

BELZ Digital Flow Counter Instructions

Digital indicating transmitter: BELZ

■ Overview

The BELZ series digital flow counter can constitute an advanced digital volumetric flowmeter with various positive flowmeter of us. The total accumulative quantity and single accumulative quantity of flow and instantaneous flow can be read directly on the flowmeter.

After external power supply, it is also able to output flow pulse and analog quantity of 4~20 mA current and realize HART communication and RS485T communication mode.

Therefore, it is an advanced digital flow counter.



■ Features

1. Advanced technology, high reliability, capable of constituting an integrated digital volumetric flowmeter;
2. Capable of battery power supply and external power supply to realize teletransmission output pulse and analog quantity output;
3. Double row LED instantaneous flow and accumulative flow, direct, convenient and clear;
4. Anti-explosion and water-proof structure appropriate for various application scenario;
5. Easy operation and multiple-output function for the convenience of selection of user.

■ Main technical index

6. Display:

Single accumulative quantity 0.000 L ~ 99999999 L or 0.000 cube ~ 99999999 cubes

Total accumulative quantity 0.000 L ~ 99999999999 L or 0.000 cube ~ 99999999999 cubes

Instantaneous flow 0.000 L/hour (min) ~ 999999 L/hour (min) or 0.000 cube/hour(min) ~ 999999 cubes/hour(min)

2. Ambient temperature of use: -25 ~ + 55°C

3. Explosion-proof sign: Exd II BT5 Appropriate for BELZ-0 ~ BELZ-5
Exd II CT5 Appropriate for BELZ-2, BELZ-4

Water-proof grade: IP 65

4. Power supply and output by model:

BELZ-0 type Battery power supply: use lithium battery, the flowmeter can be used for 2 years for uninterrupted operation and the service time will be extended in case of interrupted operation; it is also allowed for external power supply, output flow pulse signal.

BELZ-1 type External power supply: DC24V power supply, output flow pulse signal (rectangular), pulse amplitude approaching the voltage of external power supply, pulse width of 2 ms.

BELZ-2 type External power supply: DC24V power supply, two-wire system, output analog quantity 4~20 ma current directly proportional to flow size.

BELZ-3 type External power supply: DC24V power supply, four-wire system, can output analog quantity 4~20 ma current and flow pulse signal directly proportional to flow size at the same time.

BELZ-4 type External power supply: DC24V power supply, HART communication, two-wire system, output analog quantity 4~20 ma current directly proportional to flow size.

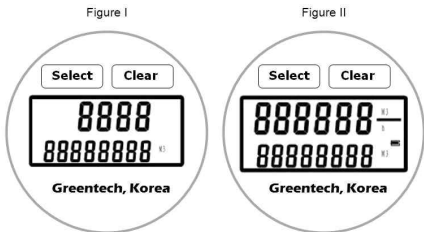
BELZ-5 type External power supply: DC24V power supply, RS485 communication, adopting standard MODBUS-RTU communication protocol.

5. Dimension of output adapter: Internal thread, G1/2", outside diameter of cable of $\Phi 7.5 \sim 10.5$.

■ Use and output wiring

1. Use

Although the BELZ flame-proof digital flow counter is divided into BELZ-0 ~ BELZ-5 types by power supply and output function, the function of counter panel is the same. There are two display interfaces which are shown as figure I and II below.



The interface of Figure I shows the total accumulative quantity of flow where the upper is high order of total accumulative quantity and the lower is the low order of total accumulative quantity and the total accumulative quantity can not be cleared on the panel.

For Figure II, the upper is the flow size and the lower is the single accumulative quantity of flow.

The clearance of single accumulative quantity can be completed by click Clear by mating magnetic rod under the interface of Figure II;

Click Select by mating magnetic rod, so as to switch the interface of figure I and figure II.

2. Output wiring

Where the wiring of BELZ digital flow counter is required, screw out the four hexagon socket screws on the cover of the digital counter by hexagon wrench to take down the cover of digital counter and the wiring shall be conducted as the following methods:

2-1. BELZ-0: this type is a digital counter of battery power supply, where teletransmission of flow signal is required in later stage of use of user, the power supply and wiring shall be conducted as the following figure:

1 (24V)	2 (PO)	3 (END)	
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BELZ-0

2-2. BELZ-1: this type is a digital flowmeter requiring flow pulse teletransmission output and external power supply, the wiring shall be conducted as the following figure:

1 (24V)	2 (PO)	3 (GND)	
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BELZ-1

2-3. BELZ-2: DC24V connects terminal 1, current output connects terminal 4, two-wire system, output analog quantity 4~20 ma current directly proportional to flow size

1 (24V)			4 (IO)
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BELZ-2

2-4. BELZ-3: the wiring shall be conducted as following figure, where terminal 1 connects DC24V and current output connects terminal 4, it is allowed to output analog quantity 4~20 Ma current directly proportional to flow size and output flow pulse signal from terminal 2.

1 (24V)	2 (PO)	3 (GND)	4 (IO)
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BELZ-3

2-5. BELZ-4: DC24V connects terminal 1 and current output connects terminal 4, two-wire system, it is allowed to output analog quantity 4 ~ 20 ma current directly proportional to flow size and realize HART communication.

1 (24V)			4 (IO)
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BELZ-4

2-6. BELZ-5: the wiring shall be conducted as following figure, terminal 1 connects positive electrode of DC24V, terminal 3 connects negative electrode of DC24V, terminal 5 connects RS485 communication line A, terminal 6 connects RS485 communication line B and terminal 7 connects the shielding line of RS485 communication line.

1 (24V)		3 (GND)		5 (A)	6 (B)	7 (G)
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BELZ-5



Step 1: Press OK on the normal display interface to display Figure 1 (Instantaneous frequency can be seen in this interface). Enter your 4-bit password by pressing Shift and Inc. Press OK to enter into setup sub-menu, as shown in Figure 2.

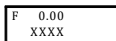


Figure 1

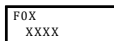


Figure 2

1111: Parameter modification password

Step 2: Press Inc to select a menu number: F01→F02→F03→F04→F05→F06→F07→F08. When a specific menu number displays, press OK and enter into the menu to set.

Step 3: Instructions on each sub-menu

F01 Options for flow unit (Figure 3): Press Inc to select a required unit after entering into F01 menu. Press Shift to select to modify the flow unit M3, L or h (hour) and m (minute). Press OK to save the changes.

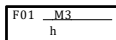


Figure 3

Note: The total accumulative flow and single accumulative flow would be cleared after the flow unit is changed.

F02: Range upper limit: To set a flow range upper limit corresponding to the output of analog quantity 4~20 ma. The number could range from 0.1-999999.9 with the same unit as selected in F01.

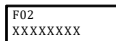


Figure 4

F03 Damping time (Figure 4): Eliminate effectively the impact of instantaneous flow pulse on flow display and flow output. Any number from 1 to 99 can be set. A higher number will have a more effective result but a slower output response time.

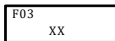


Figure 5

F04 Clearance of accumulative flow (Figure 5): Enter 0 and press OK to clear the total accumulative flow.

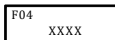


Figure 5

F05 4 ma trimming: Connect the ammeter to power circuit. Enter into this sub-menu to check if the ammeter's reading is 4 ma. If not, adjust the adjustable resistor RW2 until the ammeter reads as 4 ma. Press OK to exit the adjustable resistor.

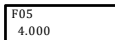


Figure 6

F06 20 ma trimming: Connect the ammeter to power circuit. Enter into this sub-menu to check if the ammeter's reading is 20 ma. If not, adjust the adjustable resistor RW1 until the ammeter reads as 20 ma. Press OK to exit the adjustable resistor.

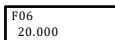


Figure 7

F07 Setting on the adjustment coefficient K

Coefficient K can be set from 0.0001 to 2.0000.

This interface displays the coefficient K (adjustment coefficient for flow meter error), ranging from 0.0001 to 2.0000

$$K = V_{\text{real}} / V_{\text{display}}$$

V_{real} = standards volume (the actual volume passing media)

V_{display} = the display value on the flow meter (the media volume measured by the flow meter outfit)

Coefficient K can be debugged from 0.0001 to 2.0000. If beyond this range, meter coefficient must be adjusted. If the input is above 2, no adjustment should be made.

If the input is 84210, it can be regarded as reset on coefficient K to eliminate the impact of coefficient K on measurement (different from $K=1$)

e.g.:

1 When a higher display value on flow meter is expected, for example, +0.25%, the coefficient = 1.0025

2 When a lower display value on flow meter is expected, for example, -0.35%, the coefficient = 0.9965

F07 XXXX.XXXX

Figure 8

F08 485 communication address is set from 1 to 255

F08 CN-XXX

Figure 9

■ Precautions

1. Electrified wiring on explosion-proof sites is prohibited, or it may cause explosion and damage the digital counter.
2. Non-professionals shall not be allowed to instrument settings and change the intrinsic parameter. In this case, the manufacturer would not be responsible for the measurement errors.
3. When the flow counter has a function of output pulse, the flow coefficient of the output pulse is showed on the name board of the flow counter.
4. Please read the instruction carefully before wiring for digital counter and changing settings.



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