Document No.IZ*-OMQ0001

SMC®

Operation Manual

Product

Intermittent control timer

Model/ Series/ Product No.

IZE110-X238

SMC Corporation

Contents

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions are categorized into three groups, "Caution", "Warning" and "Danger" depending on the level of hazard and damage, and the degree of emergency. They are all important notes for safety and must be followed in addition to International Standards (ISO/ IEC), Japan Industrial Standards (JIS)[*1)] and other safety regulations[*2)].

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems.
ISO 4413: Hydraulic fluid power -- General rules relating to systems.
IEC 60204-1: Safety of machinery -- Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1992:Manipulating industrial robots-Safety.
JIS B 8370: Pneumatic fluid power - General rules relating to systems
JIS B 8361: Hydraulic fluid power - General rules relating to systems
JIS B 9960-1: Safety of machinery - Electrical equipment of machines (Part 1: General requirements)
JIS B 8433-1993: Manipulating industrial robots - Safety, etc

*2) Labor Safety and Sanitation Law, etc.

Note	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

(1) The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

(2) Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment must be performed by an operator who is appropriately trained and experienced.

(3) Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent dropping of driven objects or run-away of machinery/equipment have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

(4) Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or used outdoors or in a location exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation. Check the product regularly in order to confirm normal operation.

Safety Instructions

⚠ Note

The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If the product is being considered for use in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited Warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

[Limited Warranty and Disclaimer]

(1) The warranty period of the product is 1 year in service or within 1.5 years after the product is delivered. *3)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

(2) For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to SMC product independently, and not to any other damage incurred due to the failure of the product.

(3) Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*3) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

[Compliance Requirements]

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

■Explanation of Symbols

Symbol	Definition
	Things you must not do Actual instructions are provided as a drawing or sentence close to this mark.
	Things you must do Actual instructions are provided as a drawing or sentence close to this mark.

■Operator

(1) This Operation Manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment.
Only those persons are allowed to perform assembly, operation and maintenance.
(2) Read and understand this Operation Manual carefully before assembling, operating or providing maintenance to the product.

■ Safety Instructions

⚠Warning	
 Disassembly prohibited	■Do not disassemble, modify (including the replacement of board) or repair. Otherwise, an injury or failure can result.
 Do not	■Do not operate the product outside of the specifications. Fire, malfunction, or damage to the product can result. Please check the specifications before use.
 Do not	■Do not use in an atmosphere containing flammable or explosive gases. Fire or an explosion can result. The product is not designed to be explosion proof.
 Instruction	■Turn off the power supply during maintenance. It may cause an injury.
⚠Caution	
 Do not touch	■Do not touch the terminals and connectors while the power is on. Otherwise electric shock, malfunction or damage to the switch can result.
 Instruction	■ After maintenance is complete, perform appropriate functional inspections. Stop operation if the equipment does not function properly. Safety cannot be assured in the case of unexpected malfunction.

■ Handling Precautions

*Product specifications

Use the UL-certified products below for combined direct current power supply.

(1) Limited voltage current circuit in accordance with UL 508.

A circuit which power is supplied by secondary coil of a insulated transformer that meets the following conditions

- Maximum voltage (No load): 30Vrms (42.4V peak) or less
- Maximum current: (1) 8 A or less (including short circuit)

(2) Limited by circuit protector (such as fuse) with the following ratings

Voltage without load (V peak)	Maximum current rating [A]
0 to 20 [V]	5.0
Over 20[V] up to 30[V]	100/peak voltage

(2) Circuit (class 2) of maximum 30vrms (42.4V peak) or less, with UL 1310 class 2 power supply unit or UL 1585 class 2 transformer.

- Use the specified voltage.

Otherwise failure or malfunction can result.

Do not exceed the specified maximum allowable load.

Otherwise it can cause damage or shorten the life of the product.

- Design the product to prevent reverse current when the circuit is opened or the product is forced to operate for operational check.

Reverse current can cause malfunction or damage to the product.

- Set data stored by the product is not deleted, even if the power supply is cut off.
- Do not use a load which generates surge voltage.

In order to actuate a surge generating load such as a solenoid valve or relay directly, use a load with a built-in surge absorption element.

*Wiring

- Wire correctly.

Incorrect wiring can cause malfunction or break the product.

- Do not perform wiring while the power is on.

Otherwise damage to the internal parts can result, causing malfunction.

- Do not route wires and cables together with power or high voltage cables.

Route the wires of the product separately from power or high voltage cables to prevent noise and surge from entering the product.

- Confirm proper insulation of wiring.

Poor insulation (interference with other circuits, poor insulation between terminals etc.) can apply excessive voltage or current to the product causing damage.

-Design the system to prevent reverse current when the product is forced to operate for operational check.

Depending on the circuit used, insulation may not be maintained when operation is forced, allowing reverse current to flow, which can malfunction and damage the product.

* Adjustment and Operation

-Do not short-circuit the load.

Although error is displayed when the product load has a short circuit, generated over current may lead to the damage of the output circuit.

- Do not press the setting buttons with a sharp pointed object.

This may damage the setting buttons.

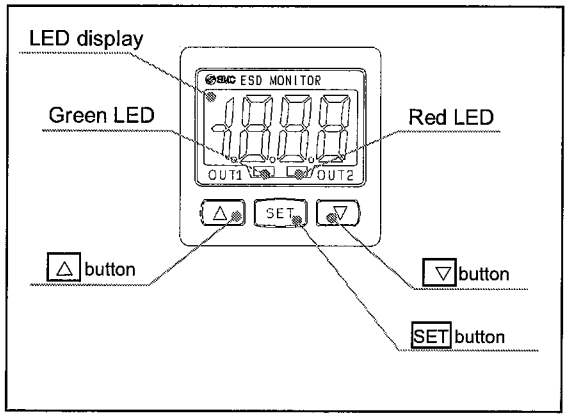
- Perform settings suitable for the operating conditions.

Incorrect setting can cause operation failure.

-Do not touch the LCD during operation.

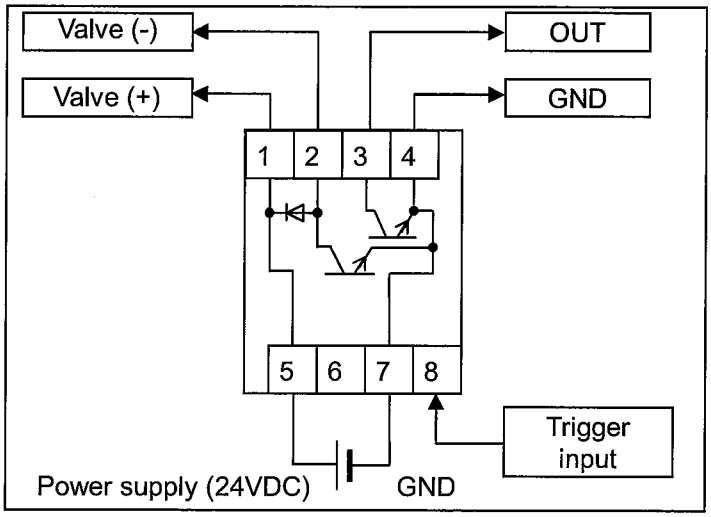
The display can vary due to static electricity.

1. Summary of product parts



[Display]
LCD: Displays the current count value and set values.
Green LED: LED is ON when the frequency or ON time is set, or valve is operating (confirmed by the count display.)
Red LED: LED is ON during duty ratio setting or OFF time setting.
[Buttons]
△ button: Changes the set mode and increases the value.
▽ button: Changes the set mode and decreases the value.
SET button: Sets the operation mode.

2. Terminal layout



Valve specification: 24 VDC 4 W or less
OUT specification: Maximum load current 80 mA
Maximum load voltage: 30 VDC
Residual voltage 1 V or less
(Load current 80 mA)
*: Terminal No.6 - Do not use.
*: Terminal No.1 and 5 are connected internally.
*: Terminal No.4 and 7 are connected internally.
*: OUT terminal is NPN open collector output.
*: Trigger input is a voltage-free input. It is turned on when connected to GND. It turns off when disconnected from GND.
*1: Terminal 1 and 2 have a built-in diode as protection against reverse voltage.

3. Input / Output

Input function	Trigger	Operates as a timer start and stop function.
Output function	OUT	Output during valve operation.

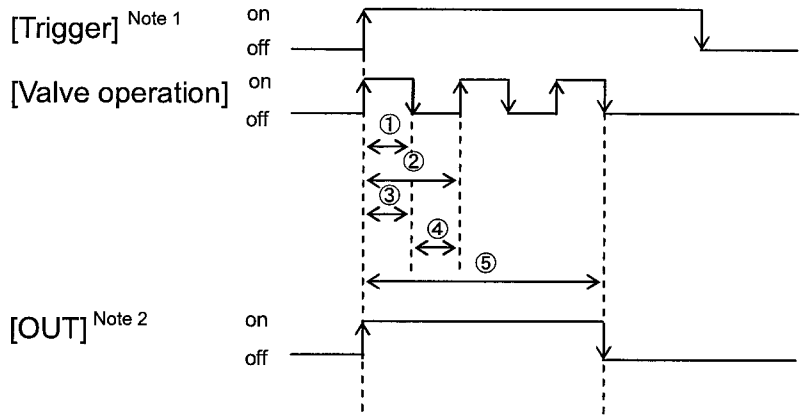
4. Operation

(1) Connect terminal No.5 to 24 VDC, terminal No.7 to GND, and terminal No. 1 and 2 to the valve.
(2) When terminal No.8 (trigger) is connected to GND, the valve operates for the time previously set by the timer.
(3) Terminal No.3 (OUT) provides an output signal while the valve is operating.
(4) The time set for the timer, frequency (or ON time), or duty ratio (or OFF time) can be changed using the setting screen.

*:, The valve operation is stopped and the timer value is cleared when terminal No.8 (trigger) is disconnected from GND, even within the time set by the timer.

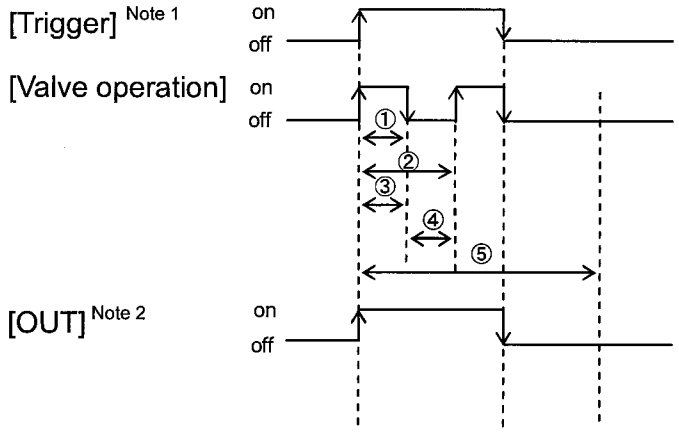
*: To restart the valve after the time set by the timer, disconnect terminal No.8, then connect to GND again.

Example 1) Trigger continuous input mode: the trigger starts, and the timer stops, the valve operation.



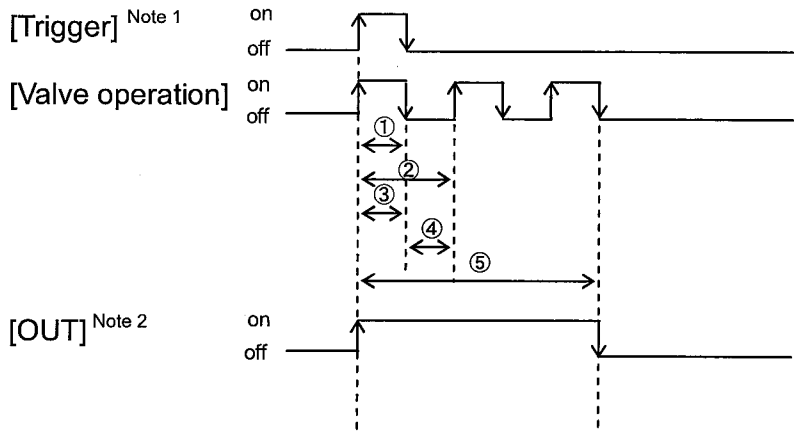
① "Duty ratio" time
② "Frequency" cycle
③ ON time
④ OFF time
⑤ Timer time

Example 2) Trigger continuous input mode: the trigger starts and stops the valve operation.



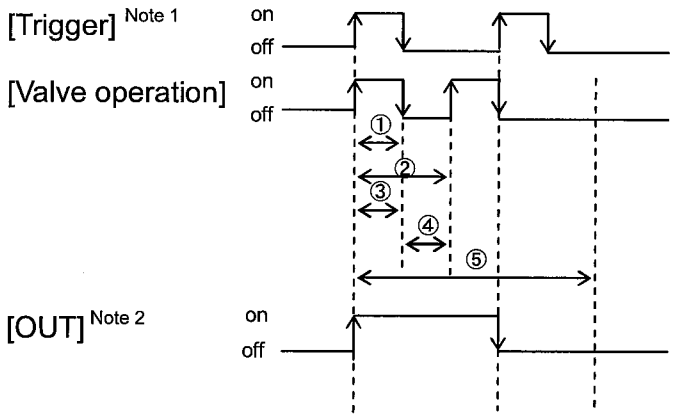
① "Duty ratio" time
② "Frequency" cycle
③ ON time
④ OFF time
⑤ Timer time

Example 3) Trigger one shot input mode: the trigger starts, and the timer stops, the valve operation.



① "Duty ratio" time
② "Frequency" cycle
③ ON time
④ OFF time
⑤ Timer time

Example 4) Trigger one shot input mode: the trigger starts and stops the valve operation.



① "Duty ratio" time
② "Frequency" cycle
③ ON time
④ OFF time
⑤ Timer time

Note1: Trigger turns ON when terminal No.8 is connected to GND .
Note2: Select the output mode in detailed setting mode: When oUt is set to o_P (Normal output)

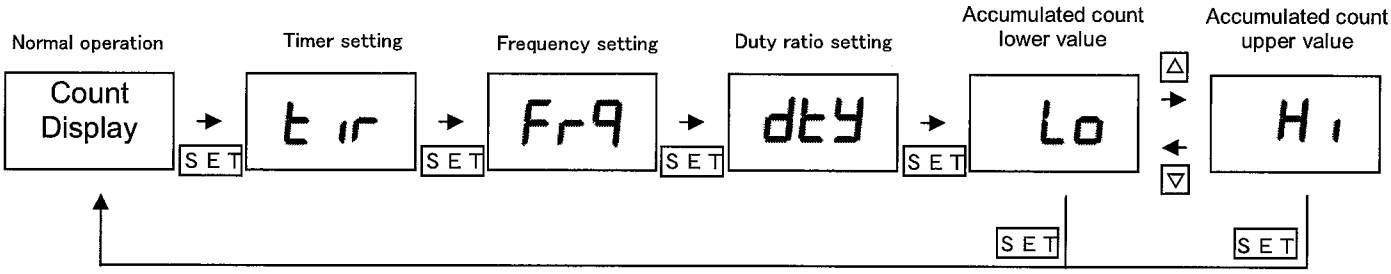
5. Mode Setting

5-1 Basic setting mode

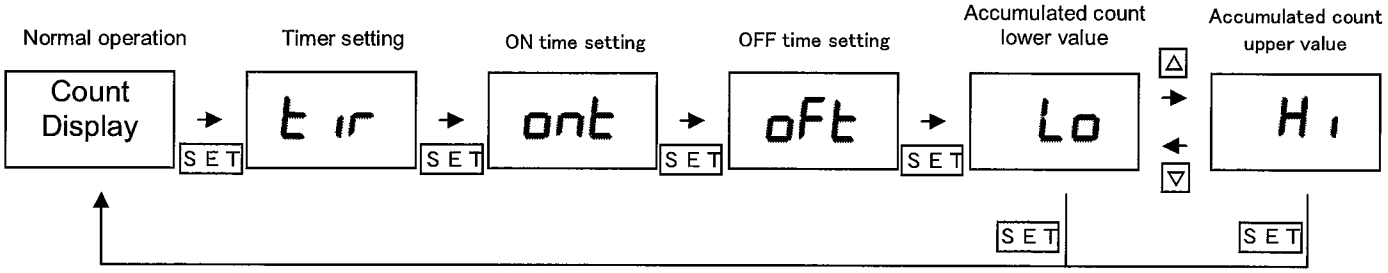
Press the SET button to select each basic setting item. Press the △ or ▽ button to change the set value in each setting mode. Press the SET button to update the value and complete the setting.

*: Press the SET button in each setting mode for 2 seconds or longer to return to normal mode.

[Valve operation cycle selection: F_d set to on]



[Valve operation cycle selection: F_d set to oFF]



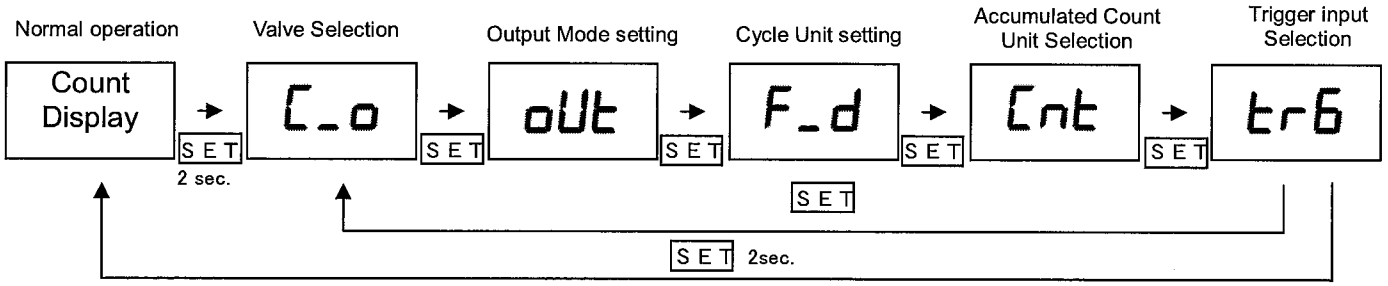
5-2 Detailed setting mode

Press the SET button for 2 seconds or longer in normal operation mode to move to the detailed setting mode.

Press the SET button to select each basic setting item.

Press the △ or ▽ button to change the set value in each setting mode. Press the SET button to complete the setting.

*: Press the SET button in each setting mode for 2 seconds or longer to return to normal mode.



6. Definitions and terminology

6-1 Basic setting mode

Item	Display	Set range	Description
Normal operation mode (Count display)	—	—	The timer is displayed, with the remaining time for the valve operation counting backwards. When the timer countdown ends, and the trigger has not been input, zero will be displayed. When the remaining time is less than 1 second, "0" is displayed. [- - -] is displayed for continuous mode[Note3]. ([Note3]: Refer to Timer Time Setting)
Timer time	t ir	1~999 [sec.]	Sets the time for valve operation after the trigger has been input. The set unit can be set from 1 to 999 [sec.]. If the set value is less than 1 or larger than 999, continuous mode is selected. The valve is continuously operated with the set cycle after the trigger is input, and [- - -] will be displayed.
Frequency	Fr9	0.1 to 50.0 [Hz]	Sets the valve operation frequency (ON/OFF cycle). The set unit is [Hz]. It can be set from 0.1 to 50.0 in increments of 1, 2 and 5. *: Frequency [Hz] = 1/hour [sec.] *: Set frequency units: 0.1/ 0.2/ 0.5/ 1.0/ 2.0/ 5.0/ 10/ 20/ 50[Hz]
Duty ratio	dty	0 to 100 [%]	Sets the pulse width for the valve operation cycle. The set unit is [%]. It can be set from 0 to 100 in increments of 10[%]. e.g. 60[%]: When valve specification nC is selected, the valve is ON for 60% of the operation cycle, and off for 40% of the operation cycle.
ON time	ont	0.1~99.9 [sec..]	Sets the ON time of the valve operation cycle. The set unit can be set from 0.1 to 99.9 [sec.]. *: This setting is valid when the valve operation cycle unit selection F_d is set to oFF in detailed setting mode. *: For a normally open valve, the power supply for the valve is OFF (valve open).
OFF time	oFt	0.1~99.9 [sec.]	Sets the OFF time of the valve operation cycle. The set unit can be set from 0.1 to 99.9 [sec.]. *: This setting is valid when valve operation cycle unit selection: F_d is set to oFF in detailed setting mode. *: For a normally open valve, the power supply for the valve is ON (valve closed).
Accumulated count Lower value	Lo	—	The accumulated count value for the ON time of the valve is displayed using lower 3 digits and upper 3 digits. The lower 3 digits are displayed first. The upper 3 digits are displayed by pressing [△] button. The lower 3 digits are displayed again by pressing [▽] button while the upper 3 digits are displayed. Check the units using the accumulated count unit selection. *: When the digits have overflowed, both the lower and upper digits will display [999]. *: To clear the accumulated count value, press the [△] and [▽] button simultaneously for 5 seconds or longer.
Accumulated count Upper value	Hi	—	

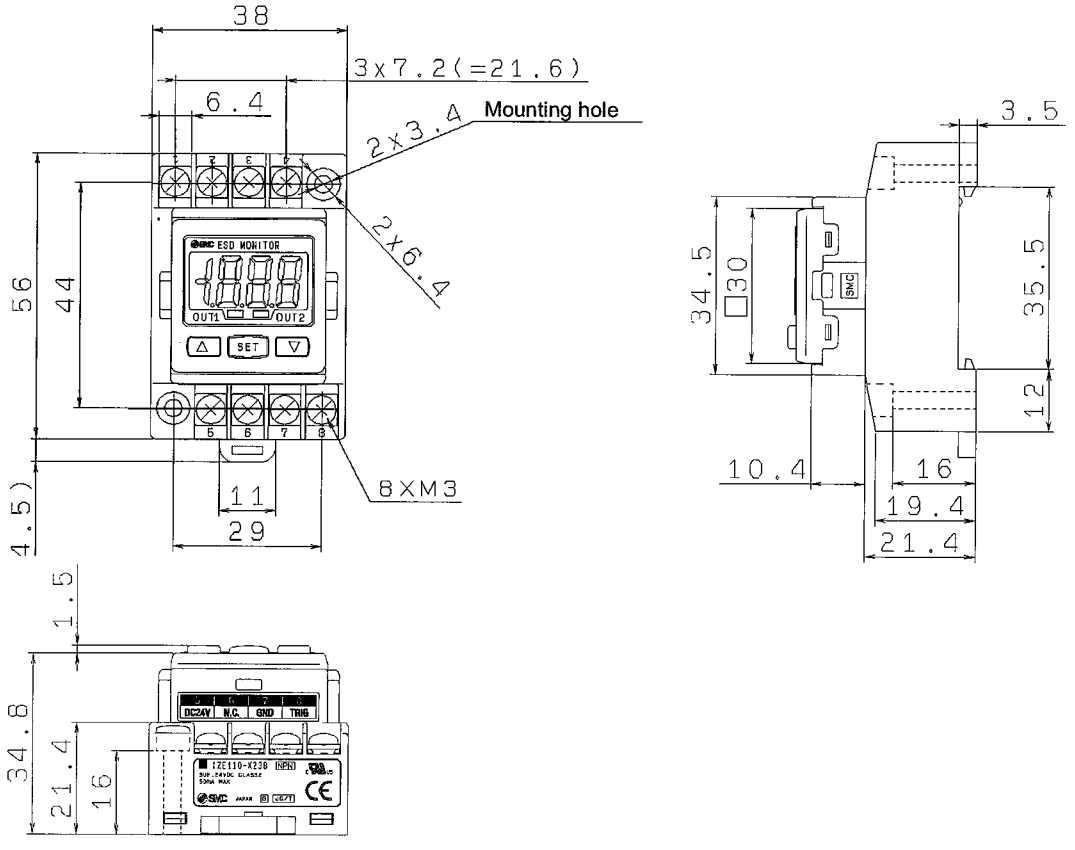
6-2 Detailed setting mode

Item	Display	Setting display	Description
Valve selection	C_o	nC (Normally closed)	Select the specification of the connected valve. The default is normally closed (nC). *: The mode of the output signal is determined according to the selected valve specification.
		no (Normally open)	
Output mode selection	oUt	o_P	Normal output
		o_n	Reversed output
Valve operation cycle unit selection	F_d	on	Set the valve operation cycle based on frequency - duty ratio.
		oFF	Set the valve operation frequency based on the ON-OFF time.
Accumulated count unit selection	Cnt	onE	Accumulated count minimum unit: [1 cycle]
		tHo	Accumulated count minimum unit: [1,000 cycles]
Trigger input selection	trG	C	Continuous input
		o	One shot input

7. Specifications

Power supply voltage		24 VDC +/-10% (with reverse connection protection)
Current consumption		50 mA or less (product alone)
Connected valve		DC24 V 4 W or less
OUT PUT	Maximum load current	80 mA
	Max.applied voltage	30 V
	Residual voltage	1 V or less (With load current 80mA)
	Short circuit protection circuit	Provided
Trigger input		Voltage free, input(read or solid state type): time required for LOW level input: 10ms or more, LOW level voltage: 0.4V or less
Display method		3+1/2 digits, 7-segment LED 2-color display (red / green)
Environmental	Enclosure	IP40
	Ambient temperature range	Under operation:0 to 50 °C, Storage: -10 to 60 °C (No condensation or freezing)
	Ambient humidity range	Under operation, Storage: 35 to 85%RH (No condensation)
	Withstand voltage	1000V AC for 1 minute between live parts and case
	Insulation resistance	50 MΩ or more (with 500 V DC mega meter) between live parts and case
	Vibration resistance	10~150Hz Double amplitude: 1.5mm or 98m/s^2 For 2 hours in direction of X, Y and Z respectively (De-energized).
	Impact resistance	100m/s^2 3 times in directions of X,Y and Z respectively (De-energized).
Material		Front case: PBT, Terminal case A: m-PPE, Terminal case B: PBT
Weight		50 g
Standards		Compliant with CE marking, UL(CSA)

7-1. Outline dimensions



7-2. Error Indication

Item	Display	Description	Countermeasures
Over current Error 1	Er 1	The valve supply load current has exceeded 160 mA.	Turn the power off and remove the cause of the over current. Then supply the power again.
Over current Error 2	Er2	The switch output load current has exceeded 80 mA.	
System Error	Er3	An internal data error has occurred.	Turn the power off and turn it on again. If the failure cannot be solved, contact SMC.

Revision history

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