



M-1600 with USC-321

Instruction Manual



Contents

1. HANDLING PRECAUTIONS.....	1
1.1 Inspection of Product	1
1.2 Storage Conditions	1
2.INSTALLATION	1
2.1 Installation of Flow Detector	1
2.1.1 Selecting Location.....	1
2.2 Installation of Converter	2
2.2.1 Selecting Location.....	2
2.2.2 Mounting of Converter.....	2
2.3 Wiring.....	3
2.3.1 Terminals and connectors.....	3
2.3.2 Connection of the Flow Detector.....	3
2.3.3 Wiring of Terminals	3
OPERATING PROCEDURES.....	5
3.1 Component Names of Front Panel.....	5
3.2 Inspection before Start Up	5
3.3 Zero Adjustment.....	5
4. Parameter Configuration.....	5
4.1 Function of Mode Switch and Keys	5
5. Parameter Setup Examples.....	9
5.1 Selecting a Full Scale Flowrate Range	9
5.2 Changing an Integration Multiplier	10
5.3 Selecting a Pulse Output	11
5.4 Selecting and Setting Up the Alarm Output Function.....	12
5.4.1 Selecting and Setting Up the High/Low Alarm.....	12
5.4.2 Selecting and Setting Up the Integration Preset Output Function	14
5.5 Setting Up the User Linearize.....	17
5.5.1 How to Use the Linearize Function.....	17
5.5.2 Linearize Data Input Procedure	17

6. MAINTENANCE.....	20
6.1 Routine checks	20
6.2 Error messages	20
6.3 Trouble Shooting.....	21
A. No display or abnormal display	22
B. No output with flow	23
B. No output with flow (continued)	24
C. Unstable zero point	25
D. Unstable indication	26
E. Inaccurate measurement	27
7 Parameter list	28
8. Warranty	29

1. HANDLING PRECAUTIONS

1.1 Inspection of Product

On delivery, check the product for damage, possibly due to improper shipping conditions. Confirm that the model code on the Tag plate matches the specifications in your purchase order.

1.2 Storage Conditions

Unpack the product, if possible, before storing it.

The storage place should be free from rain, shock or vibration.

The ambient temperature should be within -20 to 50 °C (-4 to 131 °F) and the humidity 5 to 80%R.H. without condensation

NOTES

All possible electric noise sources in the vicinity of flowmeter, such as motors, pumps, power relays or solenoid valves, should be fitted with suitable surge suppressor.

2. INSTALLATION

2.1 Installation of Flow Detector

2.1.1 Selecting Location

Consider the following when selecting installation point for the Flow Detector:

- 1) Ambient temperature: 15 to 35 °C (59 to 95 °F) away from direct sunshine.
- 2) Free from electromagnetic interference.
Keep away from such heavy electrical devices as motors, pumps, power-relays and solenoid valves.
- 3) No air or gas bubbles in the flow, since they disturb the propagation of ultrasonic waves.
- 4) The location must be with no water splashes or corrosive gases.
- 5) The location should have ease of access for maintenance.

CAUTION

Please confirm that maximum possible pressure is below the allowable pressure of Flow Detector.
No leakage is observable at the connection of Flow Detector to pipe.

2.2 Installation of Converter

2.2.1 Selecting Location

Consider the followings when selecting installation point for Signal Converter:

- 1) Ambient temperature: 0 to 50 °C (32 to 122 °F) away from direct sunshine.
- 2) Ambient humidity: less than 85%R.H. and free from condensation.
- 3) Free from rain and water drops.
- 4) Free from electromagnetic interference.
Keep away from heavy electrical devices.
- 5) Easy access for maintenance.

2.2.2 Mounting of Converter

Converter is panel mount type. Refer to the cutout dimensions in Fig. 2.1.

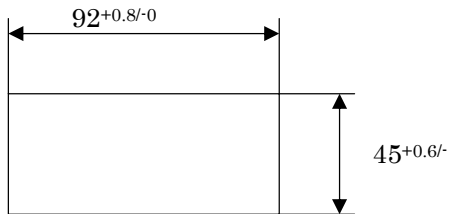


Fig. 2.1 Panel Cutout

0.8 to 5mm thick

Mounting pitches of neighboring converter in case of multiple mounting are, Min. 120mm horizontally and min. 70mm vertically.

- 1) Remove the two fixing metals from the converter.
- 2) Insert converter from front side of panel.
- 3) Slide fixing metals into guide holes of converter.
- 4) Tighten screws of fixing metals from back of converter by a screw driver. Tighten left and right screws alternately and fix the face flange of controller securely to fit on the panel.

2.3 Wiring

2.3.1 Terminals and connectors

The layout of terminal block and connectors is shown in Fig below. The function of each terminal and connectors is shown in following table.

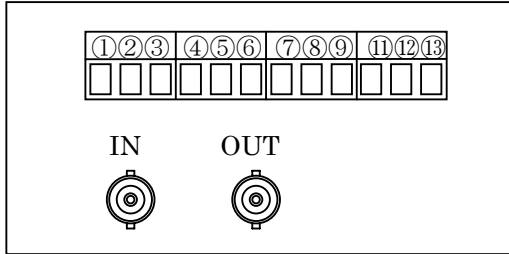


Fig.2.2

	Polarity	Functions
IN	Upstream	Flow Detector signals
OUT	Downstream	
1	+	Current output (4 – 20mA or 0-20mA)
2	-	
3	+	Pulse output (Open collector)
4	-	
5	+	Flow rate Hi alarm or 2nd Limit alarm (Open collect.)
6	-	
7	+	Flow rate Low alarm or 1st Limit alarm (Open collect.)
8	+	Reset pulse input for totalizer
9	-	
10	⏏	FG
11	COM	Power supply (DC24V)
12	+	

2.3.2 Connection of the Flow Detector

A pair of coaxial cables is provided to Flow Detector. BNC type connector is provided for each cable. Connect coaxial cable of upstream side of Flow Detector to IN receptacle and that of downstream side to OUT receptacle (See Fig 2.3)

Standard cable length is 5m. A 30m cable is available upon request (option). Do not shorten cable by cutting it at job site since termination of cable requires a special tool. When a longer cable is needed afterwards, an extension cable assembly is available from the factory.

Do not pull the coaxial cable when disconnecting it from converter. Hold cable

connector first and turn it anti-clockwise to disengage from the mating connector.

2.3.3 Wiring of Terminals

Specifications of cable

Use cable with core size of AWG26-14. Strip the sheath approximately 7mm from cable end. Insert core into terminal to the end and tighten screw. Confirm cable is securely fixed by pulling it by hand. It is preferable to use terminal end for secure fixing.

Connection of power supply

Connect power source to terminals 12 (+) and 11 (common). Confirm voltage of power source and that of converter before connection. Confirm supplied voltage is within tolerance of converter terminal.

Power should be supplied from a source separate from those for heavy electric devices.

CAUTION

Confirm terminals are securely fastened and that there is no fear of short circuit before turning power on converter.

CAUTION

When several USC-321 flowmeters are connected to a common DC power unit with current limit, the limit level must be 1.5A or above for each flowmeter. Otherwise power unit may shutdown due to current surge during start up.

Connection of analog output

Analog output is source type 4 to 20mA or 0 to 20mA. Connect meter, recorder and other devices in series, if more than one device are connected, to terminals 1 (+) and 2 (-). Maximum load resistance is 500ohms.

Connection of pulse output

Connect external counter or totalizer to

terminals 3 (+) and 4 (-). The contact rating is max. DC30V, 20mA.

Connection of flow alarm and preset alarm

Connect annunciator or other devices to the terminals 5 (+) and 6 (-) and/or terminals 6 (-) and 7 (+). Terminals 5 and 6 are for high flow rate alarm or 2nd limit alarm for totalizer. Terminals 6 and 7 are low flow rate alarm or 1st limit alarm for totalizer.

The contact rating is max DC30V, 20mA.

Connection of reset pulse for totalizer

Connect reset pulse for totalizer to terminals 8 (+) and 9 (-).

To avoid induction noise, do not run signal cables together with high voltage or high current power cables.

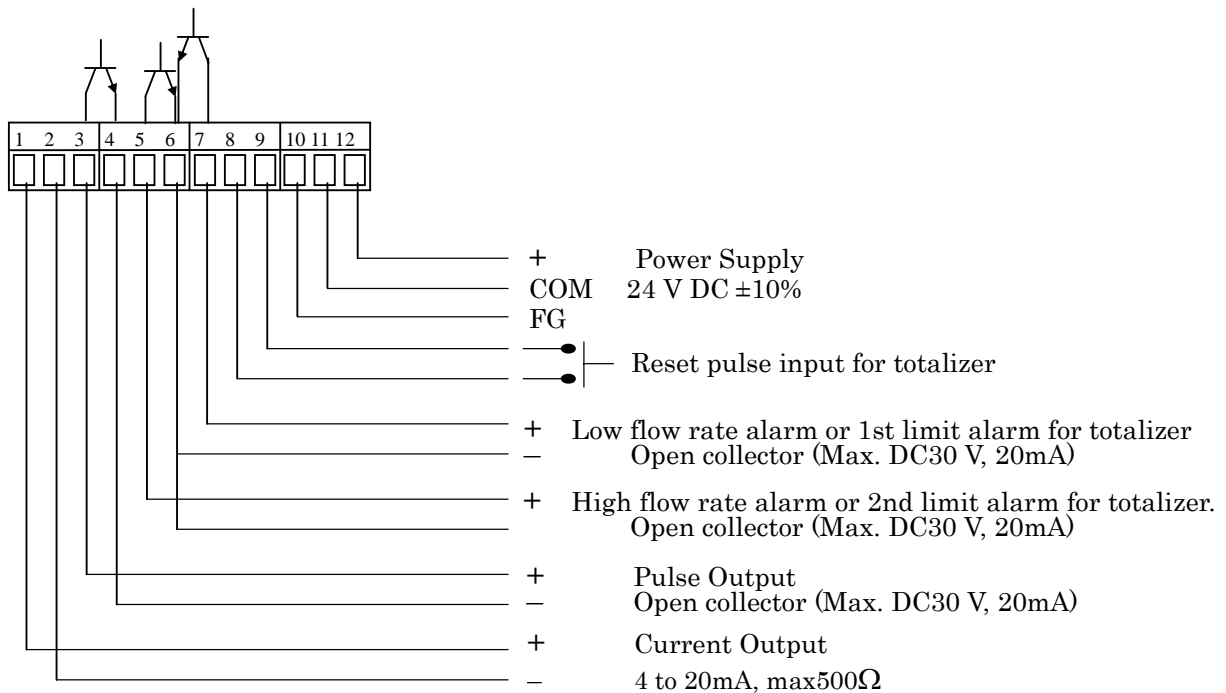
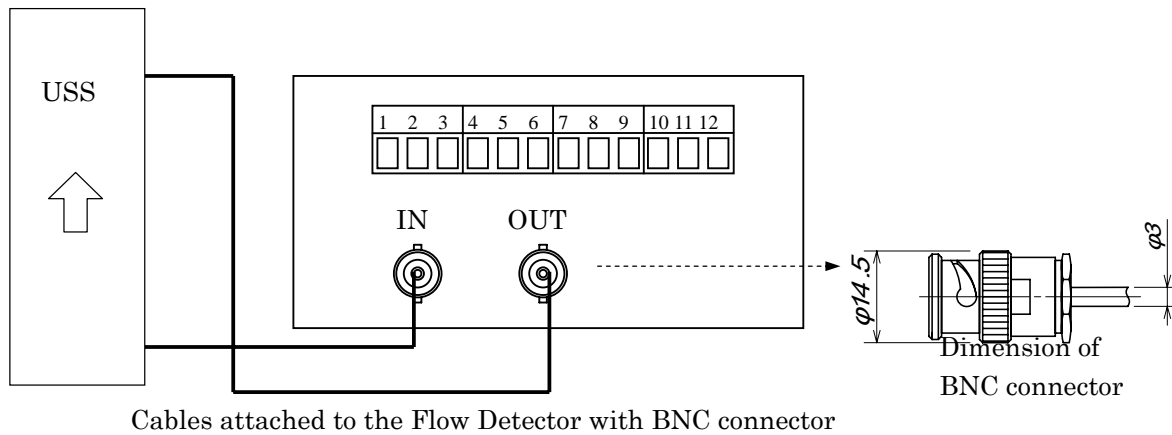


Fig. 2.3 Connection

3. OPERATING PROCEDURES

3.1 Component Names of Front Panel

Front panel layout and the component names are shown in Fig.3.1.

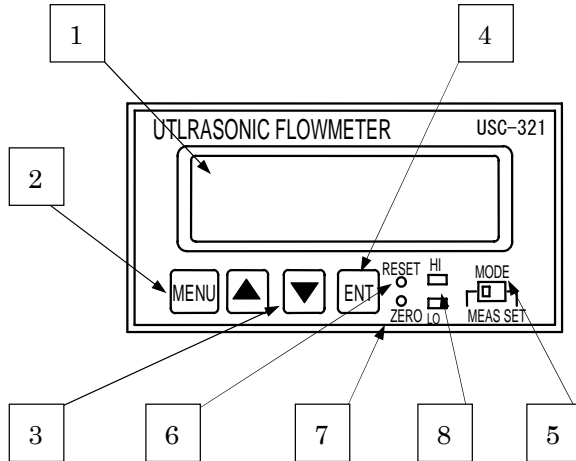


Fig. 3.1 Front panel and Component Names

No	Name	Function
1	Display	Indication of flow rate, total flow, flow velocity or parameters
2	Menu key	Selection of menu for parameter setting
3	UP/DOWN key	Setting of numerical values in parameter setting
4	Enter key (Shift key)	Fixing of set values in parameter setting mode
5	Mode selection	Selection switch for measurement or parameter setting
6	Totalizer reset	Reset switch for totalizer (counter)
7	Zero adjust Switch	Zero adjustment switch
8	Alarm indication	Indication of alarm condition

3.2 Inspection before Start Up

Confirm the following before turning power on.

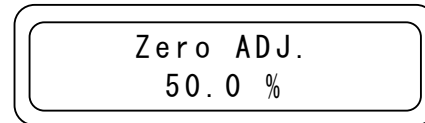
- 1) Wiring corresponds with diagram in section 2.3 and Flow Detector and converter match
- 2) Power supply voltage at terminal is DC24 V $\pm 10\%$.

- 3) Flow direction corresponds with arrow mark on Flow Detector.
- 4) Flow Detector is completely filled with liquid. Confirm no leakage, no bubbles and no deposits are observed. If there are bubbles, eliminate them by flow.

3.3 Zero Adjustment

Keep power on for approximately 15 minutes to stabilize converter, then adjust zero point by following procedure.

- 1) Stop flow completely.
- 2) Confirm liquid is free of no bubbles
- 3) Push Zero adjustment switch in the hole approximately 1 second with thin rod, e.g., pencil tip
- 4) Following display should appear for 10 seconds:



- 5) The flowmeter is now ready for operation.

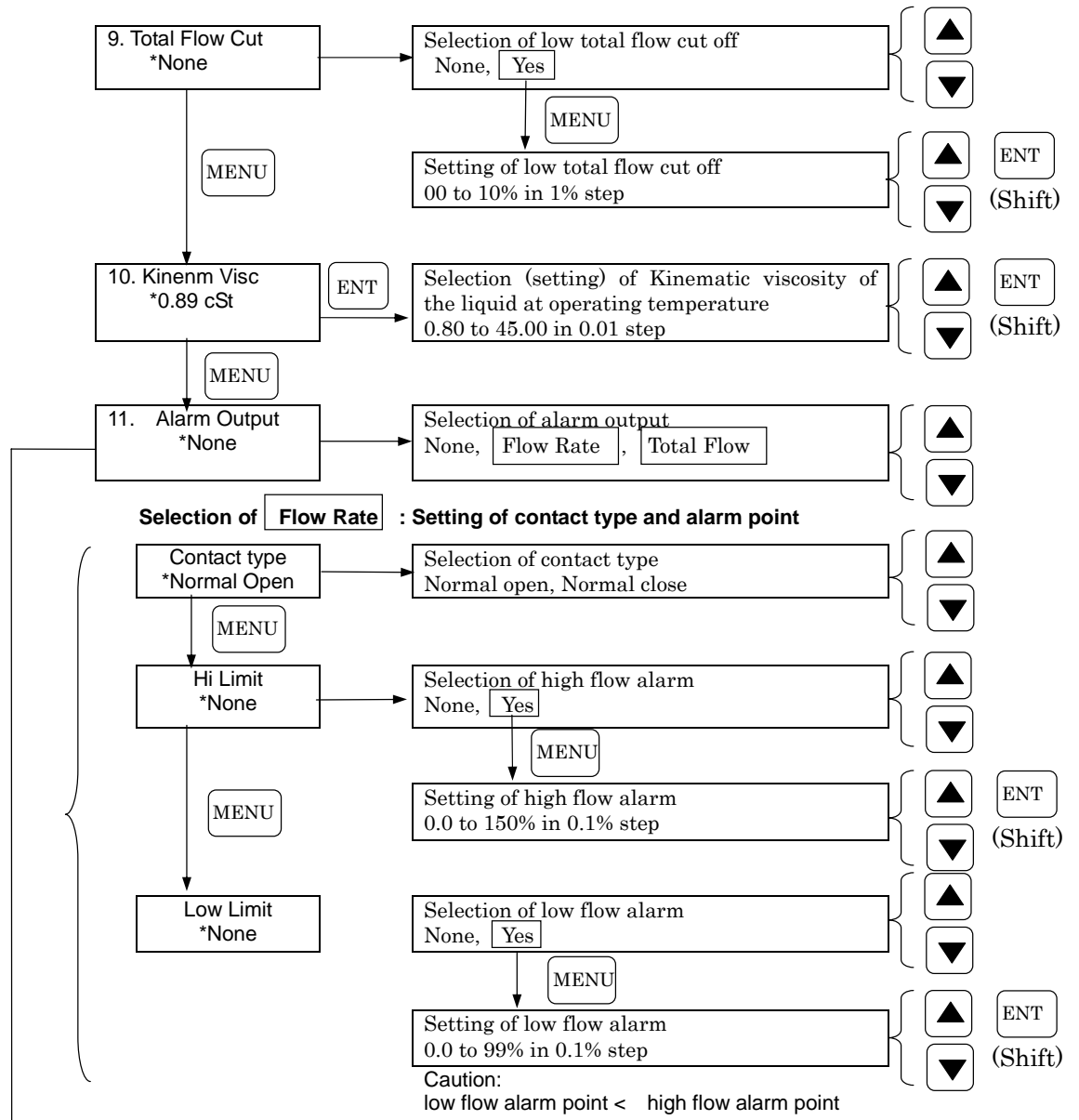
NOTE

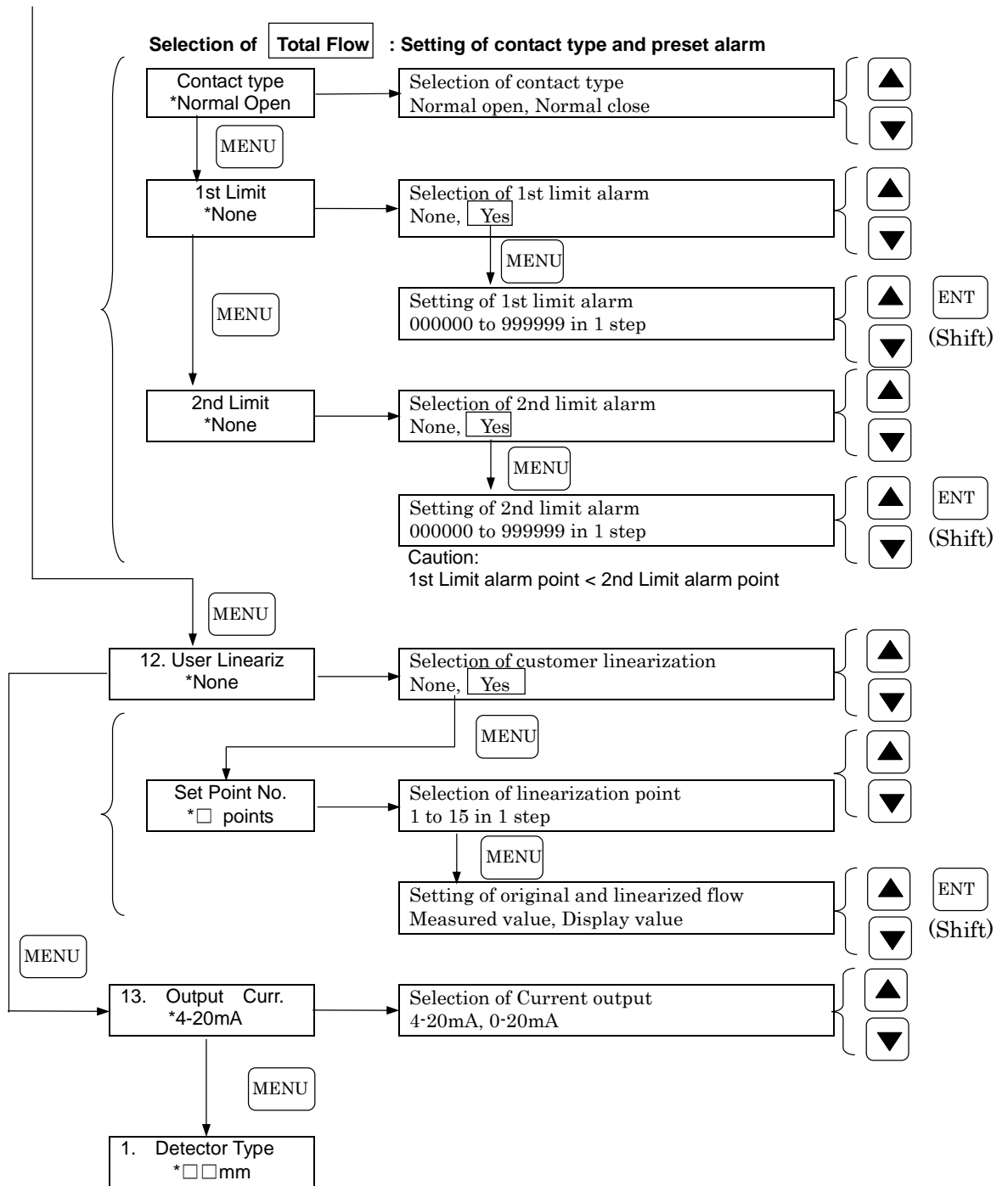
It is not necessary to repeat Zero Adjustment every time power is turned on.

4. Parameter Configuration

4.1 Function of Mode Switch and Keys

The parameters of USC-321 are set before delivery based on applications that can be accessed by mode switch. Please note the parameters before use. For access of parameters, menu key is used for selection of each item and enter key is used for fixing the setting or selected parameters. The enter key is also used for setting numerical values and for moving cursor. Up and down keys are used for selecting parameters. Please refer to the following diagram for setting or selecting parameters.



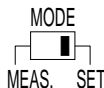


5. Parameter Setup Examples

5.1 Selecting a Full Scale Flowrate Range

The following describes the procedure used when switching the full scale flowrate range from 20.00 L/min to 1000 mL/min.

- 1 Shift the MODE switch to the SET side.



The setup mode is turned on and Parameter Menu No. 1 Detector Type appears.

1. Detector Type
*10mm

- 2 Press the **MEU** key three times.

Parameter Menu No. 4 Full Scale appears.

4. Full Scale
*20.00 L/min

- 3 Press the **ENT** key

The column of 2 flashes.

4. Full Scale
20.00 L/min

- 4 Press the **▼** key.

"2" is replaced by "1".

4. Full Scale
10.00 L/min

- 5 Press the **ENT** key four times (SHIFT).

Decimal place flashes.

4. Full Scale
10.00 L/min

- 6 Press the **▼** key twice.

Decimal place is right shifted by two column.

4. Full Scale
1000. L/min

- 7 Press the **ENT** key.

Leftmost letter of unit flashes.

4. Full Scale
1000 L/min

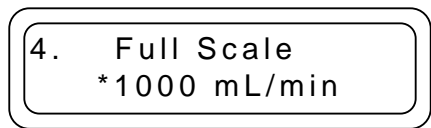
- 8 Press the **▼** key 1 time.

"L" is replaced by "mL".

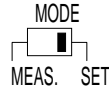
4. Full Scale
1000 mL/min

9 Press the **ENT** key.

"*" marking is lighted indicating that the specified value has been validated.



10 Shift the MODE switch to the MEAS. side.

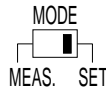


The measurement mode will be restored.

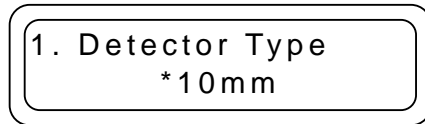
5.2 Changing an Integrating Multiplier

The following describes the procedure used for switching the multiplier from $\times 100$ L to $\times 1$ mL.

1 Shift the MODE switch to the SET side.

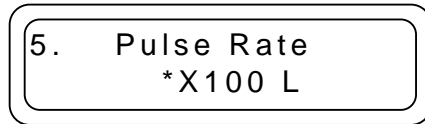


The setup mode is turned on and Parameter Menu No. 1 Detector Type appears.



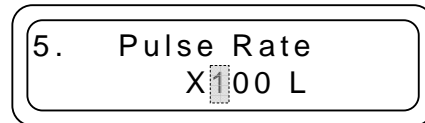
2 Press the **MBU** key 4 times.

Parameter Menu No. 5 Pulse Rate appears.



3 Press the **ENT** key.

Leftmost of constant flashes.



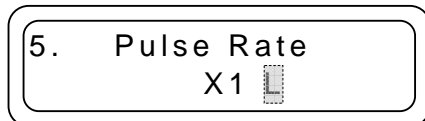
4 Press the **▼** key twice.

$\times 100$ is replaced by $\times 1$.



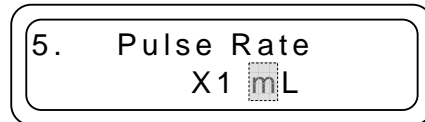
5 Press the **ENT** key.

Leftmost of unit flashes.



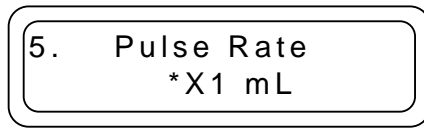
6 Press the **▼** key.

"L" is replaced by "mL".

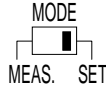


- 7 Press the **ENT** key.

"*" marking is lighted indicating that $\times 1$ mL has been validated.



- 8 Shift the MODE switch to the MEAS. side.



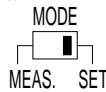
The measurement mode will be restored.

5.3 Selecting and setting up a Pulse Output

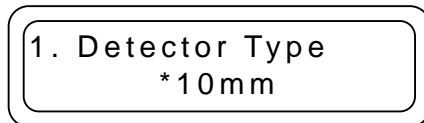
5.3 Selection of Pulse Output

At first, choose whether to use Pulse output or not.

- 1 Shift the MODE switch to the SET side.

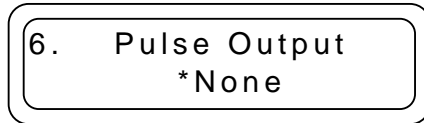


The setup mode is turned on and Parameter Menu No. 1 DETECTOR TYPE appears.



- 2 Press the **MEV** key 5 times.

Parameter Menu No. 6 Pulse Output appears.



- 3 Press the **τ** or **σ** key to select one of the following

- None : No use of Pulse Output terminal
- Scaled Pulse : Pulse output is activated.
- Fault Alarm : The pulse output terminal closes when "Signal Error" appears in the LCD display.

When Scaled Pulse is selected, then select the pulse width from following three

- 0.5ms(Max1kHz) : Pulse width 0.5ms , Max Frequency 1kHz
- 50ms(Max10Hz) : Pulse width 50ms , Max Frequency 10Hz
- 100ms(Max5Hz) : Pulse width 100ms , Max Frequency 5Hz

NOTE : Restriction for pulse output The pulse width and Max frequency restrict the parameter range for Full Scale value and total flow unit of Menu4.;Full Scale, and multiply factor/total flow unit of Menu5; Pulse Rate. The configured parameters should not be conflict and are automatically checked if settings are illegal.

5.4 Selecting and Setting Up the Alarm Output Function

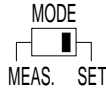
The following describes how to select and set up the High/Low Alarm Function and the Integration Preset Output Function.

Note: Be advised that the High/Low Alarm Function and the Integration Preset Output Function cannot be turned on at the same time.

5.4.1 Selecting and Setting Up the High/Low Alarm

The following describes the procedure for specifying, as an example, B contact for the contact type, 80% for the upper limit and 30% for the lower limit in the momentary flowrate alarm setup.

- 1 Shift the MODE switch to the SET side.




The setup mode is turned on and Parameter Menu No. 1 Detector Type appears.

1. Detector Type
* 10mm

- 2 Press the  key several times.

Parameter Menu No. 11 Alarm Output appears.


11. Alarm Output
* None

- 3 Press the  key.

Flow Rate appears.


11. Alarm Output
Flow Rate

Note: When you are not going to use the alarm output function, select "None".

- 4 Press the  key.

"*" marking is lighted indicating that your selection has been validated.

11. Alarm Output
* Flow Rate

- 5 Press the  key.


Contact Type appears.

Contact Type
* Normal Open

- 6 Press the  or  key.

Select Normal Close.


Contact Type
Normal Close

- 7 Press the  key.

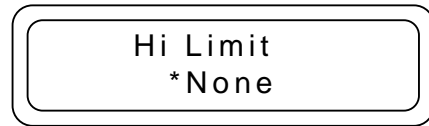
"*" marking is lighted indicating that your

Contact Type
* Normal Close

selection has been validated.

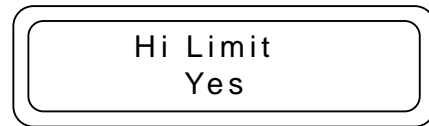
8 Press the  key.


Hi Limit appears.



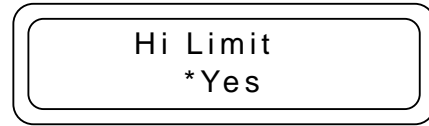
9 Press the  or  key.


Select "Yes".



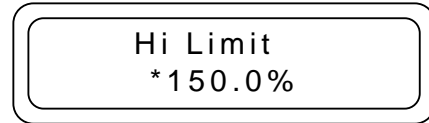
10 Press the  key.


"*" marking is lighted indicating that your selection has been validated.



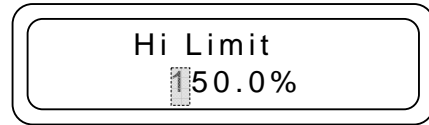
11 Press the  key.

Hi Limit setup menu appears.



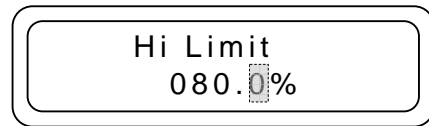
12 Press the  key.


The 1st column flashes.



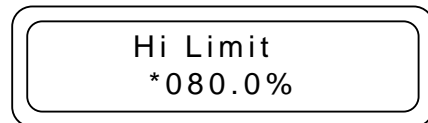
13 Press the ,  or  key.


Set the value "080.0%".



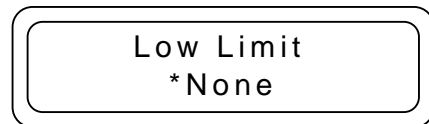
14 Press the  key.

"*" marking is lighted indicating that your selection has been validated.



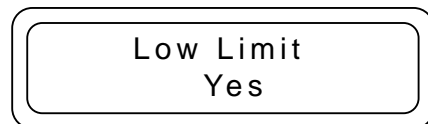
15 Press the  key.


Low Limit appears.

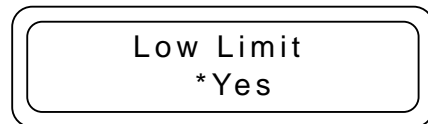


16 Press the  or  key.


Select "Yes".



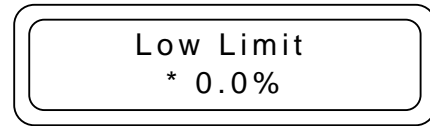
17 Press the  key.




"*" marking is lighted indicating that your selection has been validated.

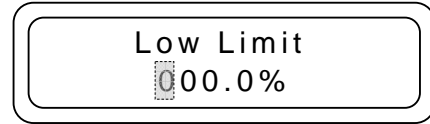
- 18 Press the  key.

Low Limit setup menu appears.



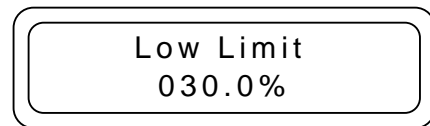
- 19 Press the  key.


The 1st column flashes.



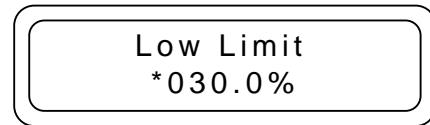
- 20 Press the ,  or  key.

Set the value "030.0%".

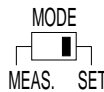


- 21 Press the  key.

"*" marking is lighted indicating that your selection has been validated.



- 22 Shift the MODE switch to the MEAS. side.

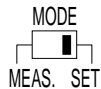


The measurement mode will be restored.

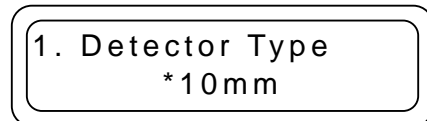
5.4.2 Selecting and Setting Up the Integration Preset Output Function

The following describes the procedure for specifying, as an example, B contact for the contact type, 50L for 1st limit and 100L for 2nd limit in the integration preset output setup.

- 1 Shift the MODE switch to the SET side.

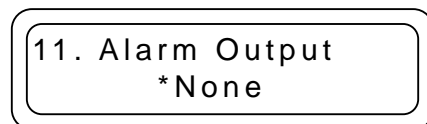



The setup mode is turned on and Parameter Menu No. 1 Detector Type appears.

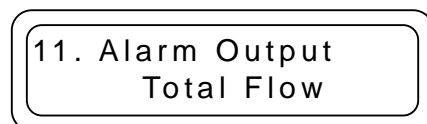


- 2 Press the  key several times.

Parameter Menu No. 11 Alarm Output appears.




- 3 Press the  key.

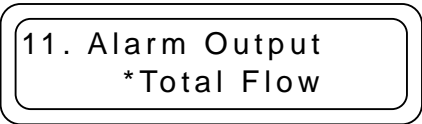


Total Flow appears.


Note: When you are not going to use the alarm output function, select "None".

- 4 Press the  key.


"*" marking is lighted indicating that your selection has been validated.



11. Alarm Output
*Total Flow

- 5 Press the  key.


Contact Type appears.




Contact Type
*Normal Open

- 6 Press the  or  key.

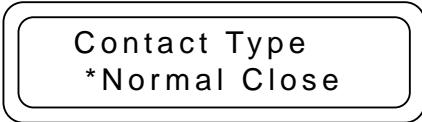
Select Normal Close.




Contact Type
Normal Close

- 7 Press the  key.

"*" marking is lighted indicating that your selection has been validated.



Contact Type
*Normal Close

- 8 Press the  key.

1st Limit appears.




1st Limit
*None

- 9 Press the  or  key.

Select "Yes".




1st Limit
Yes

- 10 Press the  key.

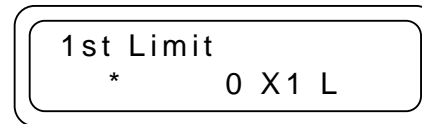
"*" marking is lighted indicating that your selection has been validated.




1st Limit
*Yes

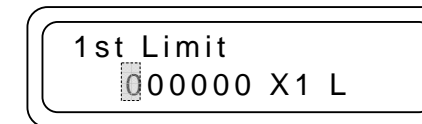
- 11 Press the  key.

1st limit setup menu appears (unit and multiplier are selected from Menu No. 5).



1st Limit
* 0 X1 L

- 12 Press the  key.

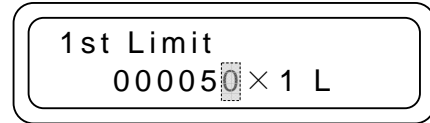


1st Limit
00000 X1 L


1st column flashes.

- 13 Press the ,  or  key.

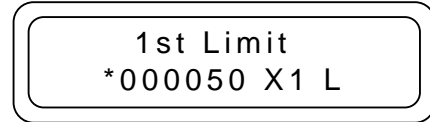
Set the value "000050 × 1L".




1st Limit
000050 X1 L

- 14 Press the  key.

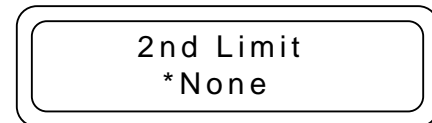
"*" marking is lighted indicating that your selection has been validated.



1st Limit
*000050 X1 L

- 15 Press the  key.

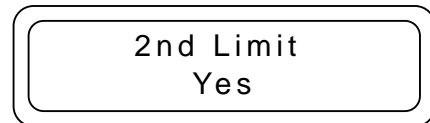
2nd limit appears.




2nd Limit
*None

- 16 Press the  or  key.

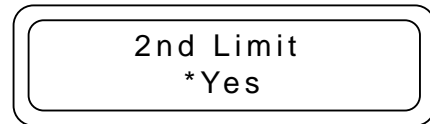
Select "Yes".




2nd Limit
Yes

- 17 Press the  key.

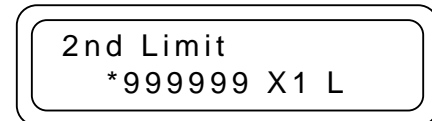
"*" marking is lighted indicating that your selection has been validated.



2nd Limit
*Yes

- 18 Press the  key.

2nd limit setup menu appears
(unit and multiplier are selected from Menu No. 5).

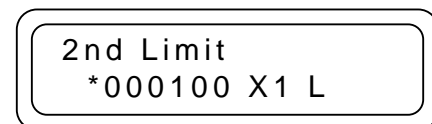


2nd Limit
*999999 X1 L

- 19 Specify the value for 2nd limit.

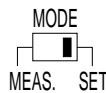
Select 000100 using the above procedures 12 through 14.

"*" marking is lighted indicating that your selection has been validated.



2nd Limit
*000100 X1 L

- 20 Shift the MODE switch to the MEAS. side.



The measurement mode will be restored.

5.5 Setting Up the User Linearize

The User Linearize (linear approximation) function is used for modifying fluid specifications or correcting deviations in the measurements.

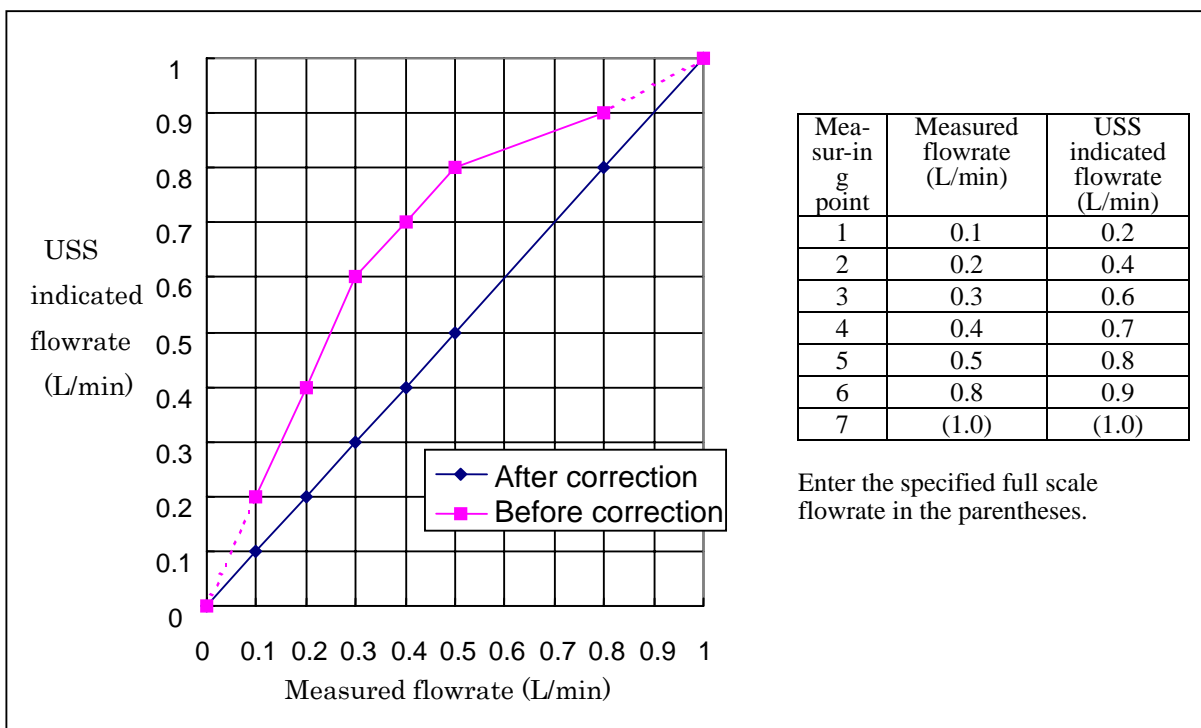
5.5.1 How to Use the Linearize Function

- Polygonal line approximation is employed for the correction. Up to 15 pieces of data can be entered for drawing the line. Measured flowrate and ones indicated by USS are entered on L/min basis.
- When you use the User Linearize, you must select unit of flowrate(selected from Parameter Menu No.4) to be "L/min"
- Any correction value entered must not exceed the specified full scale flowrate (selected from Parameter Menu No. 4). In case such value is required, the specified full scale flowrate must be previously modified.
- Data below the minimum input value up to 0 L/min are linearly approximated. You must enter the full scale flowrate for the maximum value. Note that the guaranteed accuracy may not be obtainable below the minimum input value and near to the maximum input value.

5.5.2 Linearize Data Input Procedure

The following describes the procedure to be employed for correcting the deviation shown below using data from 7 points.

When 1 L/min is selected for the full scale flowrate



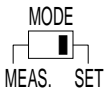
Note) The flowrate of each Measuring points 1,2,3,, should increase as the Measuring point increases. Point1<Point2<Point3<Point4< (Error message "Set Data Error")

Please note this rule when you re-configure the linearization data.

(If the number of the re-configuration points are smaller than the old data, the old data will


remain in the memory. Please do not forget deleting the old data before the measuring starts.)

1 Shift the MODE switch to the SET side.



1. Detector Type
* 10mm

The setup mode is turned on and Parameter Menu No.1 Detector Type appears.

2 Press the  key several times.


Parameter Menu No.12 User Leneariz appears.

12. User Lineariz
*None

3 Press the  or  key.


Select "Yes".

12. User Lineariz
Yes

4 Press the  key.



"*" marking is lighted indicating that your selection has been validated.

12. User Lineariz
*Yes


5 Press the  key.

Linearization input points setup menu appears.

Set Point No.
* 1 points


6 Select desired number of the input points using the  or  key (you can select up to 15 points).

12. User lineariz
7 points

7 Press the  key.

"*" marking is lighted indicating that your selection has been validated.

12. User lineariz
*7 points

8 Press the  key.

Linearization data setup menu appears.

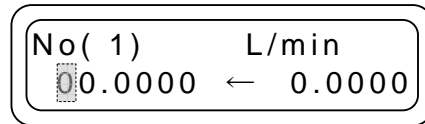
Point No.	Unit of Flowrate
No(1)	L/min
*0.0000	← 0.0000

Measured flowrate
(L/min)

USS indicated flowrate
(L/min)

9 Press the **ENT** key.

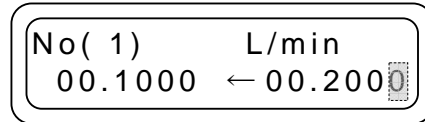
1st column of the measured flowrate data flashes.



No(1) L/min
00.0000 ← 0.0000

10 Enter the 1st point data using the **▲**, **▼** and **ENT** keys.

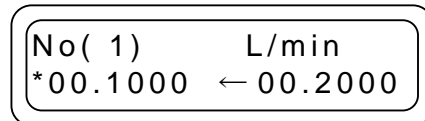
Enter the measured flowrate and USS indicated flowrate.



No(1) L/min
00.1000 ← 00.2000

11 Press the **ENT** key.

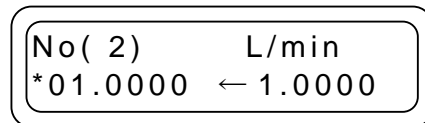
When you press the **ENT** key at the last column, "*" marking is lighted indicating that your setup has been validated.



No(1) L/min
*00.1000 ← 00.2000

12 Press the **MENU** key.

2nd point linearize data input menu appears .



No(2) L/min
*01.0000 ← 1.0000

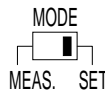
13 Enter the 2nd through 7th point data.

Repeat the above steps 9, 10 and 11.

Note: You must enter the full scale flowrate for the maximum value.

You can save the data on memory by pressing the **ENT** key at the last column of the last point (in this case, the 7th point). When you have modified some of the data, you must press the **ENT** key again at the last column.

14 Shift the MODE key to the MEAS. side.



The measurement mode will be restored.

6. MAINTENANCE

6.1 Routine checks

Ultrasonic flow meter requires no daily maintenance since it has no moving parts that can be subject to wear and tear. However, we recommend the following checks to ensure smooth and reliable operation.

- 1) Connection of Flow Detector
Check for leakage around pipe connections or liquid penetration into Flow Detector tube.
- 2) Connecting pipe
Check for mechanical stress to Flow Detector caused by possible warping of connecting pipes or loose connections caused by heavy pipe vibration.

- 3) Cable glands
Check cable glands of Flow Detector and tighten them if loose.
- 4) Deposit or bubbles in the Flow Detector
Observe the Flow Detector visually from outside and note that there are no deposits or bubbles in the measuring tube.

6.2 Error messages

USC-321 has a self-diagnosis function that automatically gives error message if setting is wrong or measurement is disturbed during parameter setting or measurement

Error message	Possible Cause
Set Data Error	Set parameter is out of setting range or conflicts with other settings. Ex. Pulse rate and/or pulse unit is too small for set pulse width. High limit is smaller than low limit in flow rate alarm setting. High-high limit is smaller than high limit in total flow alarm setting.
Signal Error	Measuring tube is empty. Bubbles in measuring tube. Coaxial cables are broken off or disconnected. Some large noise is affecting the measurement. Measuring fluid is absorbing the Ultrasound signal.
<u>Signal Error Over Flow</u>	The measuring flow is over 150% of the measuring range. Or, Zero point is shifting over 150% of the measuring range.
<u>Signal Error Opposite Flow</u>	The measuring flow is under -30% of the measuring range. Or, Zero point is shifting under -30% of the measuring range.

6.3 Trouble Shooting

Please refer to the Index Table below for trouble category.

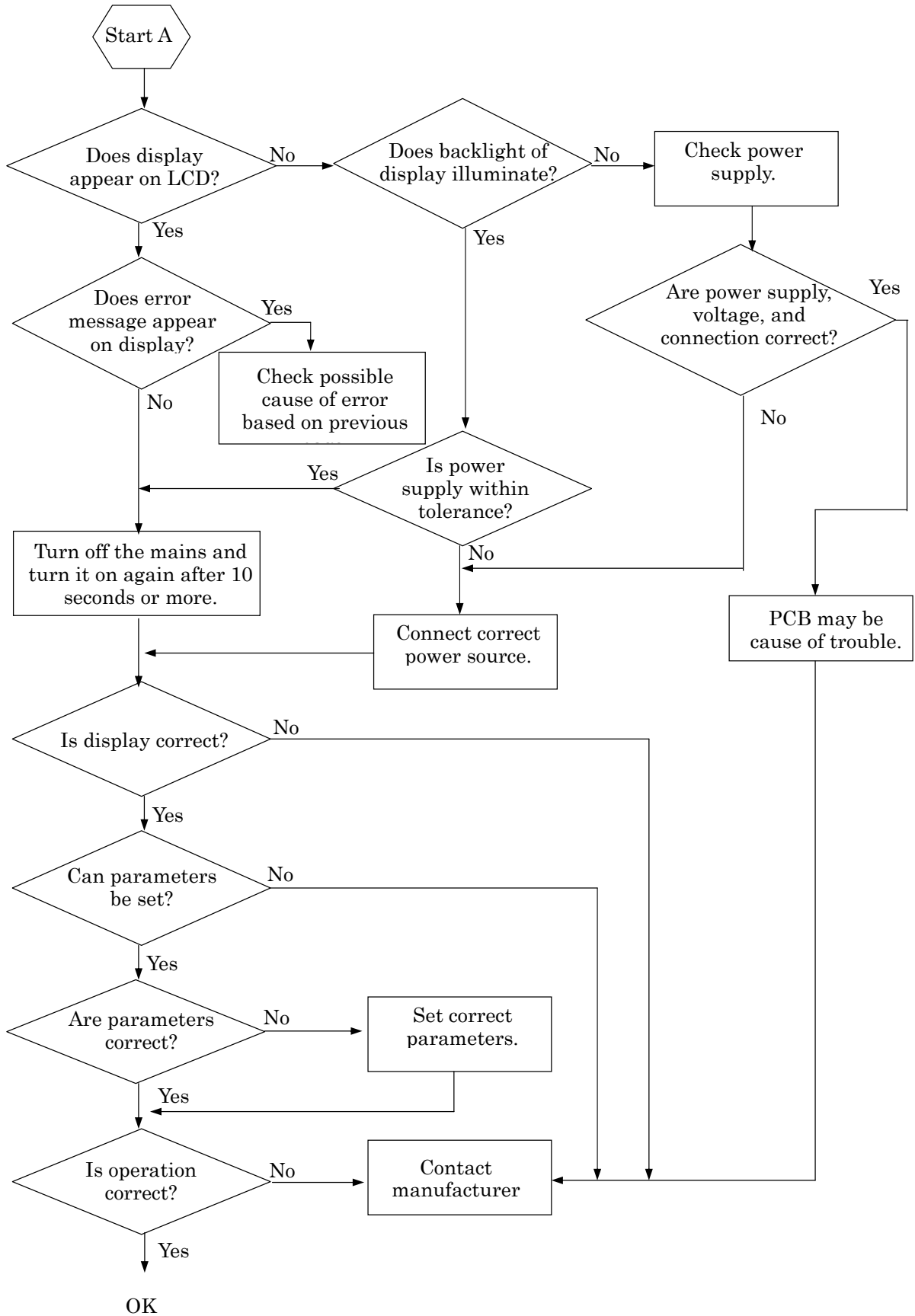
Possible troubles fall into several categories.

Trouble shooting charts on the following pages

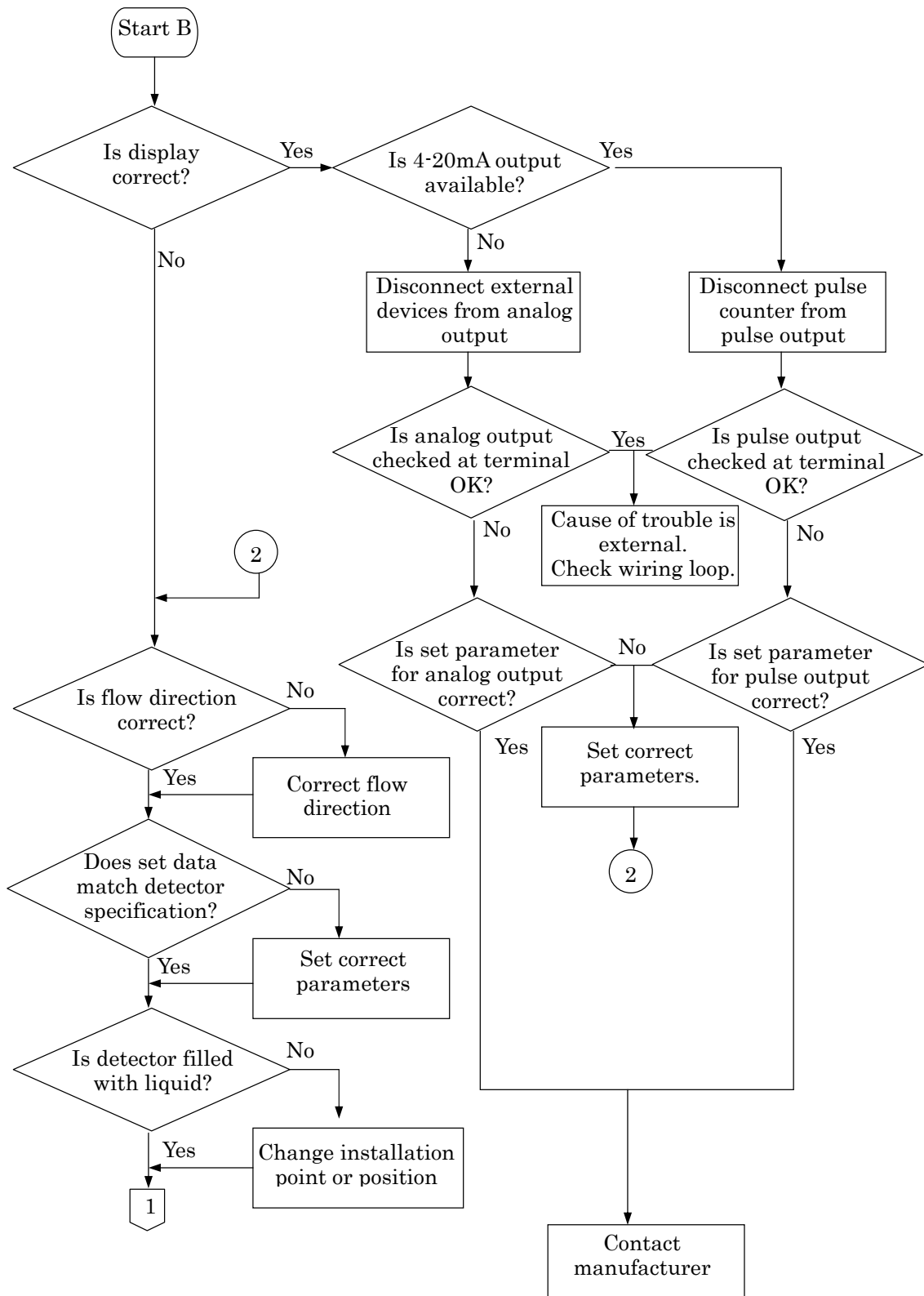
identify possible causes for each category.

Phenomenon		Trouble shooting chart by category
1	Display does not show anything	A. No display or abnormal display
2	Display shows abnormal character(s)	
3	Display is frozen	
4	Error message appears on the display	
5	Keys are not operable. Parameters cannot be set	
6	Display shows zero in liquid flow condition	B. No output with flow
7	Display shows flow rate but output is not available	
8	Zero point is not stable (Zero point drift)	C. Unstable zero point
9	Display shows flow rate or above Full scale when the flow stops	
10	Display is unstable in liquid flow condition	D. Unstable flow rate
11	Displayed flow rate differs from actual flow rate	E. Inaccurate measurement
12	Output does not match actual flow rate.	
13	Displayed value is over Full scale.	

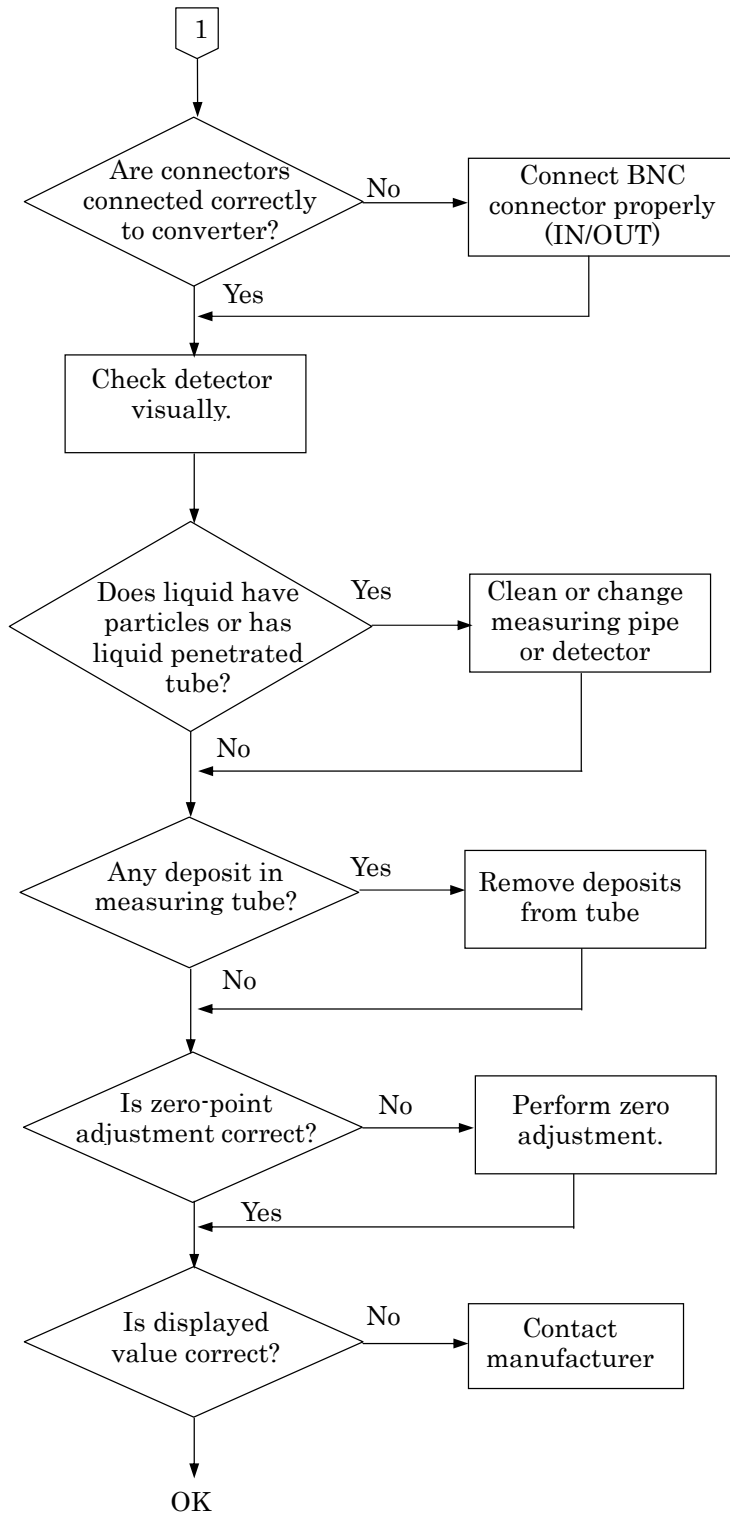
A. No display or abnormal display



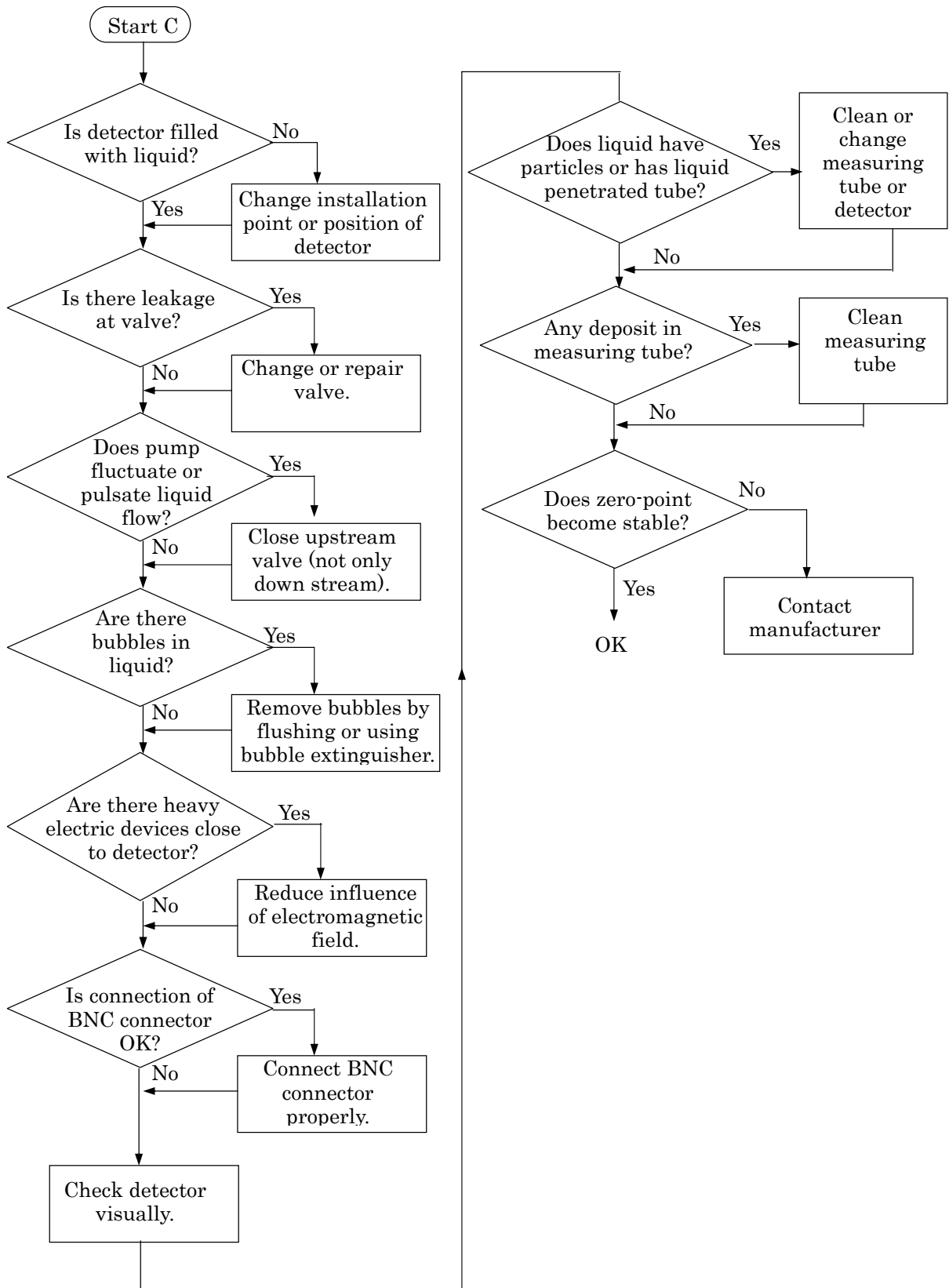
B. No output with flow



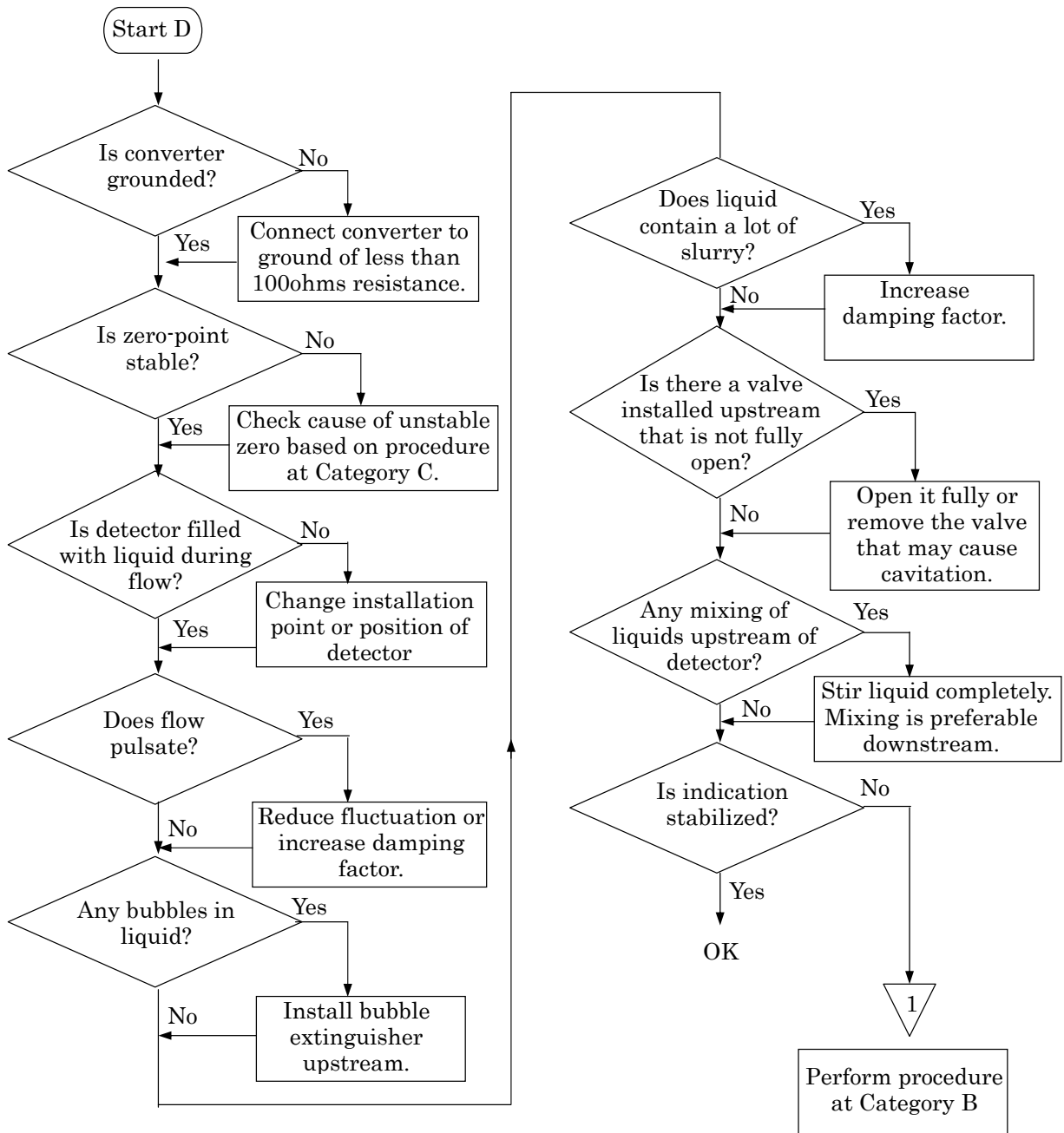
**B. No output with flow
(continued)**



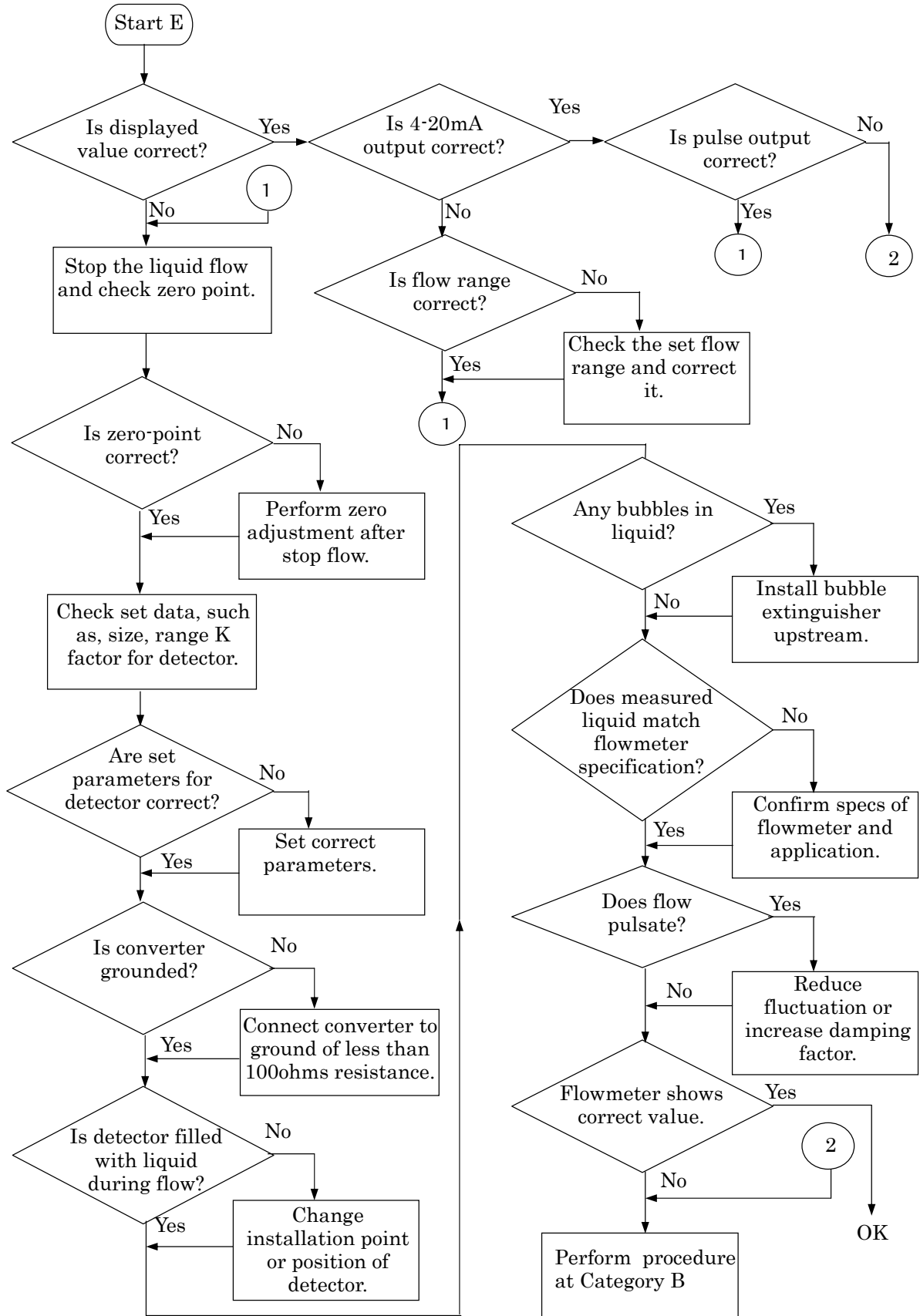
C. Unstable zero point



D. Unstable indication



E. Inaccurate measurement



7 Parameter list

Model		USC-321 /USS	Remarks
Serial No	Converter		
	Flow Detector		
Mfg. No			
Tag. No			
Fluid name			
Full scale			
Total flow			

No	Item	Allowable parameters	Set or selected parameters			
1	Detector Type	10, 08, 06, 04, 2.5 mm				
2	K Factor	0.700 to 1.300				
3	Display	Flow/Rate(%), Flow/Velocity, Flow/Total				
4	Full Scale	0 to 9999, Decimal place xxxx, xxx.x, xx.xx, x.xxx mL/s, mL/min, L/min, L/h, m3/h, m3/d, GPM, GPH				
5	Pulse Rate	×0.1, ×1, ×10, ×100 mL, L, m3, USgal				
6	Pulse Output	Scaled Pulse 0.5ms(Max.1kHz), 50ms(Max.10Hz), 100ms(Max.5Hz) None, Fault Alarm				
7	Damping Time	0.2, 0.5, 1, 2, 4, 6, 8, 10 (seconds)				
8	Low Cut	None, 00 to 10% (1% step)				
9	Total Flow Cut	None, 00 to 10% (1% step)				
10	Kinem Visc	0.80~45.00 cSt (0.01 step)				
11	Alarm Output	None, Flow Rate, Total Flow				
		Contact Type		Normal Open, Normal Close		
		Flow Rate	Hi Limit (H)	None 0.0 to 150%(L<H)		
			Low Limit (L)	None 0 to 99 %(L<H)		
		Total Flow	1st Limit (1st)	None 000000 to 999999 (1st<2nd)		
			2nd Limit (2nd)	None 000000 to 999999 (1st<2nd)		
12	User Lineariz	None, Yes				
		Set Point No.	1 to 15			
		××.×××× Unit : L/min		No	Current flow	Original flow
				1		
				2		
				3		
				4		
				5		
				6		
				7		
				8		
				9		
				10		
				11		
				12		
		13				
		14				
		15				
13	Output Curr.	4-20mA, 0-20mA				

8. Warranty

Malema Sensors

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