

Flow Rate Indicator NH , NK Instruction Manual

Main specifications

	Instantaneous / Integrated Flow Rate Indicator	Alarm Instantaneous Flow Rate Indicator
Model	NH□□□-4	NK□□□-4
Display and digits	LCD, 8 digits	LCD, 4 digits
Display unit	L, m ³ and L/min, m ³ /min	L/min and m ³ /min
Output signal	* Open drain output (equivalent to open collector) Pulse width: 5 ms or more, Maximum rated voltage: 30VDC Output capacity: ON resistance: 150Ω or less, OFF resistance: 100kΩ or more (Remaining voltage is 1.5V or less when input current is 10 mA or less)	N/A
Alarm output and setting	N/A	Non-voltage c contact output 110VAC 0.3A, 20VDC1A or less High / Low setting for alarm -- one for each. 2-digit digital setting
Other functions	6-digit trip integration, Constant setting Integrated value zero clear, Hold	Constant setting, Hold
Weight	Approx. 210g	Approx. 250g
Input signal	Open collector input (supporting 4-line type of ND type flow rate sensor and OF-Z flow rate sensor)	
Power	Built-in lithium battery. Battery life is about 10 years under normal use. * No battery replacement.	
Installation method	Panel embedded type	
Operating temperature range	0 to + 60°C	
Operating humidity limit	30 to 90 %RH (No dew condensation)	
Receivable distance	30m	
Number of the input transmission lines	4	

* For □□□ in the table above, connectable meters are as follows.

005: ND05 010: ND10 020: ND20
05M: OF05Z 10M: OF10Z

* The pulse unit of output signal is specified on the nameplate.

Standard specifications are as follows.

NH005-4: 10mL/P NH010-4: 1L/P NH020-4: 1L/P
NH05M-4: 10mL/P NH10M-4: 10mL/P

Precautions in handling

Common to NH and NK

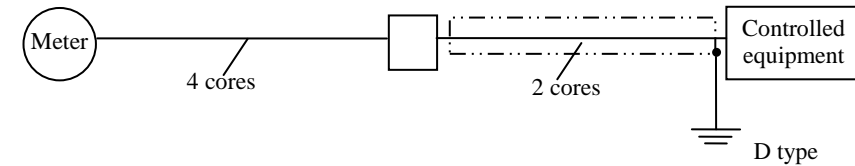
- Connect the wires with the meter correctly in accordance with the connection diagram.
- Keep the wiring distance from the meter within 30 m.
- Keep the distance of 20 cm or more from the power line (100VAC, 200VAC) for connection with the meter or this Indicator or between them.
- If the Indicator is affected by noise from a relay, motor, etc., install a spark killer or otherwise for noise prevention at the noise source.
- Be careful that this product may malfunction near equipment that generates harmonics, such as mobile phone, ultrasonic cleaner, high frequency generator, or transceiver.

NH

- When using the output, pay attention to the output polarity. Keep the output line at least 20 cm away from the power line
- Shielded cable is recommended for wiring using the output.

The shielded cable must be grounded on the side of control equipment.

When not using the output pulse, the shielded cable must be grounded on the side of this Indicator.

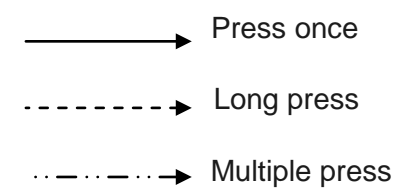


NK

- Do not exceed the rated value when using contact point.

■ NH: Switch operation

- When the integrated flow rate is displayed, the display can be switched from the integrated flow rate (trip) display to the instantaneous flow rate display.
 - When the switch is pressed for approx. 3 seconds during the instantaneous flow rate display, the screen will display the data immediately before switching to the instantaneous flow rate display. (When switching to the integrated flow rate (trip) display, the value of integrated flow rate (trip) will not be cleared to zero.)
 - When the switch is pressed again during the instantaneous flow rate display, the screen will hold the instantaneous flow rate displayed when pressed.
 - If the switch is pressed again when holding the instantaneous flow rate display, the holding will be released.
 - If the switch is pressed when the integrated flow volume display is blinking, the CL display will blink.
 - If the switch is pressed when the CL display is blinking, the integrated value will be reset and integrated flow rate will be displayed.
- L/min**
- During the integrated flow rate display or the instantaneous flow rate display, the display can be switched to the integrated flow rate (trip) display. In switching, the integrated flow rate (trip) value is cleared to zero.
 - If pressed during the integrated flow rate (trip) display, the value of integrated flow rate (trip) will be cleared to zero. If further pressed for 3 seconds, the screen will be switched to the integrated flow rate display.
 - If pressed when the integrated flow rate display or CL display is blinking, the screen will be switched to the integrated flow rate display. In switching, the integrated flow rate value will not be reset.
- TOTAL TRIP**
- If pressed simultaneously for 2 to 4 seconds, the integrated flow rate display will blink.
 - If pressed simultaneously for 4 seconds or more, the screen will switch to the constant setting mode. (The operating procedure specified separately)
- L/min + TOTAL TRIP**



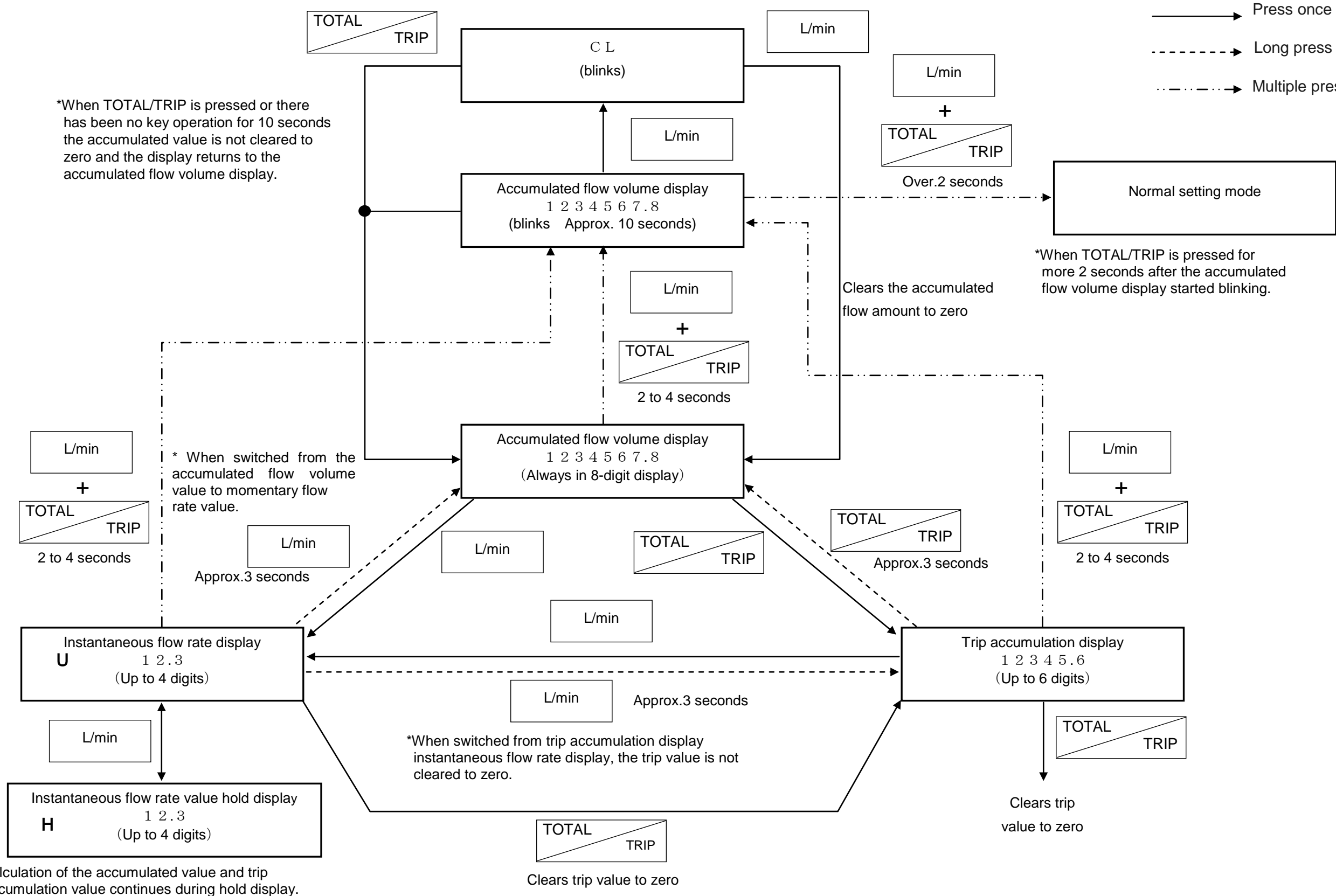
*When TOTAL/TRIP is pressed or there has been no key operation for 10 seconds the accumulated value is not cleared to zero and the display returns to the accumulated flow volume display.

*When TOTAL/TRIP is pressed for more 2 seconds after the accumulated flow volume display started blinking.

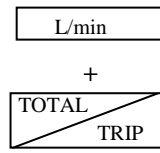
* When switched from the accumulated flow volume value to momentary flow rate value.

*When switched from trip accumulation display instantaneous flow rate display, the trip value is not cleared to zero.

*Calculation of the accumulated value and trip accumulation value continues during hold display.



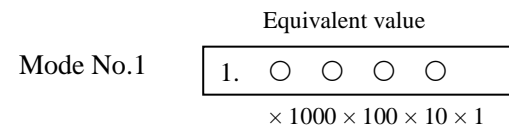
■ **NH: Constant setting function**



- The screen will switch to the setting mode when the two switches on the left are pressed simultaneously for 4 seconds or more.
- If no switch is pressed for 10 seconds or more or if TOTAL/TRIP switch is pressed when the constant setting value is lit, the screen will return to the integrated value display. Then, the setting value of the item where setting is not completed will be invalid.

Mode No.1 (Set the equivalent value of pulse constant *)

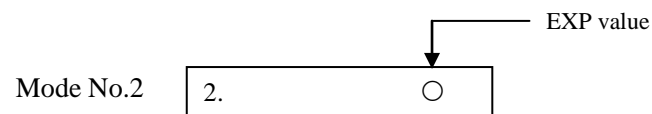
When the L/min switch and the TOTAL/TRIP switch are pressed simultaneously for 4 seconds or more, the screen will switch to Mode No. 1 and display the following. ("o" shows the present setting value.)



1. When the L/min switch is pressed for 2 seconds, the most significant digit of the setting value will blink, showing ready for setting.
2. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9.)
3. When the TOTAL/TRIP switch is pressed, the value is set and the following digit will blink, showing ready for setting.
4. Repeat this procedure until the least significant digit is set. Then, the screen will return to the state of "1" above.
5. When the L/min switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

Mode No.2 (Set the EXP value for the equivalent value of pulse constant *)

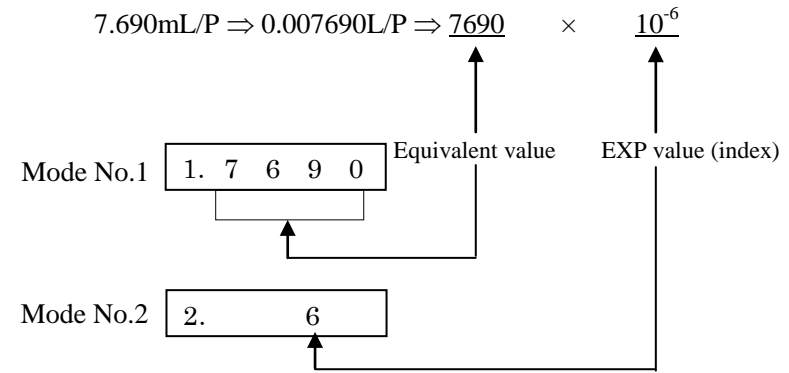
If the L/min switch is pressed when Mode No. 1 is lit, the screen will switch to Mode No. 2 and display the following. ("o" shows the present setting value.)



1. When the L/min switch is pressed for 2 seconds, the setting value will blink, showing ready for setting.
2. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is 0, 1, 2, 3, 4, 5, 6, or 7.)
3. When the L/min switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

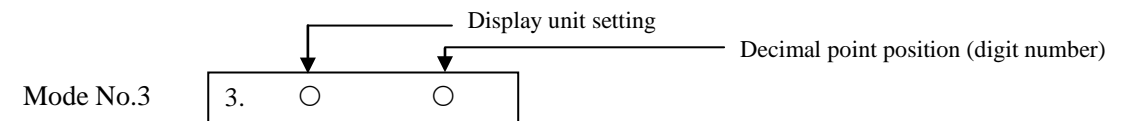
* Mode No. 1 functions as equivalent value, and No. 2, as EXP value. By entering these equivalent and EXP values, pulse constant can be set. The unit of the pulse constant set by Mode No.1 and Mode No.2 is L/P.

Ex.: When setting the pulse constant using 7.692 mL/P of ND10 per pulse.



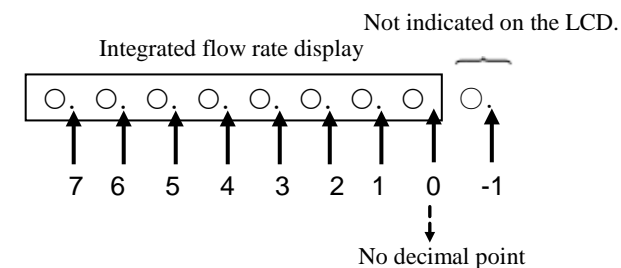
Mode No.3 (Set the decimal point position of integrated flow rate display)

If the L/min switch is pressed when Mode No. 2 is lit, the screen will switch to Mode No. 3 and display the following. ("o" shows the present setting value.)



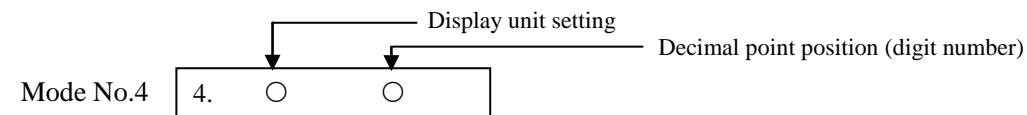
1. When the L/min switch is pressed for 2 seconds, the display digit on the left of the setting value will blink, showing ready for setting.
2. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is 0 or 1.)
(When set to 0, the value is displayed with the unit of "L", and when set to 1, "m³")
3. When the value is set with the TOTAL/TRIP switch, the display digit on the right will blink.
4. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is -1, 0, 1, 2, 3, 4, 5, 6, or 7.)
5. When the value is set with the TOTAL/TRIP switch, the screen will return to the state of "1" above.
6. When the L/min switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

The setting value on the right of the display shows the digit number of the decimal point position. The setting value of 0 means that the least significant digit of the displayed value is the digit of 10⁰L (or 10⁰m³), and the setting value of -1 means that the least significant digit of the displayed value is the digit of 10¹L (or 10¹m³). The following shows the relation between setting value and decimal point position.



Mode No.4 (Set the decimal point position of integrated flow rate (trip) display)

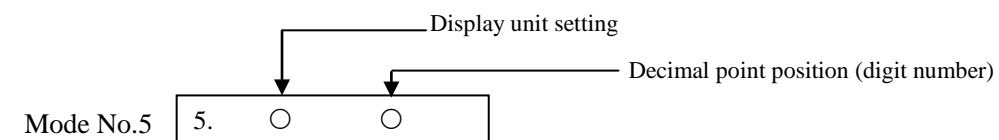
If the L/min switch is pressed when Mode No. 3 is lit, the screen will switch to Mode No. 4 and display the following.
("○" shows the present setting value.)



1. When the L/min switch is pressed for 2 seconds, the display digit on the left of the setting value will blink, showing ready for setting.
2. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is 0 or 1.)
(When set to 0, the value is displayed with the unit of "L", and when set to 1, "m³")
3. When the value is set with the TOTAL/TRIP switch, the display digit on the right will blink.
4. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is -1, 0, 1, 2, 3, 4, or 5.)
5. When the value is set with the TOTAL/TRIP switch, the screen will return to the state of "1" above.
6. When the L/min switch is pressed for 2 seconds, the set value will be lit and setting will be completed.
The setting value on the right of the display shows the digit number of the decimal point. The setting value of 0 means that the least significant digit of the displayed value is the digit of 10⁰L (or 10⁰m³), and the setting value of -1 means that the least significant digit of the displayed value is the digit of 10¹L (or 10¹m³).

Mode No.5 (Set the decimal point position of instantaneous flow rate display)

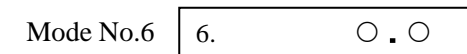
If the L/min switch is pressed when Mode No. 4 is lit, the screen will switch to Mode No. 5 and display the following.
("○" shows the present setting value.)



1. When the L/min switch is pressed for 2 seconds, the display digit on the left of the setting value will blink, showing ready for setting.
2. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is 0 or 1.)
(When set to 0, the value is displayed with the unit of "L/min", and when set to 1, "m³/min")
3. When the value is set with the TOTAL/TRIP switch, the display digit on the right will blink.
4. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is -1, 0, 1, 2, or 3.)
5. When the value is set with the TOTAL/TRIP switch, the screen will return to the state of "1" above.
6. When the L/min switch is pressed for 2 seconds, the set value will be lit and setting will be completed.
The setting value on the right of the display shows the digit number of the decimal point position. The setting value of 0 means that the least significant digit of the displayed value is the digit of 10⁰L (or 10⁰m³), and the setting value of -1 means that the least significant digit of the displayed value is the digit of 10¹L (or 10¹m³).

Mode No.6 Set the interval of updating the instantaneous flow rate display

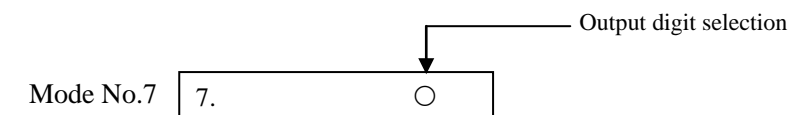
If the L/min switch is pressed when Mode No. 5 is lit, the screen will switch to Mode No. 6 and display the following.
("○" shows the present setting value.)



1. When the L/min switch is pressed for 2 seconds, the setting value will blink, showing ready for setting.
2. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is 0.5, 1.0, 2.0, 3.0, 4.0, or 5.0 sec.)
(Default is 2.0 sec)
3. When the L/min switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

Mode No.7 Set the pulse output digit

If the L/min switch is pressed when Mode No. 6 is lit, the screen will switch to Mode No. 7 and display the following.
("○" shows the present setting value.)

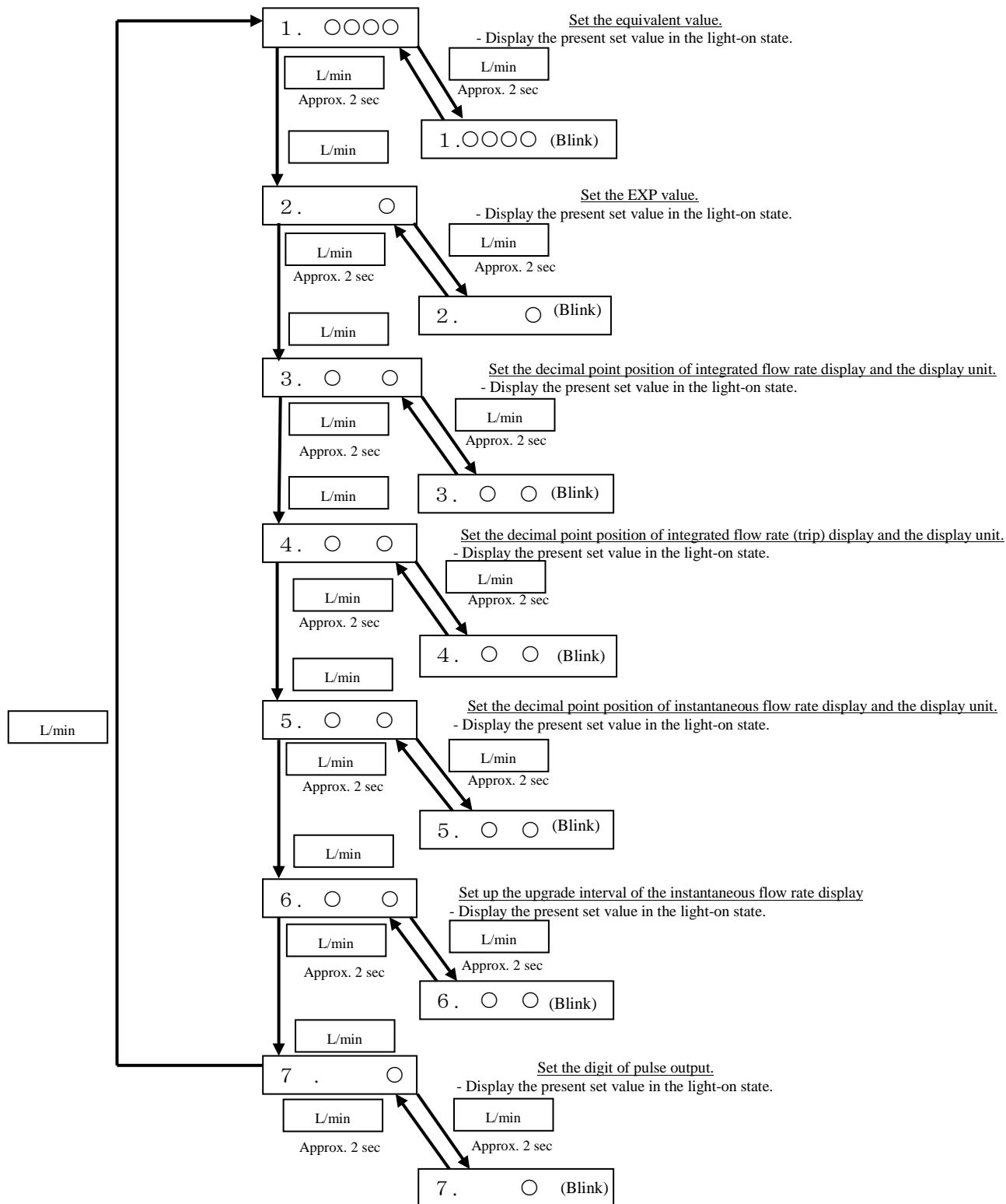


1. When the L/min switch is pressed for 2 seconds, the setting value will blink, showing ready for setting.
2. Each time the L/min switch is pressed, the setting value will change in turn. (Setting value is 0, 1, 2, 3, 4, 5, 6, 7, or 8.)
"0" represents non-unit pulse. For setting values other than 0, each time the integrated flow rate display of the setting value (i.e. digit) is counted upward, a pulse is outputted. (e.g., when set to 3, each time the third digit of the integrated flow rate display is counted upward, a pulse is outputted.)
3. When the L/min switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

Note: Set the pulse output digit greater than the most significant digit of pulse constant.

(If set to a value lower than the most significant digit of pulse constant, pulse output will be indefinite.)

When the L/min switch is pressed in this state, the screen will return to Mode No.1.

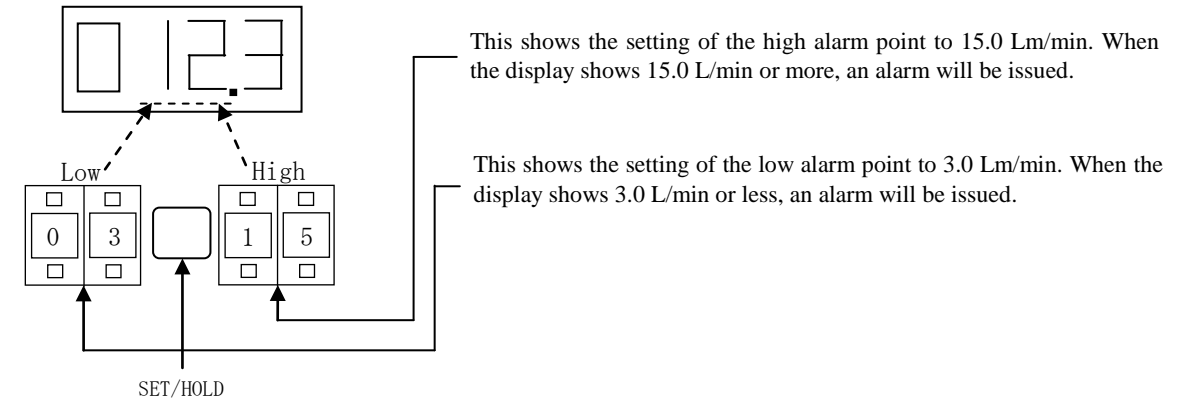


■ NK: Setting switch

Set the flow rate to give an alarm.

The value of the setting switch corresponds to the two digits at center of the LCD.

Ex.



Each time the SET/HOLD switch is pressed, hold of the instantaneous flow rate is started / released.

Even during the hold mode, this Indicator calculates instantaneous flow rate and determines whether to give an alarm when the flow rate reaches the high / low limit.

When the SET/HOLD switch is pressed for 4 seconds or more, the screen will switch to the constant setting mode. (The operating procedure specified separately)

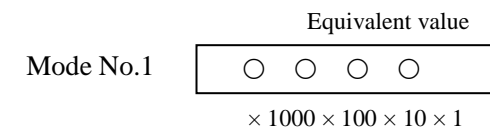
* NK has no indication of "H" representing "instantaneous flow rate display."

■ NK: Constant setting function

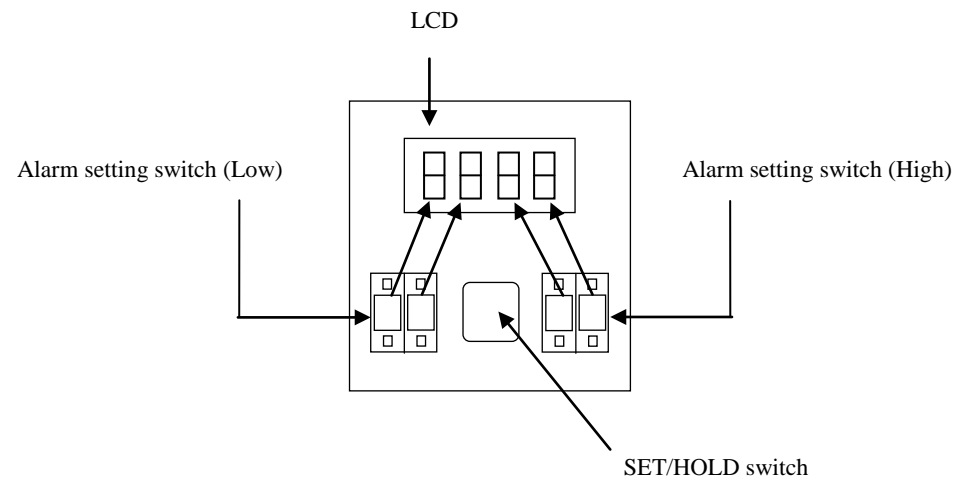
Mode No.1 (Set the equivalent value for setting of pulse constant *)

When the SET/HOLD switch is pressed for 4 seconds or more, the screen will switch to Mode No.1 and display the following.

If no switch is pressed for 10 seconds or more the screen will return to the instantaneous flow rate display. Then, the setting value of the item where setting is not completed will be invalid.

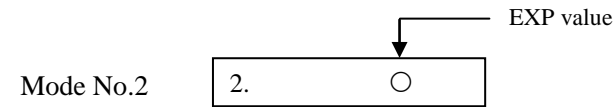


1. Set the preset equivalent value using the High / Low switch. (Set the value as displayed)
 2. When the SET/HOLD switch is pressed for 2 seconds, the setting value will blink, showing ready for setting.
 3. Set the equivalent value using the High / Low switch.
 4. When the SET/HOLD switch is pressed continuously for 2 seconds, the display will be lit and setting will be completed.
 5. Set the correct high / low alarm setting value using the High/Low switch. (For preventing malfunctioning of the alarm)
- The right figure shows the relations between the High / Low switch and display digit.



Mode No.2 (Set the EXP value for the equivalent value of pulse constant *)

If the SET/HOLD switch is pressed when Mode No. 1 is lit, the screen will switch to Mode No. 2 and display the following. ("○" shows the present setting value.)

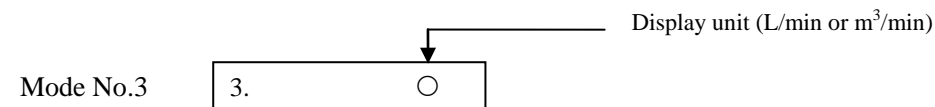


1. When the SET/HOLD switch is pressed for 2 seconds, the setting value will blink, showing ready for setting.
2. Each time the SET/HOLD switch is pressed, the setting value will change in turn. (Setting value is 0, 1, 2, 3, 4, 5, 6, or 7.)
3. When the SET/HOLD switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

* Mode No. 1 functions as equivalent value, and No. 2, as EXP value. By entering these equivalent and EXP values, pulse constant can be set. The unit of the pulse constant set by Mode No.1 and Mode No. 2 is L/P. (Refer to Mode No. 2 of NH for setting examples.)

Mode No.3 (Set the unit of instantaneous flow rate display)

If the SET/HOLD switch is pressed when Mode No. 2 is lit, the screen will switch to Mode No. 3 and display the following. ("○" shows the present setting value.)



1. When the SET/HOLD switch is pressed for 2 seconds, the setting value will blink, showing ready for setting.
2. Each time the SET/HOLD switch is pressed, the setting value will change in turn. (Setting value is 0 or 1.)
(When set to 0, the value is displayed with the unit of "L/min", and when set to 1, "m³/min")
3. When the SET/HOLD switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

Mode No.4 (Set the decimal point position of instantaneous flow rate display)

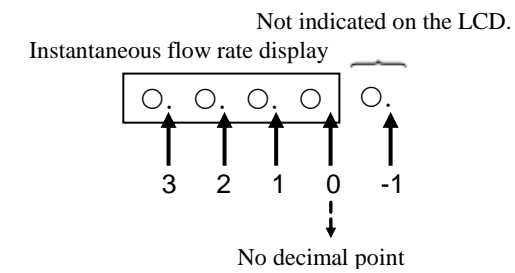
If the SET/HOLD switch is pressed when Mode No. 3 is lit, the screen will switch to Mode No. 4 and display the following. ("○" shows the present setting value.)



1. When the SET/HOLD switch is pressed for 2 seconds, the setting value will blink, showing ready for setting.
2. Each time the SET/HOLD switch is pressed, the setting value will change in turn. (Setting value is -1, 0, 1, 2, or 3.)
3. When the SET/HOLD switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

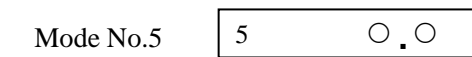
The setting value shows the digit number of the decimal point position of the LCD. The setting value of 0 means that the least significant digit of the displayed value is the digit of 10⁰L /min, and the setting value of -1 means that the least significant digit of the displayed value is the digit of 10¹L/min.

The following shows the relation between setting value and decimal point position.



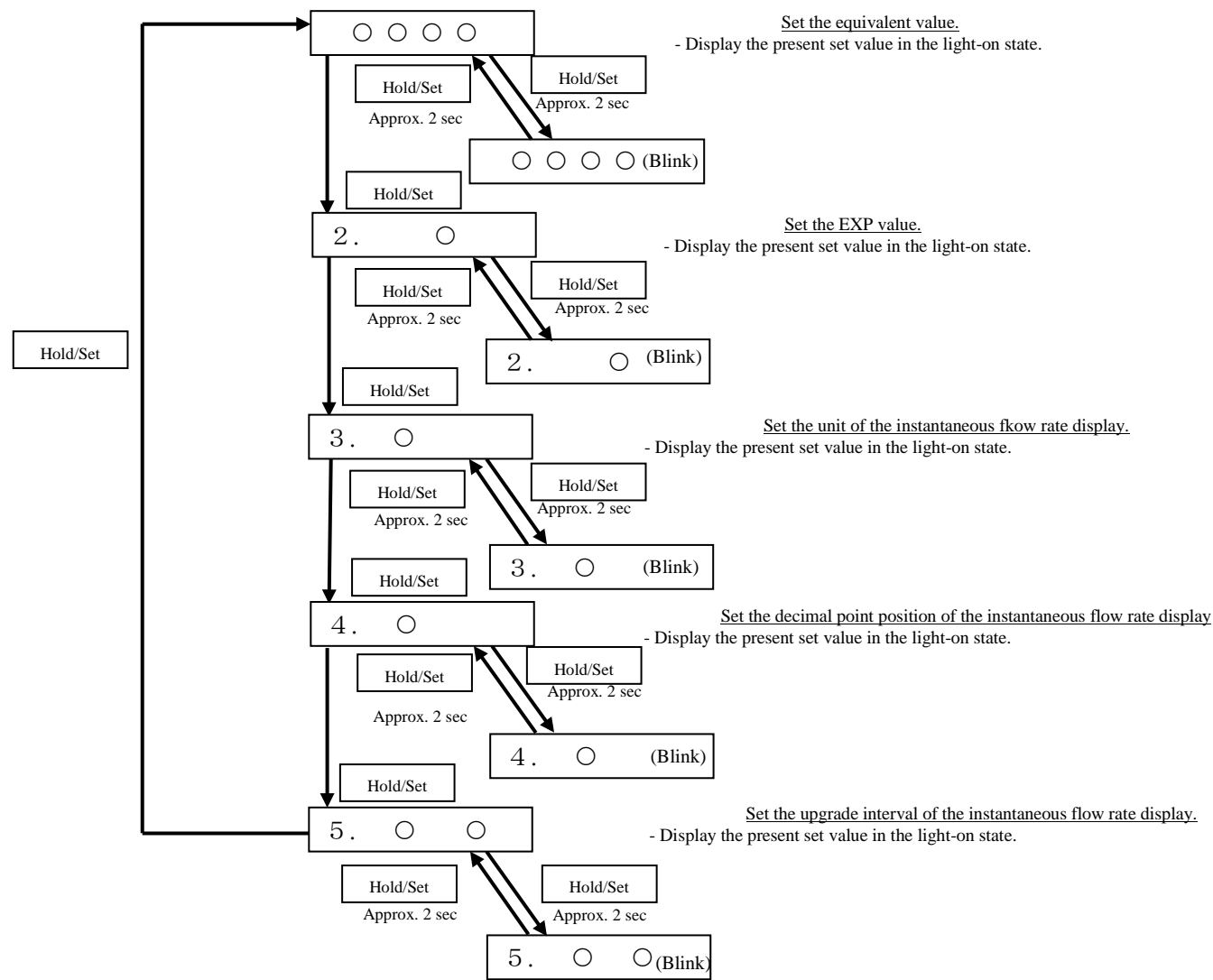
Mode No.5 (Set the interval of upgrading the instantaneous flow rate display)

If the SET/HOLD switch is pressed when Mode No. 4 is lit, the screen will switch to Mode No. 5 and display the following. ("○" shows the present setting value.)



1. When the SET/HOLD switch is pressed for 2 seconds, the setting value will blink (0.5 sec), showing ready for setting.
2. Each time the SET/HOLD switch is pressed, the setting value will change in turn. (Setting value is 0.5, 1.0, 2.0, 3.0, 4.0, or 5.0 sec.) (Default is 2 sec.)
3. When the SET/HOLD switch is pressed for 2 seconds, the set value will be lit and setting will be completed.

When the SET/HOLD switch is pressed in this state, the screen will return to Mode No.1.



■ **NH / NK: Function to detect battery voltage drop**

When the battery voltage drops, the least significant digit will blink.

■ **NH / NK storage mode**

NH: When the TOTAL/TRIP switch and the L/min switch are pressed simultaneously for 10 seconds or more, the storage mode will be activated and [-----] will be indicated on the LCD. In the storage mode, when the TOTAL/TRIP switch and the L/min switch are pressed simultaneously for 2 seconds or more, the mode will return to the measurement mode (integrated flow rate display).

NK: When the SET/HOLD switch is pressed for 10 seconds or more, the storage mode will be activated and [-----] will be indicated on the LCD. In the storage mode, when the SET/HOLD switch is pressed for 2 seconds or more, the mode will return to the measurement mode. * No need to use the storage mode in normal use.

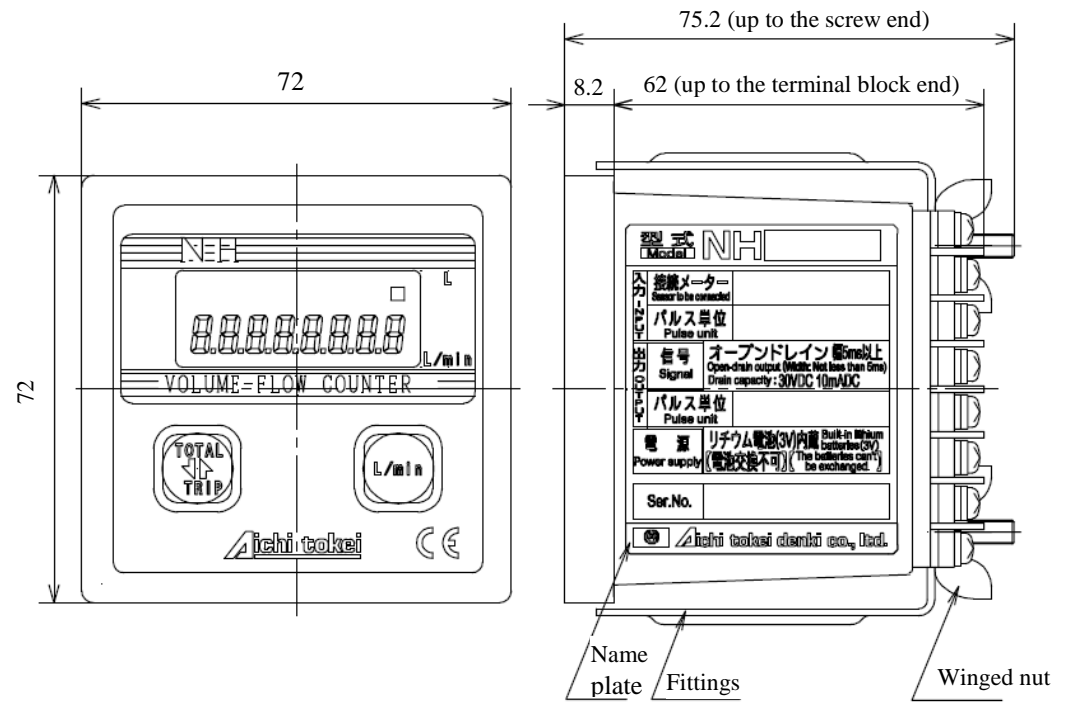
Factory default values

Mode	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7
NH005-4	2500	6	02	02	02	2.0	1
NH010-4	7690	6	01	01	01	2.0	2
NH020-4	2500	5	01	01	01	2.0	2
NH05M-4	4600	7	03	03	03	2.0	2
NH10M-4	2500	6	02	02	02	2.0	1
NK005-4	2500	6	0	2	2.0		
NK010-4	7690	6	0	1	2.0		
NK020-4	2500	5	0	1	2.0		
NK05M-4	4600	7	0	3	2.0		
NK10M-4	2500	6	0	2	2.0		

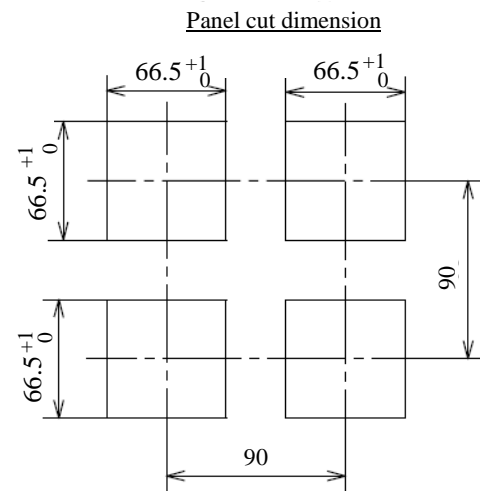
■ Connection method

See the connection seal on the terminal block mounting face.

■ Dimensional outline drawing and panel cutout drawing (common to NH and NK)



Panel thickness: mo. × 6mm (For fittings)
Up to the wing nut: 79.4 mm when panel thickness is 6 mm.



■ Product warranty

• Warranty period

One year after the dispatch date from Aichi tokei denki facility.

• Warranty scope

We are making every effort to produce our products with high quality, however if a defect which is subject to our liability should occur during the warranty period under normal use, we shall repair the product or replace it with a normal product for free.

Please understand that we shall determine whether the free remedy shall apply to your situation after our investigation of the product.

Also please understand that the free remedy shall not be applied to a defect:

- (1) Caused by use which does not follow the instructions given in our catalog, product specifications, and/or handling manual,
- (2) Caused by disaster such as a fire, earthquake, storm, flood, or lightning, or a destructive act such as a crime,
- (3) Caused by corrosion due to use in a corrosive environment,
- (4) Caused by acts of animals such as a dog, cat, rat, or insect,
- (5) Caused by a factor other than our product,
- (6) Which could not be foreseen with the science and technology levels at the time of shipment,
- (7) Caused by a repair or alteration other than done by or specified by us, and/or
- (8) Caused by an inappropriate inspection and/or maintenance or replacement of a consumable.

Please note that "warranty" in this context means warranty for our product alone and we shall not be reliable for any damage resulting from a defect of our product, including but not limited to a damage to equipment other than our product, loss of profit, loss of opportunity, transportation fee, and construction fee.



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The product specification might be changed without prior notice.