Product features

- All-metal casing design
- Color LCD display
- The button design and user-friendly menu make the product usage more convenient.
- Multiple connection methods can fully meet various specific installation requirements.
- The 330° rotatable display head can ensure the best performance under different installation methods.
- High viscosity medium, strong anti-fouling ability

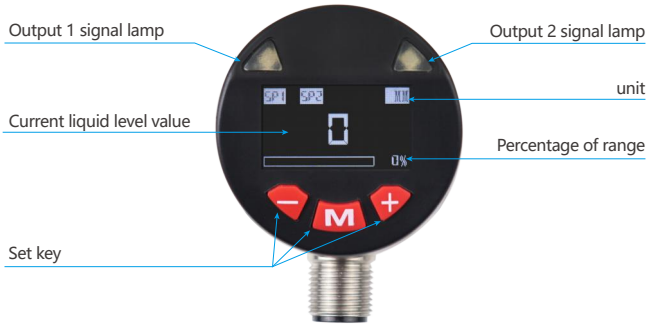
Product Application

- Can be applied to various liquid level measurements of solids

Product principle

The LM210 series uses radar-type principle sensors for liquid level measurement. The signals are processed by the rear processing circuit and then converted into standard industrial electrical signals for output and display.
The radar-type sensor is equipped with internal electrodes that interact with the metal tank or container to generate capacitance values. These capacitance values change as the medium volume in the cavity increases or decreases, thereby determining the liquid level value of the medium.

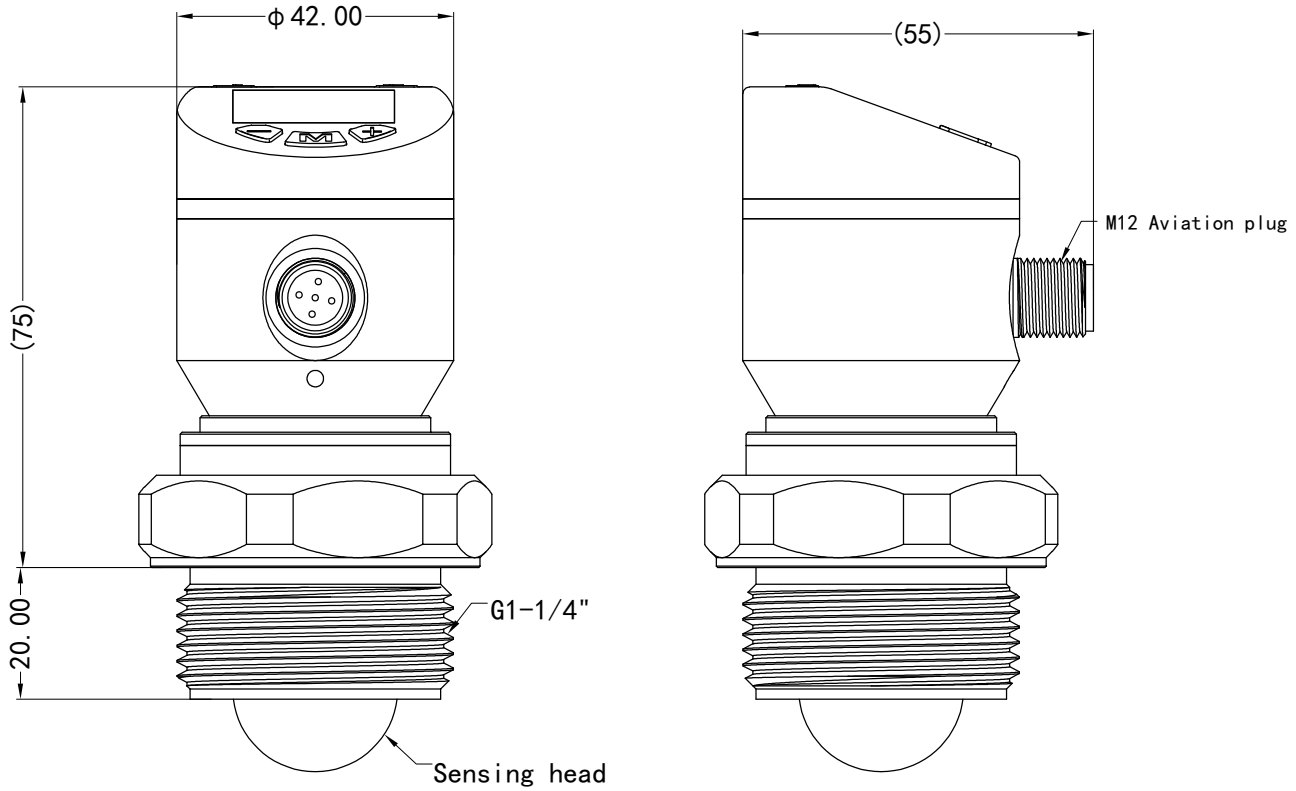
Panel diagram



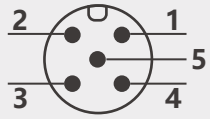
Technical Specifications

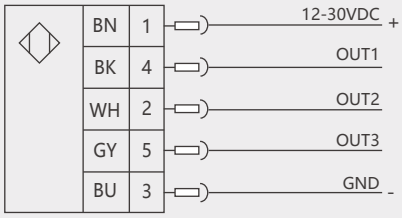
- Measurement range: 500...30000mm (top blind zone 50mm)
- Measured medium: Liquid/Solid
- Pressure resistance: 10 bar
- Accuracy: ±2mm
- Power supply voltage: 16... 28Vdc
- No-load current consumption: ≤ 30mA, when powered by 24Vdc
- Switch output
- Output type: PNP / NPN / Normally Open / Normally Closed can be set
- Output current: < 500mA
- Current-mode analog output
- Output type: Three-wire 0... 20mA/4... 20mA option
- Load RA: RA ≤ 500 ohms
- Linearity: ≤ ±1.5% of the range
- Voltage-type analog output
- Output type: three-wire 0... 5V/1... 5V optional
- Load RA: RA > 10Kohm
- Linearity: ≤ ±1.5% of the range
- Wiring protection: Inverting, overload, short circuit protection
- Display: Color LCD display
- Temperature
- Operating temperature: -20...80℃
- Medium temperature: -20...80℃
- Storage temperature: -30...80℃
- Materials
- Shell: Stainless steel 304
- Probe: Stainless steel 304 (outer layer PTFE)
- Protection level: IP67
- Outlet method: M12×1 connector directly attached wire

Dimension drawing (mm)



Wiring diagram





A3: Two switches + one analog (4-20mA)								
colour	stitch	instructions	Colour	stitch	instructions	Colour	stitch	instructions
BN	1	power supply (+)	BU	3	power supply (-)	GY	5 (OUT3)	Level: 4-20mA (factory default)
BK	4 (OUT1)	Level switch PNP (Factory default) Level switch NPN	WH	2 (OUT2)	Level switch PNP (Factory default) Level switch NPN			

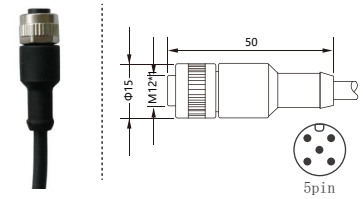
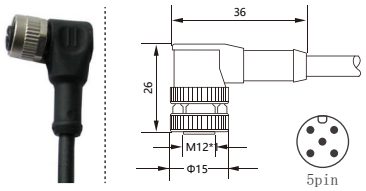
V5: Two switches + one analog (1-5V)								
colour	stitch	instructions	Colour	stitch	instructions	Colour	stitch	instructions
BN	1	power supply (+)	BU	3	power supply (-)	GY	5 (OUT3)	Level: 1-5V
BK	4 (OUT1)	Level switch PNP (Factory default) Level switch NPN	WH	2 (OUT2)	Level switch PNP (Factory default) Level switch NPN			

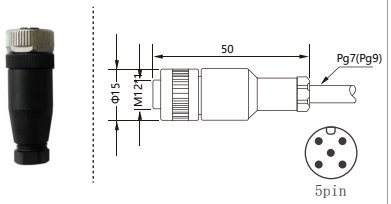
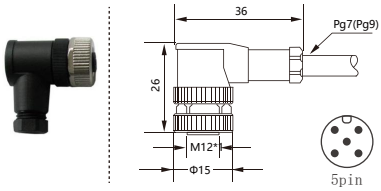
Selection Table

LM210-	A3	G112M	500	Detailed description
LM210-				Radar liquid level sensor
	A3			Output signal: Two switch outputs + analog output (4...) 20mA)
	V5			Output signal: Two switch outputs + analog output (1...) 5V)
		G112M		Process connection: G1-1/2 external thread
		G114M		Process connection: G1-1/4 external thread
		F25		Process connection: DN25 flange connection
		F50		Process connection: DN50 flange connection
			500	Measurement range: 500mm
			1000	Measurement range: 1000mm
			1500	Measurement range: 1500mm
			2000	Measurement range: 2000mm
			2500	Measurement range: 2500mm
			...	...
			30000	Measurement range: 30000mm

Special requirements can be customized.

Optional accessories - Electrical accessories (M12-5Pin: Factory default ZL05-PC02G)

name	Outline drawing/dimension drawing (unit :mm)	material	Model number	Shielded wire
M12*1-5Pin (2m cable)		PUR	ZL05-PU02G	-P
M12*1-5Pin (5m cable)			ZL05-PU05G	
M12*1-5Pin (10m cable)			ZL05-PU010G	
		PVC	ZL05-PC02G	
			ZL05-PC05G	
			ZL05-PC010G	
M12*1-5Pin (2m cable)		PUR	ZL05-PU02W	
M12*1-5Pin (5m cable)			ZL05-PU05W	
M12*1-5Pin (10m cable)			ZL05-PU010W	
		PVC	ZL05-PC02W	
			ZL05-PC05W	
			ZL05-PC010W	

M12*1-5Pin self-connector/Dimensions (Unit :mm)	Model number
	GL05 (4 Pin connector)
	WL05 (5 Pin connector)

Optional accessories - Protective cover

Color crystal screen series (switch) sensor protection cover

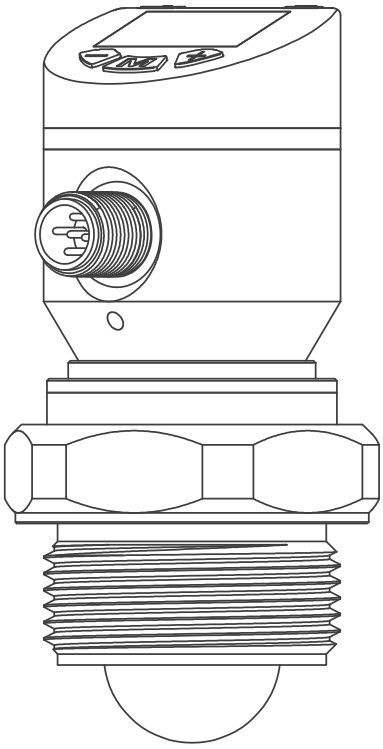
Order number: KTCS33661

Sensor and controller

■ Flow ■ pressure ■ temperature ■ level ■ position

KATU 卡图

Operation Instructions
Radar liquid level sensor
LM210 series



Purpose of product application

danger

The sensor (switch) can only be used in the specified application range.

The temperature range must be within the permissible range. Do not exceed the rated pressure and power load value.

Assembly, commissioning and operation must be carried out in accordance with applicable national and local safety instructions.

The switch is designed to be used as a safety device for pressurizing the system in accordance with "Pressure Equipment Directive 97/23 / EC(PED)".

Standard

The standards applied during development, manufacturing and configuration are listed in the CE Compliance and manufacturer declarations.

Quality assurance

Our scope of delivery and service is subject to legal warranties and warranty periods.

Warranty clause

We guarantee that the functions and materials of the dual pressure switch meet the statutory requirements under normal operation and maintenance conditions.

Security of loss

Such as:

- Incorrect use,
- Incorrect installation
- Incorrect operation or operation in violation of the provisions of this operation manual.

No liability shall be assumed for any damage resulting therefrom or consequential.

Safety instruction

Safety instructions are intended to protect users from dangerous situations and /or prevent material damage.
In the operating instructions, the severity of the potential risk can be indicated by the following signal words:

danger

An imminent danger to the user. Failure to comply may result in fatal injury.

warning

An identifiable hazard.

Failure to comply may result in fatal injury and damage to equipment or plant parts.

caution

It means a danger.

Non-compliance may result in minor injury and material damage to the sensor (switch) and/or plant.

important

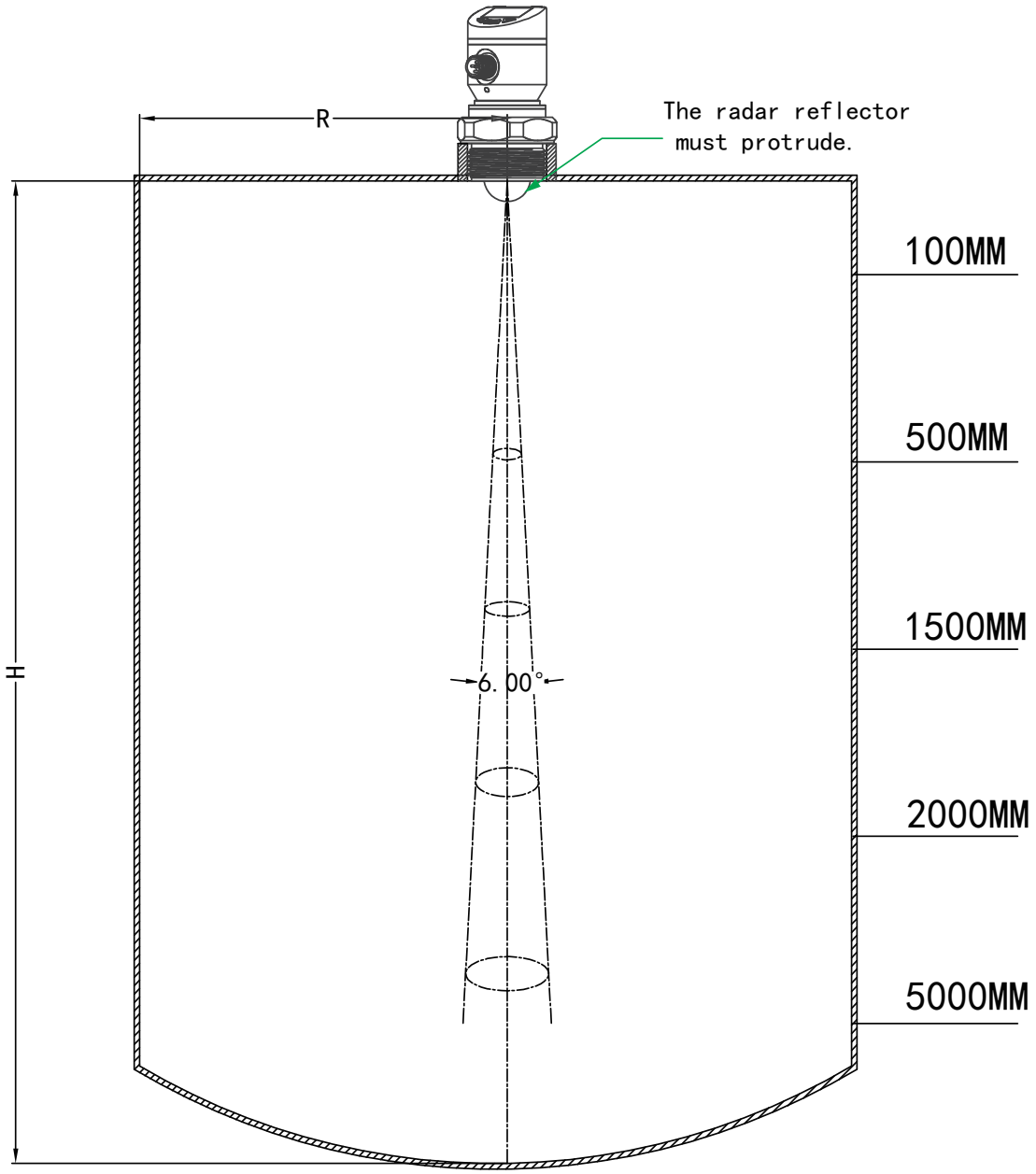
Information that is important to the user.

Deal with

Sensors (switches) must be handled correctly in accordance with national or local regulations for electrical/electronic equipment.

Sensors (switches) cannot be disposed of with household waste!

Installation

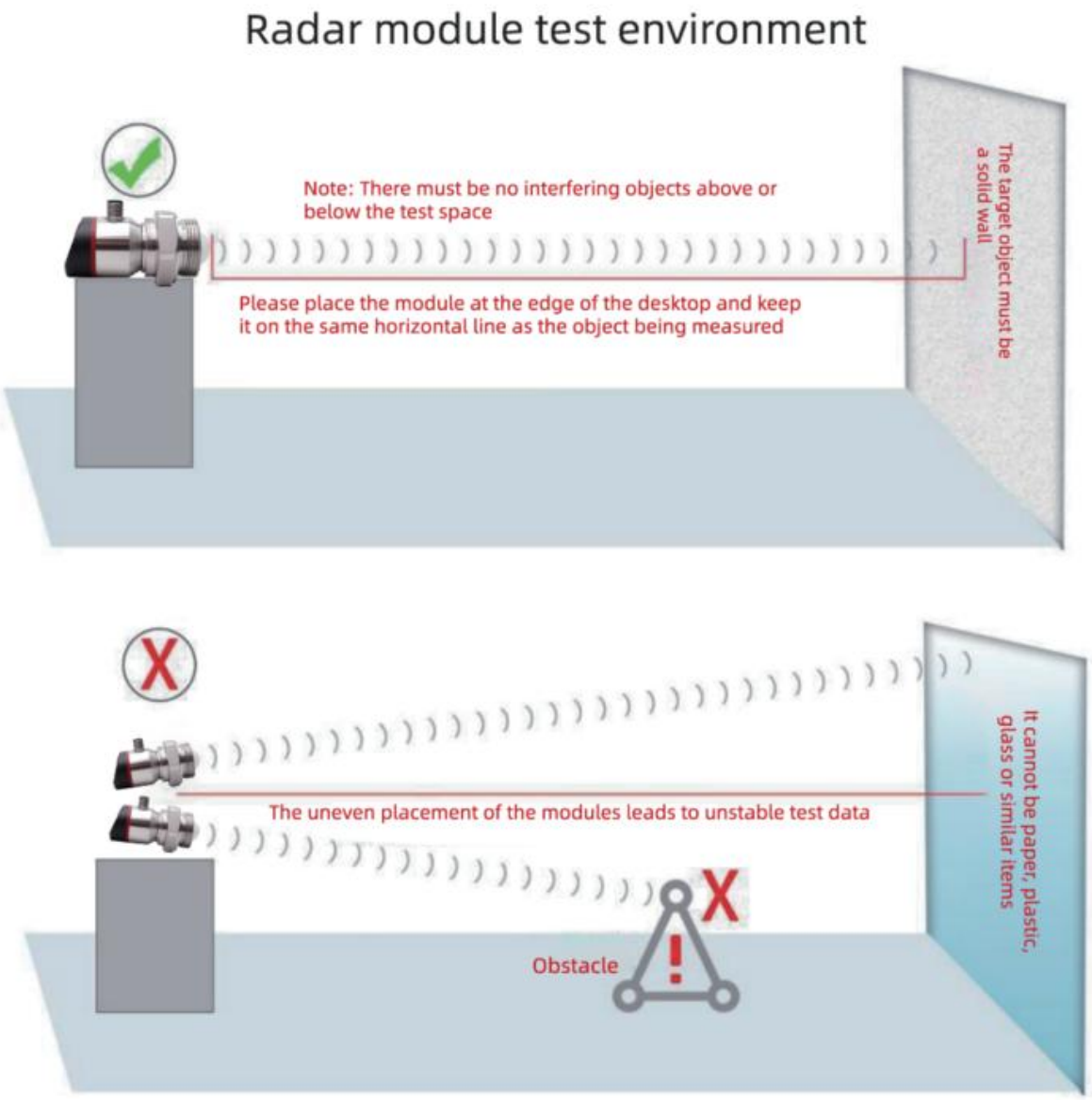


Height measurement calculation formula: H = R (radius) / tan (wave velocity angle)

For example: H=R/tan3°

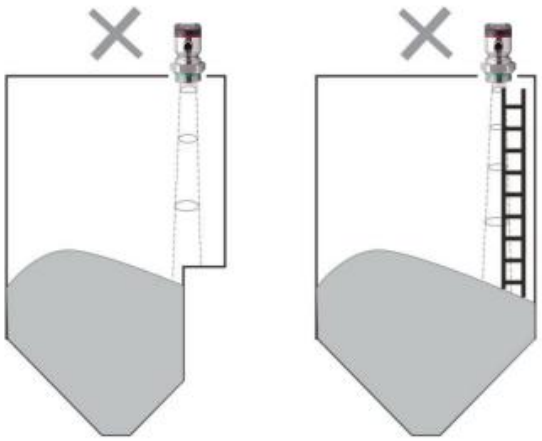
Measurement distance (H)	1000mm	2000mm	3000mm	4000mm	5000mm	10000mm
Distance from the wall (R)	60mm	110mm	160mm	210mm	270mm	530mm
For mirror-like smooth inner walls made of metal (such as stainless steel 304, etc.), the distance from the wall can be reduced by 50%.	30mm	60mm	80mm	110mm	140mm	240mm

■ *Installation Instructions*

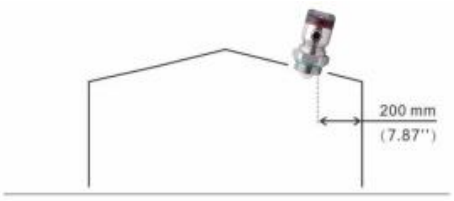


Two points to note during installation:
(1) Align with the target material level and try to ensure a vertical entry to the material level;
(2) Avoid false echoes.
For typical working conditions, refer to the following points.
Ensure there are no interfering objects within the wave beam range, such as people, ladders, and steps.
The instrument installation should ensure that the antenna wave beam avoids the feed inlet.
The instrument installation should be at least 6cm away from the container wall; otherwise, it is likely to result in incorrect readings.
For conical containers, try to ensure that the wave beam directly hits the tank; otherwise, the measurement results at the bottom of the tank may be inaccurate.

Instrument Installation Location Diagram

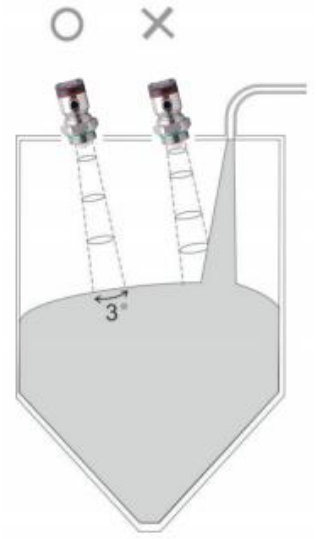


The instrument should be installed at least 20 cm away from the container wall; otherwise, there is a high possibility of incorrect readings.



Install at least 20 cm away from the container wall.

- **The installation of the instrument should ensure that the antenna beam avoids the feed inlet, as shown in the figure.**

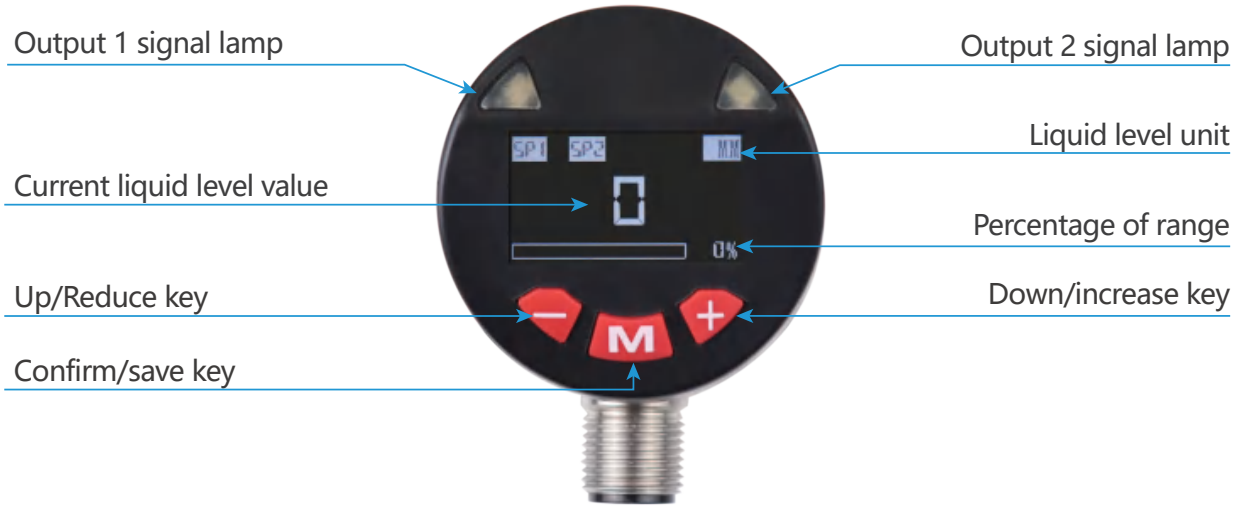


The antenna beam avoids the feed inlet.

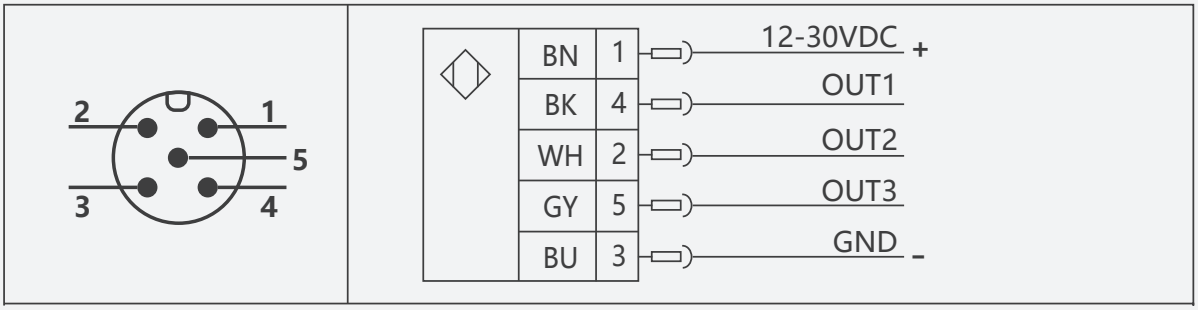
The conical container should be designed to ensure that the beam is directly directed at the bottom of the tank.
Otherwise, the measurement results at the bottom of the tank may be inaccurate.

The conical tank is designed to ensure that the beam is directly directed at the bottom of the tank.

Panel diagram



Wiring diagram



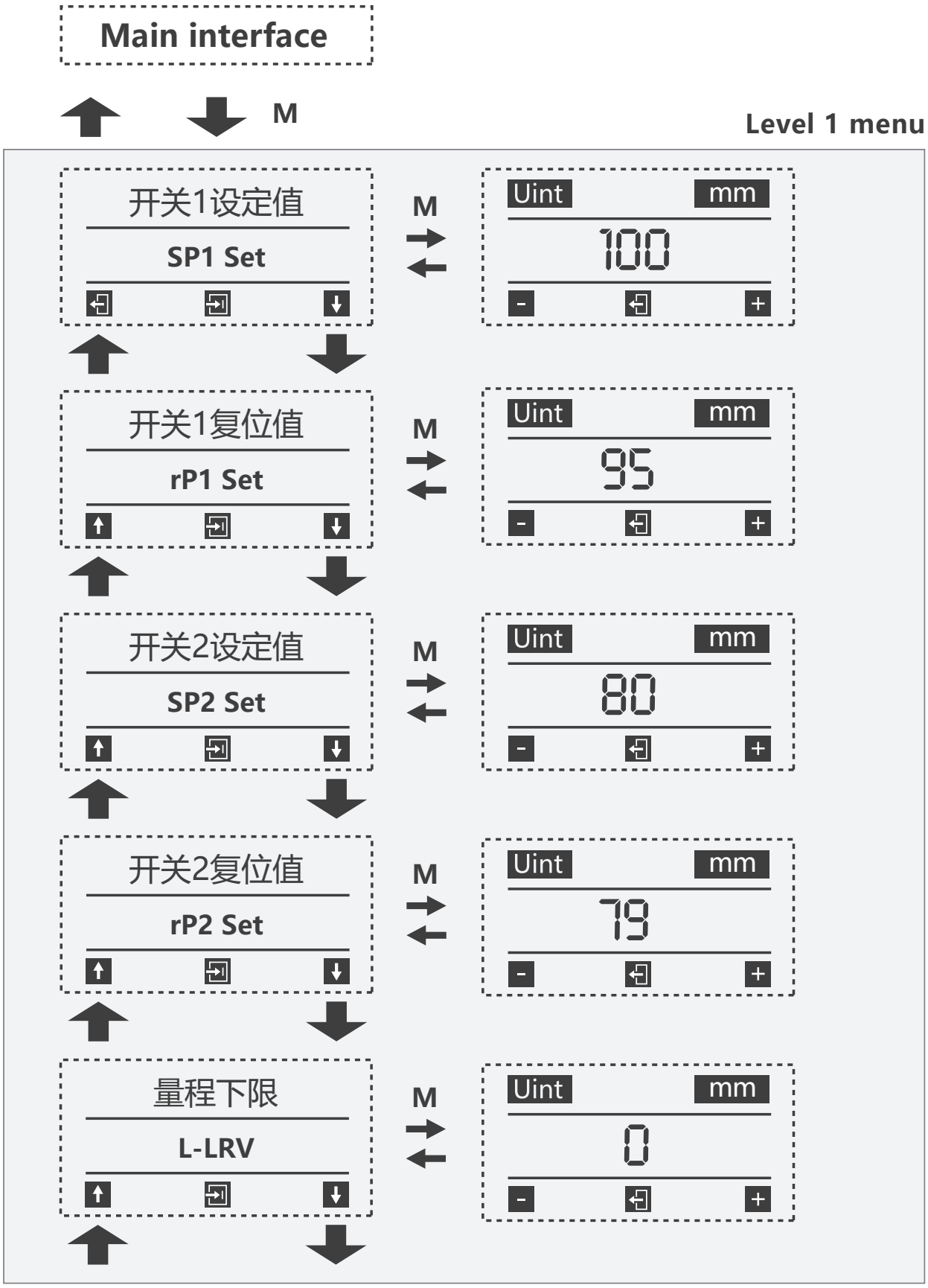
Two switches + one analog		
color	**stitch**	**Instructions**
BN	1	power supply (+)
BU	3	power supply (-)
BK	4 (OUT1)	Level switch PNP (Factory default) Level switch NPN
WH	2 (OUT2)	Level switch PNP (Factory default) Level switch NPN
GY	5 (OUT3)	Level analog (Factory default)

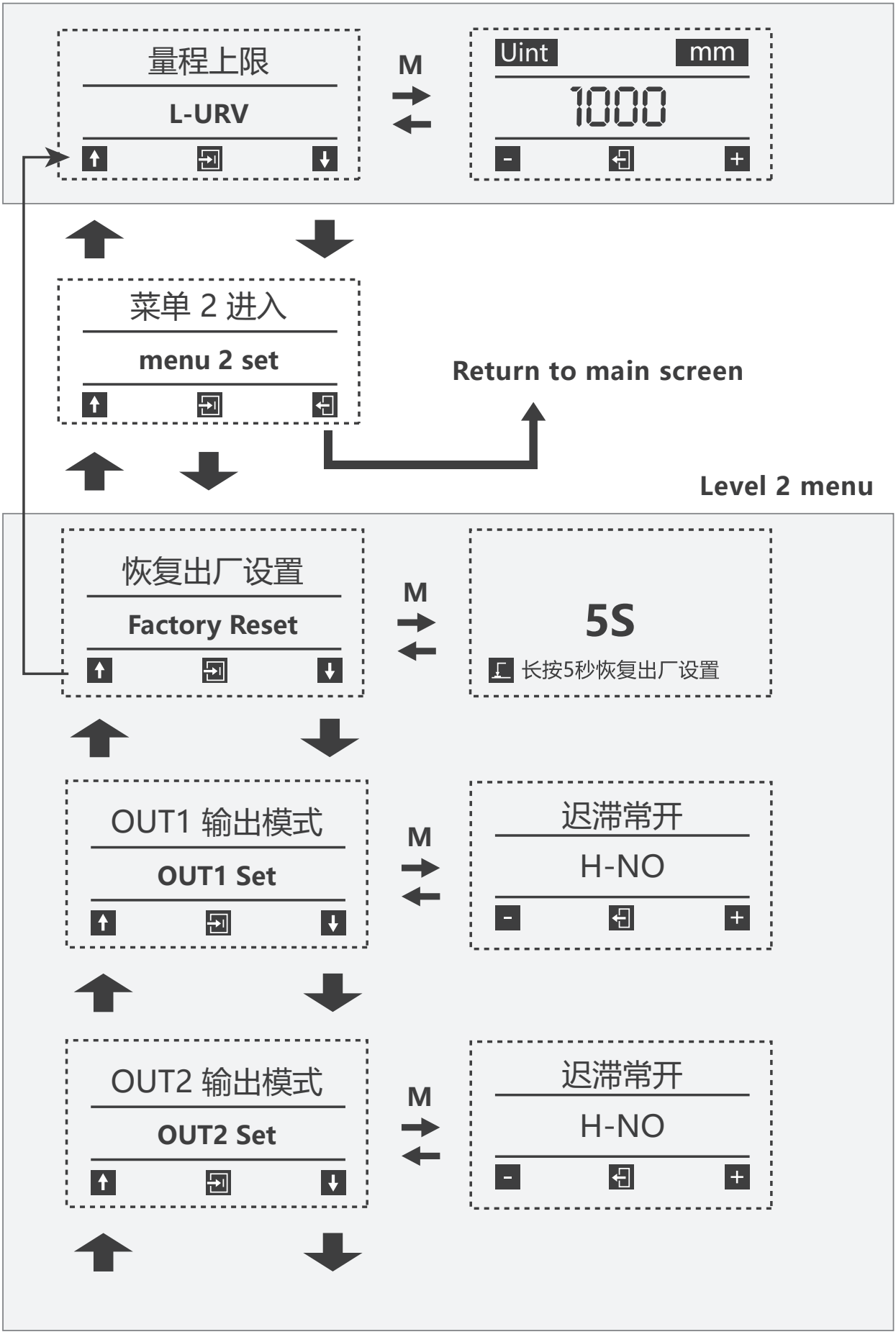
Debugging/Operation

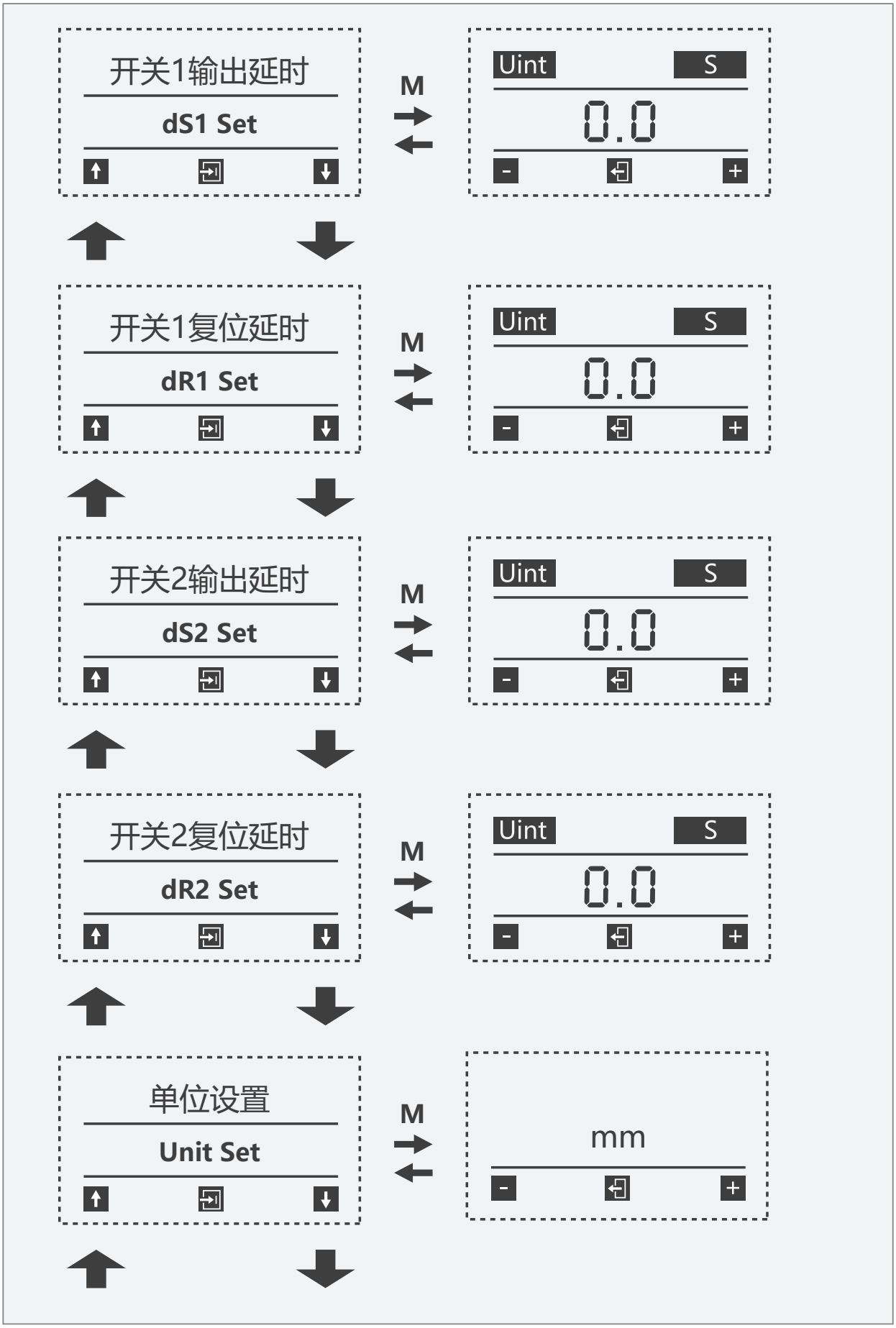
Level 1 menu	
SP1 Set	Switch 1 sets the value
RP1 Set	Switch 1 resets the value
SP2 Set	Switch 2 sets the value
RP2 Set	Switch 2 resets the value
L-LRV	Lower range limit
L-URV	Upper limit of range
Menu 2 set	Menu 2 Enter

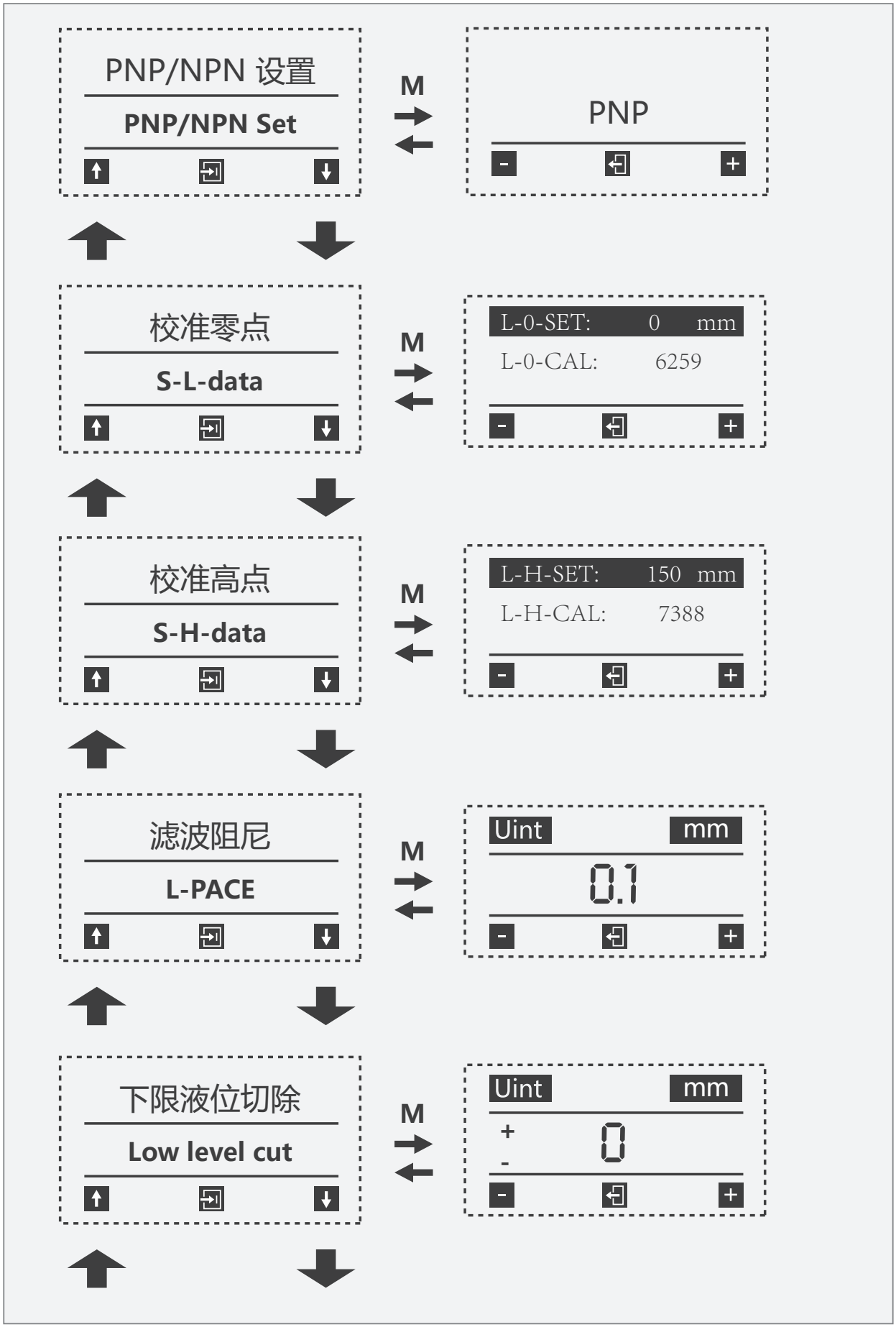
Level 2 menu	
Factory Reset	factory data reset
OUT1 Set	out1 Output mode W-NC: window is normally closed W-NO: window is normally open H-NO: hysteresis is normally open H-NC: hysteresis is normally closed
OUT2 Set	out2 Output mode W-NC: window is normally closed W-NO: window is normally open H-NO: hysteresis is normally open H-NC: hysteresis is normally closed

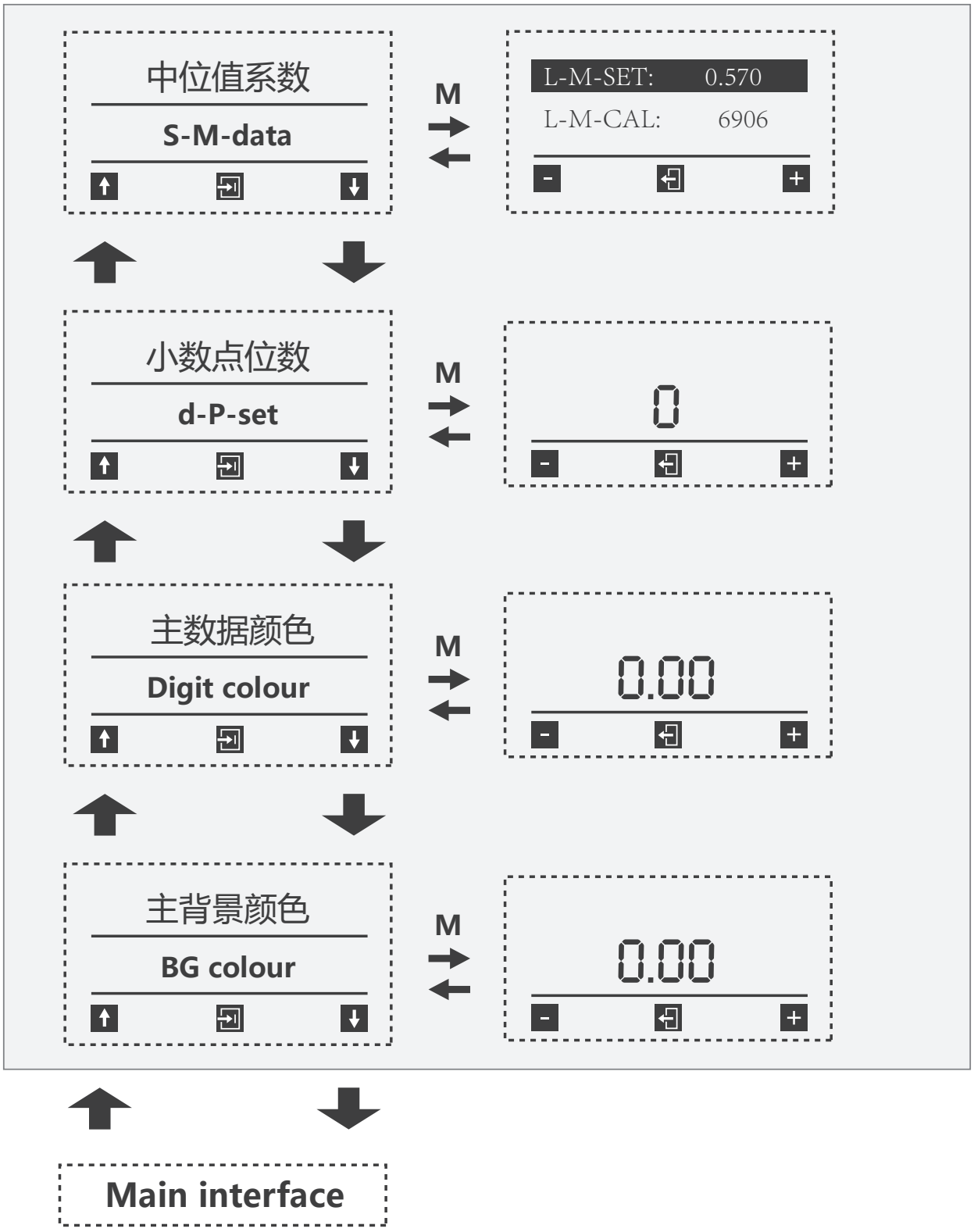
ds1 set	Switch 1 output delay
dr1 set	Switch 1 Reset delay
ds2 set	Switch 2 output delay
dr2 set	Switch 2 Reset delay
Unit set	Unit setting
PNP/NPN Set	PNP/NPN Settings
Suck-up-data	Installation height value
L-H-data	Historical maximum value
L-PACE	Filter damping
Low level cut	Lower level cutting
d-p-set	Decimal place
digit colour	Master data color
BG colour	Main background color


Main interface
M
Level 1 menu
开关1设定值
SP1 Set
M
Uint
mm
100
开关1复位值
rP1 Set
M
Uint
mm
95
开关2设定值
SP2 Set
M
Uint
mm
80
开关2复位值
rP2 Set
M
Uint
mm
79
量程下限
L-LRV
M
Uint
mm
0


量程上限
L-URV
M
Uint
mm
1000
菜单 2 进入
menu 2 set
Return to main screen
Level 2 menu
恢复出厂设置
Factory Reset
M
5S
长按5秒恢复出厂设置
OUT1 输出模式
OUT1 Set
M
迟滞常开
H-NO
OUT2 输出模式
OUT2 Set
M
迟滞常开
H-NO


开关1输出延时
dS1 Set
M
Uint
S
0.0
开关1复位延时
dR1 Set
M
Uint
S
0.0
开关2输出延时
dS2 Set
M
Uint
S
0.0
开关2复位延时
dR2 Set
M
Uint
S
0.0
单位设置
Unit Set
M
mm


PNP/NPN 设置
PNP/NPN Set
M
PNP
-
+
校准零点
S-L-data
M
L-0-SET: 0 mm
L-0-CAL: 6259
-
+
校准高点
S-H-data
M
L-H-SET: 150 mm
L-H-CAL: 7388
-
+
滤波阻尼
L-PACE
M
Uint
mm
0.1
-
+
下限液位切除
Low level cut
M
Uint
mm
+
-
0
-
+


中位值系数
S-M-data
M
L-M-SET: 0.570
L-M-CAL: 6906
小数点位数
d-P-set
M
0
主数据颜色
Digit colour
M
0.00
主背景颜色
BG colour
M
0.00
Main interface

Maintenance/cleaning

Sensors (switches) do not require maintenance.

warning

Periodically check whether the switch is working properly.

If the switch does not work properly, stop the operation immediately.

caution

Use of improper cleaning agent may damage the switch.
The following cleaning agents can be used to clean polycarbonate: mild soap or detergent Isopropyl alcohol
Immediately after cleaning, rinse with water. Do not leave cleaner on the surface of the product. Do not clean products in high heat or direct sunlight.
The following cleaning agents are known to affect the integrity of polycarbonate components and should not be used: ZEP Fast 505, Pinesol, Formula 409
Halogenated solvents (benzene, gasoline, acetone or carbon tetrachloride)
Strong alkalinity
Methyl ethyl ketone
Abrasive substance

disassemble

danger

Only remove the switch in case of power failure (electrical, hydraulic/pneumatic).

Switch disconnection from pressure and power supply must be performed by trained or directed personnel in accordance with the most advanced standards.

warning

Be aware that the surface of the shell may become very hot if the operating temperature is higher!

Katu Electronic （Kunshan）Co.,Ltd.

telephone：400-150-8815

Website: www.katusensor.com

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No.9 Jinjie Road, Huaqiao Economic Development Zone,
Kunshan City, Suzhou