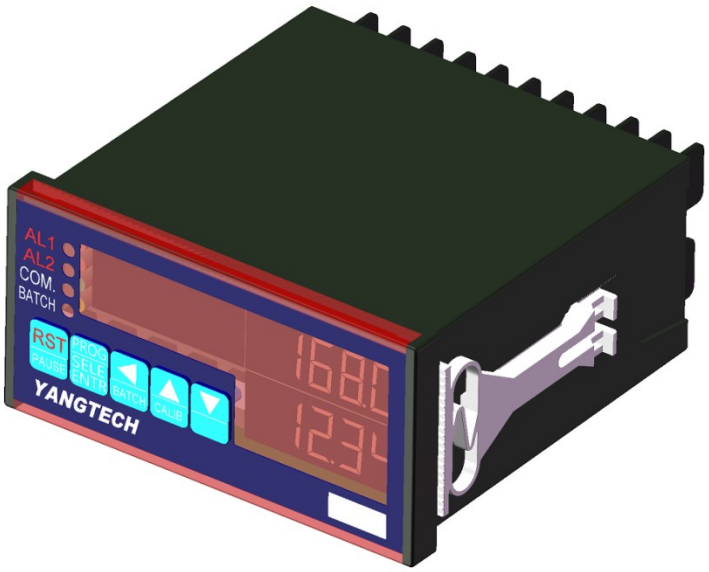
YANGTECH®

# YFM02-ADVANCED DIGITAL FLOW COUNTER

OPERATION MANUAL

CE UL ISO 9001




創裕實業股份有限公司

**YANGTECH TECHNOLOGY CO., LTD (Taiwan)**

YANGTECH

# YFM-02 ADVANCED DIGITAL FLOW COUNTER OPERATION MANUAL

## A. CHARACTERISTICS

Thanks for your wise choice buying our YFM-02 multi-functional digital flow meter. This product has the following outstanding features and can be widely used in various applications such as flow display/monitoring/control:

- Design compliance with CE/ UL electrical safety regulation.
- Production compliance with ISO900 regulation, which ensure high quality of this product.
- Quick press and lock mechanism for easy and securely installation. (This model is for panel install only.)
- 0.4" large self-illuminating LED display, which ensure the highest visibility in dim.
- High compatibility, suitable for most world's brand flow detectors (NPN/PNP/on-off signal)
- Password lock function, it prevents from changing parameters without authorization.
- Automatically correct the K-Factor function, the calibration procedure is simple, fast and accurate ◦
- Equip with 10 digits of cumulative value disply and 5 digits of instantaneous value disply.
- Ultra-high calculation accuracy, high internal precision (8 digits under the decimal point), the cumulative error is minimized.
- Universal 100V~240V power supply, which gives most convenient to you.
- The accumulated value automatically be saved to the EEPROM when power off. This ensure the valid accumulated value.
- Swich between low speed (0~50Hz) contected signal and high speed (0~10K) voltaged pulse signal by interal jump (hardware control).
- Built-in +5.0V synchronous pulse output function (synchronized with input signal).
- Built-in international common volume units (metric/imperial/US), which can be directly selected, and customized definition is also allowed.
- Timing unit of instantaneous value can be changed. (sec/minute/hour/day)
- Batch function with remote pause/reset control. (Optional) ◦
- Analog output by voltage (0~10V) or by current (4~20mA). Zero and higest point can be chenged by internal parameter. (Optional)
- RS485 function, which can remote control the meter by PC. (Optional)

**NOTE**

Failure to install or operate the pump in accordance with this manual may result in equipment malfunction or personal injury!

1. Read this manual thoroughly before installing and operating this pump.
2. This device is limited to be installed in the control box, and an environment of good ventilation and heat dissipation.
3. This product is not explosion-proof grade. Do not use it in an environment that may cause gas explosion due to electrical sparks.
4. Confirm the power supply is correct before powering on. (100~240V AC)

5. Prohibited from using the inverter to supply power, otherwise it will cause damage.
6. Do not disassemble or modify this product, these cause warranty invalid. No user-modified design in this product.

## B. MODEL CODE

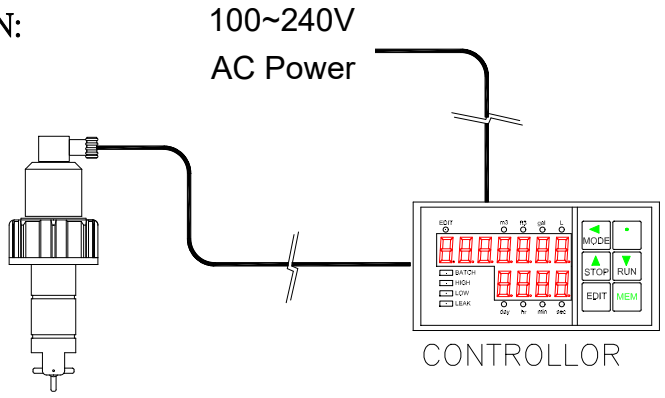
**YFM02-A1-ABC**

A B C

| | |
|---|---|
| A= Model Code | (Model Code) |
| B= Number of Alarm | (A1=1 set A2=2 sets) |
| C= Optional Functions | |
| A= Analog Output | (A=Equip Function Null=No Function) |
| B= Batch Function | (B= Equip Function Null=No Function) |
| C= RS485 Communication | (C= Equip Function Null=No Function) |

## C. INSTALLATION

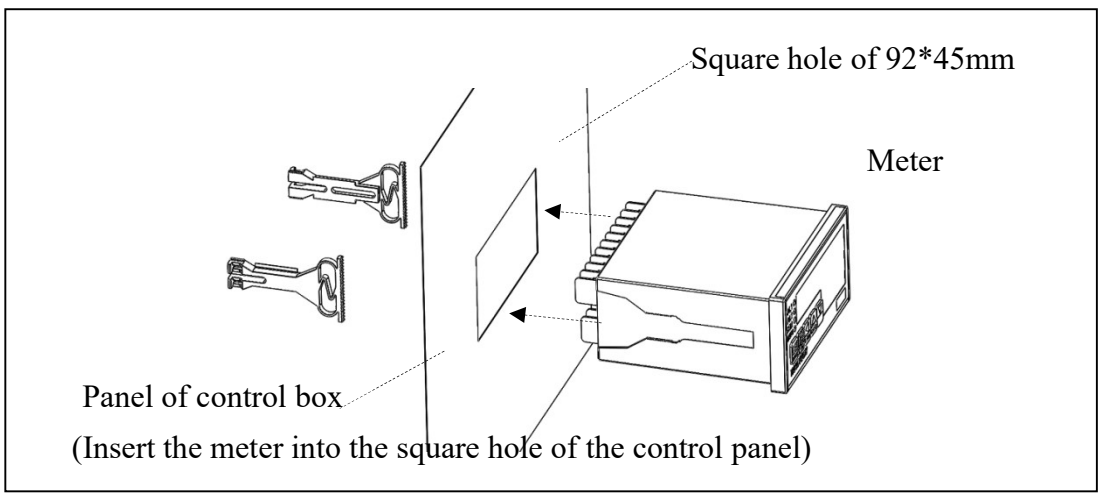
SYSTEM ILLUSTRATION:



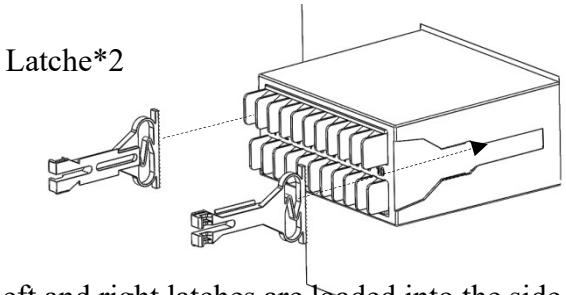

(On the pipe) (On the control box panel)

STEPS OF INSTALLATION:

A.

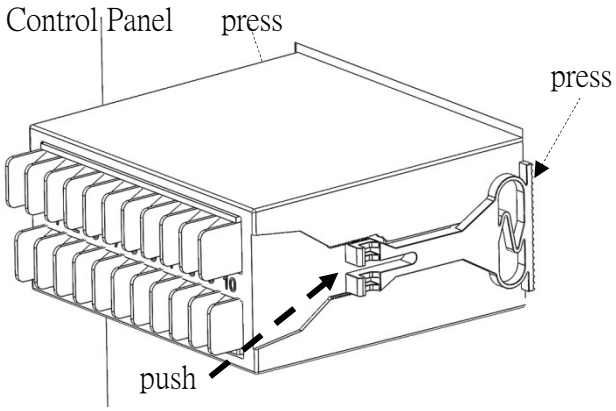


B.




(The left and right latches are loaded into the side rails of the meter)

C.




(Push and press left and right latches to fix the meter on the panel)

## D. DISCRIPTIONS OF CONNECTER / INNER JUMPERS

| NO. | NAME | FUNCTIONS | DISCRIPTIONS |
|---|---|---|---|
| L 01 | AC power | 100-240 VAC / 50~60Hz Power input | Misconnection or power supply specification error will cause burnout |
| L 02 | AC power | | |
| L 03 | Analog com | 4~20mA /0~10V Output 0V | J7 switches current or voltage output (Note1) |
| L 04 | Analog out | 4~20mA /0~10V Output + | |
| L 05 | Pulse out | Pulse signal output + | +5V (Synchronize with the input pulse) |
| L 06 | AL1 | Alarm#1/Batch control | Max. AC/DC 48V, 300mA, <20W(Auto COM select) |
| L 07 | AL1 COM | Alarm#1/Batch control (com) | |
| L 08 | COM | (com) | |
| L 09 | +13V | +13VDC supply | Max. 13V,300mA |
| L 10 | Pulse in | Pulse signal input + (>3.0V=High Level, <0.8V=Low Level) | J2 switches NPN/PNP mode, J5 switches on-off or Pulse (Voltage signal) |

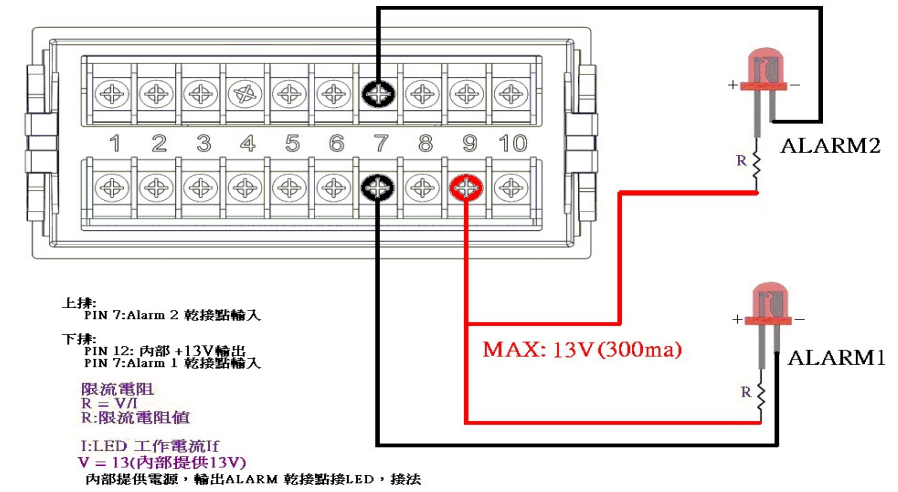
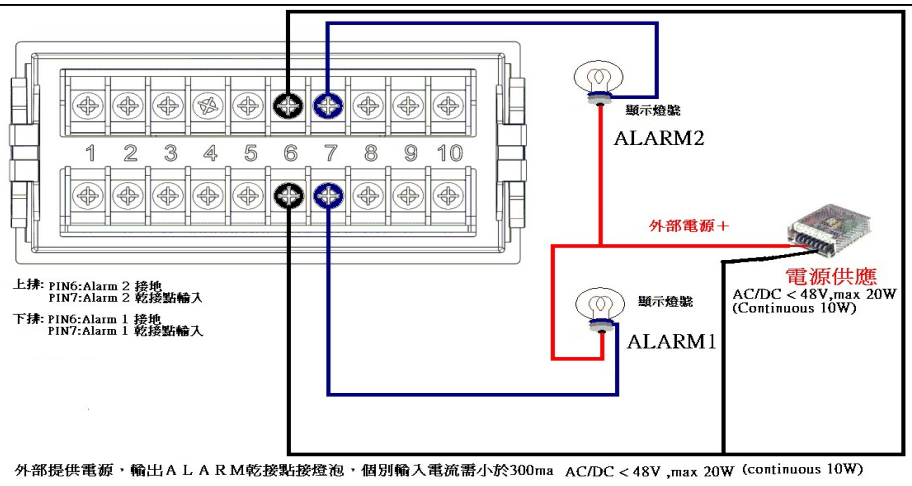
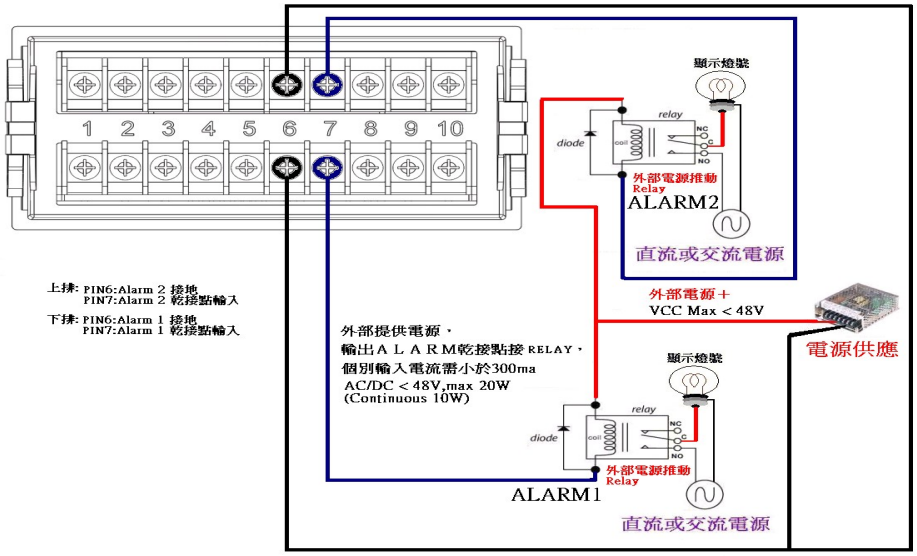
Note1: Load impedance in voltage output mode must >470Ω (too small devices may burnout)
Load impedance in current output mode must <470Ω (too large not to reach 20mA)

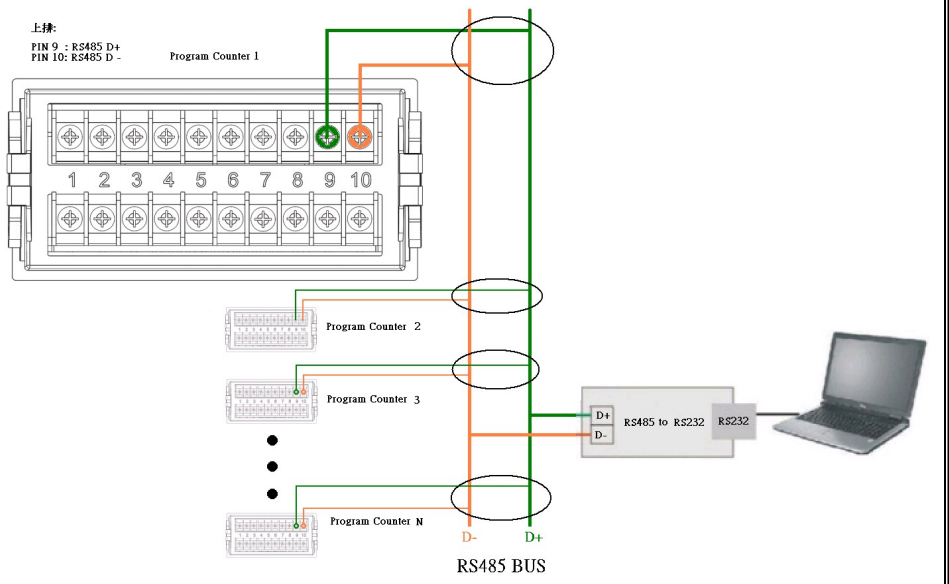
| | | | |
|---|---|---|---|
| U 01 | Null | Null pin | |
| U 02 | Null | | |
| U 03 | +13V | +13V Power supply | Max. 13V,300mA |
| U 04 | COM | 0V | |
| U 05 | Reset | Remote Reset | |
| U 06 | Reset COM | Remote Reset (com) | |
| U 07 | AL2 | Alarm#2 | Max. AC/DC 48V,300mA, <20W(Auto COM select) |
| U 08 | AL2 COM | Alarm#2 (com) | |
| U 09 | RS485 + | RS485 + | Non-isolated RS485, Concatenation number < 10, Transmission distance >100Meters |
| U 10 | RS485 0V | RS485 0V(com) | |

| JUMPER | FUNCTIONS | DESCRIPTIONS |
|---|---|---|
| Jumper 02 | Pulse in (L10) Trigger mode setup | ■■□ 1-2 short-Low level (NPN)<br>□■■ 2-3 short-High level (PNP) |
| Jumper 05 | Pulse in(L10) Trigger speed setup | ■■ 1-2 short-Low speed 0~50Hz (Mechanic trigger)<br>□□ 1-2 open-High speed 0~10KHz (TTL/CMOS trigger) |
| Jumper 06 | Cumulative memory reset | ■■ 1-2 short- Resettable<br>□□ 1-2 open- Not resettable |
| Jumper 07 | Voltage or current output mode setup | ■■□ 1-2 short- 0~10V Voltage output<br>□■■ 2-3 short- 4~20mA Current output |

*Do not rearrange the jumpers by user, this cause warranty to be invalid.

## EXAMPLES OF CONNECTIONS:

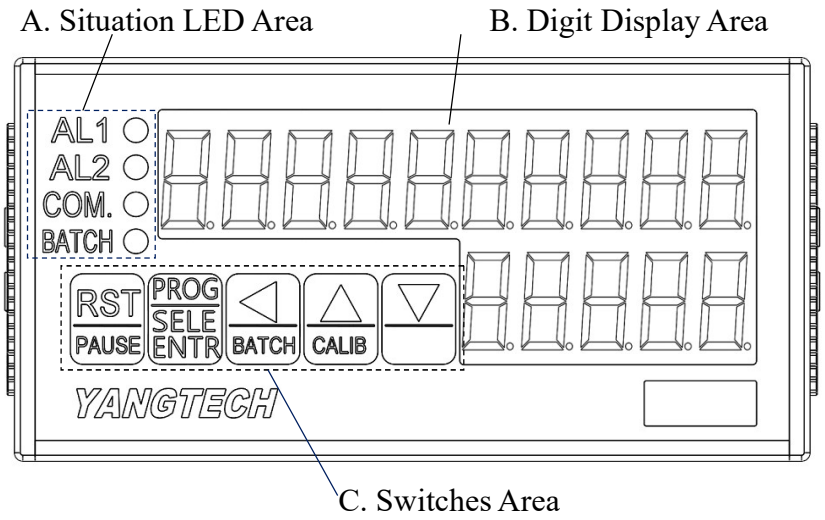
| ILLUSTRATIONS | DESCRIPTIONS |
|---|---|
|  | Self-power supply wiring method:<br><br>1. LED could be light bulb/resistant loading/Relay.<br>2. Maximum current below 300mA. |
|  | External power supply wiring method:<br><br>1. Light bulb could be LED/resistant loading/Relay.<br>2. The external power could be AC power.<br>3. Maximum current below 300mA. |
|  | External power supply and relay wiring method:<br><br>1. The external power could be AC power.<br>2. Maximum current below 300mA |




RS485wiring method:

1. Up to 10 units can be connected in series
2. Parameter Dout. (Digital Output) Identifies IDs of units.

## E. PANEL DESCRIPTIONS




A. Situation LED Area (red light):

AL1(Alarm 1): When LED is on, the connectors of alarm1 is on. (L06,L07 are connected)
AL2(Alarm 2): When LED is on, the connectors of alarm2 is on. (U07,U08 are connected)
COM(Communication): When LED rapidly blink, RS485 communication is working.
BATCH: In batch mode, LED is on, LED blinks when batch mode working.

B. Digit Display Area:

Display Mode: Upper row (10 digits) display cumulative value, Lower row (5 digits) display instant value.
Setting Mode: The upper row displays the parameter value or parameter adjustment status, The lower row displays the parameter name.
Batch Mode: The upper row displays cumulative value. The lower row displays instant value.
Calibration Mode: The upper row displays cumulative value. The lower row displays status by texts.

C. Switches Area:

| SWITCH | LAYER 1 (Display) | LAYER 2 (Select parameter group) | LAYER 3 (Select parameter) | LAYER 4 (set parameter) |
|---|---|---|---|---|
| RST/PAUSE (Reset/Pause) | Press over 7 secs to reset cumulative value (only resettable model) | No function | No function | No function |
| PROG/SELE/ENTR (Program/select/ Enter) | Press over 2 secs to layer 2 | Press over 2 secs to layer 3 | Press over 2 secs to layer 4 | Press over 2 secs to store parameter and back to layer3 |
| | | Press to select parameter group | Press to select parameter | |
| ＜/BATCH (Left/ Batch) | Press over 2 secs to access batch mode | Press to go to up layer | Press to go to up layer | Press to select digits |
| △/CALIB (Up/ Calibration) | Press over 2 secs to access calibration mode | No function | No function | Press to increase digits |
| ▽ (Down) | No function | No function | No function | Press to decrease digits |

## F. PARAMETER DESCRIPTIONS

| Parameter Groups | 1. Parameter Name<br>2. Unit(s)<br>3. Disply | Descriptions |
|---|---|---|
| SyS. (System) | 1. K- factor<br>2. L/Pulse<br>3. K.F. | 1. K-Factor, provided by probe manufacturer.<br>2. K-Factor should be convert to unit of L/Pulse then input.<br>3. Range 0.00000001~99.99999999<br>4. Default=1.00000000<br>5. Auto calibration method (Note2) |
| | 1. Totalizer Scale<br>2. Null<br>3. ScALE | 1. Pre-set: 3 types of metric units, 11 types of British units 2 types of U.S. units. (Note1) |
| | 1. User Define<br>2. Null<br>3. uSEr | 1. User can freely define totalizer scale as needed.<br>2. Range 0.00001~99999.99999 |
| | 1. Count Time<br>2. Sec/min/Hr/Day<br>3. c.tiME | 1. The denominator (time) unit of the instant value is determined by C.time。<br>2. Range second(1)/minute(60)/hour(3600)/day(86400) |
| | 1. Decimal Point of Totalizer<br>2. Null<br>3. dPt | 1. Define the decimal Point of Totalizer.<br>2. When the number of integer digits is not enough to display, the number of decimal places is automatically reduced and the decimal point is flashed to remind the user.<br>3. Range 0~6 |

| | | |
|---|---|---|
| SyS. (System) | 1. Decimal Point of Rate<br>2. Null<br>3. dPr | 1. The number of decimal places displayed in an instant value.<br>2. When the number of integer digits is not enough, the number of decimal places is automatically reduced and the decimal point is flashed to remind the user。<br>3. Range 0~4。 |
| | 1. Pass Code<br>2. Null<br>3. P.codE | 1. If this code=0000 then parameters can be change. If this code=0001~9999 then user has to enter the same number to access parameters setting.<br>2. Range 0000~9999。 |
| ALout. (Alarm Output ) | 1. Alarm 1 Action Type<br>2. Null<br>3. AL1tP | 1. Setup the action type of alarm 1.<br>2. rAtE=instant value, totAL=cumulative value.<br>3. Default=rAtE。 |
| | 1. Alarm 2 Action Type)<br>2. Null<br>3. AL2tP | 1. Setup the action type of alarm 2.<br>2. rAtE=instant value, totAL=cumulative value.<br>3. Default=rAtE。 |
| | 1. Alarm 1 Action Value<br>2. Null<br>3. AL1 | 1. Setup the action value of alarm 1. (Value=0, alarm 1 no action)<br>2. Range= 0.0000000001~9999999999. 9999999999 。<br>3. Default=0。 |
| | 1. Alarm 2 Action Value)<br>2. Null<br>3. AL2 | 1. Setup the action value of alarm 2. (Value=0, alarm 2 no action)<br>2. Range= 0.0000000001~9999999999. 9999999999 。<br>3. Default=0。 |
| | 1. Alarm 1 Action condition<br>2. Null<br>3. AL1A | 1. Setup the active condition of alarm 1. When Hi is set, alarm 1 is activated if the actual value is higher than the set value (The opposite is same)<br>2. Range=Hi/Lo，Default=Lo。<br>3. For example, if user wish the alarm 1 is activated when the cumulative amount reaches 2000., AL1 sets to 2000. and AL1A sets to Hi.<br>4. For example: if user wish the alarm 1 is activated when the instant vale is lower than 20, AL1 is set to 20. and AL1A is set to Lo. |
| | 1. Alarm 2 Action condition<br>2. Null<br>3. AL2A | 1. Same as above descriptions of alarm 1.<br>2. For example: if you want to monitor the instant value (below 20 and above 100 will alarm), then set AL1=20, AL2=100, AL1A=Lo, AL2A=Hi |
| | 1. Batch Value<br>2. Null<br>3. B.vALu | 1. To setup the target value of batch mode.<br>2. Range=0.0000000001~9999999999. 9999999999。<br>3. Default=100。 |
| | 1. Calibrate Value<br>2. Null<br>3. CvALu | 1. To setup the target value of calibration mode.<br>2. Range=0.0000000001~9999999999. 9999999999 。<br>3. Default=1000。 |
| Aout. (Analog Output | 1. Analog Output Type<br>2. Null<br>3. AotP | 1. To setup the analog output type<br>2. Range= rAtE (instant value)) or totAL(cumulative value)<br>3. Default= rAtE。 |

| | | |
|---|---|---|
| Aout. (Analog Output ) | 1. Analog Lowest Point corresponds to Display<br>2. Null<br>3. ALPtd | 1. Set the analog zero point (for example, 4~20mA is 4mA, 0~10V is 0V)<br>2. Range=0.0000000001~9999999999. 9999999999。<br>3. Default=0 (No action)<br>4. ALPtd must be less than AHPtd or it cannot be entered. |
| | 1. Analog Highest Point corresponds to Display<br>2. Null<br>3. AHPtd | 1. Set the analog greatest point (for example, 4~20mA is 20mA, 0~10V is 10V)<br>2. Range=0.0000000001~9999999999. 9999999999。<br>3. Default=0 (No action)<br>4. AHPtd must be greater than ALPtd or it cannot be entered. |
| | 1. Analog Zero point Adjust<br>2. Null<br>3. ALPA | 1. Fine-tuning when the analog zero point output voltage level is deviated<br>2. Range=0~511 (Correspond to range of 0~7V)<br>3. Default=0 |
| | 1. Analog Highest point Adjust<br>2. Null<br>3. AHPA | 1. Fine-tuning when the analog greatest point output voltage level is deviated<br>2. Range=+60~-127。(Correspond to range of +8.5~+11V for 10V point )<br>3. Default=0。 |
| Dout. (Digital Output) | 1. Counter ID<br>2. Null<br>3. C. Id | 1. Set the ID code of counter to identify counter in digital communication. (RS485)<br>2. Range=1~250 (Max. 10 sets in a single stream)<br>3. Default=1<br>4. Digital Communication Rate=9600 bits/sec (fixed)<br>5. Digital Communication Parity Check=non (fixed) |

Note1:

The unit of K-factor is L/Pulse, values of ScALE describe as below:

| STD. | Cumulative value Units in Chinese | Cumulative value Units in English (Notation) | ScALE set up | Remark |
|---|---|---|---|---|
| **Metric** | 立方公尺 | Cubic meter (m3) | 0.00100 | =1000 liters |
| | 公升 | Liter (L) | 1.00000 | =1 liter |
| | 毫升 | Mini-liter (c.c. or mL) | 1000.00000 | =0.001liter |
| **U.K.** | 英-液量盎司 | Vol.Oz./Ounce (oun) | 35.21127 | =28.4mini-liters |
| | 英-及耳 | Gill (GiLL) | 7.04225 | =5 Ounces |
| | 英-品脫 | Pint (Pint) | 1.76056 | =4 Gills |
| | 英-夸脫 | Quart (QuAr) | 0.88028 | =2 Pints |
| | 英-加侖 | Gallon (GALL) | 0.22007 | =4 Quarts |
| | 英-配克 | Peck (PEcK) | 0.11004 | =2 Gallons |
| | 英-坎寧 | Kenning (Kenn) | 0.05502 | =2 Pecks |
| | 英-蒲式耳 | Bushel (buSH) | 0.02751 | =8 Gallons |
| | 英-夸特 | Quarter (QtEr) | 0.00344 | =8 Bushels |
| | 英-立方英吋 | Cubic inch (inc) | 61.02376 | =16.38706 Mini-liters |
| | 英--立方英呎 | Cubic feet (FEEt) | 0.35315 | =172.8 Cubic inches |
| **U.S.** | 美-液量盎司 | American-Vol.oz. (uvo) | 33.82447 | = 1.041 Ounces |
| | 美-加侖 | American-gallon (uGAL) | 0.26419 | = 0.833 Gallon |

Please convert by other volume units

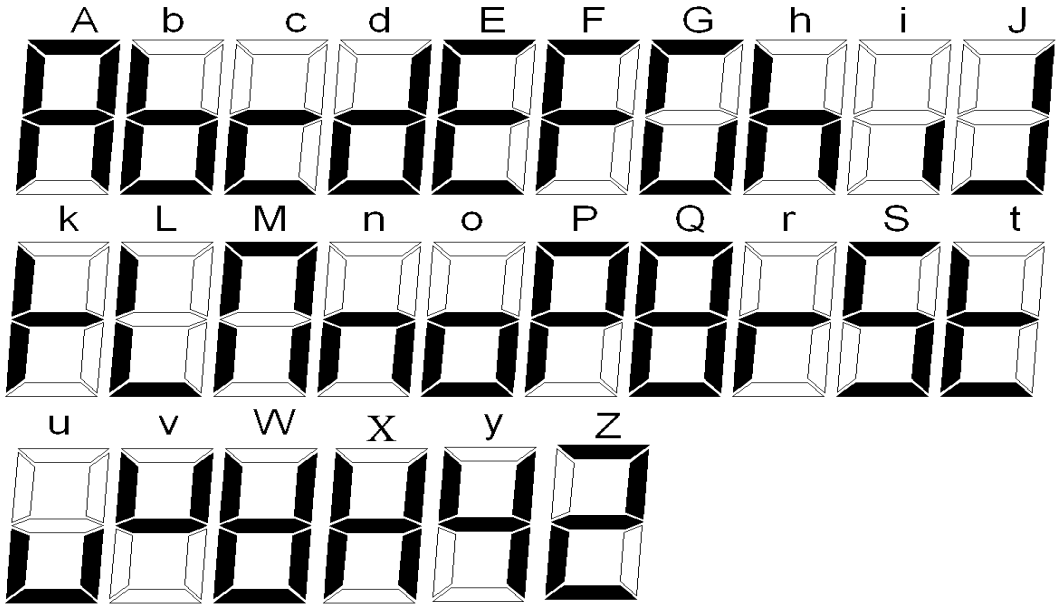
Note2: Auto calibration method:

For example: set the calibration target value = 1000 (ml), please prepare a 1000ml graduated cylinder (or weight-scale). Start the water flow, watch the cylinder when indicates to the 1000ml stop the flow, press [↑] the K-factor automatically filled. The correction completed.

If a total of 500 pulses are generated internally during the calibration period, the K value = 1000ml / 500Pulses = 2 ml / Pulse. Unit conversion: 2(mL/P)/1000(mL/L)=0.002 L/Pulse, this value programs to K-factor automatically.

The more number of pulses generated during calibration, the more accurate the K value obtained.

## G. PARAMETERS TEXT ON DISPLAY

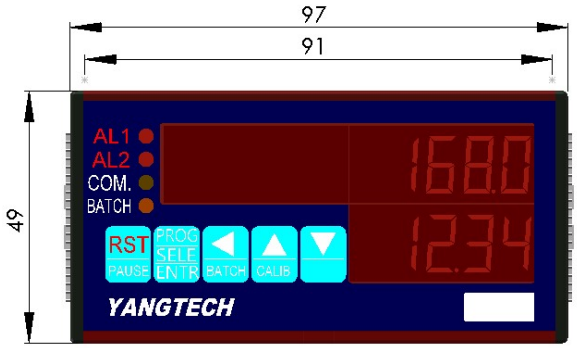


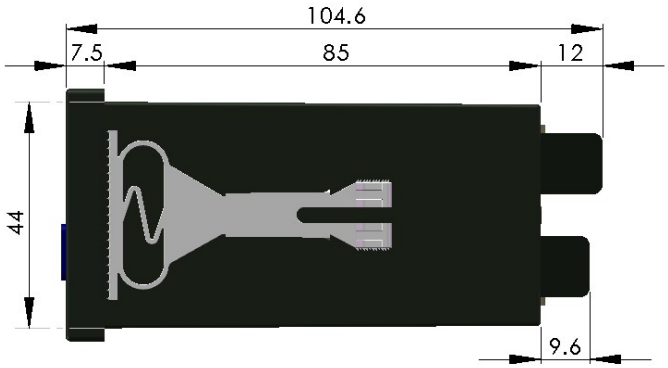

## H. COMMON ABNORMALITIES AND COUNTERMEASURES

| ITEM | ABNORMALITIES | POSSIBILITIES | COUNTERMEASURES |
|---|---|---|---|
| 1. | Panel is dark | Power is not turned on. | Turn on the power source |
| | | Power supply specifications or wiring are incorrect (serious) | Correct the power/wiring |
| | | Circuit component failure | Return to Factory for fixing |
| 2. | Panel display freezes | Stuck of operation | Reset (power off and on) |
| | | Ambient temperature and humidity are too high (serious) | Improve the ambient |
| 3. | Switch(es) is(are) no response | Stuck of operation | Reset (power off and on) |
| | | Key failure | Return to Factory for fixing |

| | | | |
|---|---|---|---|
| 4. | No counting | wiring is incorrect (First time installation) | Correct the wiring according to manual |
| | | Stuck of operation | Reset (power off and on) |
| | | Failure of sensor | Fix or renew the sensor |
| | | Loose wiring / poor contact | Tighten connector/screws |
| 5. | Some time there is no counting | Failure of sensor | Fix or renew the sensor |
| | | Sensor inner stuck | Clean sensor inside |
| | | Loosing wiring | Tighten connector/screws |
| | | Fluid is not full the pipe | Change the pipe setting to make the pipe full |

## I. DIMENSIONS AND SPECIFICATIONS




### SPECIFICATIONS

(The contents of the specifications are subject to change without notice)

1. Dimensions: L104mm*W97mm*H49mm
2. Weights: 175g (single connector row) / 225g (Double connector rows)
3. Power Source: 100~240VAC
4. Ambient: Temperature=0~60℃, Humidity=10~90%

Manufacturing/Sales

**YANGTECH®**

創裕實業股份有限公司(台灣)

***YANGTECH TECHNOLOGY CO., LTD.(Taiwan)***