



涡街流量计使用手册  
**Vortex Flow Meter Manual**



**CN BOILER ENGINEERING SOLUTION LLC**

## The Main Technical Parameters

Caliber: DN15-DN150, other calibers are available by agreement.

Medium: gas, steam, liquid

Environmental conditions:

Environmental temperature:  $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$ , LCD display:  $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$

Relative humidity of 5% to 90%,

Atmospheric pressure 86 ~ 106Kpa,

Medium temperature:  $-50^{\circ}\text{C} \sim +250^{\circ}\text{C}$ ,  $-50^{\circ}\text{C} \sim +350^{\circ}\text{C}$

## Overview

The two-wire LUGB-F2 series display circuit is a new simplified circuit of the vortex flowmeter, and its amplifying circuit is analog. It can accurately measure the flow of gas, liquid and steam in the conventional flow range. It can be set by the switch to adapt to various calibers and various measurement media. The data post-processing and signal remote transmission circuit is a two-wire 4-20mA current output and can provide isolated original pulse output.

LUGB-Y2 series vortex on-site display instrument is one of the series of vortex flowmeter special circuits developed by our company. It adopts MSP430 series chips and double-row segment liquid crystal chips. The function of the display board is to complete the setting and calculation. and display functions.

## Connection Wire

Three-wire:

Three-wire pulse circuit wiring power supply and output signal terminal "24V-" is the common "-" end of power supply and signal.

24V+	24V-
F+	Blank

Two-wire main power supply and output signal terminals

24V+	24V-
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"-": 4~20mA current output terminal. "+": the "+" terminal of the 24V power supply

"+" is connected to +24V external power supply, and the current output flows from the "-" terminal to the computer or display meter

The sampling resistor flows back to the "-" terminal of the power supply after passing through the load such as the sampling resistor.

## Debug Settings

The production adjustment of the instrument should be carried out by professionals with a deep understanding of the instrument under the condition of calibration equipment with corresponding accuracy. In the two-wire system adjustment, there should be at least an ammeter with a range > 20mA and an accuracy better than 0.1%.

Production adjustment and some advanced settings are carried out in the production setting state. If there is no corresponding equipment and sufficient professional knowledge, improper adjustment will cause the instrument to not work normally. Press the key combination to enter the production setting state, and set the corresponding instrument parameters according to different instrument models.

Open the front cover of the meter and enter the production calibration menu according to the following operating instructions.

### ★ LUGB-F2 Series Operating Instructions

The LCD on the conversion board displays various parameters as shown in the following screen

Content	LCD Display			
On the main display page of running status, the upper row displays five-digit instantaneous value, the lower row displays eight-digit cumulative value	<table border="1" data-bbox="984 335 1173 466"> <tr> <td data-bbox="984 335 1173 388">Q 12345</td> </tr> <tr> <td data-bbox="984 388 1173 466">12345678</td> </tr> </table>		Q 12345	12345678
Q 12345				
12345678				
Frequency display, the upper row displays the logo, and the lower row displays the frequency value	<table border="1" data-bbox="984 531 1173 654"> <tr> <td data-bbox="984 531 1173 584">Fr- -</td> </tr> <tr> <td data-bbox="984 584 1173 654">204.56</td> </tr> </table>		Fr- -	204.56
Fr- -				
204.56				
Output current display	<table border="1" data-bbox="984 668 1173 791"> <tr> <td data-bbox="984 668 1173 721">PE- -</td> </tr> <tr> <td data-bbox="984 721 1173 791">4.4500</td> </tr> </table>		PE- -	4.4500
PE- -				
4.4500				
Temperature display	<table border="1" data-bbox="984 805 1173 929"> <tr> <td data-bbox="984 805 1173 858">C- - -</td> </tr> <tr> <td data-bbox="984 858 1173 929">120.0</td> </tr> </table>		C- - -	120.0
C- - -				
120.0				
Compensated density display	<table border="1" data-bbox="984 938 1173 1062"> <tr> <td data-bbox="984 938 1173 991">dE- —</td> </tr> <tr> <td data-bbox="984 991 1173 1062">2.0000</td> </tr> </table>		dE- —	2.0000
dE- —				
2.0000				
Density compensation method Ur: 1.00 setting density 3.00 temperature compensated density	<table border="1" data-bbox="984 1072 1173 1195"> <tr> <td data-bbox="984 1072 1173 1125">Ur- -</td> </tr> <tr> <td data-bbox="984 1125 1173 1195">2.000000</td> </tr> </table>		Ur- -	2.000000
Ur- -				
2.000000				
Setting density display	<table border="1" data-bbox="984 1258 1173 1381"> <tr> <td data-bbox="984 1258 1173 1311">dEn--</td> </tr> <tr> <td data-bbox="984 1311 1173 1381">2.000000</td> </tr> </table>		dEn--	2.000000
dEn--				
2.000000				
Flow coefficient	<table border="1" data-bbox="984 1391 1173 1515"> <tr> <td data-bbox="984 1391 1173 1444">- - U</td> </tr> <tr> <td data-bbox="984 1444 1173 1515">3.600000</td> </tr> </table>		- - U	3.600000
- - U				
3.600000				
Damping time, the value is 1~9 valid	<table border="1" data-bbox="984 1524 1173 1648"> <tr> <td data-bbox="984 1524 1173 1577">Lr- -</td> </tr> <tr> <td data-bbox="984 1577 1173 1648">1.000000</td> </tr> </table>		Lr- -	1.000000
Lr- -				
1.000000				

Flow upper limit, output the flow value corresponding to the full scale.		FH- - 800.0000	
Cut off the small signal, when the flow rate is lower than the set value of this item, the instantaneous display will be zero without accumulation.		FL- - 60.0000	
<p>Remark:</p> <p>Display unit:</p> <p>Accumulation flow: t, Instantaneous flow: t/h, Frequency: Hz, Flow coefficient: pulse/m<sup>3</sup>, Medium density: Flow upper and low limit: t/h, Temperature: °C, Current: mA</p> <p>If the flow unit needs to use kg, just set the flow coefficient according to "pulse/dm<sup>3</sup>"</p> <p>The damping coefficient (Lr) is the frequency sampling period in seconds</p>			

### Range rod

In order to judge whether the flow rate is within the allowable range, a bar that follows the instantaneous flow change will be displayed on the right side of the LCD screen. The upper limit of the bar represents the set flow upper limit, and the lower limit represents 0.

### Key

The specific description of the three membrane buttons on the display is as follows

Position	Left key	Middle key	Right key
Running state	Accumulation (Instantaneous)	frequency	content
Setting state	Shift	Turn the word	Confirmation and page turning

In running state:

Press the cumulative key (left key) to display the instantaneous flow and cumulative volume.

Press the frequency key (middle key) to display the instantaneous flow rate.

Press the content button (right button) to display frequency (Fr), temperature (C), compensation density (dE), density compensation mode (Ur), set density display (dEn), flow coefficient (U), damping coefficient ( Lr), flow upper limit (FH), flow lower

Limit (FL) lower limit, output current (Pe), etc.

### Setting state

Click the left button to shift the word to be set (flashing word);

Press the middle button to change the word to be set (flashing word);

Right click to confirm this page and turn the page.

### Setting method

First press the right button, and then press the middle button at the same time to enter the setting state. At this time, the flashing word of density U appears on the display screen. From this, the shift of the left button, the change of the flashing word by the middle button, the confirmation of the right button and the Turn the page to complete the setting of density compensation mode (Ur), setting density display (dEn), flow coefficient (U), flow upper limit (FH), flow lower (FL) and damping coefficient (Lr) in sequence. For example, if the flow coefficient needs to be set to 123.45, first enter the setting state, then the display shows U-XXXXXX, and the first digit is flashing, press the middle button to make the first digit display 1, then press the left button (move to The second digit, at this time the second digit is flashing), press the middle button to make the second digit display 2, and so on until the last digit is set, after confirming that the set number is correct, press the right button to confirm, and it will display Enter the next parameter setting, when all parameters are set, press the right button, and press the middle button at the same time to exit the setting state and enter the running display state.

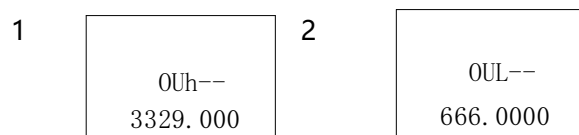
### Cumulative amount cleared:

In the setting state, when Un is set to "4321.000" and confirmed, the current accumulation will be cleared.

Un- - 4321.000
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## Output Validation

This converter can verify the full scale (20 mA) and zero point (4mA) of the output current. The method is: after entering the setting state, press the content key (right button) and the following two screens will appear at the end:



The above-mentioned screen 1 indicates that the calibration output is 20mA, and screen 2 indicates that the calibration output is 4mA. During calibration, an ammeter is connected in series in the output circuit, and the zero point (4mA) and full scale (20mA) of the output can be adjusted by changing the displayed number.

Note: All products have been calibrated before leaving the factory. Non-professionals are not allowed to operate.

## How to use the DIP switch of the amplifier board:

For different calibers and media, dial the dial switch according to the table below

		Dn 15/25	Dn 32/40	Dn 50	Dn65/ 80	Dn 100
K1	Steam	1, 5	2, 6	2, 6	2, 6	2, 6
	Liquid	3, 7	3, 7	3, 7	3, 7	3, 7
K2	Steam	1	2	2	3	1, 3
	Liquid	5	5	6	6	6
K3	Steam	1	2	2	3	1, 3
	Liquid	4	4, 5	6	7	7
		Dn125	Dn150	Dn200	Dn250	Dn300
K1	Steam	2, 6	2, 6	3, 7	3, 7	3, 7
	Liquid	3, 7	3, 7	3, 7	4, 8	4, 8
K2	Steam	2, 3	4	4	4	4
	Liquid	6	6	7	7	7, 8
K3	Steam	4	5	4, 5	6	6
	Liquid	7	8	7, 8	7, 8	7, 8

## ★ LUGB-Y2 Series Operating Instructions

The LCD on the conversion board displays various parameters as shown in the following screen

Content	LCD Display
<p>On the main display page of running status, the upper row displays five-digit instantaneous value, the lower row displays eight-digit cumulative value</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>Q 1.2345 12345678</p> </div>
<p>Instantaneous flow display, The upper line displays the logo, The lower line shows the flow value.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>F — — — 1. 000000</p> </div>
<p>frequency display The upper line displays the logo, The lower line shows the frequency value.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>Fr — — — 1. 000000</p> </div>
<p>Flow Coefficient Uplink display logo, The lower row shows the set value.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>U — — — 2. 000000</p> </div>
<p>Set density display Uplink display logo, The lower line shows the density setting.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>dEn — — — 1 . 000000</p> </div>
<p>Damping coefficient value Uplink display logo, The lower row shows the set value.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>Lr — — — 1. 000000</p> </div>
<p>Flow lower limit (small signal cut-off) below this value will not be displayed and will not accumulate</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>FL — — — 200.0000</p> </div>
<p>The cumulative amount is cleared. When entering the setting state, Set this item to "4321.000" , the cumulative amount can be cleared to zero.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>Un — — — 4321.000</p> </div>
<p>Remark: A) Display unit: Accumulation flow: t, Instantaneous flow: t/h, Frequency: Hz, Flow coefficient: pulse/m<sup>3</sup>, Medium density: Flow upper and low limit: t/h, Temperature: °C, Current: mA B) If the flow unit needs to use kg, just set the flow coefficient according to "pulse/dm<sup>3</sup>"</p>	



C) The damping coefficient (Lr) is the frequency sampling period in seconds

### Range rod

In order to judge whether the flow rate is within the allowable range, a bar that follows the instantaneous flow change will be displayed on the right side of the LCD screen. The upper limit of the bar represents the set flow upper limit, and the lower limit represents 0.

Note: Whether or not the setting of the "flow upper limit" or its size will not affect the normal measurement.

### Key

The specific description of the three membrane buttons on the display is as follows

Position	Left key	Middle key	Right key
Running state	Accumulation(Instantaneous)	frequency	content
Setting state	Shift	Turn the word	Confirmation and page turning

In running state:

Press the cumulative key (left key) to display the instantaneous flow and cumulative volume;

Press the frequency key (middle key) to display the vortex frequency;

Press the content key (right button) to display the instantaneous flow value (F), frequency (Fr), flow coefficient (U), density setting value (dEn), damping coefficient (Lr), flow lower limit (FL) lower limit, etc. in sequence.

Setting state

Click the left button to shift the word to be set (flashing word);

Press the middle button to change the word to be set (flashing word);

Right click to confirm this page and turn the page.

Setting method:

First press the right button, and then press the middle button at the same time to enter the setting state. At this time, the display shows the mark "U" and the flashing word of the setting value. From this, the shifting of the left button and the flashing word of the middle button can be performed. change, right click to confirm and turn the page to complete the flow coefficient (U), density (dEn), damping coefficient (Lr), flow lower limit (small signal cut off) (FL), clear (Un) and other setting items in sequence set up. For example, if

the density is set to 123.4500, first enter the setting state, and the display will display XXXXXXXX in the lower row, and the first digit is flashing. Press the middle button to make the first digit display 1, and then press the left button (to move to the second digit , the second digit is flashing), press the middle button to make the second digit display 2, and so on until the last digit is set. After confirming that the set number is correct, press the right button to confirm, and the display will enter the next Parameter setting, when all parameters are set, press the right button and press the middle button at the same time to exit the setting state and enter the display state.

**How to use the DIP switch of the amplifier board:**

For different calibers and media, dial the dial switch according to the table below

		Dn 25	Dn 32	Dn 40	Dn 50	Dn 65	Dn 80/ 100
K1	Steam	1 , 5	1 , 5	1 , 5	1 , 5	1 , 5	2 , 6
	Liquid	3 , 7	3 , 7	3 , 7	3 , 7	3 , 7	3 , 7
K2	Steam	1	1	1	1	1	2
	Liquid	5	5	5	6	6	6
K3	Steam	1	1	1	1	1	2
	Liquid	4	3 , 4	4 , 5	6	5 , 6	7
		Dn125	Dn150	Dn200	Dn250	Dn300	
K1	Steam	2 , 6	2 , 6	3 , 7	3 , 7	3 , 7	
	Liquid	3 , 7	3 , 7	3 , 7	4 , 8	4 , 8	
K2	Steam	3	3	4	4	4	
	Liquid	6	6	7	7	7 , 8	
K3	Steam	3	3	4 , 5	6	6	
	Liquid	7	8	7 , 8	7 , 8	7 , 8	

For magnification adjustment, you can dial the dial switch to set the magnification according to the following table: " © " is dialed, " × " is disconnected

Note: 1. K4-1, K4-2, K4-3 are sensitivity adjustment

2. K4-4, K4-5, K4-6 are amplitude adjustment

3. It is generally recommended to use 4 times the switch of K4: use the method of dialing K4-2 and K4-5

K4 multiple	K4- 1	K4-2	K4-3	K4-4	K4-5	K4-6
0	×	×	×	×	×	×
2	×	×	©	×	×	©

4	x	⊙	x	x	⊙	x
6	x	⊙	⊙	x	⊙	⊙
8	⊙	x	x	⊙	x	x
A	⊙	x	⊙	⊙	x	⊙
C	⊙	⊙	x	⊙	⊙	x
E	⊙	⊙	⊙	⊙	⊙	⊙

Note: This instrument is only used as a process detection instrument. If it needs to be used as a measuring instrument, please send it to the Metrology Bureau to re-calibrate the flow coefficient and use this flow coefficient as the standard.

**CN BOILER ENGINEERING SOLUTION LLC**

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