turndown Ratio	: 10:1 (20:1 Optional)	● Current output	: 4~20 mA (2 wire) Load : 600 Ohm
● Accuracy	: +/-1.6%(Standard) +/-1.0%(Optional)	● Pulse output	: General Pulse Rating : 3 to 30VDC, 20mA Max.
● Repeatability	: +/-0.5% of reading	● Data Storage	: Operation parameters and totalization figures are stored by EEPROM for more then 10 years
● Material	: Stainless Steel 304 Stainless Steel 316 Stainless Steel 316L	● Alarm output	: 2 point(open collector) Rating : 3 to 30Vdc, 100 mA Max.
● Standard Pressure	: 40 Kg/cm ² (15mm ~ 50mm) 16 Kg/cm ² (65mm ~ 200mm)	● Keyboard	: 3 keys from internal for programming and display control.
● Temperature	: -80 ~ +200 °C (Standard) -25 ~ +100 °C (LCD Display) 0 ~ +85 °C (PTFE Liner) -80 ~ +400 °C (Optional)	● Ambient temperature	: -25 to +60 °C
● Flange Type	: JIS 10K / JIS 20K / JIS 40K ANSI 150# / ANSI 300# / ANSI 600# DIN PN 10 / PN 16 / PN25 / PN 40	● Protection class	: IP 65 Intrinsically Safe, Eex ia IIC T5 Explosion Proof, Ex d IIB T6
● Fluid Viscosity	: 15m ~ 20 mm - < 30 CP 25mm ~ 40 mm - < 250 CP 50mm ~ 200mm - < 300 CP	● Housing Material	: Aluminum Alloy
		● Cable entry	: M20 * 1.5
		● Pressure Drop	: 0.07 ~ 0.7 Kg/cm ²
		● Power supply	: 11 ~ 36VDC(2 wire 4-20 mA) Ni-MH Battery(3 years working hours)



BT (Bottom - Top)			
Size mm	A mm	Weight Kg	ΔP mbar
15	173	3.7	140
25	173	5.2	190
50	173	8.7	230
80	173	14	330
100	173	15	420
150	178	34	600
200	180	49	700

BR (Bottom - Top Side)					
Size mm	H mm	L mm	A mm	weight Kg	ΔP mbar
15 mm	350	250	120	7.0	180
25 mm	350	250	120	8.0	220
50 mm	600	250	120	15	280
80 mm	700	250	150	25	350
100 mm	700	250	150	29	450
150 mm	760	300	180	53	580
200 mm	800	350	200	61	700



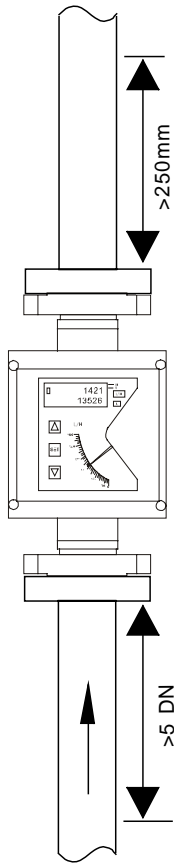
LR / RL (Horizontal)			
Size mm	H mm	weight Kg	ΔP mbar
15	430	6.5	300
25	450	10.5	350
50	540	21	400
80	557	32	450
100	570	48	500
150	620	95	630

RR (Bottom Side - Top Side)					
Size mm	H mm	L mm	A mm	weight Kg	ΔP mbar
15	500	250	120	5.1	200
25	500	250	120	8.2	280
50	650	250	120	14	360
80	800	300	150	31	450
100	800	300	150	50	580
150	850	350	180	67	630
200	880	400	200	81	700

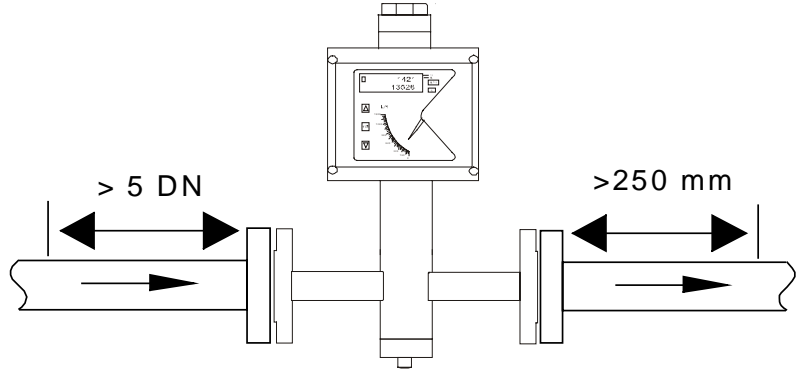
** L : 80~100mm - 400mm, 150 mm - 500mm

4.Installation

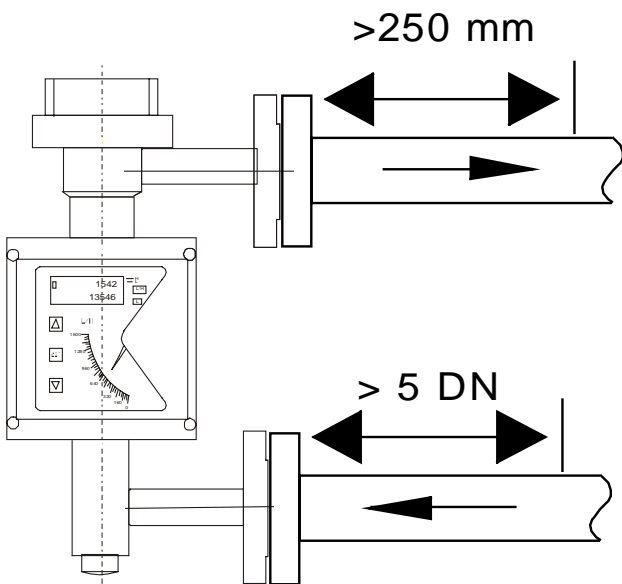
It is important to select appropriate place for meter installation, otherwise it will affect meter accuracy or even damage the meter



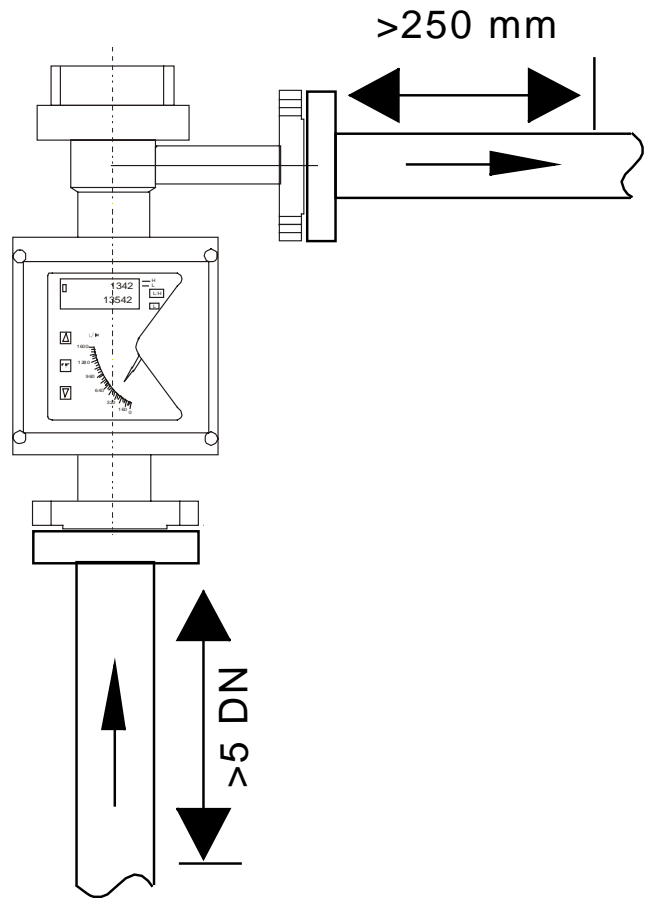
Bottom-Top



Left-Right



Right-Right



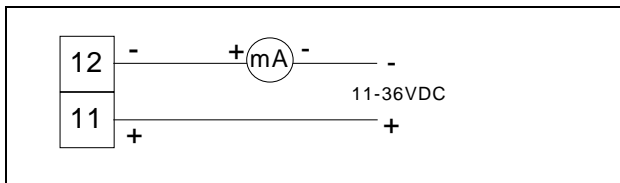
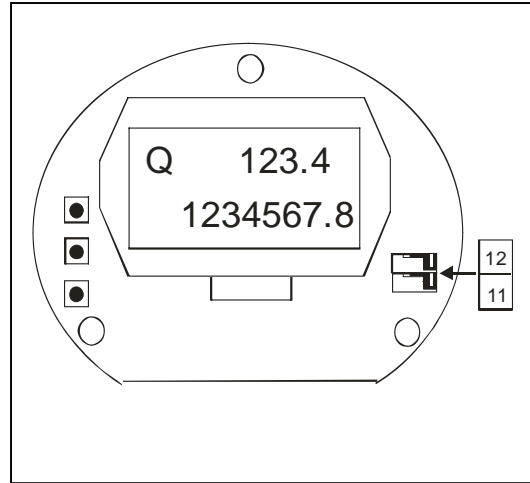
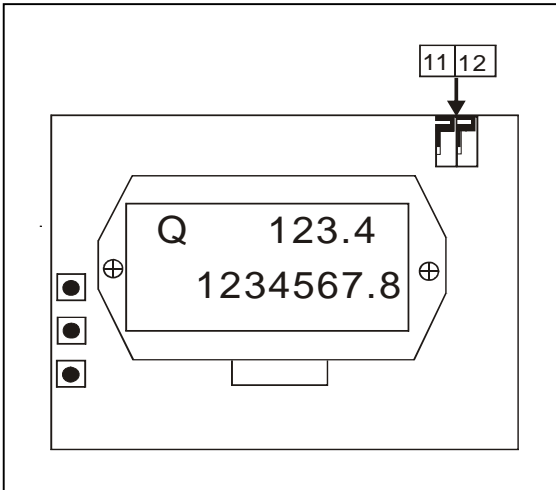
Bottom-Right

5.Wiring

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

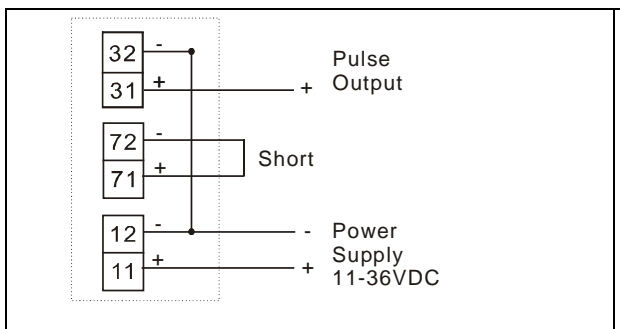
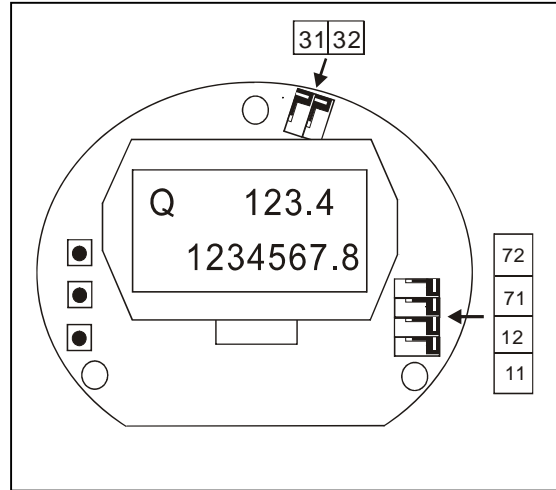
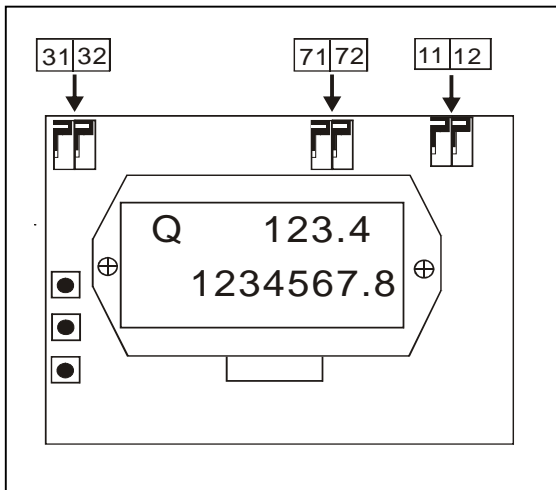
In general condition, 600V PVC isolating wire or cable be used as connecting wire. The two core shielding wire (RWP2× 0.5mm) be used in the place where electricity noise occurred easily, the out layer of shielding wire should be connected to the grounding screw in the house of amplifier fixedly. Uses appropriate cable to conform with the operating temperature if the temperature is too high or low.

5.1 4-20 mA Output (2 wire System)



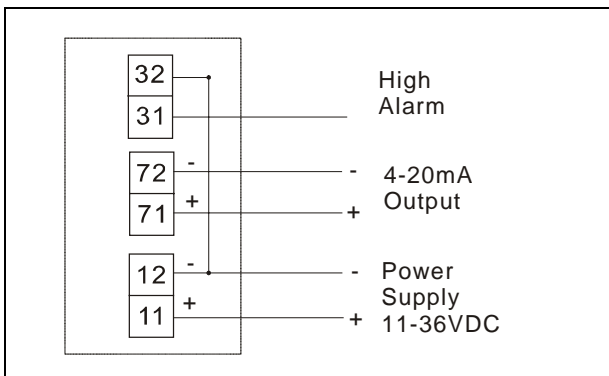
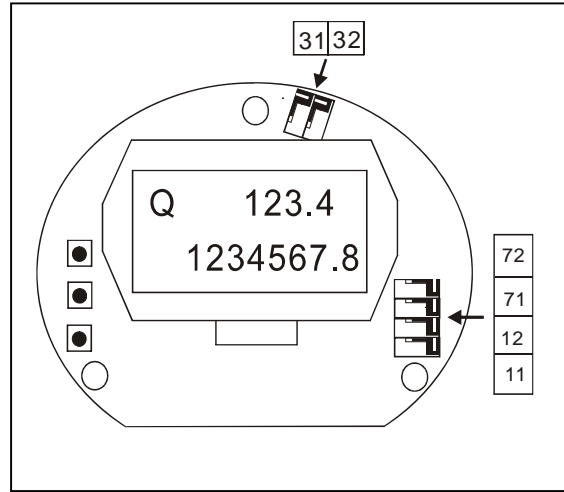
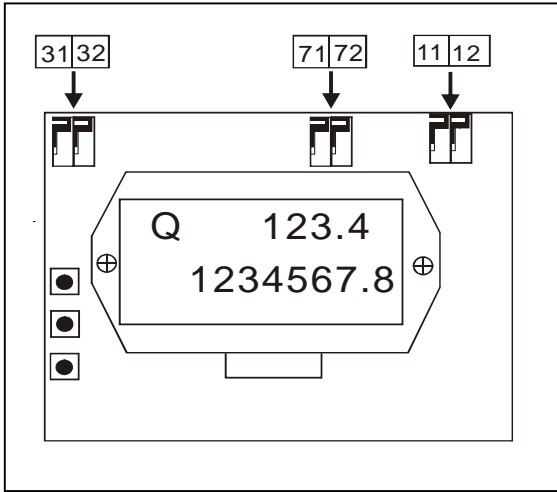
Pin 11,12 : 4~20 mA(2 Wire)
11~36VDC Power Supply

5.2 Pulse Output (3 wire)



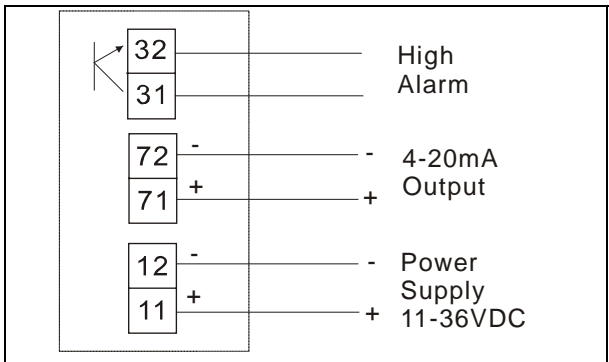
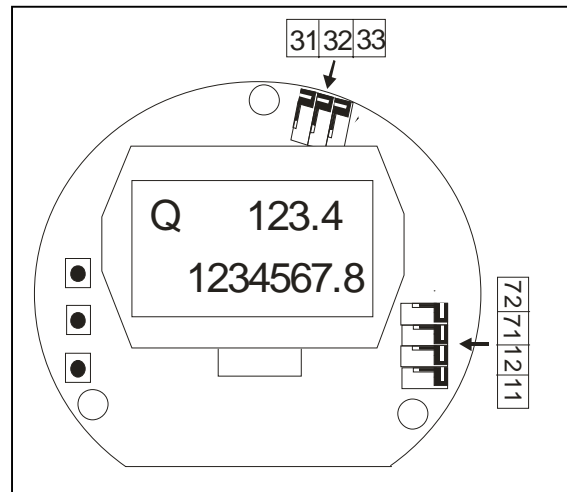
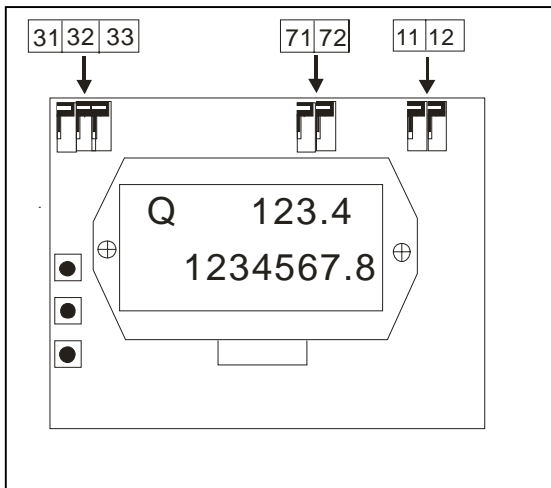
Pin 11,12 : Power supply:11~36VDC
Pin 31,32 : Pusle output
Short Pin 32,12
Short Pin 71,72
Pulse Width : 50 Ms
Outer Voltage : 5~30VDC

5.3 4-20mA + Pulse Output

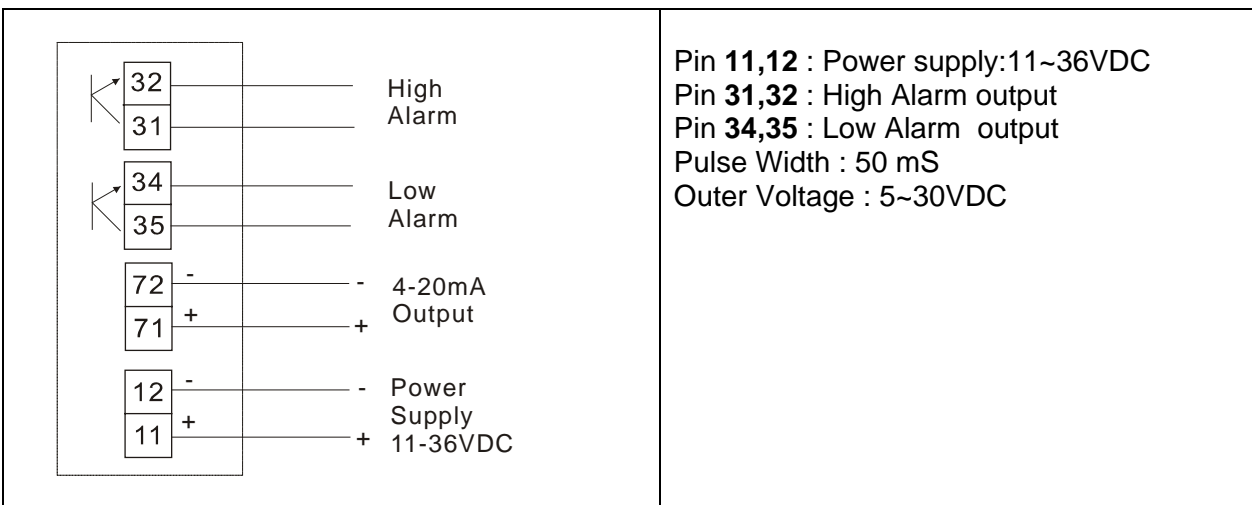
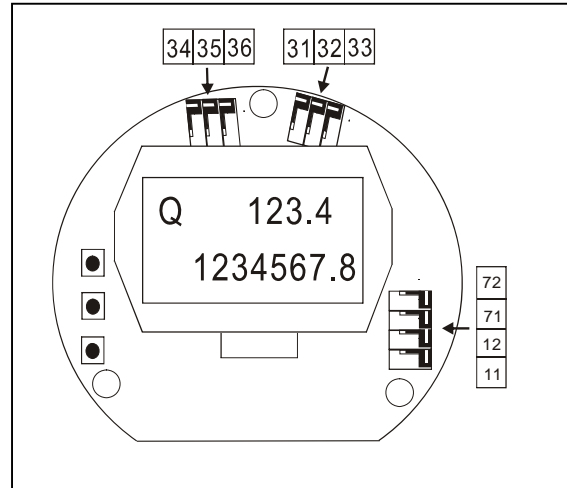
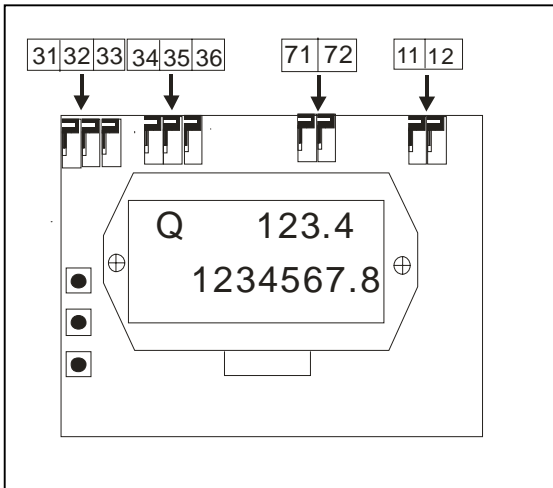


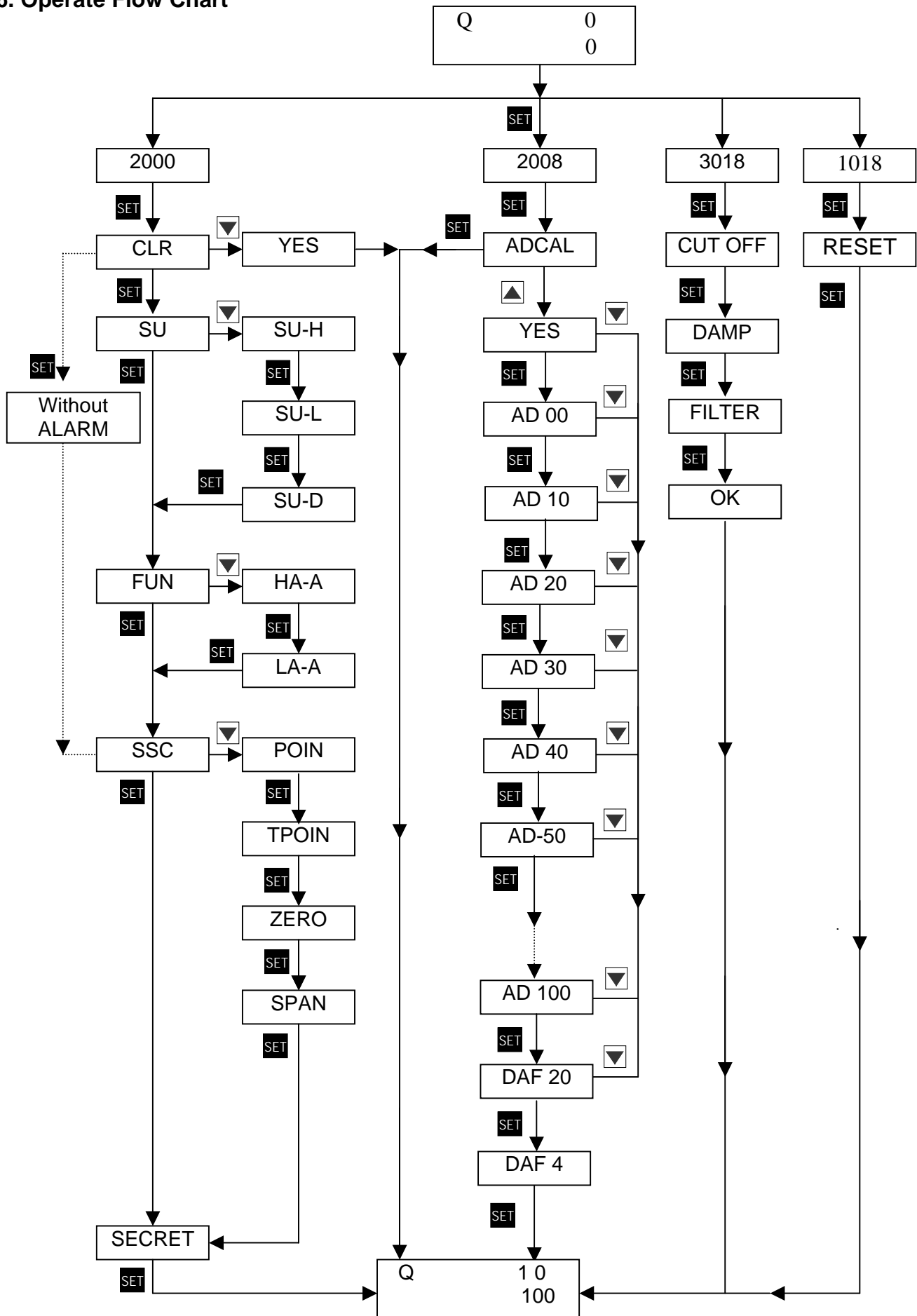
Pin 11,12 : Power supply:11~36VDC
 Pin 31,32 : Pulse output
 Short Pin 32,12
 Pulse Width : 50 mS
 Outer Voltage : 5~30VDC

5.4 One Point Alarm

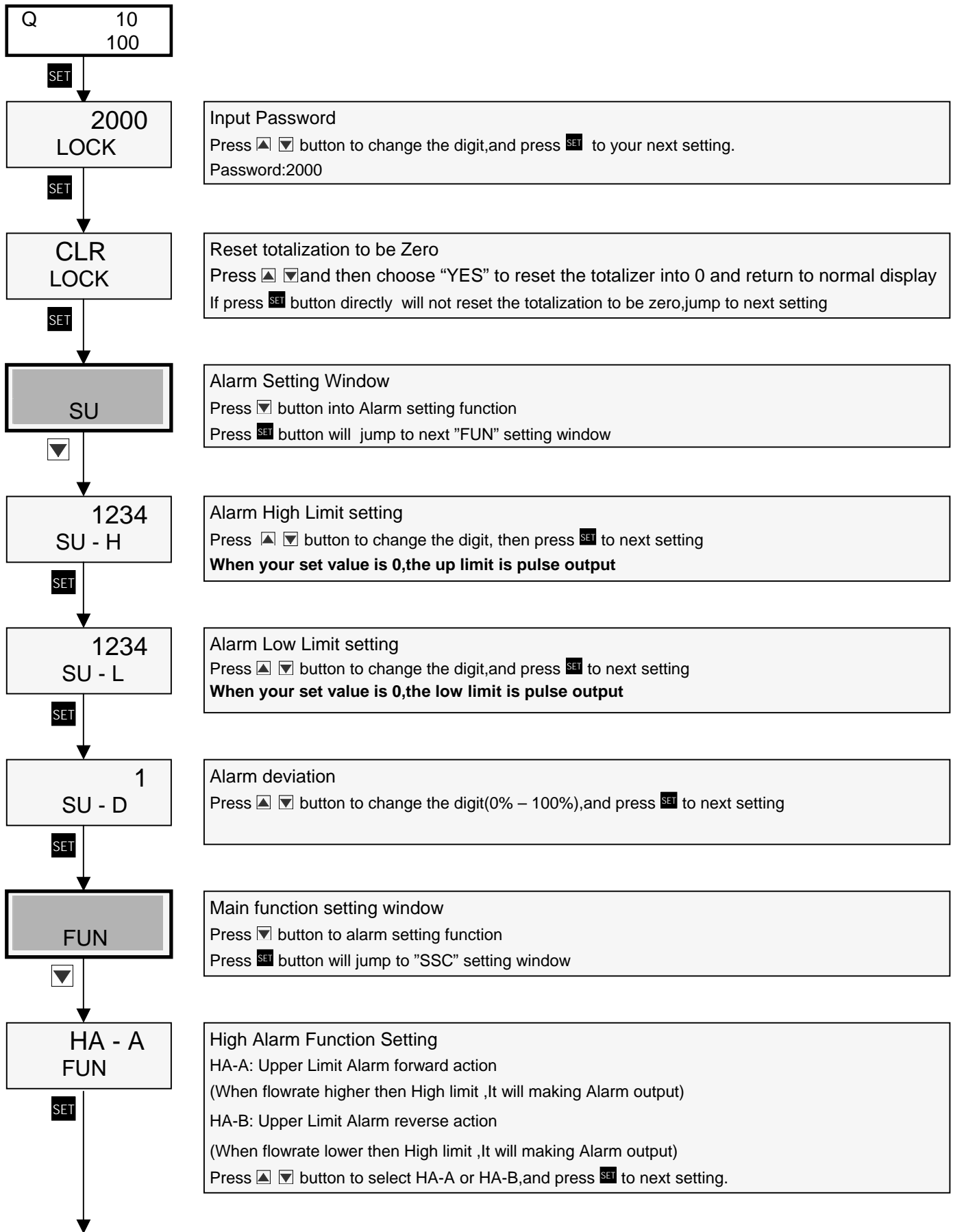


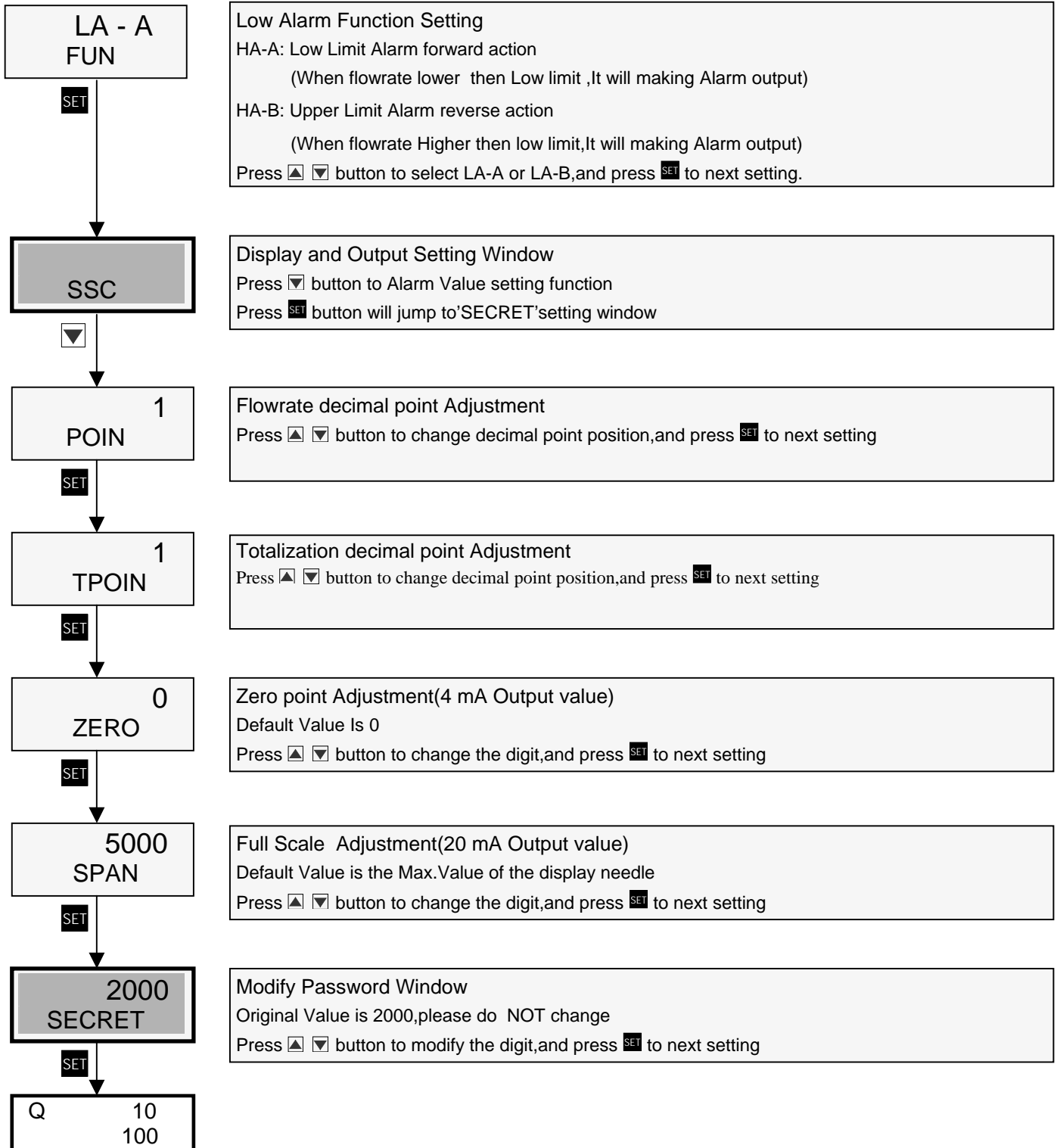
Pin 11,12 : Power supply:11~36VDC
 Pin 31,32 : High Alarm output
 Pulse Width : 50 mS
 Outer Voltage : 5~30VDC



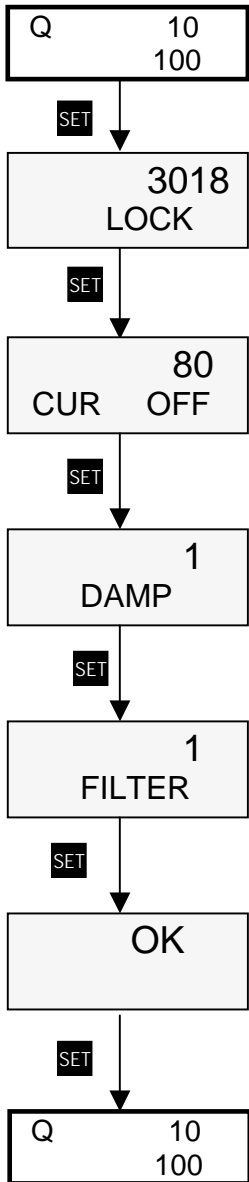


7. General Parameter Setting





8. other ParameterSetting



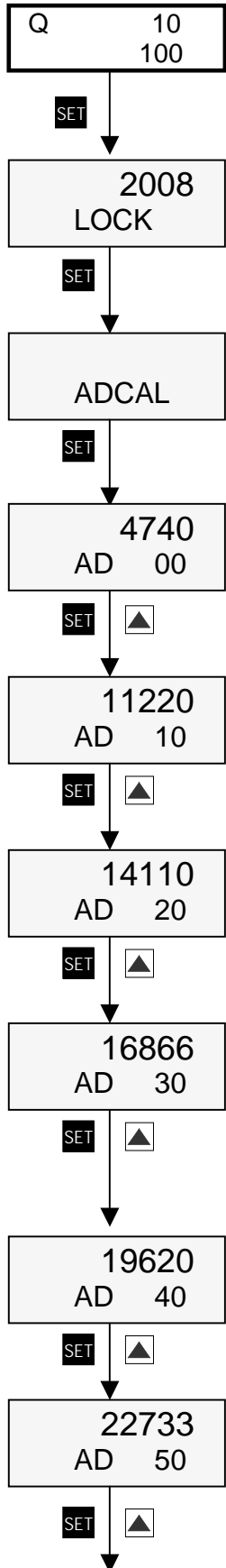
Input Password
 Press ▲ ▼ button to change the digit, and press SET to your next setting.
 Password:3018

Low Flow Cutoff (Setting Range:1 –10)
 Press ▲ ▼ button to change the value and press SET to your next setting.
 80 mean 8%, if full scale is 80 M3/Hr, when the flowrate less then 6.4 M3/Hr, the display will be 0.

Damping (Setting Range:1 – 10)
 Press ▲ ▼ button to change the value and press SET to your next setting.
 Example: Damp=5, the new flowrate value will display after 5 seconds

Filter
 Press ▲ ▼ button to change the value and press SET to your next setting.
 Example: Filter=5, it's will take 5 seconds from old flowrate value go to new flowrate value

9. Calibration Parameter Setting



Input Password
 Press ▲ ▼ button to change the digit, and press SET to next setting.
 Password:2008

Prepare to the Flowmeter Calibration Function (Please Do Not adjust this parameter)
 Press SET in to the Flow Calibration setting, Press ▼ button will jump to 20 mA for Calibration

0% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 0% status, wait for the value being settled, then press SET to next parameter
 Press ▲ button, no adjustment the value, direct go to next parameter directly.
 Press ▼ button to 20 mA Calibration parameter.

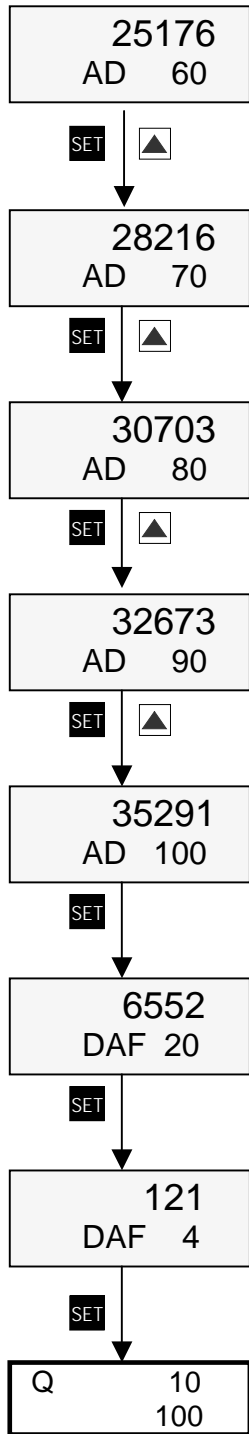
10% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 10% status, wait for the value being settled, then press SET to next parameter
 Press ▲ button, no adjustment the value, direct go to next parameter directly.
 Press ▼ button to 20 mA Calibration parameter.

20% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 20% status, wait for the value being settled, then press SET to next parameter
 Press ▲ button, no adjustment the value, direct go to next parameter directly.
 Press ▼ button to 20 mA Calibration parameter.

30% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 30% status, wait for the value being settled, then press SET to next parameter
 Press ▲ button, no adjustment the value, direct go to next parameter directly.
 Press ▼ button to 20 mA Calibration parameter.

40% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 40% status, wait for the value being settled, then press SET to next parameter
 Press ▲ button, no adjustment the value, direct go to next parameter directly.
 Press ▼ button to 20 mA Calibration parameter.

50% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 50% status, wait for the value being settled, then press SET to next parameter
 Press ▲ button, no adjustment the value, direct go to next parameter directly.
 Press ▼ button to 20 mA Calibration parameter.



60% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 60% status,wait for the value being settled, then press **SET** to next parameter
 Press **▲** button ,no adjustment the value , direct go to next parameter directly.
 Press **▼** button to 20 mA Calibration parameter.

70% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 70% status,wait for the value being settled, then press **SET** to next parameter
 Press **▲** button ,no adjustment the value , direct go to next parameter directly.
 Press **▼** button to 20 mA Calibration parameter.

80% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 80% status,wait for the value being settled, then press **SET** to next parameter
 Press **▲** button ,no adjustment the value , direct go to next parameter directly.
 Press **▼** button to 20 mA Calibration parameter.

90% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 90% status,wait for the value being settled, then press **SET** to next parameter
 Press **▲** button ,no adjustment the value , direct go to next parameter directly.
 Press **▼** button to 20 mA Calibration parameter.

100% Flowrate Calibration (Please Do Not adjust this parameter)
 Adjust the flowrate to 100% status,wait for the value being settled, then press **SET** to next parameter
 Press **▲** button ,no adjustment the value , direct go to next parameter directly.
 Press **▼** button to 20 mA Calibration parameter.

20 mA Calibration
 Measure the output with mA meter, If 20 mA Value higher or lower than standard value
 press **▲▼** button to adjust the value to correct 20mA And press **SET** button to next parameter.

4 mA Calibration
 Measure the output with mA meter, If 4 mA Value higher or lower than standard value
 press **▲▼** button to adjust the value to 4mA And press **SET** button to next parameter.