(A) Counter / Timer

NEW

Compact LCD Counter
LA8N Series

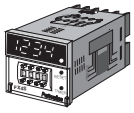
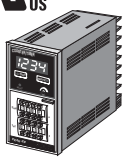
UPGRADE

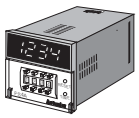
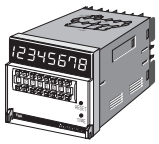
Programmable Counter/Timer
CTY Series

Product Overview

Series		LA8N SERIES(LCD Type)	
Digit		8digits	
Model		**LA8N-BN**	**LA8N-BF**
Appearances and sizes			
Display		[W48×H24×L54mm] LCD Zero Blanking type(Height : 8.7mm)	
Operation method		Count up mode	
Power supply		Internal lithium battery	
Input type		No-voltage input	Universal voltage input
Counting speed		Selectable 1cps / 30cps / 1kcps	20cps
Count input		Residual voltage at short-circuit : Max.0.5V Impedance at short-circuit : Max. 10kΩ (ON) Impedance at open-circuit : Min. 500kΩ (OFF)	"H" level voltage : 24-240VAC / 6-24VDC "L" level voltage : 0-2VAC / 0-2.4VDC
External switch		SW1, SW2	SW1
RESET input		No-voltage input	
Min.signal width of RESET		Min. 20ms	
Battery life cycle		Over 7 years(at 20℃)	
Insulation resistance		Min. 100MΩ (at 500VDC)	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction	0.3mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions for 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times	
External power		12VDC ±10%, 50mA Max.	
Reference		**A-3~5**	

Series		CTY SERIES	CTS SERIES		CT SERIES
Digit		6digits	4digits	6digits	6digits
Model	Single preset type	**CT6Y**	**CT4S**	**CT6S**	**CT6**
	Dual preset type	**CT6Y-2P**	**CT4S-2P**	**CT6S-2P**	**CT6-2P**
	Indicator	**CT6Y-I**	———	**CT6S-I**	**CT6-I**
Appearances and sizes		 [W72×H36×L77mm]	 [W48×H48×L90mm]		 [W72×H72×L85mm]
Operation type		Count up, Count down, Count Up/Down			
Power supply		100-240VAC 50/60Hz, 24-60VDC			
Allowable voltage range		90~110% of power supply			
Max. counting speed		Selectable **1cps, 30cps, 1kcps, 5kcps, 10kcps**			
Min. signal range	Counter	Input reset : Select either 1ms or 20ms			
	Timer	INA, INH, RESET signal : Select either 1ms or 20ms			INA, RESET, INHIBIT, BATCH RESET : Select either 1ms or 20ms
Input type		[**Voltage input**] Input impedance : 5.4kΩ, "H" level voltage : 5-30VDC, "L" level voltage : 0-2VDC [**No voltage input**] Impedance at short-circuit : Max. 1kΩ, Residual voltage at short-circuit : Max. 2V, Impedance at open-circuit : Min. 100kΩ			
Control output	Contact Type	Single preset type:SPDT(1c) Dual preset type: First output SPST(1a)+ Second output SPDT(1c)	Single preset type : SPDT(1c), Dual preset type : SPST(1a) for first/second output		Single preset type : SPDT(1c) Dual preset type : SPST(1a) for first output SPDT(1c) for second output
	Contact Capacity	No: 250VAC 3A at resistive load, NC: 250VAC 2A at resistive load			
	Solid-state Type	Single preset type : 1NPN open collector Dual preset type : 1NPN open collector			Single preset type : 2 NPN open collectors Dual preset type : 3 NPN open collectors
	Solid-state Capacity	30VDC 100mA Max.			
Memory protection		10 years(when using non-volatile semiconductor memory)			
External power		12VDC ±10%, 100mA Max.			
Reference		**A-6~29**			

Series			FXY SERIES		FXS SERIES		FX SERIES		FXH SERIES		FXL SERIES	
Digit			4digits	6digits	4digits	5digits	4digits	6digits	4digits	6digits	4digits	6digits
Model	Single preset type		—	—	**FX4S**	—	**FX4**	**FX6**	**FX4H**	—	—	—
	Dual preset type		—	—	—	—	**FX4-2P**	**FX6-2P**	**FX4H-2P**	—	**FX4L-2P**	**FX6L-2P**
	Indicator		**FX4Y-I**	**FX6Y-I**	—	**FX5S-I**	**FX4-I**	**FX6-I**	**FX4H-I**	—	**FX4L-I**	**FX6L-I**
Appearances and sizes			 [W72×H36×L93mm]		 [W48×H48×L91mm]		 [W72×H72×L112mm]		 [W48×H96×L100mm]		 [W144×H72×L112mm]	
Operation type			Count up, Count down, Count Up/Down									
Power supply			100-240VAC 50/60Hz, **12-24VAC/DC**(Option)									
Allowable voltage range			90~110% of power supply									
Max. counting speed			Selectable **1cps, 30cps, 2kcps, 5kcps** by internal DIP switch									
Min. signal range			Min. 20ms(Input INHIBIT, RESET)									
Input type	CP1, CP2 input		**[No-voltage input]** Impedance at short-circuit: Max. 1kΩ, Residual voltage at short-circuit:Max. 1V, Impedance at open-circuit:Min. 100kΩ		**[No-voltage input]** ☞ Impedance at short-circuit:Max. 1kΩ, Residual voltage at short-circuit:Max. 2V, Impedance at open-circuit: Min. 100kΩ **[Voltage input]** ☞ Input impedance:10kΩ, "H" level voltage:5-30VDC, "L" level voltage:0-2VDC							
	RESET input											
Control output	Con-tact	Type	———		SPDT(1c)		Single preset type:SPDT(1c), Dual preset type:SPDT(1c)×2					
		Capacity	———		250VAC 3A resistive load		250VAC 3A resistive load					
	Solid-state	Type	———		1 NPN open collector		Single preset type:1 NPN open collector, Dual preset type:2 NPN open collectors					
		Capacity	———		Max. 30VDC 100mA		Max. 30VDC 100mA					
Reference			**A-30~35**		**A-36~43**		**A-44~52**					

Series			FS SERIES		F SERIES	L SERIES	FM SERIES		LM SERIES	
Digit			4Digit	5Digit	8Digit	8Digit	4Digit	6Digit	4Digit	6Digit
Model	Single preset type		**FS4A**	———	**F8A**	**L8A**	**F4AM**	**F6AM**	———	———
	Dual preset type		———	———	———	———	**F4AM-2P**	**F6AM-2P**	**L4AM-2P**	**L6AM-2P**
	Indicator		———	**FS5B**	**F8B**	**L8B**	**F4BM**	**F6BM**	**L4BM**	**L6BM**
Appearances and sizes			**※8Pin plug type**  [W48×H48×L85mm]		 [W72×H72×L113mm]	 [W144×H72×L112mm]	 [W72×H72×L112mm]		 [W144×H72×L112mm]	
Operation type			Count up, Count down			Count up, Count down, Count Up/Down				
Power supply			100-240VAC 50/60Hz, **12-24VAC/DC**(Option)							
Allowable voltage range			90~110% of power supply							
Max. counting speed			Selectable **1cps, 30cps, 2kcps, 5kcps** by internal DIP switch							
Min. signal range			RESET input : Min. 20ms							
Input type	CP1, CP2 input		**[No-voltage input]** Impedance at short-circuit: Max. 1kΩ, Residual voltage at short-circuit:Max. 1V, Impedance at open-circuit:Min. 100kΩ		**[Voltage input]** ☞ Input impedance:5.4kΩ, "H" level voltage:5-30VDC, "L" level voltage:0-2VDC **[No-voltage input]** ☞ Impedance at short-circuit:Max. 1kΩ, Residual voltage at short-circuit:Max. 2VDC, Impedance at open-circuit: Min. 100kΩ					
	RESET input									
Control output	Con-tact	Type	SPST(1a)	———	SPDT(1c)		Single preset type:SPDT(1c) Dual preset type:SPDT(1c)×2			
		Capacity	250VAC 3A resistive load	———	250VAC 3A resistive load					
	Solid-state	Type	1 NPN open collector	———	1 NPN open collector		Single preset type:1 NPN open collector Dual preset type:2 PNP open collectors			
		Capacity	Max. 30VDC 100mA	———	Max. 30VDC 100mA					
Reference			**A-53~57**		**A-58~64**		**A-65~73**			

DIN W48×H24mm, Indication only, LCD Counter

▣Features

- **Upgraded version of LA7N series**
- Small size and count up mode only
- Internal lithium battery
- Signal input
  - No-voltage input ☞ Please use reliable contacts enough to flow 3VDC 5㎂ of current.
  - Universal voltage input ☞ "H" : 6-240VDC, 24-240VAC
    "L" : 0-2.4VDC, 0-2VAC
- Screw Terminal type(Terminal protection cover)
- LCD Display
- Built-in Microprocessor
- IP66 rated(Front panel only)

Please read "Caution for your safety" in operation manual before using.

▣Ordering information

L A 8 N - B F

F	Universal voltage input
N	No-voltage(Small signal) input
B	Internal lithium battery
N	DIN W48×H24mm
8	99999999(Digit)
A	Counter
L	LCD Display

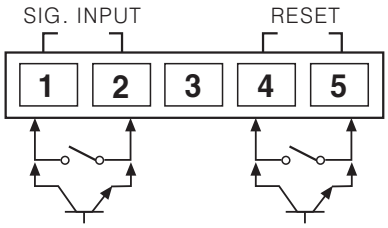
▣Specifications

Series		LA8N-BN	LA8N-BF
Digit		8digits	
Display		LCD Zero Blanking type(Height : 8.7mm)	
Operation method		Count up mode	
Power supply		Internal lithium battery	
Input type		No-voltage input	Universal voltage input
Counting speed		Selectable 1cps / 30cps / 1kcps	20cps
Count input		• Impedance at short-circuit : 10kΩ(ON), residual voltage : Max. 0.5V • Impedance at open-circuit : 500kΩ(OFF)	High : 24-240VAC / 6-240VDC Low : 0-2VAC / 0-2.4VDC
RESET input		No-voltage input	
Min.signal width of RESET		Min. 20ms	
Battery life cycle		Over 7 years(Approx. 20℃)	
External switch		SW1(★1), SW2(★2)	SW1(★1)
Insulation resistance		Min. 100MΩ(at 500VDC mega)	
Dielectric strength		(★3) 2000VAC 60Hz for 1 minute	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction	0.3mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions for 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times	
Ambient Temperature		-10 ~ +55℃(at non-freezing status)	
Storage Temperature		-25 ~ +65℃(at non-freezing status)	
Ambient humidity		35 ~ 85%RH	
Approval		CE cULus	
Unit weight		Approx. 58g	

(★1) SW1 is a switch ENABLE / DISABLE the front RESET.
(★2) SW2 is a switch setting counting speed.
(★3) No-voltage input: Between all terminals and case, Universal voltage input: Between input terminal and reset input terminal, all terminals and case

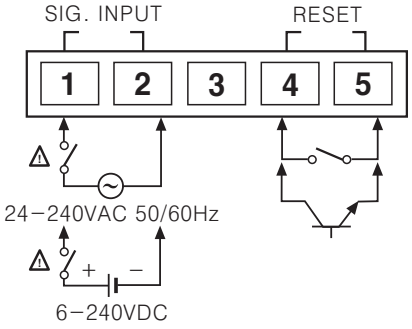
▣Connections

●No-voltage input



※Use reliable contacts enough to flow 5㎂ of current.
※Terminal 2 and 5 are connected inside.(Non-isolation)

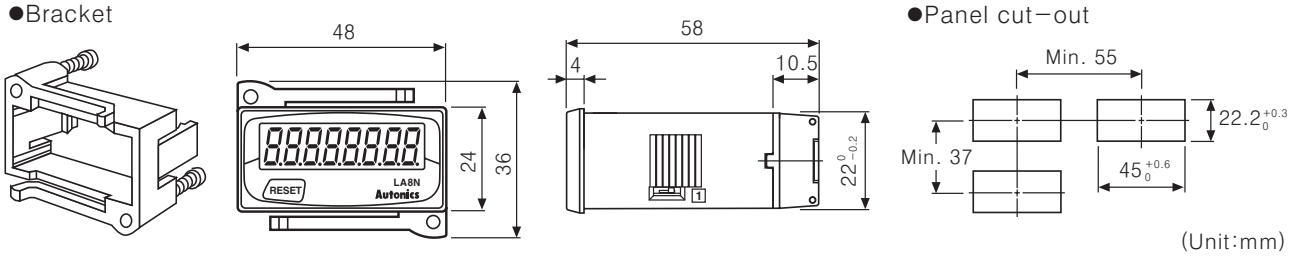
●Universal voltage input



※Terminal 1, 2 and 4, 5 are isolated.

▣Dimensions

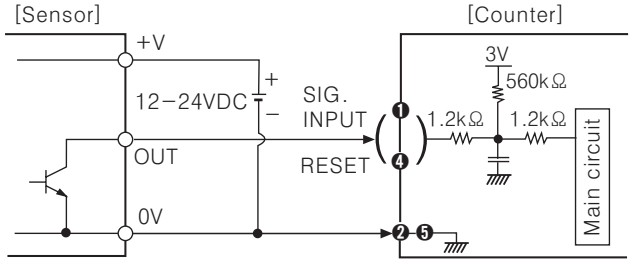
●Bracket



▣Input connections

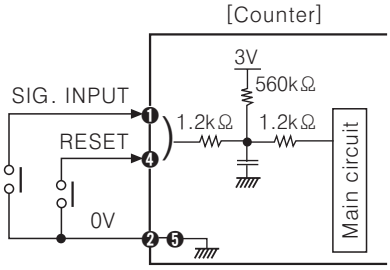
◎No-voltage input (Standard sensor: NPN open type sensor)

●Solid-state input



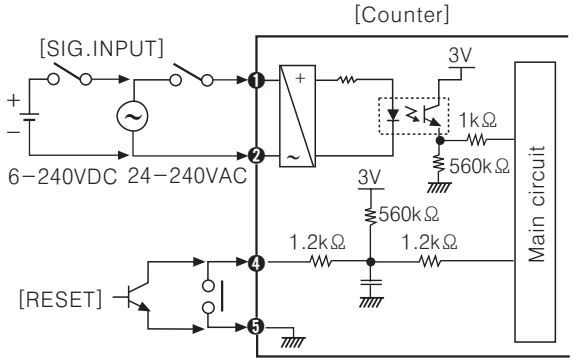
※When power is applied to terminal No ❶ and ❹, input terminal circuit can be broken and a malfunction can occur.
(NPN output, PNP output, PNP open collector output type sensor cannot be used.)
※❷ and ❺ are connected inside.

●Contact input



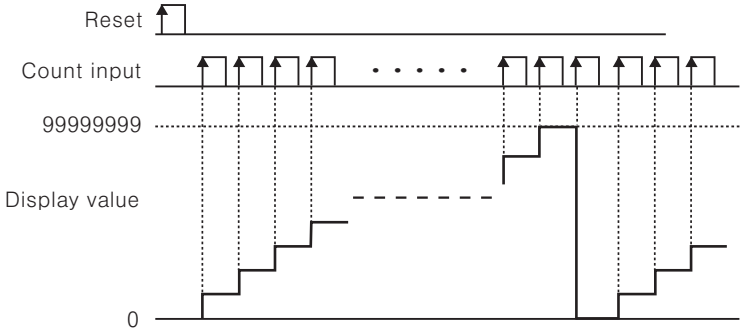
※Please use reliable contacts enough to flow 3VDC 5㎂ of current.

◎Universal voltage input

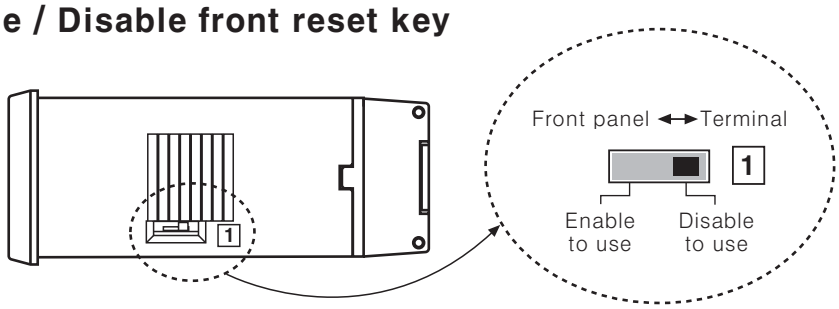


※AC type proximity sensor cannot be used as the source of count input signals.
※Input terminal ❶, ❷ and Reset terminal ❹, ❺ are insulated inside.
※It is not possible to reset with AC power or DC power.
※When relay contact is used as the source of RESET signal, please use reliable contacts enough to flow 3VDC 5㎂ of current.

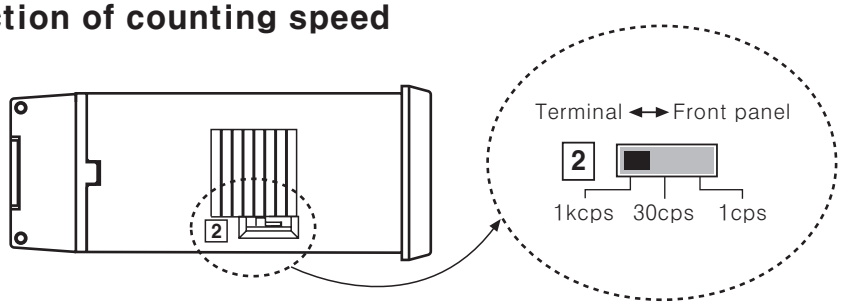
▣Counter operation mode



▣Enable / Disable front reset key



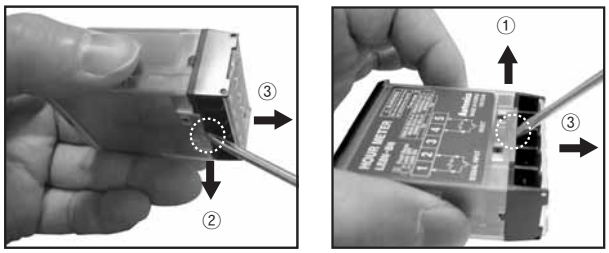
▣Selection of counting speed



※Please supply RESET signal(Front or external reset terminal) after changing counting speed during the operation.
※There is no SW2 in LA8N-BF.(20cps)

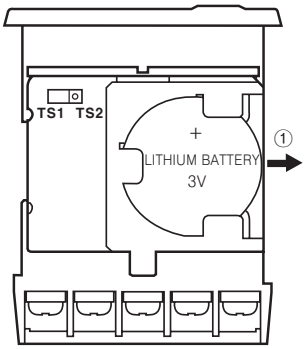
▣Case detachment and battery replacement

●Case detachment



※Hold up Lock part toward ①, ② of the product with the tool and pull toward ③, the case is detached.
⚠ Please be careful of the injury caused by tools.

●Battery replacement



1)Detach the case.
2)Push the battery and detach toward ①.
3)Insert new battery with correct alignment of polarity pushing toward opposite of ①.
※Battery is sold separately.
※Do not burn up or disassemble the lithium battery.

DIN W72×H36mm, W48×H48mm, W72×H72mm Counter/Timer

▣Features

- ●Selectable Counter or Timer function
- ●Multi-functional Counter/Timer(Includes 829,728 functions)
- ●Prescale function
- ●High speed counting of 10kcps
- ●Batch counter function for CT6, CT6-2P only
- ●Selectable Voltage input(PNP) or No voltage input(NPN)
- ●Able to set ON/OFF time individually in Flicker (FLK) mode
- ●Key Lock function

⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Ordering information

CT 6 S – 2P

	I	Indicator
		Single preset
※	2P	Dual preset
	Y	DIN W72×H36mm
	S	DIN W48×H48mm
		DIN W72×H72mm
	4	9999(Digit)
	6	999999(Digit)
	CT	Counter/Timer

※When using dual preset as a timer, setting time is limited to one time.

▣Specifications

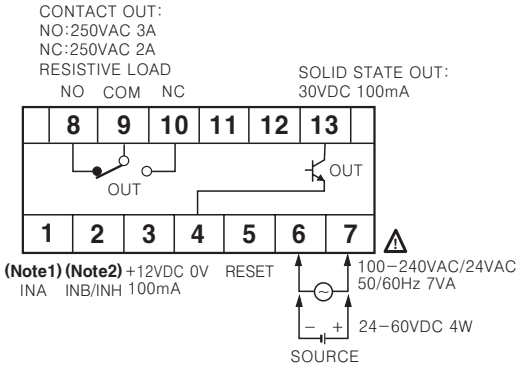
Model	Single preset		**CT6Y**	**CT4S**	**CT6S**	**CT6**
	Dual preset		**CT6Y-2P**	**CT4S-2P**	**CT6S-2P**	**CT6-2P**
	Indicator		**CT6Y-I**	———	**CT6S-I**	**CT6-I**
Digit			6	4	6	6
Digit size			PV:W4.5×H10mm SV:W3.5×H7mm	PV:W7×H11mm SV:W5×H8mm	PV:W4.5×H10mm SV:W3.5×H7mm	PV:W7×H13mm SV:W5×H9mm
Power supply	AC		100-240VAC 50/60Hz			
	AC/DC		24-60VAC 50/60Hz, 24-60VDC			24VAC 50/60Hz, 24-60VDC
Allowable voltage range			90 ~ 110% of rated voltage(AC power)			
Power consumption	AC		Approx. 7VA(240VAC 50/60Hz)			CT6-I:Approx. 9VA, CT6:Approx. 10VA, CT6-2P:Approx. 10VA (240VAC 50/60Hz)
	AC/DC		Approx. 7VA(24VAC 50/60Hz) Approx. 4W(24VDC)			CT6-I:Approx. 5W, CT6:Approx. 5W, CT6-2P:Approx. 6W(24VDC) CT6-I:Approx. 9VA, CT6:Approx. 10VA, CT6-2P:Approx. 10VA (24VAC 50/60Hz)
Counting speed of INA, INB			Selectable 1 / 30 / 1k / 5k / 10kcps			
Min. input signal width	Counter		Reset input : Selectable 1ms or 2ms			
	Timer		INA, INHIBIT, RESET : Selectable 1ms or 20ms			INA, RESET, INHIBIT, BATCH RESET (Except CT6-I) : Selectable 1ms or 20ms
Input			Selectable voltage input or No-voltage input [Voltage input] Input impedance : 5.4kΩ, "H" level : 5-30VDC, "L" level : 0-2VDC [No-voltage input] Short-circuit impedance : Max. 1kΩ, Residual voltage : Max. 2VDC, Open-circuit impedance : Min. 100kΩ			
One-shot output			10 / 50 / 100 / 200 / 500 / 1000 / 2000 / 5000ms			
Control output	Con-tact	Type	Single preset type : SPDT(1c) Dual preset type : SPST(1a) for first output SPDT(1c) for second output	Single preset type : SPDT(1c), Dual preset type : SPST(1a) for first/second output		Single preset type : SPDT(1c) Dual preset type : SPST(1a) for first output SPDT(1c) for second output
		Capacity	NO contact : 250VAC 3A resistive load, NC contact : 250VAC 2A at resistive load			
	Solid-state	Type	Single preset type : 1 NPN open collector Dual preset type : 1 NPN open collector			Single preset type : 2 NPN open collectors Dual preset type : 3 NPN open collectors
		Capacity	Max. 30VDC, Max. 100mA			

▣Specifications

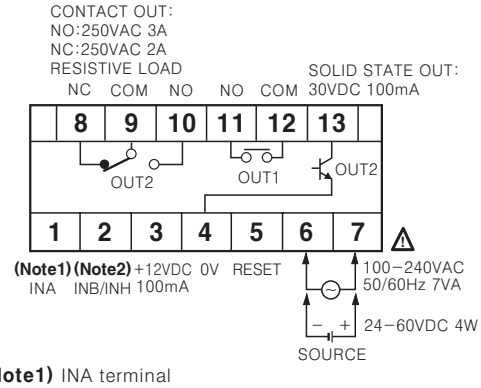
Memory protection		10 years (When using non-volatile semiconductor memory)			
External power		12VDC ±10%, Max. 100mA			
Timer accuracy	Repeat error	Power ON start : Max. ±0.01% ±0.05sec Signal start : Max. ±0.01% ±0.03sec			
	Set error				
	Voltage error				
	Temperature error				
Insulation resistance		Min. 100MΩ (at 500VDC mega)			
Dielectric strength		2000VAC 50/60Hz for 1 minute			
Noise strength		±2kV the square wave noise (pulse width:1μs) by the noise simulator			
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour			
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes			
Shock	Mechanical	300m/s² (Approx. 30G) in X,Y,Z directions for 3 times			
	Malfunction	100m/s² (Approx. 10G) in X,Y,Z directions for 3 times			
Relay life cycle	Mechanical	Min. 10,000,000 times			
	Electrical	Min. 100,000 times (NO : 250VAC 3A at resistive load, NC : 250VAC 2A at resistive load)			
Protection		IP65 (Front panel only)			
Ambient temperature		-10 ~ +55℃ (at non-freezing status)			
Storage temperature		-25 ~ +65℃ (at non-freezing status)			
Ambient humidity		35 ~ 85%RH			
Unit weight	AC power	CT6Y:Approx. 160g CT6Y-2P:Approx. 163g CT6Y-I:Approx. 127g	CT4S:Approx. 155g, CT4S-2P:Approx. 162g	CT6S:Approx. 155g CT6S-2P:Approx. 162g CT6S-I:Approx. 136g	CT6:Approx. 264g CT6-2P:Approx. 271g CT6-I:Approx. 244g
	AD/DC power	CT6Y:Approx. 164g CT6Y-2P:Approx. 167g CT6Y-I:Approx. 130g	CT4S:Approx. 152g CT4S-2P:Approx. 159g	CT6S:Approx. 152g CT6S-2P:Approx. 159g CT6S-I:Approx. 133g	CT6:Approx. 263g CT6-2P:Approx. 270g CT6-I:Approx. 243g
Approval		cULus (100-240VAC 50/60Hz), CE			

▣Connections

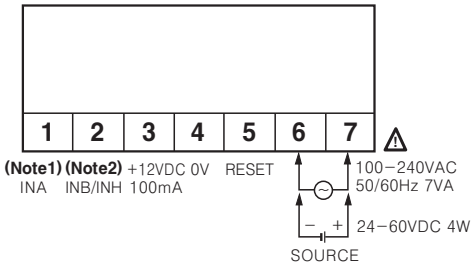
◎CT6Y



◎CT6Y-2P



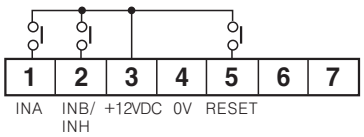
◎CT6Y-I



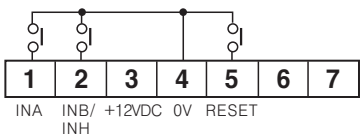
※**(Note1)** INA terminal
- Operation of Counter : Operating as INA signal or INH signal
- Operation of Timer : Operating as "START"

※**(Note2)** INB/INH terminal
- Operation of Counter : Operating as INB signal
- Operation of Timer : Operating as INH signal
  If the signal is applied to INH terminal, the processing time is stopped. (Time hold)

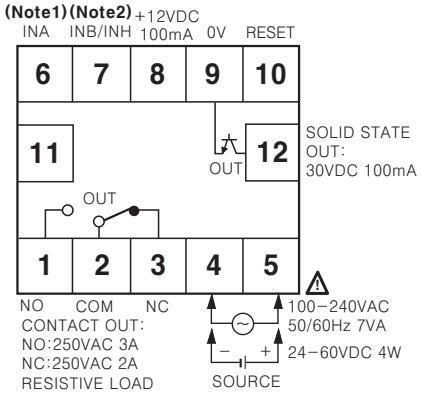
※Connection of relay contact input when voltage input(PNP) is selected



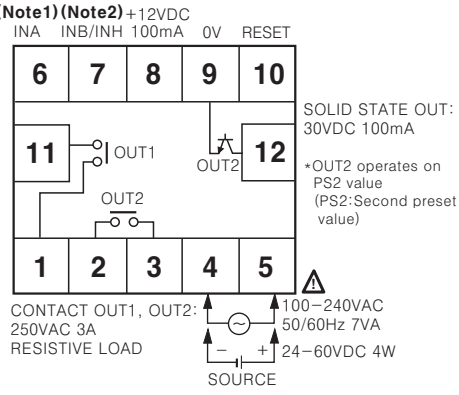
※Connection of relay contact input when No-voltage input(NPN) is selected



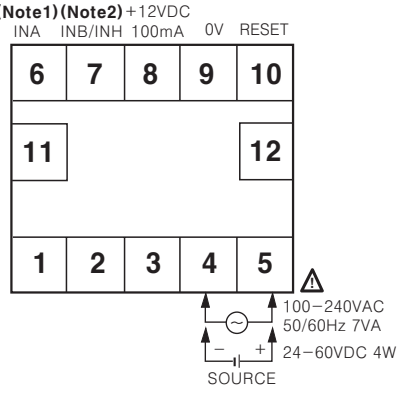
◎CT4S, CT6S



◎CT4S-2P, CT6S-2P



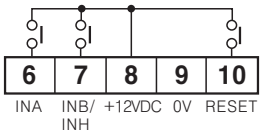
◎CT6S-I



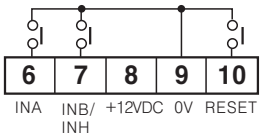
※**(Note1)** INA terminal
- Operation of Counter : Operating as INA signal or INH signal.
- Operation of Timer : Operating as "START".

※**(Note2)** INB/INH terminal
- Operation of Counter : Operating as INB signal
- Operation of Timer : Operating as INH signal
  If the signal is applied to INH terminal, the processing time is stopped. (Time hold)

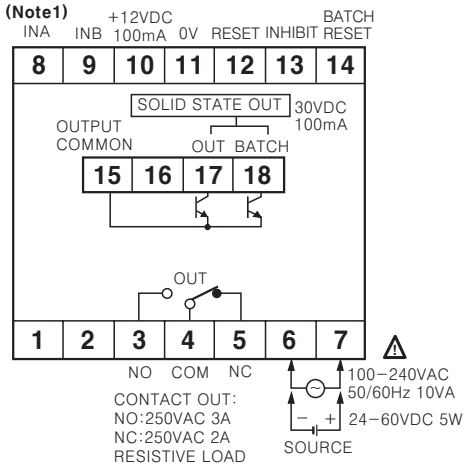
●Connection of relay contact input when voltage input (PNP) is selected



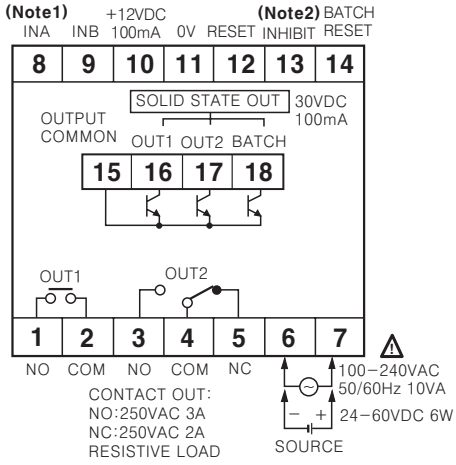
●Connection of relay contact input when No-voltage input (NPN) is selected



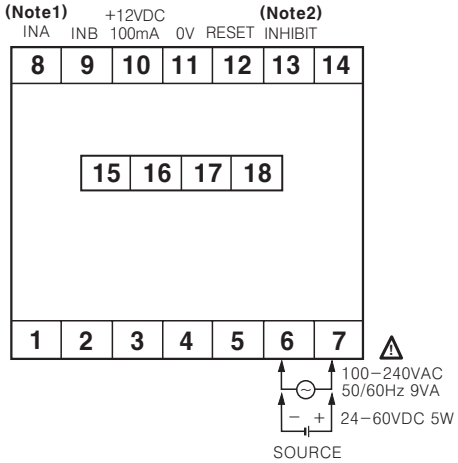
◎CT6



◎CT6-2P



◎CT6-I

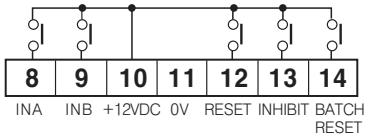


※**(Note1)** INA terminal
- Operation of Counter : Operating as INA signal or INH signal.
- Operation of Timer : Operating as "START"

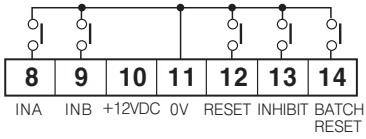
※**(Note2)** INHIBIT signal
- If the signal is applied to INH terminal, the processing time is stopped. (Time hold)

※Solid state output is insulated from inner circuit by photocoupler. (Power supply : 5-30VDC Max.)

●Connection of relay contact input when voltage input (PNP) is selected



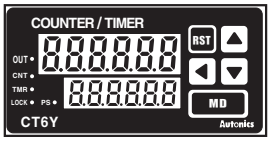
●Connection of relay contact input when No-voltage input(NPN) is selected

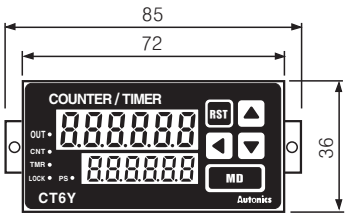


▣Dimensions

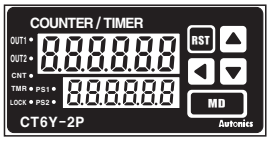
◎CTY Series

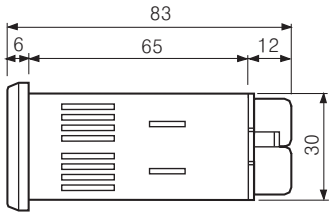
●CT6Y



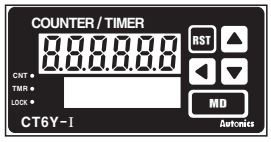


●CT6Y-2P

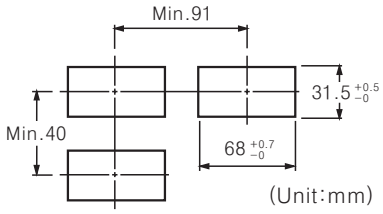




●CT6Y-I



●Panel cut-out



(Unit:mm)

◎CTS Series

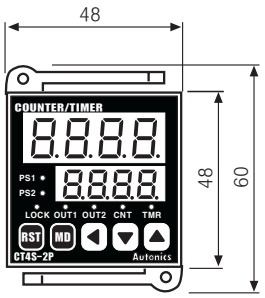
●CT4S

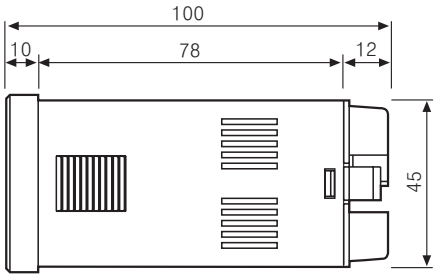
●CT4S-2P

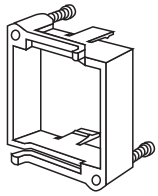
●CT6S

●CT6S-2P

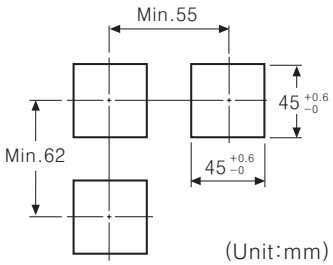
●CT6S-I







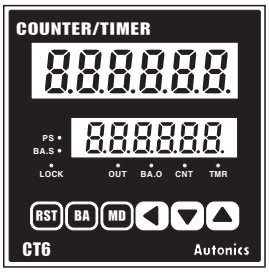
●Panel cut-out



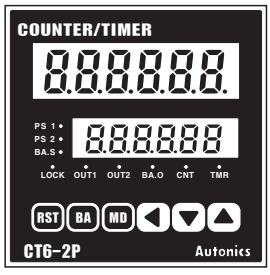
(Unit:mm)

◎CT Series

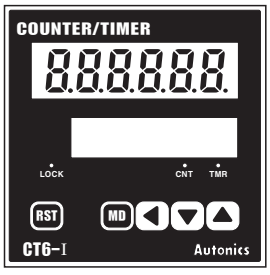
●CT6

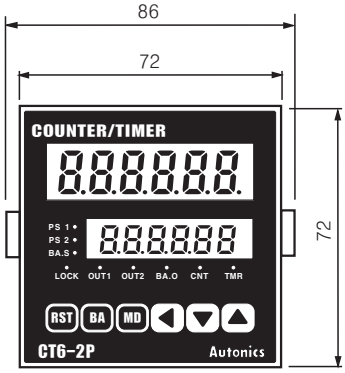


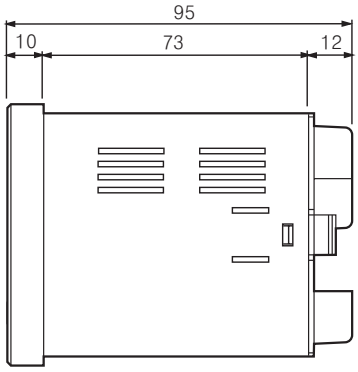
●CT6-2P



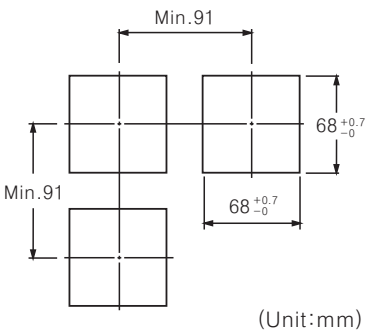
●CT6-I







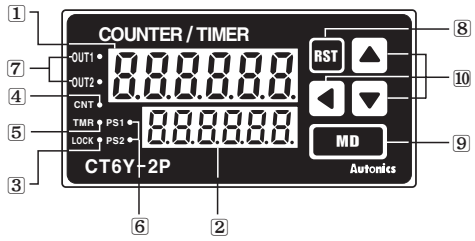
●Panel cut-out



(Unit:mm)

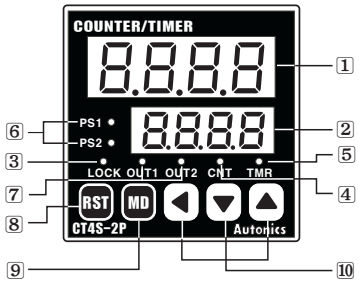
▣Front panel identification

◎CTY series

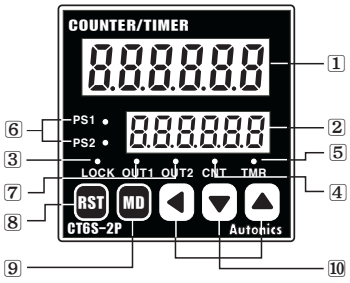


◎CTS series

●4 Digit



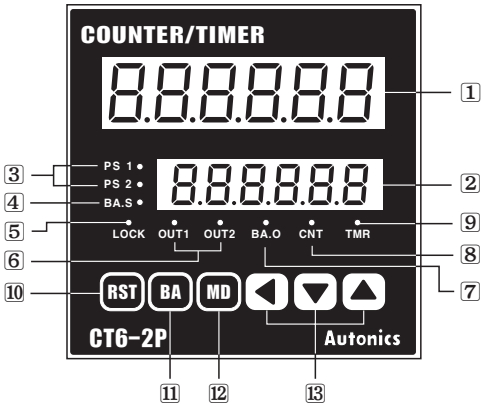
●6 Digit



1 Display for process value(Red LED)
Count value(Counter) / Process time(Timer) / Setting symbols
LED height : 11mm for 4digit, 10mm for 6digit
2 Display for setting value(Yellow-Green LED)
Setting value(Counter)/Preset time(Timer) and setting symbols.
LED height : 8mm for 4digit, 7mm for 6digit
3 LOCK : Key Lock indication
-Lock OFF : Light OFF
-Lock ON : Light ON
4 CNT : Indicates operation as a counter
5 TMR : Indicates operation as a timer
-LED flashes when timer operates
-LED turns on when the time stop operating
6 PS1, PS2 : Indicates that preset is being displayed or changed.
7 OUT1, OUT2 : Indicating the operation of output
8 RST : Reset key
9 MD : Mode key
10 ◀, ▼, ▲ : Set key

※There is no 6, 7 LED in CT6Y-I, CT6S-I.
※In CT4S, CT6S, CT6Y, PS2 will be changed to PS and OUT2 is OUT and there is no PS1, OUT1 LED.

◎CT Series



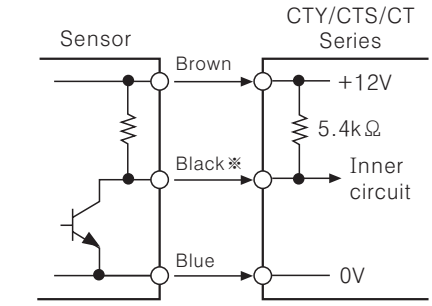
※In CT6, PS2 will be changed to PS and OUT2 to OUT, since there is no PS1, OUT1 LED.
※There are no PS1, PS2, BA.S, OUT1, OUT2, BA.0 LED in CT6-I.
※There is no BA key in CT6-I.

1 Display for process value(Red LED)
Count value(Counter)/Process time(Timer)/Setting symbols
LED height : 13mm
2 Display for setting value(Yellow-Green LED)
Setting value(Counter)/Setting time(Timer) and setting symbols
LED height : 9mm
3 PS1, PS2 : Indicates which setting value(Single, Dual) is being displayed or changed
4 BA.S : Set a batch setting value and display the change
-Use BA.S : Turn ON
-Not use BA.S : Turn OFF
5 LOCK : Display Key Lock operation
-Use Lock : Turn ON
-Not use Lock : Turn OFF
6 OUT1, OUT2 : Preset the operation of output(Single & Dual)
7 BA.O : Indicates operation as BATCH output
8 CNT : Indicates operation as counter
9 TMR : Indicates operation as timer
-LED flashes when the timer is operating
-LED turns on when the timer stops operating
10 RST : Reset key
11 BA : Batch key
12 MD : Mode key
13 ◀, ▼, ▲ : Set key

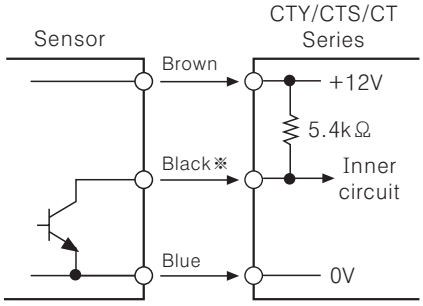
▣Input connections

◎No-voltage input(NPN)

●Solid-state input(Standard sensor : NPN output type sensor)

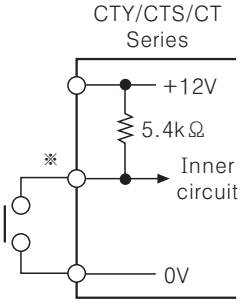


(NPN voltage output)



(NPN open collector output)

●Contact input

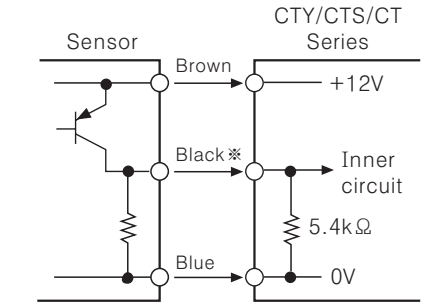


※Please select the counting speed as 1cps or 30cps when it is used for counter.

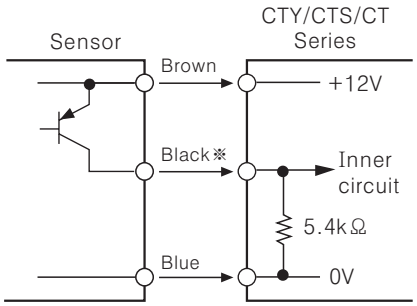
※INPUT circuit of INA, INB, INH(INHIBIT), BATCH RESET, RESET are the same.
※INA is input terminal when it is used for Counter and can be START signal input terminal when it is used for Timer.

◎Voltage input(PNP)

●Solid-state input(Standard sensor : PNP output type sensor)

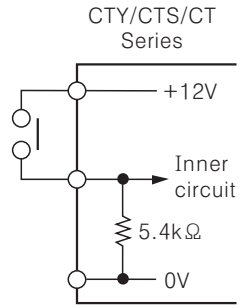


(PNP voltage output)



(PNP open collector output)

●Contact input



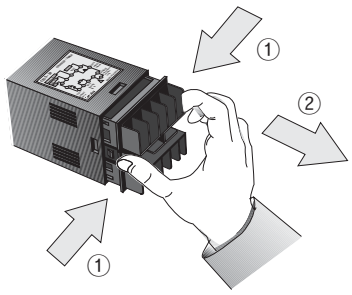
※Please select the counting speed as 1cps or 30cps when it is used for counter.

※INPUT circuit of INA, INB, INH(INHIBIT), BATCH RESET, RESET are the same.
※INA is input terminal when it is used for Counter and can be START signal input terminal when it is used for Timer.

▣Input logic selection

◎CTY/CTS Series

1. The power must be cut off.
2. Detach the case from the body.

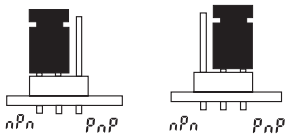


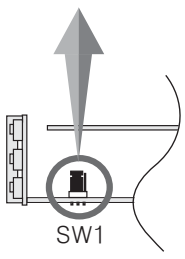
*Case detachment
Squeeze toward ① and pull toward ② as shown in picture.

⚠ **Please check if the power is cut off.**

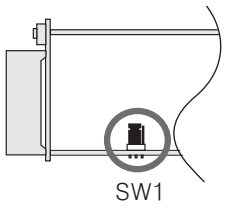
3. Select input logic by using input logic switch inside Counter/Timer.

●Select No-voltage input(NPN) ●Select voltage input(PNP)





< CTY Series >

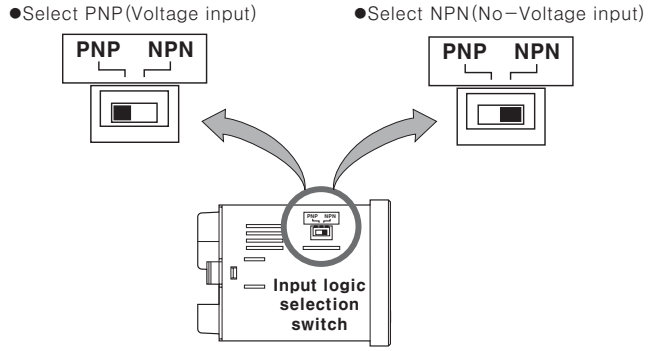


< CTS Series >

4. Please assemble opposite way of the case detachment.
5. Then apply the power to Counter/Timer.

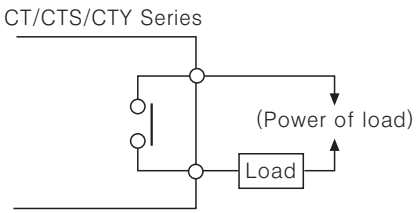
◎CT Series

It is easy to change input logic by switch.



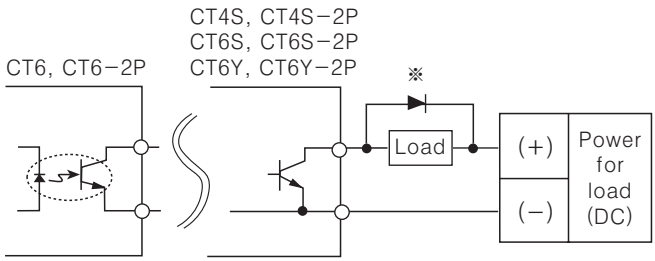
▣Output connections

◎Contact output



※Contact capacity is max. 250VAC 3A. Use proper load not to exceed the capacity.
※When use inductive load(Relay, etc), surge absorber(Diode, Varistor etc) should be connected at both-edge of load.

◎Solid-state output



※Use proper load and power for load not to exceed ON/OFF capacity (Max. 30VDC 100mA) of solid-state output.
※Be careful not to apply reverse polarity of power.

▣Factory default settings

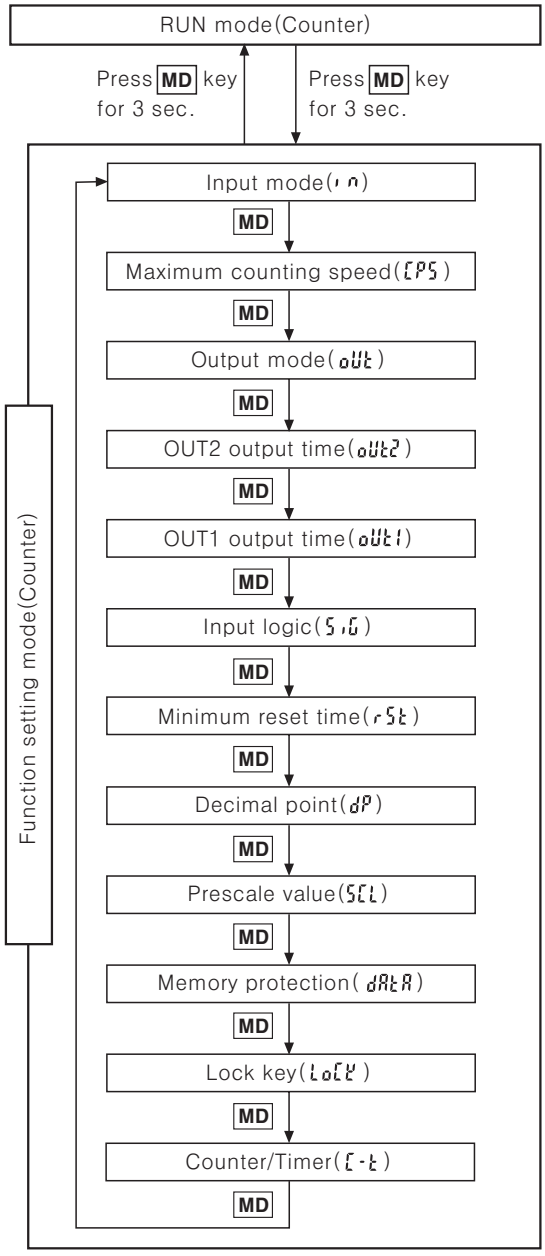
Set item \ Model	CT6-2P CT6S-2P CT4S-2P CT6Y-2P	CT6 CT6S CT4S CT6Y	CT6-I CT6S-I CT6Y-I
COUNTER Input mode	Up/Down-C(U/D-C)		
COUNTER Max. counting speed	30cps		
COUNTER Output mode	F		——
COUNTER OUT2(OUT) output time	Hold		——
COUNTER OUT1 output time	100ms	——	
COUNTER Min. reset time	20ms		
COUNTER Decimal point	No decimal point		
COUNTER Prescale value	6digit : 1.000, 4digit : 1.00		
COUNTER Memory protection	CLEr(Power reset)		
TIMER Time range	6digit : 0.01s ~ 9999.99s 4digit : 0.01s ~ 99.99s		
TIMER Up/Down mode	U(UP)		
TIMER Output mode	OND(ON Delay)		——
TIMER Output time	Hold		——
TIMER Input signal mode	20ms		
Input logic	No-voltage input(NPN)		
Lock key	L.oFF(Lock OFF)		
Counter / Timer	Counter		

▣Error display

Error display	Errors	Output status	How to return
Err 1	CPU error	OFF	RST key, RESET input

▣Counter mode

◎Operation mode in Counter



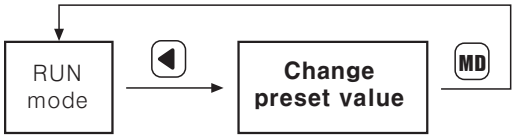
- Press MD key for over 3sec., in Counter RUN mode, it advances to Counter function setting mode and press MD key for over 3sec in function setting mode, it returns to RUN mode.

(Note) Be careful when it advances to function setting mode during operation, it is reset.

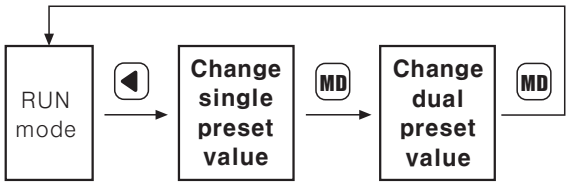
- If no keys are touched for over 60sec., it returns to RUN mode.
- When using this unit as a timer, change as timer (tiME) in Counter/Timer setting item of function setting mode and press MD key for over 3sec. then, it advances to RUN mode. (See A-21 for the specific description of Timer.)

▣Change of setting value(Counter)

◎Change the setting value in the single preset type



◎Change the setting value in the dual preset type



※When register input signal during setting value change, it controls counting and output.

※If no keys are touched for over 60sec., during setting value change, it returns to RUN mode.

※After change setting value as "0", press RST or input RESET during RUN mode, output will be maintained as OFF status.
(When set single setting as "0" in output mode "t (T)" it is maintained as ON status.)

◎Change of batch setting value

Batch counter function is only available in CT6, CT6-2P type.

※If you press BA key in RUN mode, it will allow you to make change to the batch setting value.
After change the batch setting value by same method as the method of Counter setting value changes by ◀, ▼, ▲ keys, it will return to RUN mode by pressing MD key.
When it advances to change the batch preset value, the prior value of the batch counting is displayed.

※Batch setting is limited to single setting mode even in dual setting model.

▣How to set Lock key

Be sure to set the lock mode in order to protect against accidental or unauthorized key operation.

- LoFF (Lock OFF) : Cancellation of the lock mode "LOCK" OFF
- LoC.1 (Lock level 1) : Lock RST key "LOCK" ON
- LoC.2 (Lock level 2) : Lock ◀ & ▼ & ▲ key "LOCK" ON
- LoC.3 (Lock level 3) : Lock RST & ◀ & ▼ & ▲ key "LOCK" ON

▣Setting function mode(Counter)

(MD key : Use the ▲ or ▼ key to change the setting)

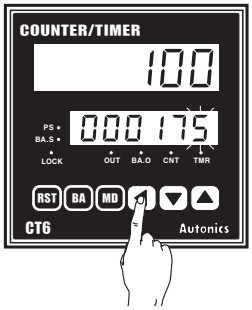
Setting mode	How to set(▲, ▼)
Input mode (in)	U → d → Ud-A → Ud-b → Ud-C ※When "U" or "d" of input mode is set, "S, t, d" of output mode will not be displayed.
Maximum counting speed (CPS)	1 → 30 → 1K → 5K → 10K ※Max. counting speed is determined when duty ratio of INA or INB input signal is 1:1 and it is applied to both INA and INB. ※When using setting "d" in output mode, 5kcps and 10kcps are not indicated in the display.
Output mode (oUt)	●Up or Down input mode F → n → C → r → Y → P → 9 → A ●Up/Down-A, B, C input mode F → n → C → r → Y → P → 9 → A → S → t → d ※As output mode, "F, n" maintains ON status after count up, "OUT2 output time" is not displayed. ※If the maximum counting speed is 5kcps or 10kcps, when change output mode to "d". In order to change counting speed as 30 or 1kcps, configure at function setting mode again.
OUT2 output time(oUt2)	10 → 50 → 100 → 200 → 500 → 1000 → 2000 → 5000 Unit:ms ※There is no "OUT1 output time" in single preset model, "OUT2 output time" will be shown as "OUT output time(oUt t)".
OUT1 output time(oUt1)	10 → 50 → 100 → 200 → 500 → 1000 → 2000 → 5000 → HoLd Unit:ms
Input logic (S, G)	nPn : No-voltage input PnP : Voltage input ※The input logic is not changed with ▲ and ▼ key, because it is under confirmation state of the prior input logic.
Min. reset time (rSt)	1 ⇄ 20 Unit:ms ※Set the min. external RESET signal width
Decimal point (dP)	● 6 Digit ● 4 Digit ※Setting the decimal point is applied same to counting value and setting value.
Prescale value (SCL)	※◀ key : Shift flashing digit ※▲, ▼ key : Change the prescale value ※Refer to A-18 page for prescale function. ※Setting range of prescale value 6Digit : 0.001 ~ 99.999 4Digit : 0.01 ~ 9.99
Memory protection (dAtA)	CLEr ⇄ rEC ※CLEr : Reset power for count value. (Initialize count value when power off.) rEC : Memorize count value. (Memorize count value the moment when power off.)
Lock key (LoCK)	L.oFF → LoC.1 → LoC.2 → LoC.3 ※Refer to A-13
Counter/Timer (C-t)	CoUn ⇄ tiME ※CoUn : Counter tiME : Timer

※When selecting the "d" output mode and if 1 kcps is used, the output may not operate normally because of response time of the contact. In this case, be sure to use the solid state output.
※In function setting mode, no external input signal will be accepted and the output will stay in the OFF state.
※There are no output mode and output time setting mode(OUT1, OUT2) of function setting mode in CT6Y-I, CT6S-I, CT6-I models.

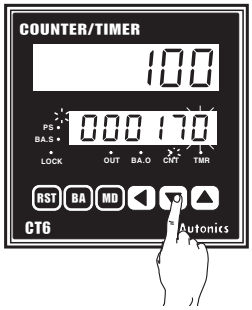
▣Change of counter setting value

◎Change the setting value of single preset type(CT6)

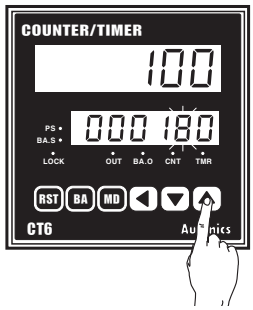
●To change the setting value from **175 to 180.**

1 

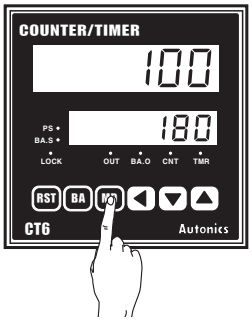
Press ◀ key to advance in setting value change mode. Previous setting value is displayed and the first digit 5 flashes. (PS LED ON)

2 

Change "5" to "0" by press ▼ key 5 times and shift to the second digit by press ◀ key once.

3 

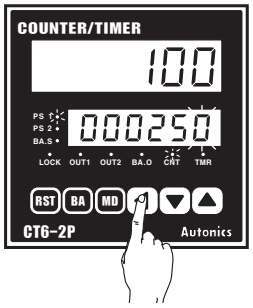
Change "7" to "8" by pressing ▲ key once.

4 

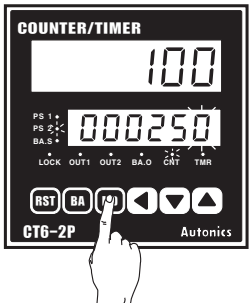
Press MD key to complete the change of setting value and it returns to RUN mode. (PS LED OFF)

◎Change the setting value of dual preset type(CT6-2P)

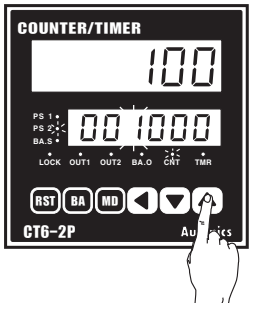
●How to change in the dual preset type : To change the dual setting value from **500** to **1000** when the single setting value is **250** and the dual setting value is **500**.

1 

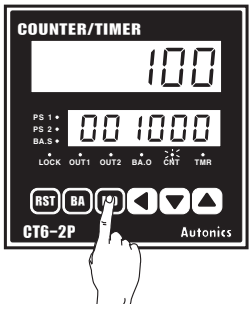
Press ◀ key to enter in status of changing setting value. The prior setting value will be displayed and "0" will flash. (PS1 LED ON, PS2 LED OFF)

2 

The single setting value is not changed. Move to the change of dual setting value by pressing MD key. The prior dual setting value "500" is displayed and the "0" will flash.

3 

Change "500" to '1000" using ◀, ▼, ▲ keys. (It is same with change of single PRESET counter setting value.)

4 

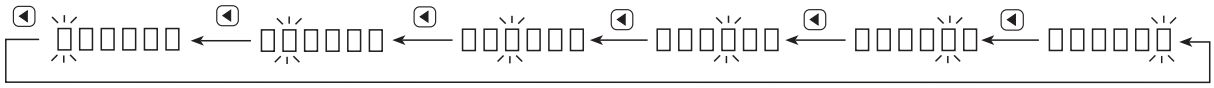
Press MD key to complete the change of setting value and it returns to RUN mode. (PS1 LED OFF, PS2 LED OFF)

※If no keys are touched for over 60sec., during setting value change, it returns to RUN mode.

※After change setting value as "0", press RST or input RESET during RUN mode, output will be maintained as OFF status.

(When set single setting as "0" in dual setting type with output mode "ㅌ (T)" single output is maintained as ON status.)

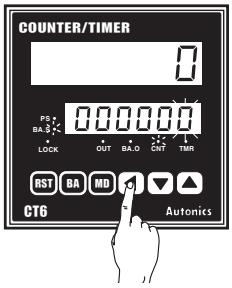
※Whenever press ◀ key during setting value change, the flashing digit shifts.



▣Batch counter function

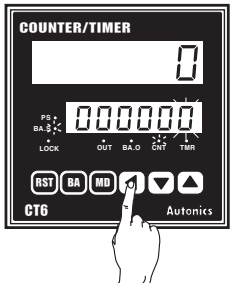
◎Change the setting value of Batch counter

●In case of setting Batch setting value as "**50**"

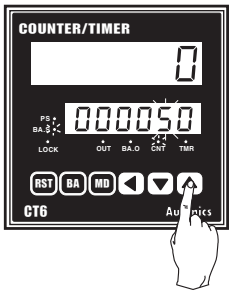
1 

Press (BA) key in RUN mode, it advances to Batch setting value mode. (BA.S LED ON)

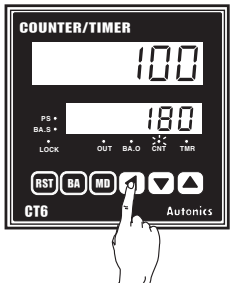
Then, the first digit "0" flashes and others light on.

2 

Press (◀) key once to advance to the second digit of setting display part.

3 

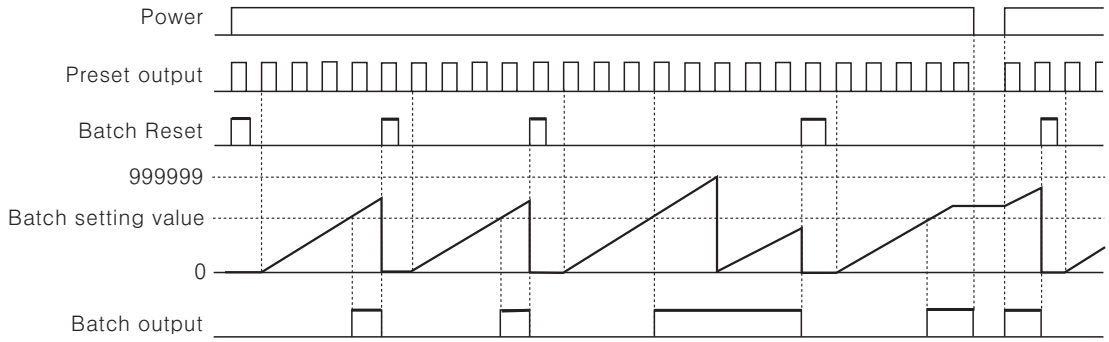
Change "5" to "0" by press (▲) key 5 times.

4 

Press (MD) key, it completes to set Batch setting value and returns to RUN mode. (BA.S LED OFF)

※Batch Counter function is only in CT6 and CT6-2P.
※When advance to Batch setting, if no key is touched for 60sec., it will return to Counter operation mode.

◎Batch Counter function(CT6)



※When Batch counting value reaches to Batch setting value, Batch counting value is continuously increased and Batch output remains in the ON state until Batch reset is applied.
※When the Batch output turns on and if the power turns off and then turns on again, the Batch output remains in the ON state until the Batch reset signal is applied.
※When the Batch counting value counts over 999999, it resets to "0", and it counts up again.
※If Batch setting value is "0 (ZERO)", Batch counting value counts up, but output remains in the OFF status.
※The Batch counting value is not changed by front (RST) key or external reset signal.
※In case of CT6-2P, "Count-up" refers to operation state of output when the counting value is reached to the preset value.

◎Reset the Batch counting value

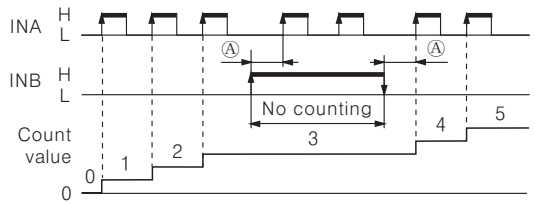
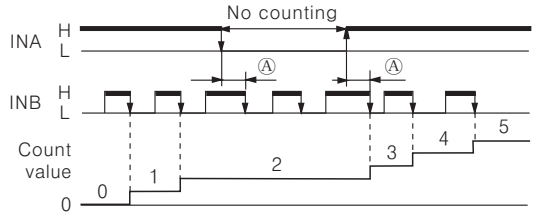
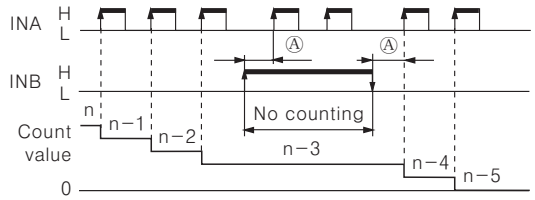
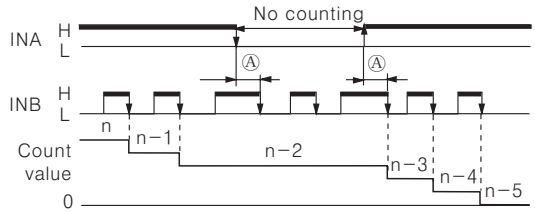
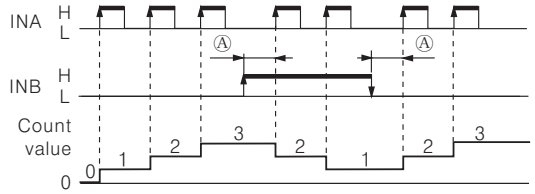
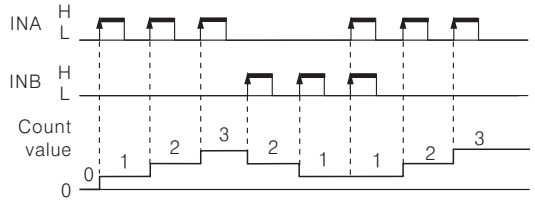
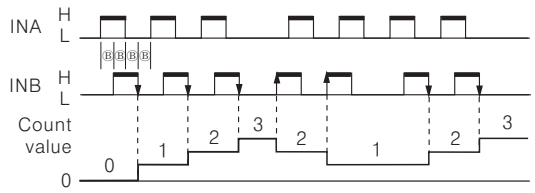
When the external terminal of Batch RESET is short-circuited, the Batch counting value is reset.
But the terminal number of Batch Reset is different depending on the input logic.
☞ When Voltage input type(PNP) is selected, please make terminal numbers **10** and **14** short-circuited.
And when No-voltage input type(NPN) is selected, please make terminal number of **11** and **14** short-circuited.

◎Check the Batch counting value

In order to check the Batch counting value during the Counter operation, press the (BA) key to display both the Batch counting value and preset value.
After checking Batch counting value, it returns to RUN mode by press (MD) key.
※There is no (BA) key lock function for Batch function.

▣Input operation mode for counter

Ⓐ : Over Min. signal width, Ⓑ : Over 1/2 of Min. signal width

Input mode	Count chart	Notice
U (UP)		※INA : Count input ※INB : Inhibition input (Limit the count input of INA) ※When INA is "L", Configure the inhibition(INB : "L" → "H") or Cancel the inhibition(INB : "H" → "L")
		※INA : Inhibition input (Limit the count input of INB) ※INB : Count input ※When INB is "H", Configure the inhibition(INB : "H" → "L") or Cancel the inhibition(INB : "L" → "H")
d (DOWN)		※INA : Count input ※INB : Inhibition input (Limit the count input of INA) ※When INA is L, Configure the inhibition(INB : "L" → "H") or Cancel the inhibition(INB : "H" → "L")
		※INB : Count input ※INA : Inhibition input (Limit the count input of INB) ※n=Setting value(Preset value) ※When INB is H, Configure the inhibition (INB : "H" → "L") or Cancel the inhibition (INB : 'L" → "H")
Ud-A (Up/Down−A) Command input		※INA : Count input ※INB : Command input of Count up/down ※When INB is L, count increases. When INB is H, count decreases.
Ud-b (Up/Down−B) Individual input		※INA : Count down input ※INB : Count up input ※When INA and INB are applied L to H at same time, the count remains unchanged.
Ud-C (Up/Down−C) Phase difference input		※When using A, B phase of encoder and connecting to INA, INB, please set counter input mode(in) as phase difference input(Ud-C).

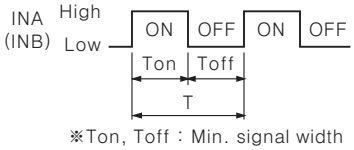
※Ⓐ : Over Min. signal width, Ⓑ : Over 1/2 of Min. signal width.
If the signal width of Ⓐ or Ⓑ is less than min. signal width, ±1 of count error is occurred.

※"H" and "L"

	Voltage input (PNP)	No−voltage input (NPN)
H	5−30VDC	Short circuit
L	0−2VDC	Open

※Min. signal width by counting speed

Counting speed	Min. signal width
1cps	500ms
30cps	16.7ms
1kcps	0.5ms
5kcps	0.1ms
10kcps	0.05ms



※Ton, Toff : Min. signal width

▣Application of Prescale function

This function is to indicate specific unit or optional multiple multiplying configured scale value by count value.

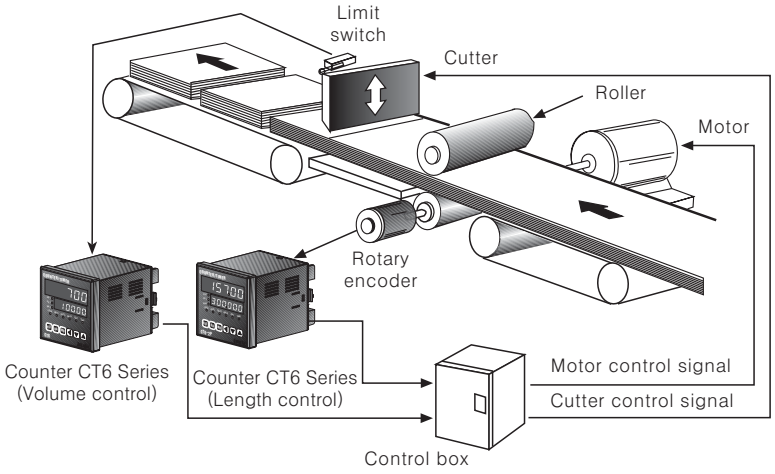
Ex1) Volume control by Counter and Limit Switch

In order to count 10 sheets of paper is produced when the cutter operates 1 time as below application, inner counter counts whenever the limit switch is operated as 1, 2, 3 times... if preset value is configured as 10 in function setting mode and indicates 10, 20, 30... multiplying scale value depending on count value.

Ex2) Length control by Counter(CT6) and Encoder

In case of cutting paper as 300mm using a 50mm diameter(D) roller connected with Encoder of 1000 pulse.

- ●Rectify the run-length of roller per 1 pulse, it is 0.157mm. (Refer to formula of prescale value.)
- ●Configure the value as a prescale value(SCL) and 300mm of the cutting length as preset value of counter. The decimal point setting(dP) function is not used.
- ●Counter counts as 0.157mm per 1 pulse, indicates 300mm and outputs when 1,911 pulse is inputted. But when selecting "---×---" in decimal point setting (dP) mode and set preset value of counter as 300.000 same with decimal point, 300.027mm is indicated and outputted for inputting 1,911 of pulse. It is available to control accurately depending on decimal point.



$$\text{●Prescale value} = \frac{\pi \times \text{Diameter of the roller(D)}}{\text{Numbers of pulse per 1 revolution of the encoder}}$$

$$= \frac{3.1416 \times 50}{1000}$$

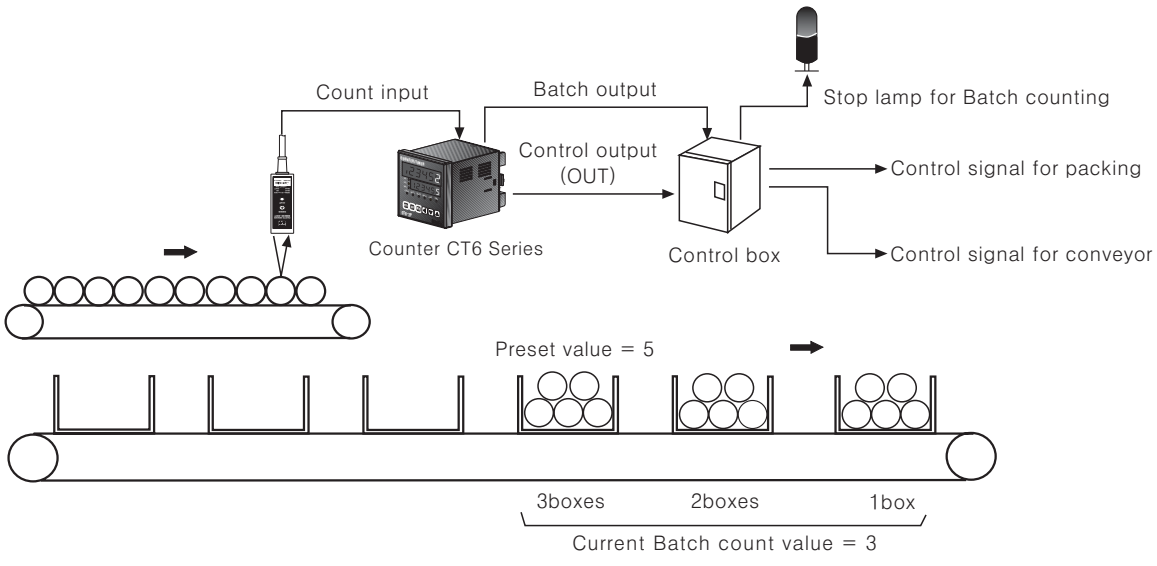
$$= 0.157\text{mm/pulse}$$

●Count input value × Prescale value
= Display value
1911 × 0.157 = 300.027

▣Application of Batch Counter function

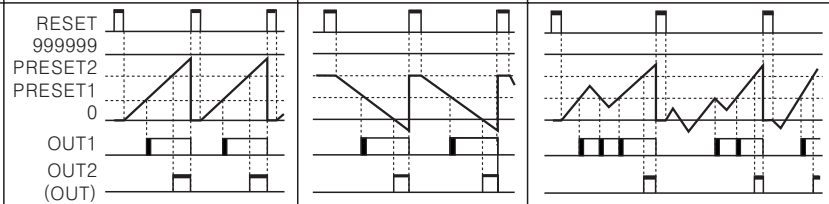
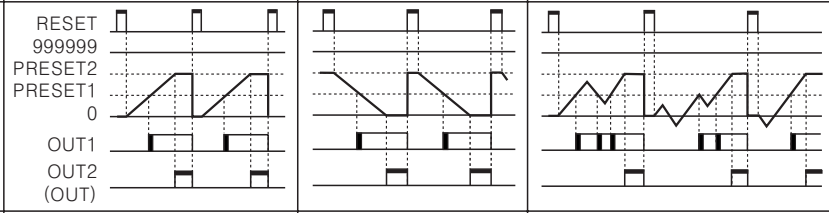
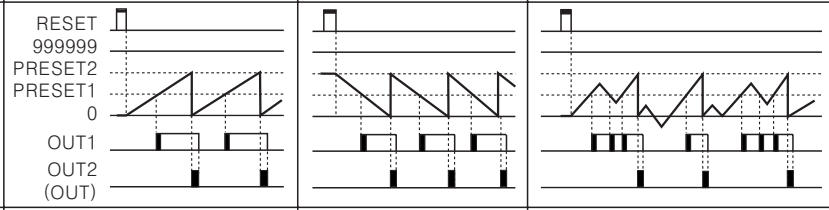
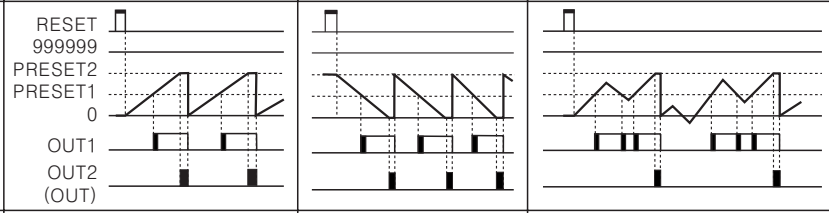
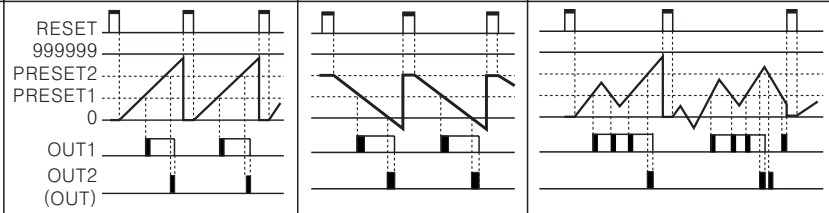
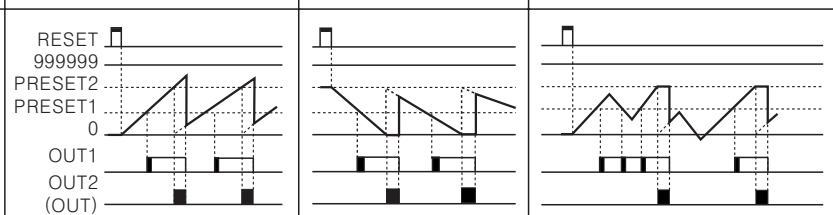
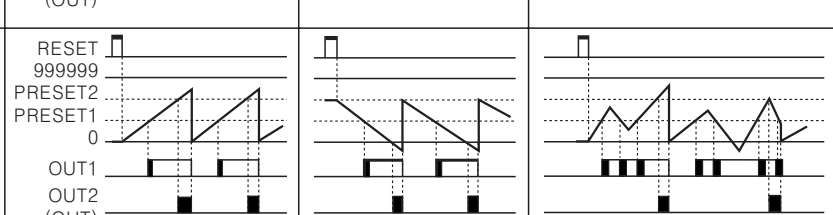
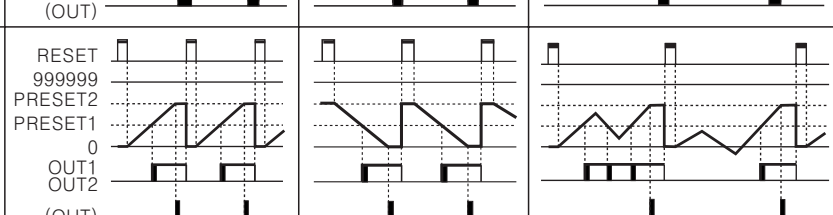
◎In case, put 5 products in a box then pack the boxes when they reaches to 200

- ●Counter preset value : Preset value(setting value)="5", Batch setting value = "200"
- ●When the count value of Counter reaches to the preset value"5", the count value of Batch Counter will be increased by "1" and the control output(OUT) will be on. When the control box receives the control output(OUT), it moves the full box so the next empty box can be filled. When the count value of Batch reaches to "200", Batch output will be ON. Then the control box stops conveyor and provides a control signal for packing.



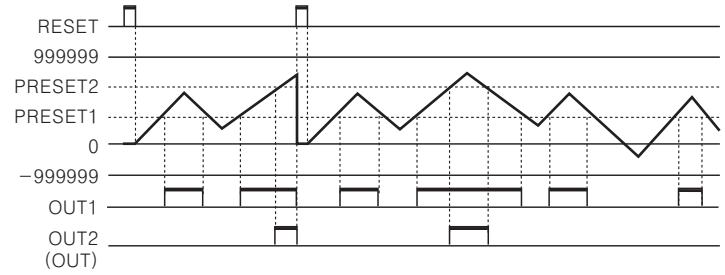
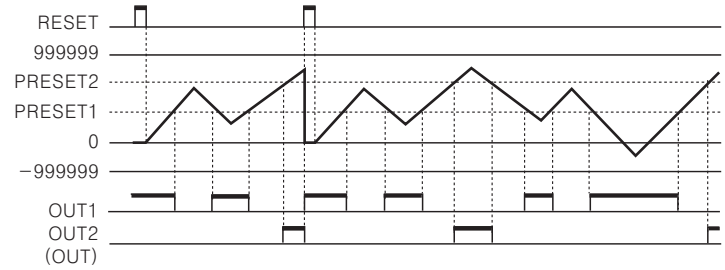
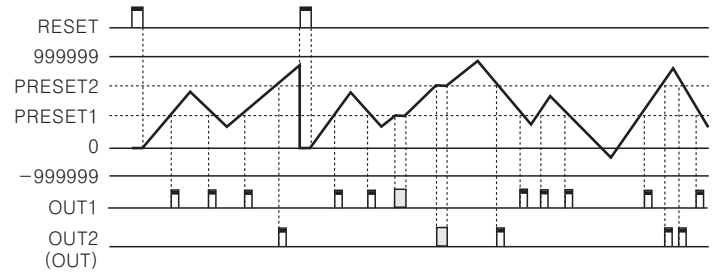
▣Output operation mode(Counter)

One-shot output (OUT1 output) / Retained output
One-shot output (OUT2 output)
Retained output
Coincidence output

Output mode	Input mode			Operation
	Up	Down	Up/Down A, B, C	
F (F)				※After count up, display value increases or decreases until Reset signal is applied and retained output is maintained.
n (N)				※After count up, display value and retained output are maintained until Reset signal is applied.
C (C)				※Display value will be Reset Start status as soon as count up. ※OUT1 retained output will be OFF after OUT2 one-shot time. ※The one-shot output time of OUT1 is operated regardless of OUT2 output.
r (R)				※Display value after count up will be Reset Start status after OUT2 one-shot time. ※OUT1 retained output will be OFF after OUT2 one-shot time. ※The one-shot output time of OUT1 is operated regardless of OUT2 output.
K (K)				※After count up, display value increases or decreases until Reset signal is applied. ※OUT1 retained output will be OFF after OUT2 one-shot time. ※The one-shot output time of OUT1 is operated regardless of OUT2 output.
P (P)				※After count up, display value is maintained during OUT2 one-shot time and counting operation will be Reset Start status as soon as OUT2 output is ON. ※OUT1 retained output will be OFF after OUT2 one-shot time. ※The one-shot output time of OUT1 is operated regardless of OUT2 output.
q (Q)				※After count up, display value increases or decreases during OUT2 one-shot time. ※OUT1 retained output will be OFF after OUT2 one-shot time. ※The one-shot output time of OUT1 is operated regardless of OUT2 output.
A (A)				※After count up, display value and OUT1 retained output are maintained until Reset signal is applied. ※The one-shot output time of OUT1 is operated regardless of OUT2 output.

※The output of single preset type is operating the same as OUT2 of dual preset type.

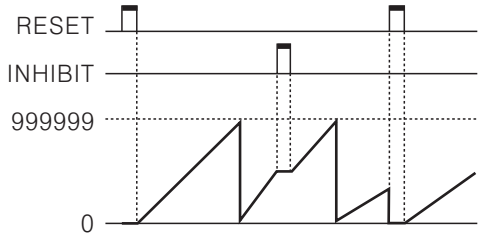
Retained output　Coincidence output

Output mode	Up/Down – A, B, C	Operation
S (S)		※OUT1 and OUT2 keeps ON state in following condition ; Display value ≧ Preset 1 Display value ≧ Preset 2
t (T)		※OUT1 keeps OFF state when display value is smaller than Preset 1 value, but if Preset 2 is "0", OUT1 keeps ON state. (But, if preset is "0", OUT1 keeps ON state.) ※OUT2 keeps ON state when display value is equal or larger than Preset 2.
d (D)		※When display value is equal to setting value(PRESET1, PRESET2) only, OUT1 or OUT2 output keeps ON state. ※When setting 1kcps for counting speed, solid state contact output should be used. (When contact output is used, it can't be operated normally because of response time of contact.)

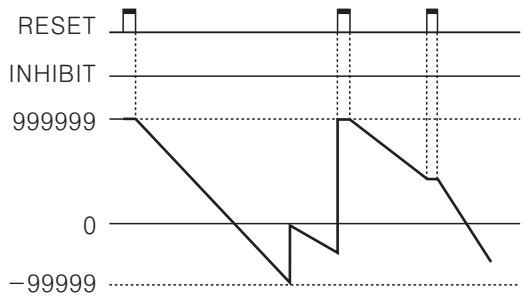
※The single preset type output(OUT) is operated as OUT2 of dual preset type.

▣Counter operation of Indication model(CT6Y-I, CT6S-I, CT6-I)

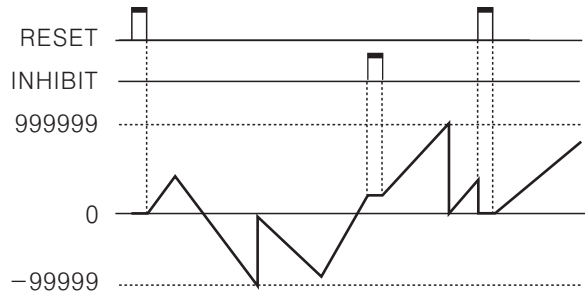
●In case of input mode is Up(U)



●In case of input mode is Down(d)



●In case of the input mode is Command input(Ud-A), Individual input(Ud-b), Phase difference input(Ud-E)

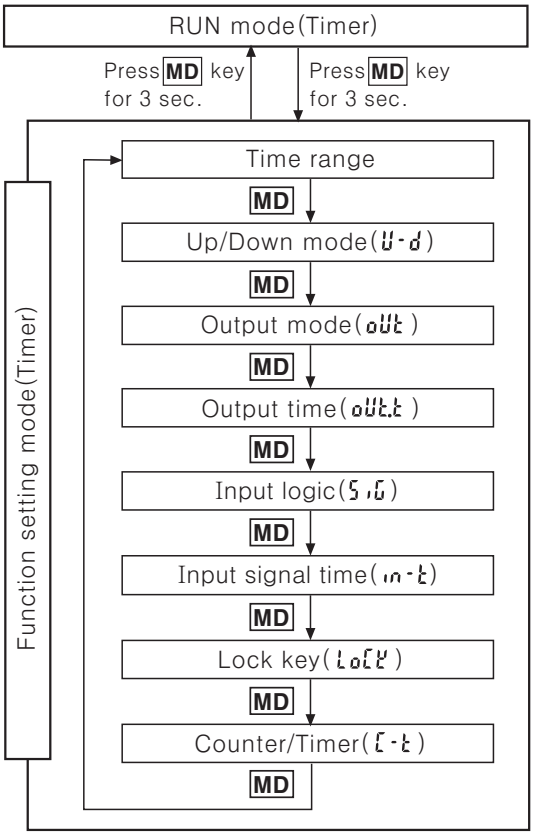


※If "dAtA" setting value of function setting mode(count) is "CLEr", count value is reset or count value is memorized when it is "rEC".

※CT6-I has an INHIBIT terminal only.

▣Timer mode

◎Operation mode in Timer



- Press MD key for over 3sec., in Timer RUN mode, it advances to Timer function setting mode and press MD key for over 3sec in function setting mode, it returns to RUN mode.

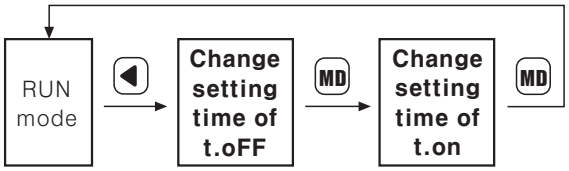
(Note) Be careful when it advances to function setting mode during operation, it is reset.

- If no keys are touched for over 60sec., it returns to RUN mode.
- After select counter(CoUn) in Counter/Timer setting item of function setting mode and press MD key for over 3sec. then, it advances to Counter RUN mode.

▣Change of setting value in Timer operation

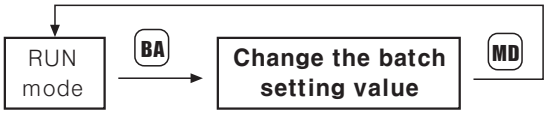
◎To change setting value in case of the output is not FLK

◎To change setting value in case of the output is not FLK



- When dual preset type is used for timer, the setting time is limited as one and only OUT2 is operated.
- If no keys are touched for over 60sec., after advance to setting value change mode, it returns to RUN mode. Be careful not to press MD key, output is not operated and same result can occur when press MD key after OFF power and ON again in change mode after advance to change mode, in case, output mode is OND.2, FLK.2.

◎Change the batch setting value



- Press BA key in RUN mode, it advances to Batch setting value change mode. Press MD key after change Batch setting value same as counter setting value change by ◀, ▼, ▲ keys, it completes to change Batch setting value and advances to RUN mode. When it advances to Batch setting value change mode, it displays previous Batch count value.
- Press MD key to return to RUN mode after advance in Batch setting value change mode.

※Batch setting is limited to single setting mode even in dual setting model.

▣Time range

1)6 Digit type Time range

Time range	Function setting mode	
	Timing display	Preset display
0.01s to 9999.99s	SEC	9999.99
0.1s to 99999.9s	SEC	99999.9
1s to 999999s	SEC	999999
0.01s to 99m 59.99s	n S	99S.99
0.1s to 999m 59.9s	n S	999S.9
0.1m to 99999.9m	n	99999.9
1m to 999999m	n	999999
1s to 99h 59m 59s	H n S	99S9S
1m to 9999h 59m	H n	9999S9

※Model : CT6Y-2P, CT6Y, CT6Y-I, CT6S-2P, CT6S, CT6S-I, CT6-2P, CT6, CT6-I

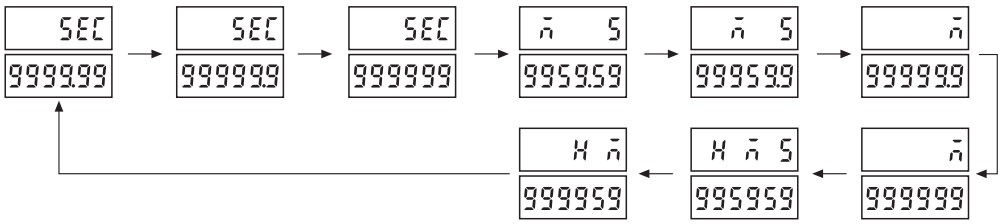
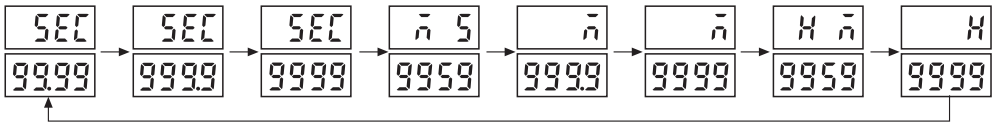
2)4 Digit type Time range

Time range	Function setting mode	
	Timing display	Preset display
0.01s to 99.99s	SEC	99.99
0.1s to 999.9s	SEC	999.9
1s to 9999s	SEC	9999
1s to 99m 59s	n S	99S9
0.1m to 999.9m	n	999.9
1m to 9999m	n	9999
1m to 99h 59m	H n	99S9
1h to 9999h	H	9999

※Model : CT4S-2P, CT4S

▣Setting function mode(Timer)

(MD key : Use the ▲ or ▼ key to Change the setting)

Setting mode	How to set
Time range (SEC / Min / HOUR)	※The time range for 6digit type  ※The time range for 4digit type 
UP/DOWN mode (U-d)	U ⇄ d ※UP : Time proceeds from 0(ZERO) to the setting value. DOWN : Time proceeds from the setting value to 0(ZERO).
Output mode (oUt)	ond → ond.1 → ond.2 → FLK → FLK.1 → FLK.2 → Int → Int.1 → oFd
Output time (oUt.t)	10 → 50 → 100 → 200 → 500 → 1000 → 2000 → 5000 → HoLd Unit: ms ※It is operation time of control output according to output mode.
Input logic (S.G)	nPn : No-voltage input PnP : Voltage input ※The input logic is not changed with ▲ and ▼ key, because it is under confirmation state of the prior input logic.
Input signal time (In-t)	1 ⇄ 20 Unit: ms ※CTS series : Min. external INA, INH, RESET signal width CT series : Min. external INA, INHIBIT, RESET, BATCH, RESET signal width
Lock key(Lock) (LoCK)	LoFF → LoC.1 → LoC.2 → LoC.3
Counter/Timer (C-t)	CoUn ⇄ tIME ※ CoUn : Counter tIME : Timer

※In function setting mode, no external input signal will be accepted and the output will stay in the OFF status.
※In case of output mode is FKL, INT, INT1, OFD, there is no output time setting in the function setting mode.
※In the indicator type(CT6Y-I, CT6S-I, CT6-I), there are no output modes or output times in the function setting mode.
※Control output operates as OUT2 in the dual preset type(CT6Y-2P, CT6S-2P, CT4S-2P, CT6-2P), and OUT1 always remains in "OFF" status. (Time setting is limited to one time.)
※If no key is touched for 60 sec., in change status of setting time(PRESET value) the timer will return to RUN mode.

▣How to set Lock key

Be sure to set the lock mode in order to protect against accidental or unauthorized key operation.

LoFF (Lock OFF) : Cancellation of the lock mode
"LOCK" OFF

LoC.1 (Lock level 1) : Lock RST key
"LOCK" ON

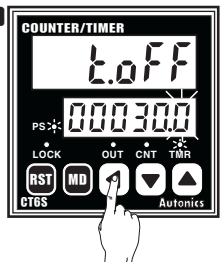
LoC.2 (Lock level 2) : Lock ◀ & ▼ & ▲ key
"LOCK" ON

LoC.3 (Lock level 3) : Lock RST & ◀ & ▼ & ▲ key
"LOCK" ON

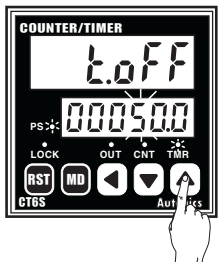
▣Change of the setting time of Timer

◎Change of setting time in case, the output is FLK(CT6S)

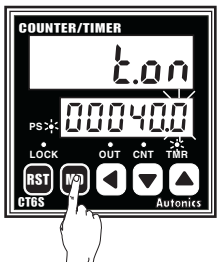
Change t.oFF time from 30sec. to 50sec., t.on setting from 40sec. to 20sec.
(Output mode : FLK, Time range : 99999.9)



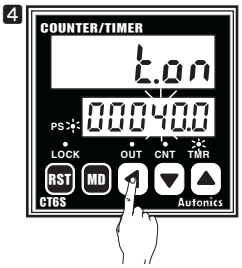
Advance to setting time change mode by press ◀ key. Shift the flashing digit to position "3"by press ◀ key twice. (PS LED ON)



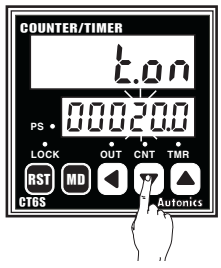
Change "3" to "5" by press ▲ key twice.



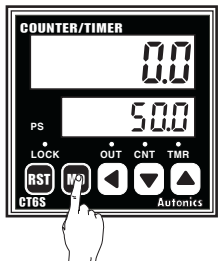
Press MD key to complete t.oFF time set and advance to t.on setting time change mode.



Shift to the third position "4" by press ◀ key twice.



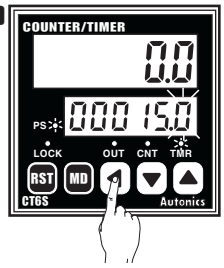
Change "5" to "0" by press ▼ key 5 times.



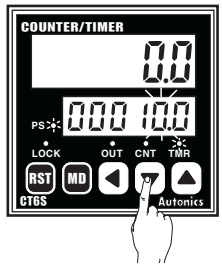
Press MD key to complete setting time change and return to RUN mode. (PS LED OFF)

◎Change of setting time in case of the output is not FLK(CT6S)

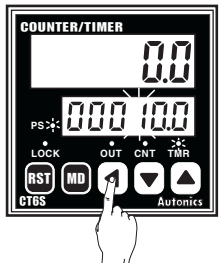
Change the setting time from 15.0 to 20.0(Output mode : OND, Time range : 99999.9)



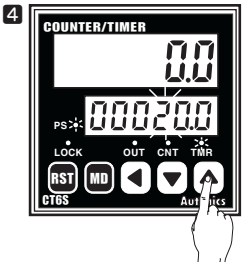
Advance to setting time change mode by press ◀ key. Shift the second digit to position "5" by press ◀ key once. (PS LED ON)



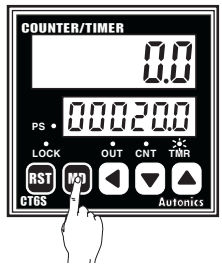
Change "5" to "0" by press ▼ key 5 times.



Shift to the third position "1" by press ◀ key once.

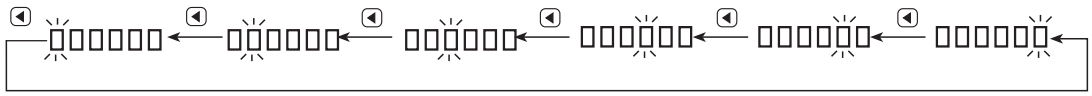


Change "1" to "2" by press ▲ key once.



Press MD key to complete setting time change and return to timer RUN mode. (PS LED OFF)

※When advance to setting time change mode, time will progress continuously.
※If no keys are touched for over 60sec., after advance to setting value change mode, it returns to RUN mode. Be careful not to press MD key, output is not operated and same result can occur when press MD key after OFF power and ON again in change mode after advance to change mode, in case, output mode is OND.2, FLK.2.
※Whenever press ◀ key during setting value change, the flashing digit shifts.



※When use CT6Y-2P, CT4S-2P, CT6S-2P, CT6-2P as a timer, there is no dual preset function.

▣Batch Counter function(Timer)

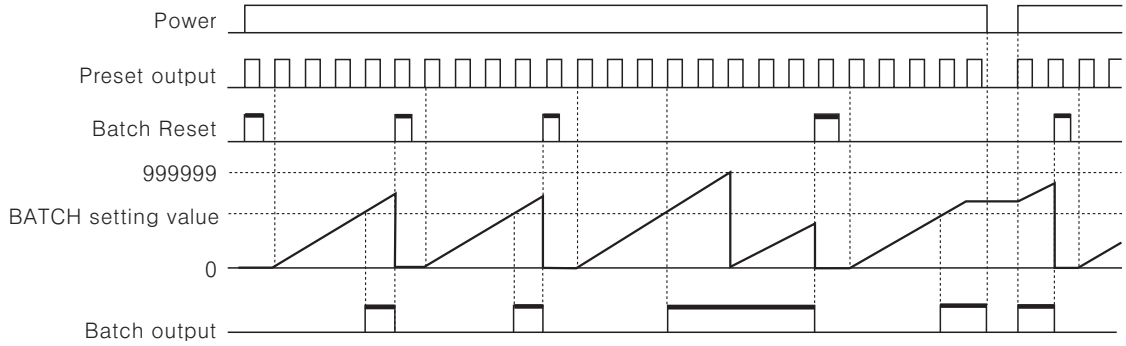
When it reaches the batch setting value to count the number of Time-up, the batch output will be ON.
But when the output mode is "FLK", the number of Time-ups will be 2 times because it will count both Toff, and Ton time-ups.

☞ When time reaches the Toff setting time, Batch count value will be increased.
And when it reaches the Ton time, Batch count value will be increased.

◎How to set the batch setting value

Batch setting value is not for setting the time, it sets the count value like a counter.
Refer to A-23 for the batch setting value using as a timer, it is same as a counter.

◎Batch Counter function



※When count value of the number of Time-up of setting value reaches the batch setting value, the batch output is operated and the batch count value is increased until the batch reset signal is applied and the batch output returns to the OFF status.

※When the batch output turns on and if the power turns off and then turns on again, the batch output remains in the ON state until the batch reset signal is applied.

※If batch setting value is "0(ZERO)", the batch count value is increased, but the batch output remains OFF status.

※If batch setting value is 0(ZERO), the batch count value counts up, but the batch output remains OFF state.

※The batch count value is not changed by front (RST) key or external reset signal.

◎Reset the Batch count value

When the terminal of Batch RESET is externally short-circuited, the BATCH count value will be reset.
But the Batch RESET is different dependent on the input logic setting.

☞ When Voltage input type(PNP) is selected, please make terminal numbers **10** and **14** short-circuited.
And when No-voltage input type(NPN) is selected, please make terminal number of **11** and **14** short-circuited.

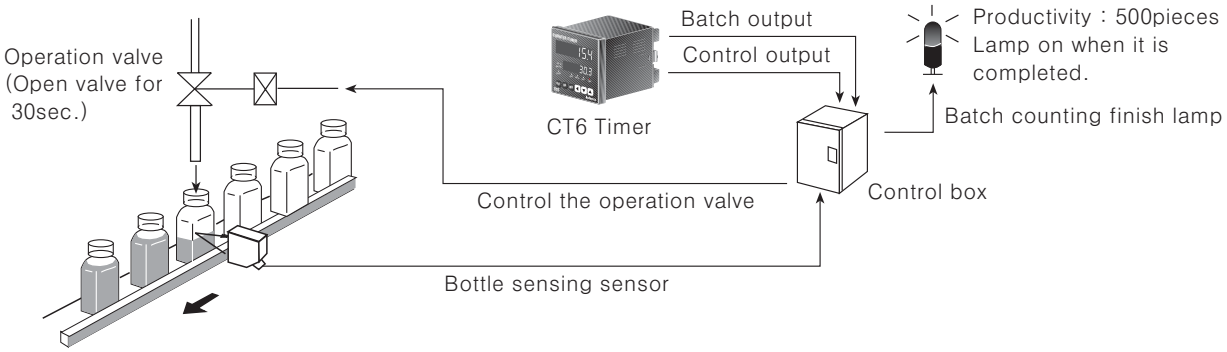
◎Check the Batch count value

In order to check the Batch count value during the Timer operation, press the (BA) key to display both the Batch count value and setting value. After check Bach count value, it returns to RUN mode by press (MD) key.

※There is no (BA) key lock function for Batch function.

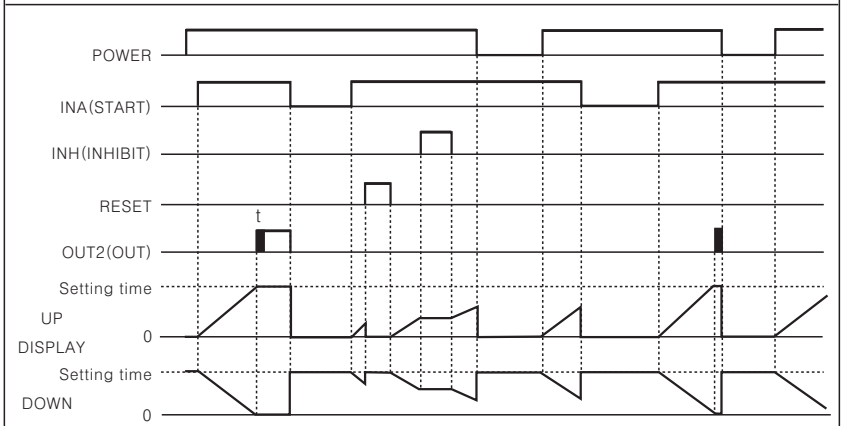
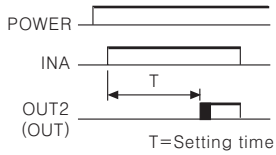
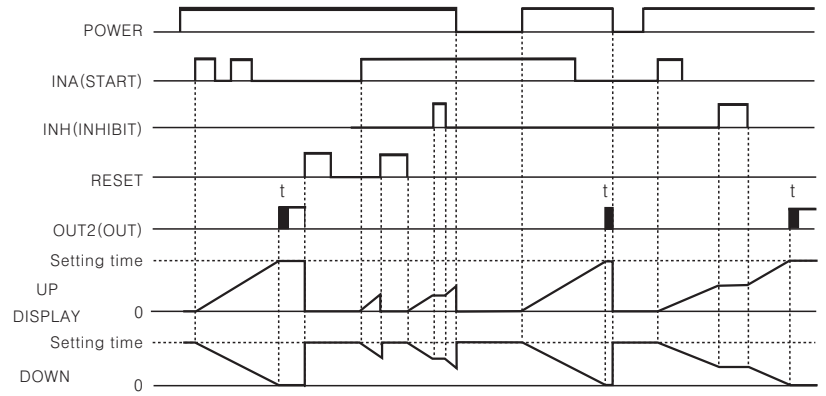
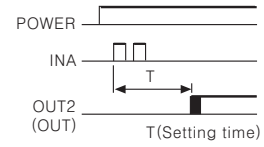
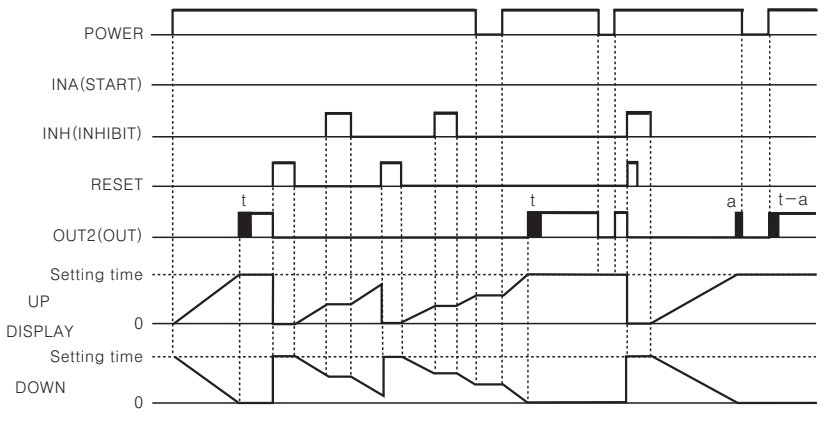
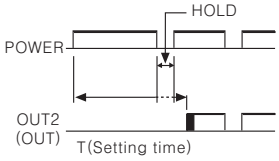
◎Application of Batch counter

Fill milk into the bottle for 30sec.(Setting time), then when 500 bottles are completed, turn Batch counting finish lamp on. (Setting time : 30sec., Batch setting value : 500)



▣Output operation mode(Timer)

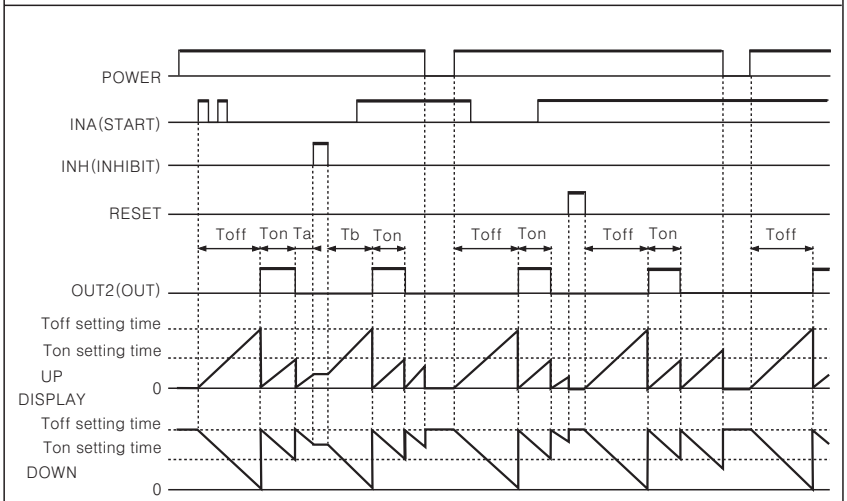
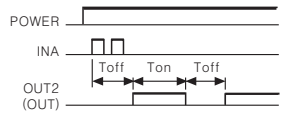
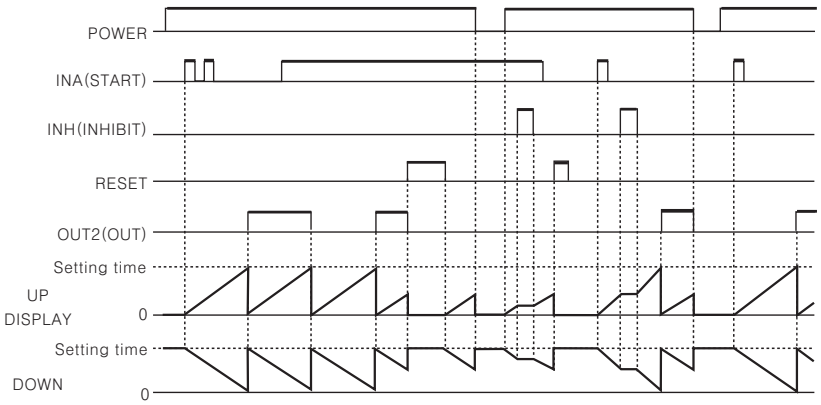
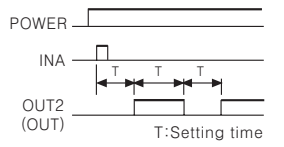
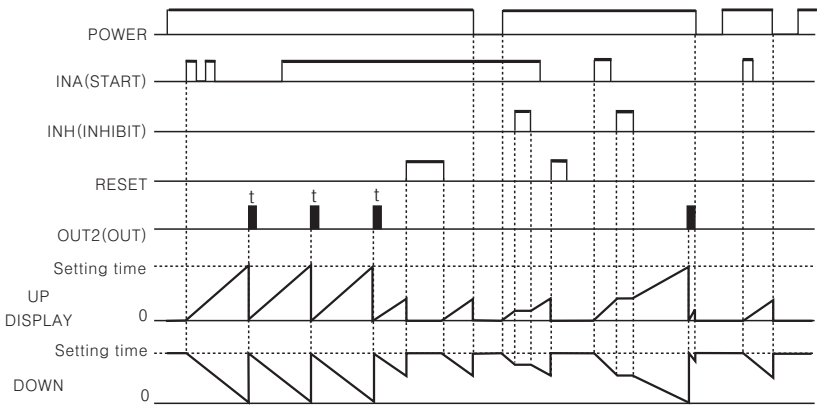
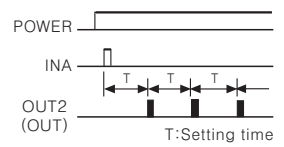
One-shot output (t=One-shot output time) — Retained output

Output mode	Time chart	Operation
ond (OND)	Signal ON Delay(Power Reset) 	1)Time starts when INA signal turns on. When INA signal turns off, time resets. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as retained or one-shot. 
ond.1 (OND.1)	Signal ON Delay 1(Power Reset) 	1)Time starts when INA signal turns on, if INA signal is applied repeatedly, only initial signal is recognized. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as retained or one-shot. 4)The initial signal is effective when input INA repeatedly. 
ond.2 (OND.2)	Power ON Delay(Power Hold)  ※Memory protection of the indication value:10 years	1)Time starts when power turns on. (There is no INA function) 2)Time resets when reset turns on. Time starts when reset turns off. 3)Control output operates as remained or one-shot. 4)It memorizes display value at the moment of power off. 

※Power RESET : There is no memory protection. (Initialize the indication value when power is off.)
※Power Hold : There is memory protection. (Memorize the indication value for a moment of power-off, indicate the memorized indication value when power is applied.)

▣Output operation mode(Timer)

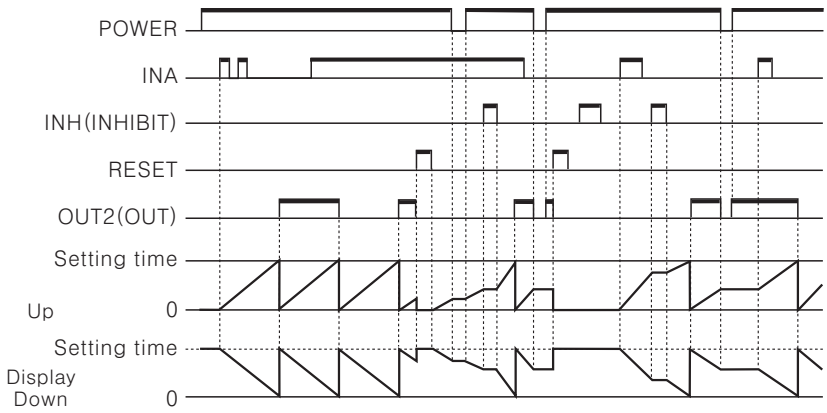
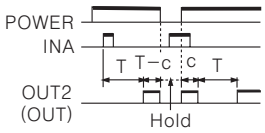
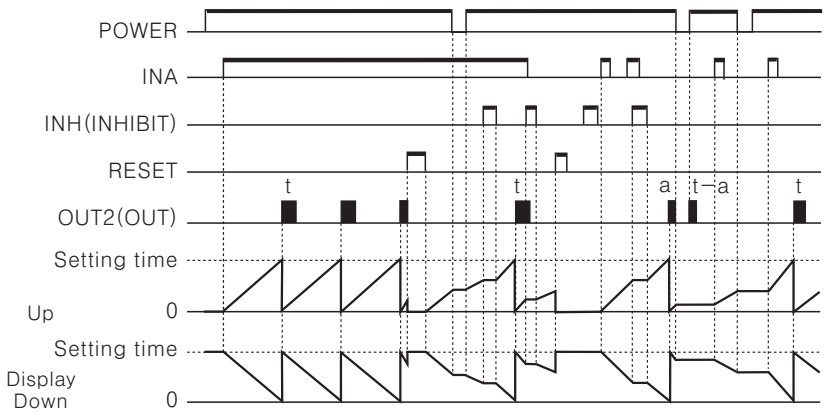
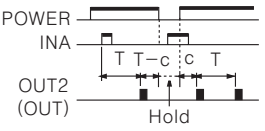
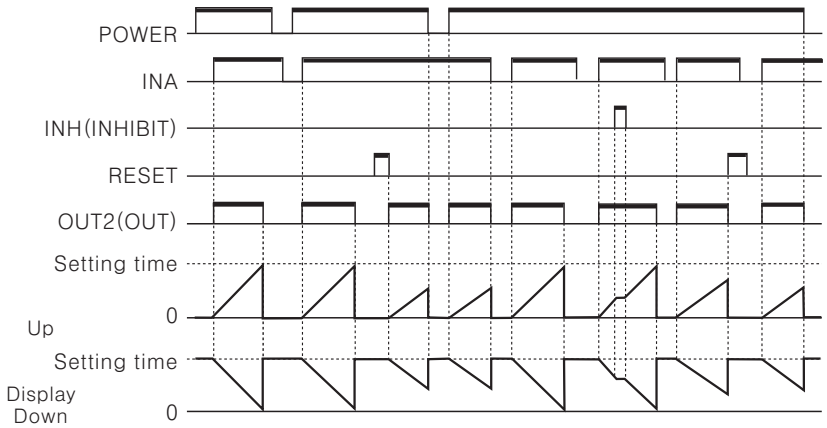
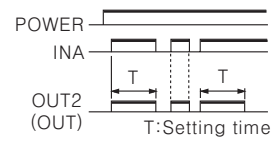
One-shot output (t=One-shot output time) — Retained output

Output mode	Time chart	Operation
FLK (FLK)	Flicker(Power Reset) 	1)Time starts when INA signal turns on. If INA signal is applied repeatedly, only initial signal is recognized. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as retained output, output turns off for the Toff time and turns off for the Toff time and turns on for the Ton time repeatedly. Ta+Tb=Toff setting time 4)The Ton time and the Toff time must be set individually. 5)FLK output mode has retained output. 6)In case of using the contact output, min. setting time must be set over 100ms. 
FLK.1 (FLK.1)	Flicker 1(Power Reset) **Retained output** 	1)Time starts when INA signal turns on. If INA signal is applied, repeatedly only initial signal is recognized. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as retained output. In case of using the contact output, min. setting time must be set over 100ms. 
	One-shot output 	1)Time starts when INA signal turns on, if INA signal is applied repeatedly, only initial signal is applied. 2)Time starts when power turns on and when reset turns off during INA signal on. 3)Control output operates as one-shot. In case of using the contact output, min. setting time must be set over 100ms. 

※Power Reset : There is no memory protection. (Initialize the indication value when power is off.)
※Power Hold : There is memory protection. (Memorize the indication value for a moment of power-off, indicate the memorized indication value when power is applied.)

▣Output operation mode(Timer)

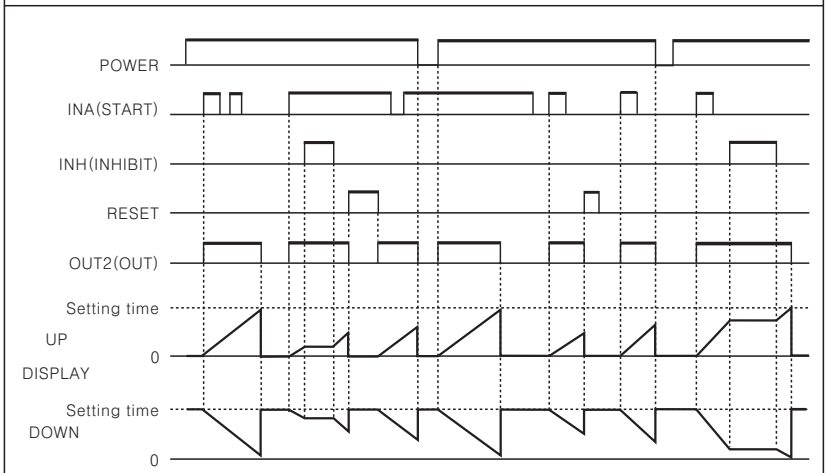
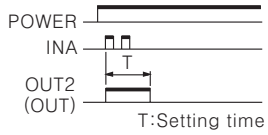
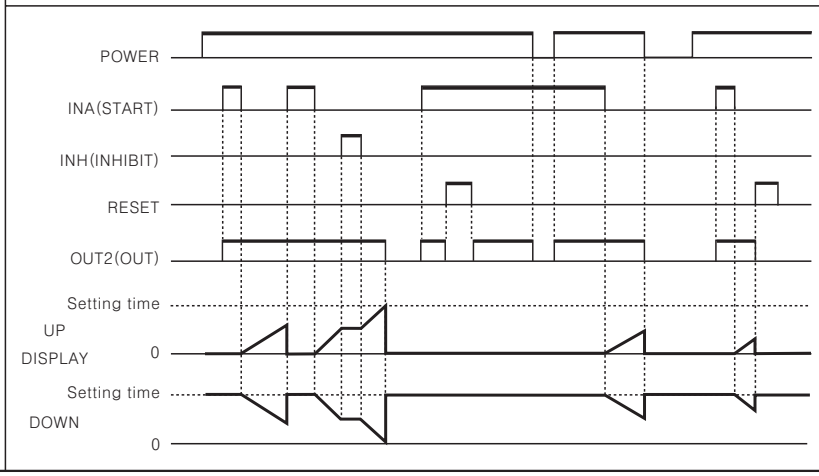
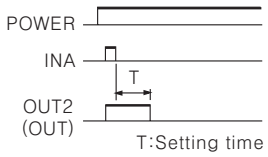
One-shot output (t=One-shot output time) — Retained output

Output mode	Time chart	Operation
FLK.2 (FLK.2)	FLICKER 2(POWER HOLD) **Retained output**  ※Memory protection of the indication value:10 years	1)Time starts when INA signal turns ON. If INA signal is applied repeatedly, only initial signal is recognized. 2)Control output operates as retained. 3)Control output will be reversed when it reaches to setting time. (At the initial start, OUT2 control output is OFF.) 4)In case of using the contact output, min. setting time must be set over 100ms.  T:Setting time
	One-shot output  ※Memory protection of the indication value:10 years	1)Time starts when INA signal turns ON. If INA signal is applied repeatedly, only initial signal is recognized. 2)Control output operates as one-shot output when reaches to the setting time. 3)Time starts when power turns ON and when reset turns OFF during INA signal on. 4)In case of using the contact output, min. setting time must be set over 100ms.  T:Setting time
INT (INT)	INTERVAL(POWER RESET / SIGNAL RESET)  	1)During INA is ON, Time starts and contorl output turns ON. When it is reaches to setting time, the indication value and control output will be reset automatically. 2)When INA is OFF, time resets. 3)During INA signal on Power OFF:Processing time and control output Reset Power ON:Time Reset Reset ON:Processing time and control output Reset Rset OFF:Time Reset 

※POWER RESET : There is no memory protection. (Initialize the indication value when power is off.)
※POWER HOLD : There is memory protection. (Memorize the indication value for a moment of power-off, indicate the memorized indication value when power is applied.)

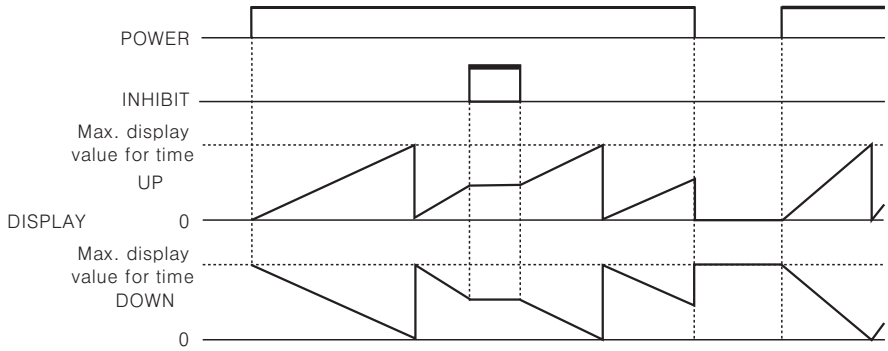
▣Output operation mode(Timer)

One-shot output (t=One-shot output time) — Retained output

Output mode	Time chart	Operation
int.1 (INT.1)	Interval 1(Power Reset) 	1)Control output turns ON and time starts when INA signal turns ON. 2)If INA signal is applied repeatedly, only initial signal is recognized. 3)When it reaches to setting time, indication value and control output are reset automatically. 4)Time starts when power turns ON and when reset turns OFF during INA signal on. 5)Control output is ON when time is progressing. 
ofd (OFD)	Signal OFF Delay(Power Reset) 	1)If INA is ON, control output remains ON. 2)When INA signal is OFF, time processes. 3)When it reaches to setting time, indication value and control output are reset automatically. 

※Power Reset : There is no memory protection. (Initialize the indication value when power is off.)

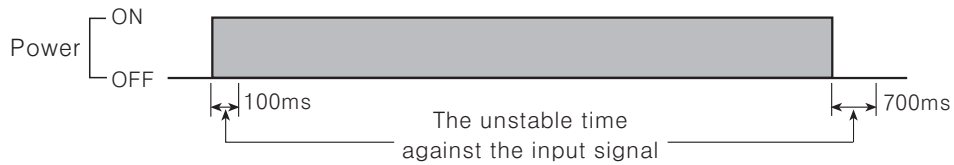
▣Timer operation of Indication model(CT6-I, CT6S-I)



※When power is off, processing time is initialized. (There is no memory protection.)

▣Proper usage

◎Turning power ON/OFF



- ●During 100ms after applying power, 700ms after cutting power, it is the unstable time for rising and fall of power
- ●Please apply the input signal after 100ms from power supplied and apply the power after 700ms from power cut.

◎Input signal line

- ●Use as short a cable from the sensor to this unit as possible.
- ●Use shielded cable for long input line.
- ●Keep input cables separate from power cables.

◎Input logic selection

When selecting or changing the input logic, the power source must be cut off.
Then select the input logic according to the method of changing input logic.

◎Contact counting input

If applying contact input at high speed mode(1k, 5k, 10k), it may miscount by chattering.
Therefore, set low speed mode. (1 or 30cps)

◎Test circuit dielectric, impulse voltage and measure insulated resistor by installing in control panel,

- ●Separate the unit from control box circuit.
- ●Short-circuit all terminals in terminal block.

◎Do not use this unit in the following places

- ●A Place where ambient temperature is over 55℃ or less than -10℃.
- ●A Place where ambient humidity is over 85%RH or where condensation occurs by temperature changes.
- ●A Place where there is severe vibration or impact.
- ●A Place where strong magnetic field or electric noise is generated.
- ●A Place where strong alkalis or acids are used.
- ●A Place where there are direct rays of the sun.

◎Use under these conditions

- ●Indoors
- ●Maximum height 2000m
- ●Pollution Degree 2
- ●Installation category II

DIN W72×H36mm of Counter/Timer with indication only

▣Features

- ●Upgraded counting speed : 1cps/30cps/2kcps/5kcps
- ●Application of Up/Down input mode
- ●Selectable Up/Down indication of display value
- ●Wide range of input power supply : 100-240VAC 50/60Hz, 12-24VAC/DC
- ●Selectable Counter or Timer function by internal DIP switch
- ●Selectable time ranges
- ●Built-in Microprocessor

Please read "Caution for your safety" in operation manual before using.

▣Ordering information

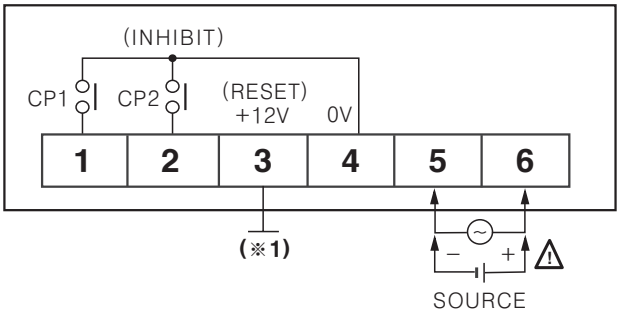
FX 4 Y - I

I	Indicator
Y	DIN W72×H36mm
4	9999(Digit)
6	999999(Digit)
FX	Counter/Timer type

▣Specifications

Model		FX4Y-I	FX6Y-I
Digit		4	6
Digit size		W8×H14mm	W4×H8mm
Power supply		100-240VAC 50/60Hz, 12-24VAC/DC	
Allowable voltage range		90 ~ 110% of rated voltage	
Power consumption		Approx. 4.5VA(240VAC 60Hz), Approx. 4.5VA(24VAC 60Hz), Approx. 2.5W(24VDC)	
Max. counting speed		Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. input signal width	INHIBIT input	Min. 20ms	
	RESET input		
Input	CP1, CP2 input	No voltage input☞ Impedance at short-circuit : Max. 470Ω, Residual voltage at short-circuit : Max. 1VDC, Impedance at open-circuit : Min. 100kΩ	
	RESET input		
Memory protection		10 years(When using non-volatile semiconductor memory)	
Eexternal power		12VDC±10% 50mA Max.	
Insulation resistance		Min. 100MΩ(at 500VDC mega)	
Dielectric strength		2000VAC 50/60Hz for 1 minute	
Noise strength	AC Type	±2kV the square wave noise(pulse width:1㎲) by the noise simulator	
	DC Type	±500V the square wave noise(pulse width:1㎲) by the noise simulator	
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1hour	
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions for 3 times	
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times	
Ambient temperature		-10 ~ +55℃(at non-freezing status)	
Storage temperature		-25 ~ +65℃(at non-freezing status)	
Ambient humidity		35 ~ 85%RH	
Life cycle		Semi-permanent	
Unit weight		AC type:Approx. 126g, DC type:Approx. 130g	AC type:Approx. 128g, DC type:Approx. 132g
Approval			

▣Connections

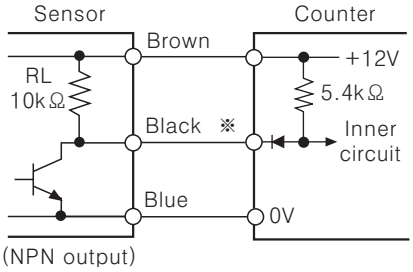


(※1) It can be selected RESET or sensor power(+12V 50㎃) by internal PIN operation. (Refer to A-35)
(※2) CP1, CP2 : Input signal terminals when using as Counter.
(※3) INHIBIT(CP2) : Time Hold terminal when using for timer(Connect switch to ②+④ from the external.)
(※4) Operated by a Power ON Start method when it is used as a timer.

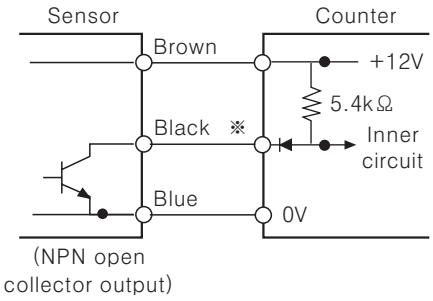
▣Input connections

◎Using for no-voltage input(NPN)

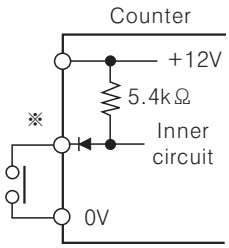
●Solid-state input(Standard sensor : NPN output type sensor)



※CP1, CP2(INHIBIT), RESET input



●Contact input

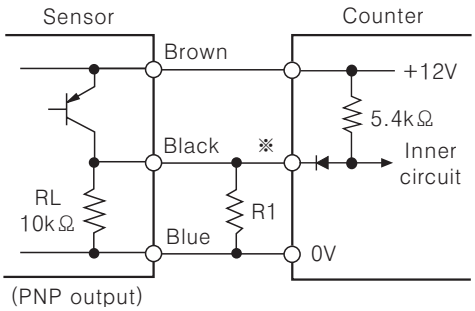


※Please select the counting speed as 30cps when using for counter.

◎Using for voltage input(PNP)

FXY series is for no-voltage input type, it is not available to count applying DC voltage from the external. For using PNP type sensor, please use as the following to count.

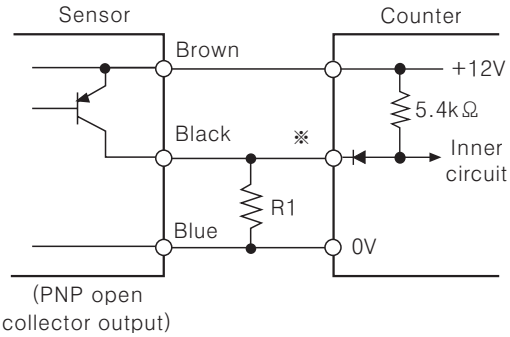
●PNP output type sensor



●Please set R1 value to make the composed resistance of RL + R1 as Max. 470kΩ is an impedance for short-circuit.

※CP1, CP2(INHIBIT), RESET input

●PNP open collector output type sensor



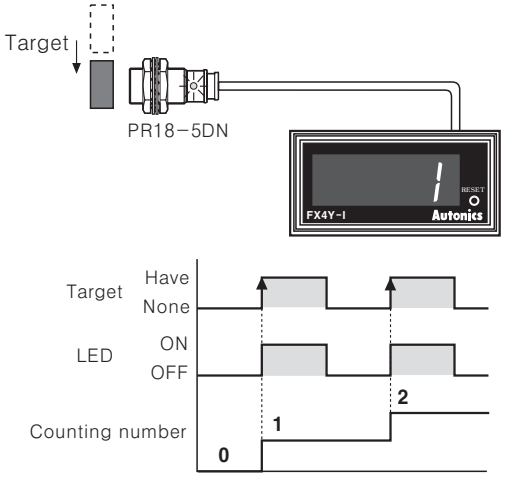
※In case of PNP open collector output type sensor, please connect lower than 470Ω of R1 to input terminal before using.

▣Counting method

Be careful to select sensor because the counting method of NPN output type sensor is different from PNP output type sensor.

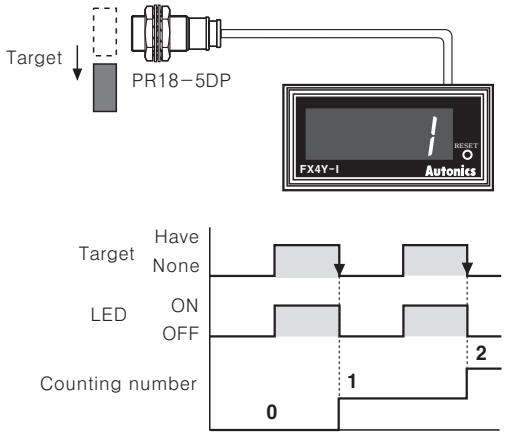
●NPN output type sensor

When the sensor is changed from OFF to ON, it counts.

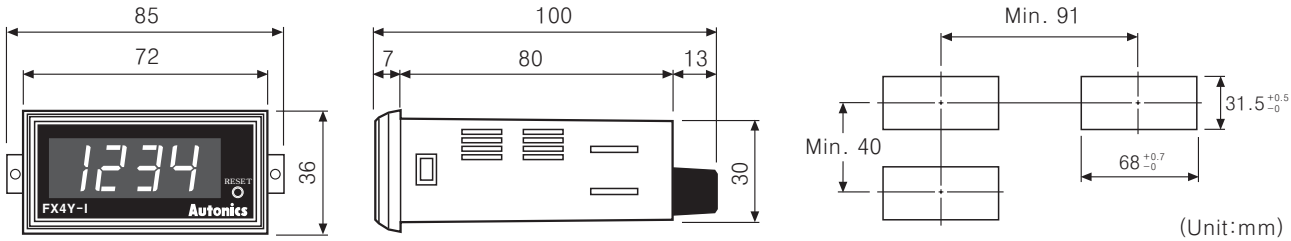


●PNP output type sensor

When the sensor is changed from ON to OFF, it counts.

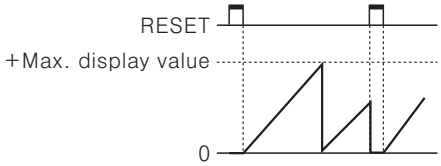


▣Dimensions

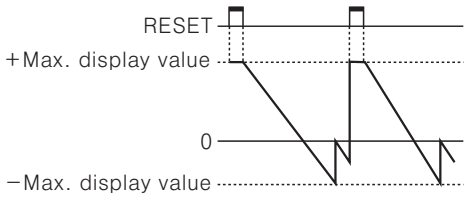


▣Counting function of indication type(Counter)

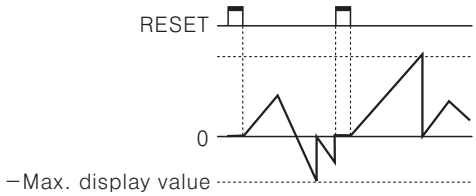
●Up mode



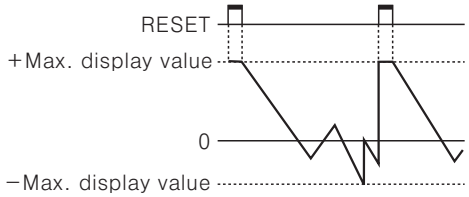
●Down mode



●Up/Down-A, B, C Mode

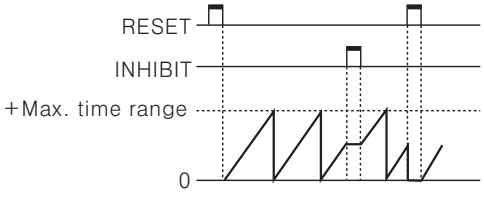


●Up/Down-D, E, F Mode

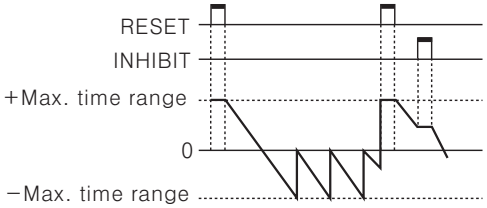


▣Counting function of indication type(Timer)

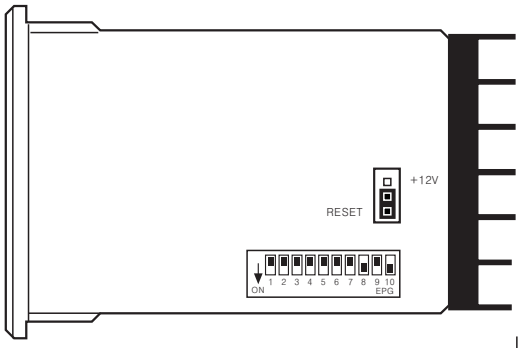
●Up mode



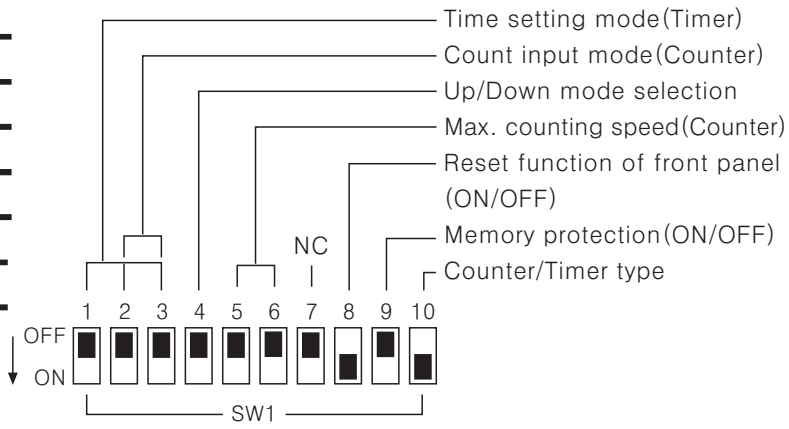
●Down mode



▣Description of inner DIP switches



※Inner selection switch is changed from 8pin to 10pin with upgrade of counting speed.



●Up/Down mode

SW1		Function
4	OFF / ON	Up mode
	OFF / ON	Down mode

●Counter/Timer selection

SW1		Function
10	OFF / ON	Timer
	OFF / ON	Counter

●Reset function of front panel(ON/OFF)

SW1		Function
8	OFF / ON	Disable the front panel reset function
	OFF / ON	Enable the front panel reset function

●Max. counting speed

SW1	CP1, CP2
5 6 OFF / ON	1cps
5 6 OFF / ON	30cps
5 6 OFF / ON	2kcps
5 6 OFF / ON	5kcps

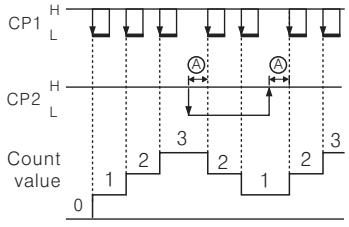
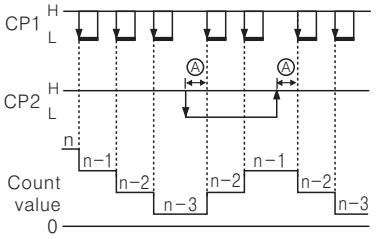
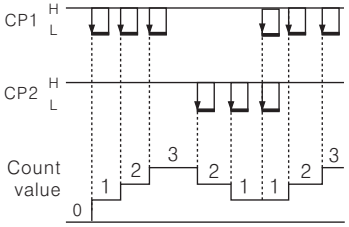
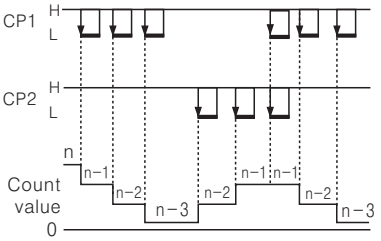
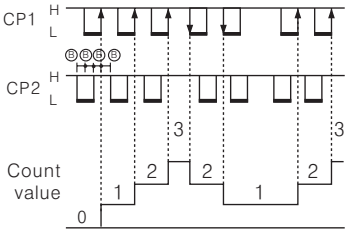
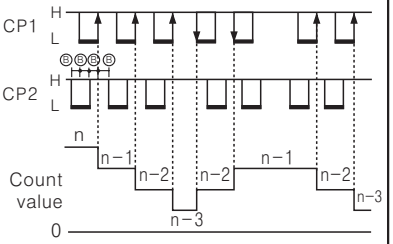
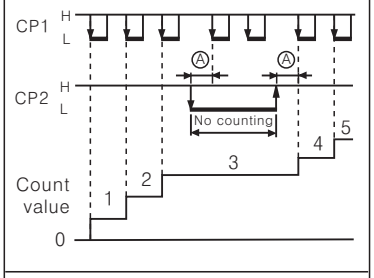
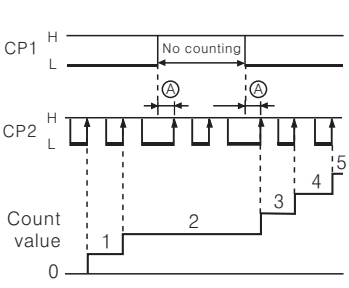
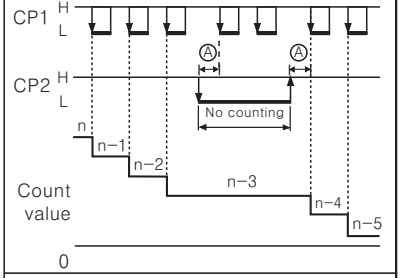
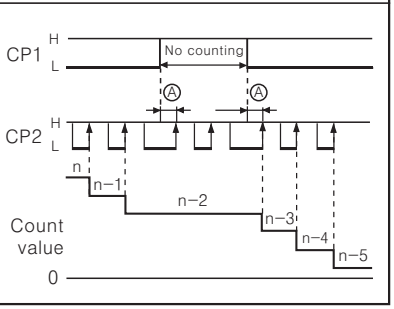
●Memory protection(ON/OFF)

SW1		Function
9	OFF / ON	Enable the memory protection
	OFF / ON	Disable the memory protection

▣Time setting mode(Timer)

SW1	4Digit	6Digit	SW1	4Digit	6Digit
A (1 2 3 OFF / ON)	**99.99sec**	**99999.9sec**	E (1 2 3 OFF / ON)	**999.9min**	**99999.9min**
B (1 2 3 OFF / ON)	**999.9sec**	**999999sec**	F (1 2 3 OFF / ON)	**99hour 59min**	**99hour 59min 59sec**
C (1 2 3 OFF / ON)	**9999sec**	**99min 59.99sec**	G (1 2 3 OFF / ON)	**999.9hour**	**9999hour 59min**
D (1 2 3 OFF / ON)	**99min 59sec**	**999min 59.9sec**	H (1 2 3 OFF / ON)	**9999hour**	**99999.9hour**

▣Input mode(Counter)

Input mode	SW1	Up mode	Input mode	SW1	Down mode
Up/Down−A (Command input)	2 3 OFF ON		Up/Down−D (Command input)	2 3 OFF ON	
Up/Down−B (Individual input)	2 3 OFF ON		Up/Down−E (Individual input)	2 3 OFF ON	
Up/Down−C (Phase difference input)	2 3 OFF ON		Up/Down−F (Phase difference input)	2 3 OFF ON	
UP (Count up input)	2 3 OFF ON	 	Down (Count down input)	2 3 OFF ON	 

※Ⓐ : Over Min. signal width, Ⓑ: Over 1/2 of Min. signal width.
If the signal width of Ⓐ or Ⓑ is less than min. signal width, ±1 of count error is occured.
※n : + Max.display value(FX4Y−I : 9999, FX6Y−I : 999999)

▣Proper usage

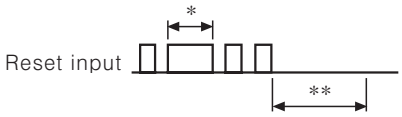
◎Reset

●Reset

When selecting a reset input/output mode, please apply the external reset or manual reset signal.
If it is not reset, it is operated as the prior mode.

●Reset signal width

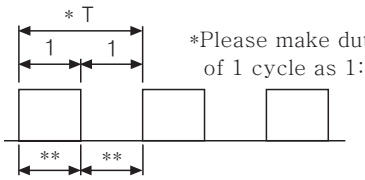
It is reset perfectly when the reset signal is applied for **max. 20ms** regardless of the contact input & solid-state input.



*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied for max. 20ms even though a chattering is occured.

**Signal input(CP1, CP2)is possible if there is no reset input for min. 50ms after reset input.

◎Min.signal width

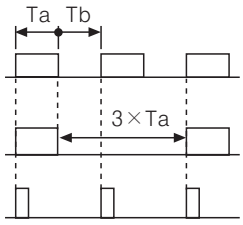


*Please make duty ratio(ON/OFF) of 1 cycle as 1:1.

** Min. signal width [30cps : Over 16.7ms
2kcps : Over 0.25ms

◎Maximum counting speed

This is a response speed per 1 sec. when the duty ratio(ON:OFF) of input signal is 1:1.
If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed will getting slower against input signal. And one of ON width and OFF width is under min.signal width, this product may not response.



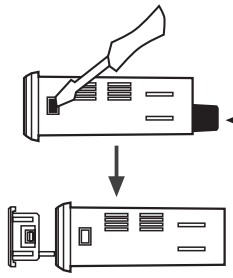
Ta(ON width) and Tb(OFF width) need to be over min. signal width.

When duty ratio is 1:3, the max. counting speed will be 1/2 from the rated spec.

This product does not respond.

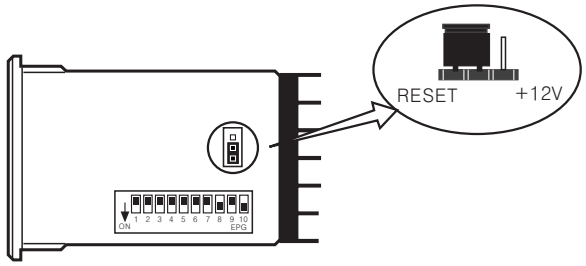
◎Detach the case from body

While pushing the Lock part with with driver to the front, push the terminal block.

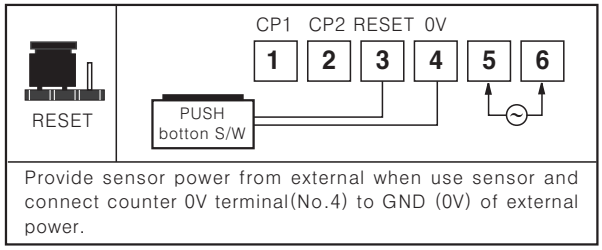


Push the terminal block to front part

◎Using switching pin of Reset / +12V

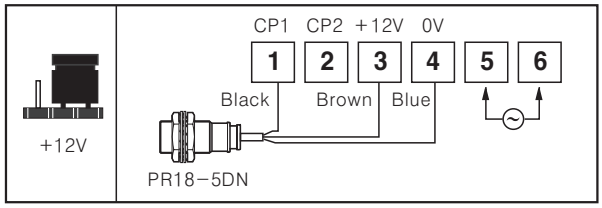


●When using terminal 3 for external reset terminal

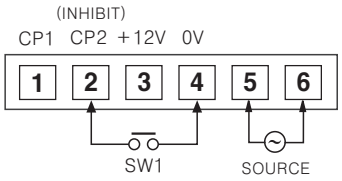


Provide sensor power from external when use sensor and connect counter 0V terminal(No.4) to GND (0V) of external power.

●When using terminal 3 for sensor power terminal



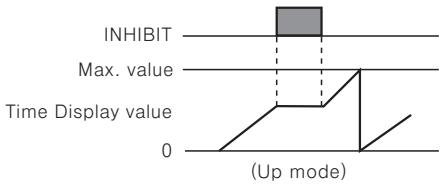
◎INHIBIT[For Timer]



●It becomes the INHIBIT mode when SW1 turns on. (Time Hold)

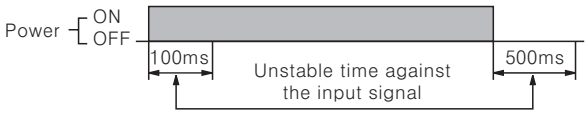
●When power is applied, it starts to progress and INHIBIT mode is used to stop the time is under the progress at the moment.

●When SW1 is OFF, timer starts to progress again.



◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



DIN W48×H48mm, Preset Counter/Timer

▣Features

- ●Upgraded counting speed : 1cps/30cps/2kcps/5kcps
- ●Selectable voltage input(PNP) or No-voltage input(NPN)
- ●Addition of Up/Down input mode
- ●Available to set a decimal point(Fixed decimal point of display)
- ●Wide range of input power supply :
  100-240VAC 50/60Hz, 12-24VAC/DC(Option)
- ●Selectable Counter/Timer by internal DIP switch
- ●Various time range
- ●Built-in Microprocessor

⚠ **Please read "Caution for your safety" in operation manual before using.**

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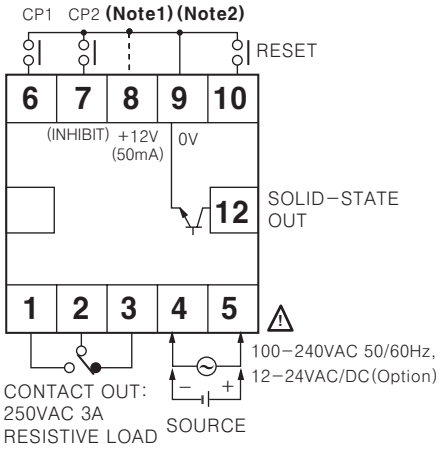
▣Specifications

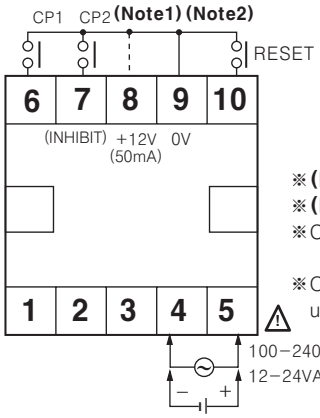
Model	Single preset		FX4S	———
	Dual preset		———	FX5S-I
Digit			4	5
Digit size			W4×H8mm	
Power supply			100-240VAC 50/60Hz, 12-24VAC/DC(Option)	
Allowable voltage range			90 ~ 110% of rated voltage	
Power consumption			• Indication type : Approx. 4.7VA (240VAC 60Hz), Approx. 5.6VA (24VAC 60Hz), Approx. 2.8W(24VDC) • Single preset : Approx. 5.7VA(240VAC 60Hz), Approx. 4.5VA(24VAC 60Hz), Approx. 3W(24VDC)	
Max. counting speed for CP1, CP2			Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. input signal width	INHIBIT input		Approx. 20ms	
	RESET input			
Input	CP1, CP2 input (INHIBIT)		Input logic is selectable [Voltage input] Input impedance : 5.4kΩ "H" level : 5-30VDC, "L" level : 0-2VDC [No-voltage input] Impedance at short-circuit : Max. 1kΩ, Residual voltage at short-circuit : Max. 2VDC, Impedance at open-circuit : Max. 100kΩ	
	RESET input			
One-shot output time			0.05 ~ 5sec	———
Control output	Contact	Type	SPDT(1c)	———
		Capacity	250VAC 3A at resistive load	———
	Solid-state	Type	NPN open collector	———
		Capacity	30VDC Max. 100mA Max.	———
Memory protection			10 years(When using non-volatile semiconductor memory)	
External power			12VDC±10% 50mA Max.	
Dielectric strength			Min. 100MΩ(at 500VDC mega)	
Insulation resistance			2000VAC 50/60Hz for 1 minute	
Noise strength	AC power		±2kV the square wave noise(pulse width:1㎲) by the noise simulator	
	DC power		±500V the square wave noise(pulse width:1㎲) by the noise simulator	
Vibration	Mechanical		0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction		0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical		300m/s² (Approx. 30G) in X, Y, Z directions for 3 times	
	Malfunction		100m/s² (Approx. 10G) in X, Y, Z directions for 3 times	
Relay life cycle	Mechanical		Min. 10,000,000 times	
	Electrical		Min. 100,000 times(250VAC 3A at resistive load)	
Ambient temperature			-10 ~ +55℃(at non-freezing status)	
Storage temperature			-25 ~ +65℃(at non-freezing status)	
Ambient humidity			35 ~ 85%RH	
Unit weight			AC type : Approx. 147g, DC type : Approx. 153g	AC type : Approx. 137g, DC type : Approx. 143g
Approval			c UL us	

▣Connections

●FX4S



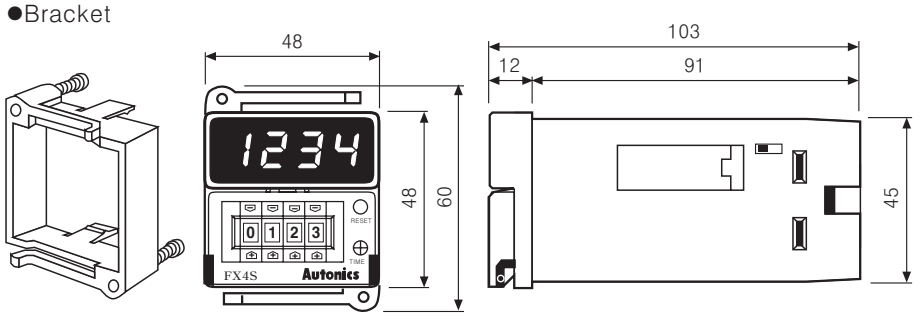
●FX5S-I



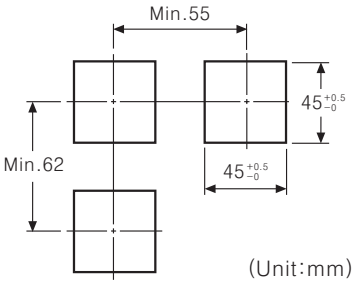
※**(Note1)** : Connection of PNP input
※**(Note2)** : Connection of NPN input
※CP2(INHIBIT): Time Hold terminal when using for timer.
※Operated by a power ON start when it is used as a timer.

▣Dimensions

●Bracket



●Panel cut-out

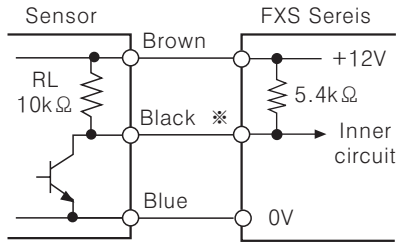


(Unit:mm)

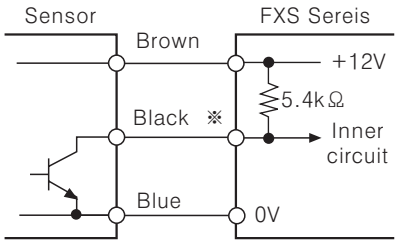
▣Input connections

◎Input logic : No-voltage(NPN) input

●Solid-state input(Standard sensor : NPN output type sensor)

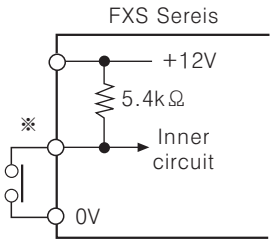


(NPN output)



(NPN open collector output)

●Contact input

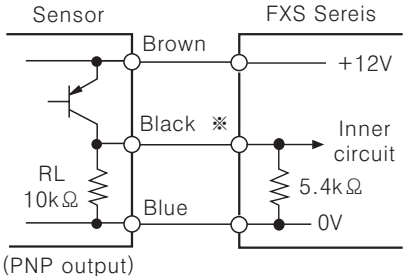


※Please select the counting speed as 30cps when it is used for counter.

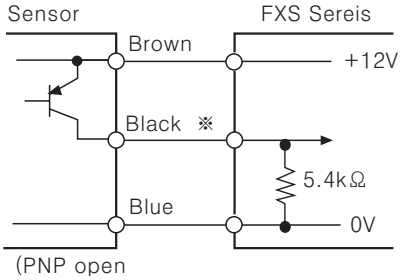
※CP1, CP2(INHIBIT), RESET input

◎Input logic : Voltage(PNP) input

●Solid-state input(Standard sensor : PNP output type sensor)

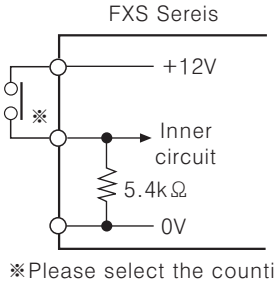


(PNP output)



(PNP open collector output)

●Contact input



※Please select the counting speed as 30cps when it is used for counter.

※CP1, CP2(INHIBIT), RESET input

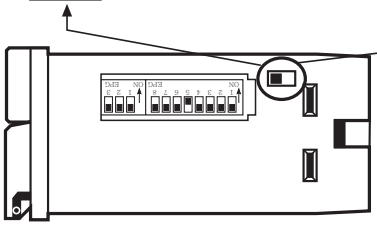
▣Input logic selection

●Select NPN(No-voltage input)

NPN ■ PNP

●Select PNP(Voltage input)

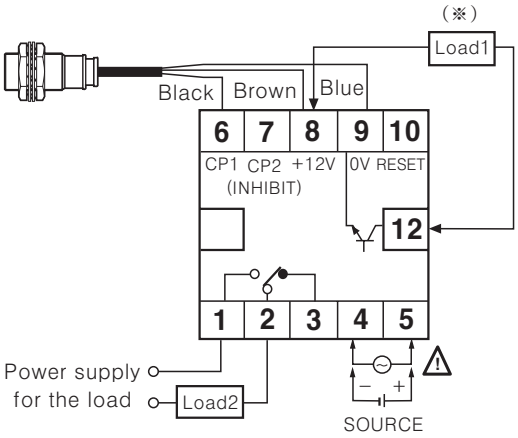
NPN ■ PNP



※Please be sure to turn OFF the power before changing input logic.

▣Input & Output connections

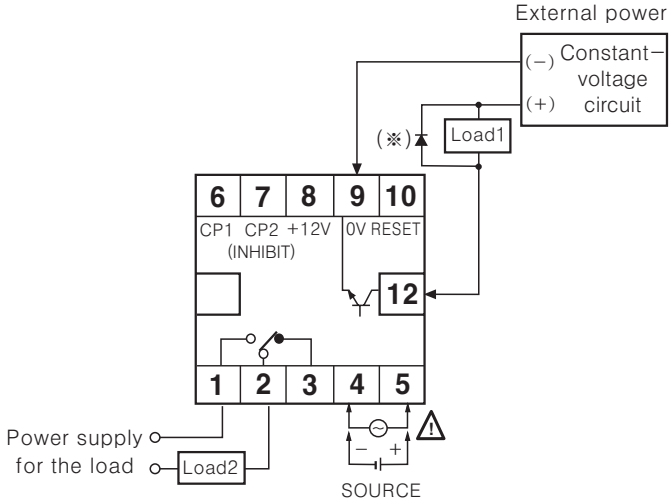
◎In case of operating the load by power supply of the sensor



●(※)Please select proper capacity of load, because total current consumption should not be exceed current capacity. (Max. 50mA)

●Contact capacity : Max. 250VAC 3A

◎In case of operating the load by external power supply



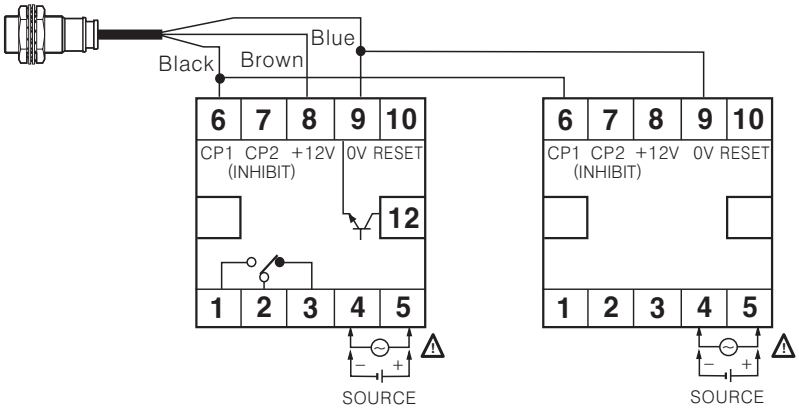
●The capacity of Load1 must not be exceed Max. 30VDC, Max. 100mA of the switching capacity of the transistor.

●Please do not supply the reverse polarity voltage.

●(※)Please connect the surge absorber(Diode) at both terminals of Load1, in case of using the inductive load. (Relay, etc.)

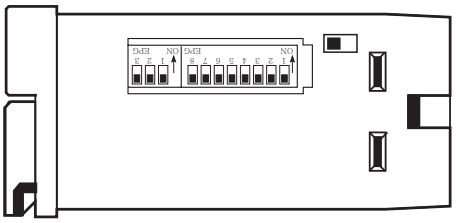
◎Using 2 counters with one sensor

●It is available to use 2 counters with one sensor.
Please connect as the power of sensor is supplied from only one of countes and design input logic with same way.

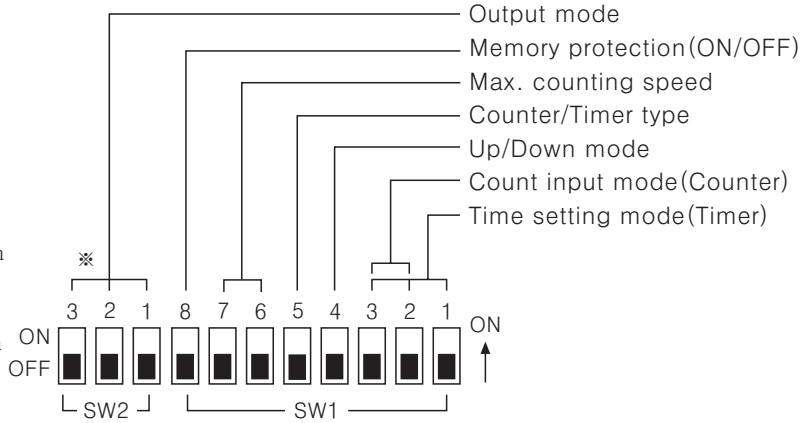


〈 FX4S 〉 〈 FX5S-I 〉

▣Description of inner DIP switches



※Inner selection switch is changed from 10pin to 11pin with upgrade of counting speed.
※There is no output operation mode in indication type(FX5S-I) and SW2 selection switch.



●Up/Down mode

SW1		Function
4	ON OFF	Down mode
	ON OFF	Up mode

●Counter/Timer

SW1		Function
5	ON OFF	Counter
	ON OFF	Timer

●Memory protection

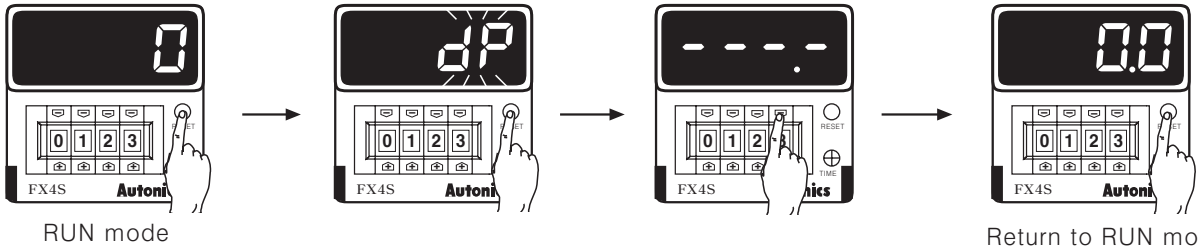
SW1		Function
8	ON OFF	Disable the memory protection
	ON OFF	Enable the memory protection

●Max. counting speed

SW1	CP1, CP2
6 7 ON OFF	1cps
6 7 ON OFF	30cps
6 7 ON OFF	2kcps
6 7 ON OFF	5kcps

▣ Setting function of Decimal point

Dispaly the decimal point.



RUN mode

※If press RESET button for over 3sec. it advanced to decimal point setting mode.

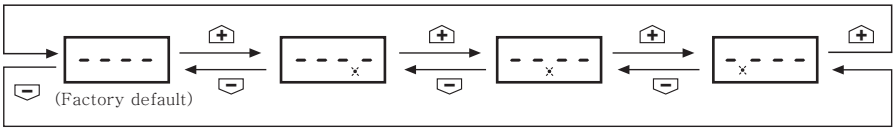
※When "dP" flashes, touch RESET button once.

※Set the position of decimal point using ⊕, ⊖ buttons of digital switch.

Return to RUN mode

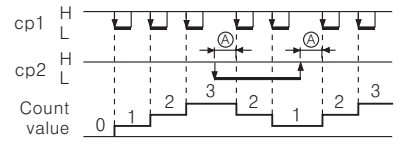
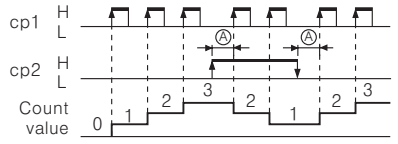
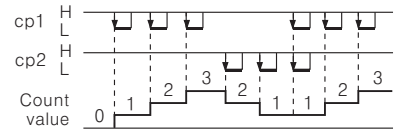
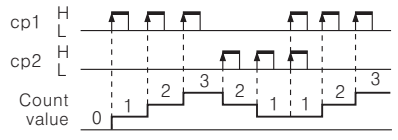
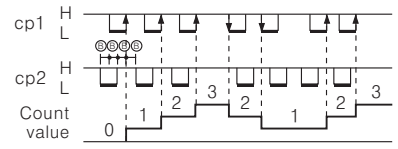
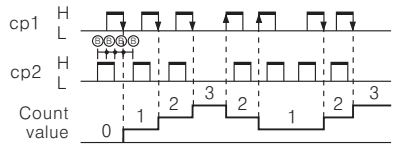
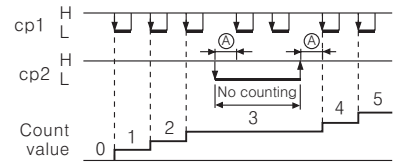
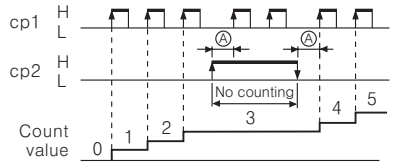
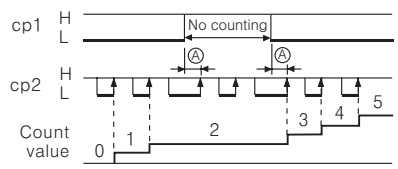
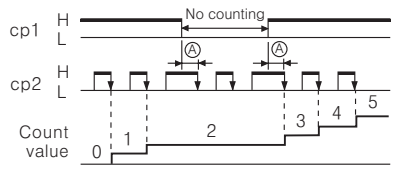
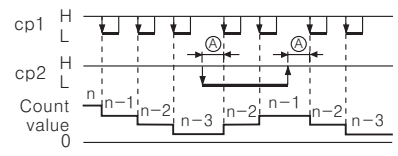
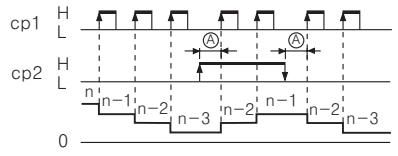
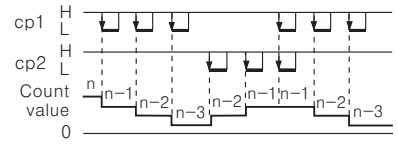
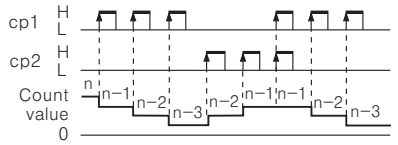
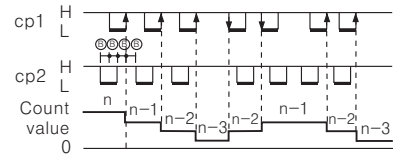
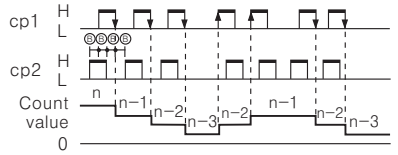
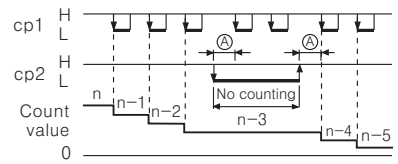
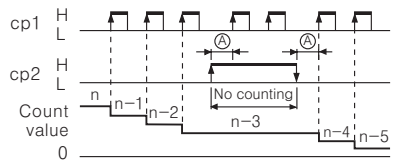
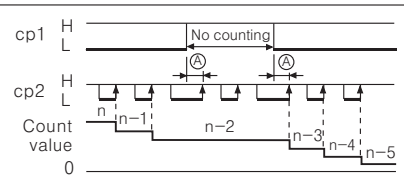
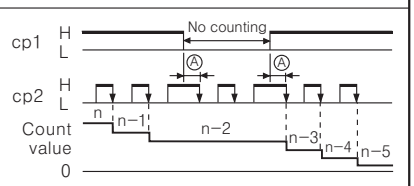
※It returns to RUN mode by press RESET button over 3sec.

●Changing the decimal point



※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point setting status.
※The decimal point setting is not existed in indication type.

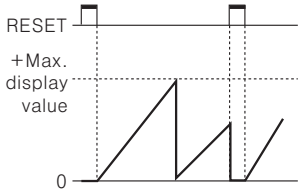
▣Input operation mode(Counter)

Input mode			No-voltage input(NPN)	Voltage input(PNP)
Count up mode	Up/Down-A (Command input)			
	Up/Down-B (Individual input)			
	Up/Down-C (Phase difference input)			
	Up (Count up input)			
				
Count down mode	Up/Down-D (Command input)			
	Up/Down-E (Individual input)			
	Up/Down-F (Phase difference input)			
	Down (Count down input)			
				

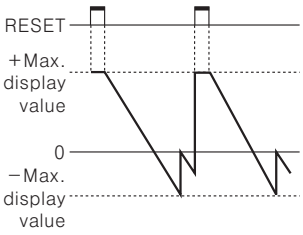
*Ⓐ : Over Min. signal width, Ⓑ: Over 1/2 of Min. signal width.
If the signal width of Ⓐ or Ⓑ is less than Min. signal width, ±1 of count error is occured.

▣Counting operation of indication type(Counter)

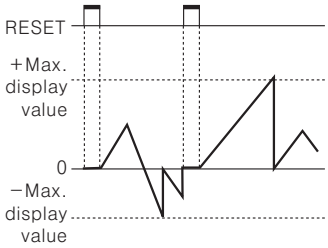
●Up input mode



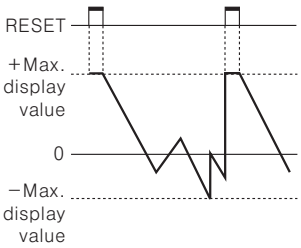
●Down input mode



●Up/Down-A, B, C input mode

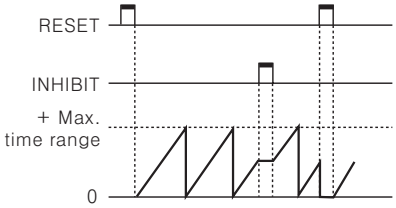


●Up/Down-D, E, F input mode

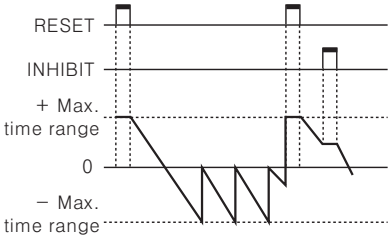


▣Time operation of indication type(Timer)

●Up input mode



●Down input mode

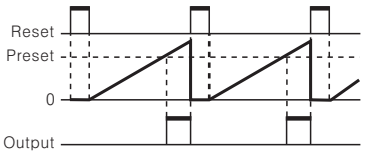
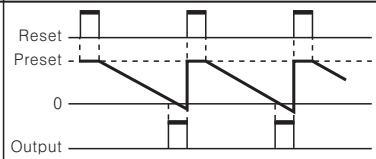
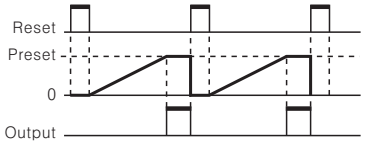
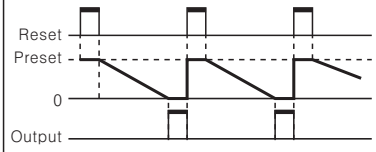
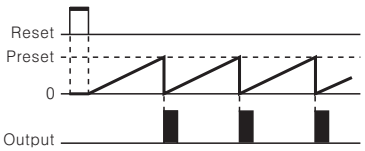
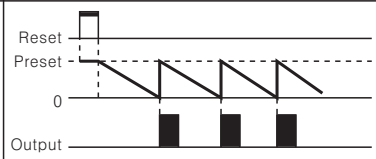
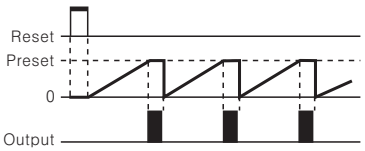
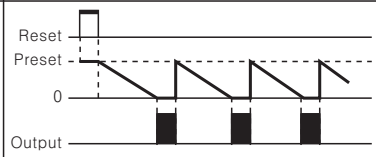
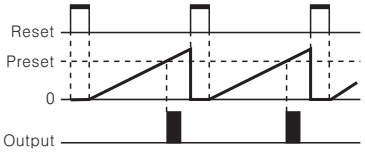
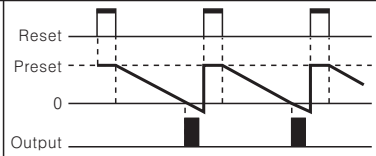
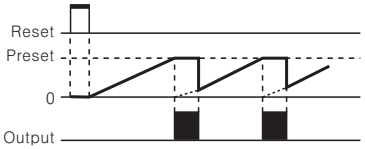
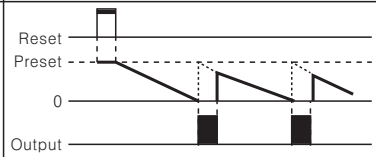
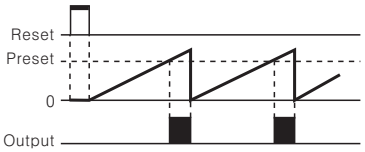
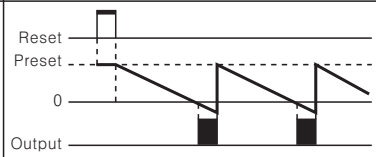
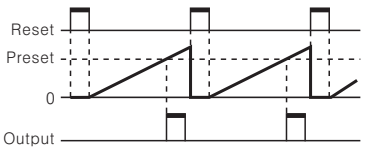
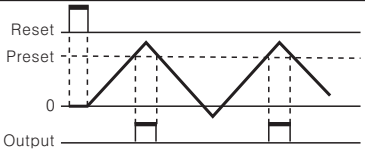
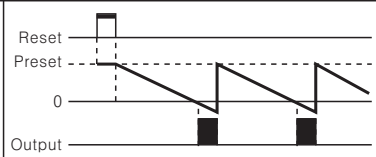
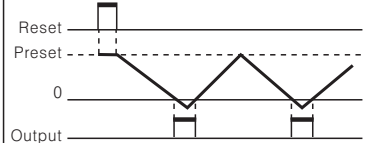
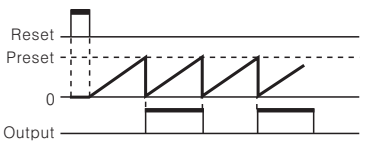
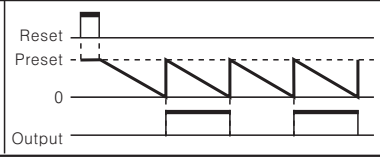


▣Time setting mode(Timer)

SW1	4Digit	5Digit
1 2 3 ON OFF	99.99sec	9999.9sec
1 2 3 ON OFF	999.9sec	99999sec
1 2 3 ON OFF	9999sec	9min 59.99sec
1 2 3 ON OFF	99min 59sec	99min 59.9sec
1 2 3 ON OFF	999.9min	9999.9min
1 2 3 ON OFF	99hour 59min	9hour 59min 59sec
1 2 3 ON OFF	999.9hour	999hour 59min
1 2 3 ON OFF	9999hour	9999.9hour

▣Output operation mode(by internal DIP switch)

▮ ← One-shot output **(0.05~5sec)** ▯ ← Retained output

Output mode (SW1)	ON 4 OFF **Up mode**	ON 4 OFF **Down mode**	Operation after count up
	Up / Down-A, B, C	**Up / Down-D, E, F**	
F 8 9 10 ON OFF			The display value continues until reset signal is applied then output is held. • Retained output will be maintained until Reset signal is applied.
N 8 9 10 ON OFF			Display value and retained output are maintained until Reset signal is applied.
C 8 9 10 ON OFF			The display value returns to reset start status as soon as display value is reached to preset value.
R 8 9 10 ON OFF			The display value is held until output is OFF then returns to reset start status.
K 8 9 10 ON OFF			The display value continues until reset signal is applied.
P 8 9 10 ON OFF			The display value is held during one-shot output time, counting process is returned to reset start status as soon as output is ON.
Q 8 9 10 ON OFF			The display value continues during one-shot output time.
S Counter 8 9 10 ON OFF	**Up input**  **Up / Down-A, B, C** 	**Down input**  **Up / Down-D, E, F** 	• Up, UP/Down-A, B, C input mode -Output is ON when (Display value) ≥ (Preset value) • Down, UP/Down-D, E, F input mode -Output is ON when (Display value) ≤ (Zero)
S Timer 8 9 10 ON OFF			The output turns ON after the setting time and then turns OFF after the setting time. This operation is repeated sequentially.(Flashing)

※One-shot output time is set by front TIME adjuster.

▣Proper usage

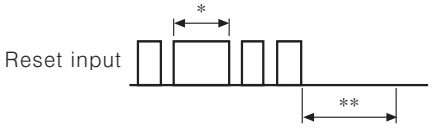
◎Reset function

●Reset

In case of changing the input mode after supplying the power, please take external reset or manual reset. **If reset is not executed, the counter will be working as previous mode**.

●Reset signal width

It is reset perfectly when the reset signal is applied during **max. 20ms** regardless of the contact input & solid-state input.



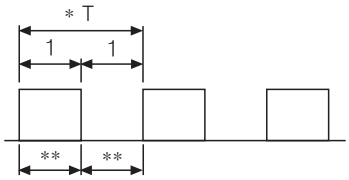
*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during max. 20ms even though a chattering is occurred.

**It can be input the signal of CP1, CP2 after max. 50ms from closing time of reset signal.

◎Sensor power

The power 12VDC which is provided to sensor is built in it. Please use it under Max. 50mADC.

◎Min.signal width of CP1, CP2 input



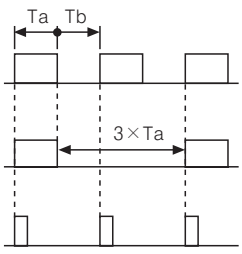
*Please make duty ratio(ON/OFF) 1:1

** Min. signal width
- 1cps : Min. 500ms
- 30cps : Min. 16.7ms
- 2kcps : Min. 0.25ms
- 5kcps : Min. 0.1ms

◎Max. counting speed

This is a response speed per 1 sec. when the duty ratio(ON:OFF) of input signal is 1:1.

If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed will getting slower against input signal. And one of ON width and OFF width is under min.signal width, this product may not respond.

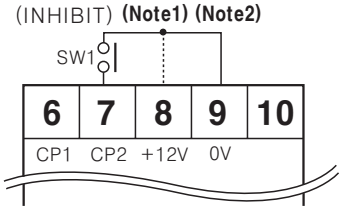


Width of Ta(ON)and Tb(OFF) must be larger than Min. signal width.

Max. counting speed is 1/2 value of catalog spec. when duty ratio is 1:3.

It can not respond because Max. signal width (1a) is small.

◎INHIBIT(When using as Timer)

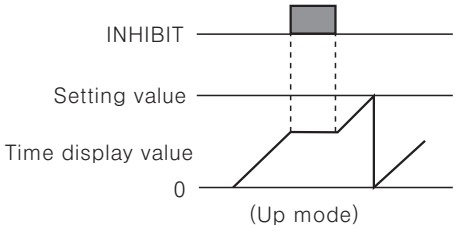


※**(Note1)**:PNP input
(Note2):NPN input

●If SW1 is ON, it becomes INHIBIT. (Time Hold)

●When power is applied, it starts to progress and INHIBIT mode is used to stop the time is under the progress at the moment.

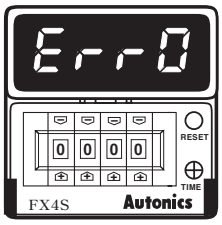
●When SW1 is OFF, timer starts to progress again.



◎Error display

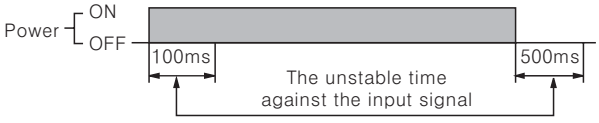
Error signal	Error description	Returning method
Err0	Zero setting status	Change the setting value to non zero status

※When Error is displayed, the output continues OFF state.
※There is no Error function in indicator.

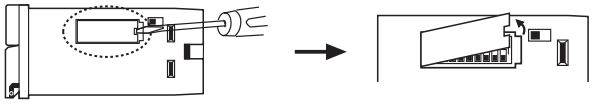


◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



◎Case & DIP switch detachment



Push a lock part to front direction and widen it simultaneously.

※Please be careful of the injury caused by tools.

DIN W72×H72, W48×H96, W144×H72mm Counter/Timer

▣Features

- ●36 input modes and 20 output modes
- ●Counting speed : 1cps/30cps/2kcps/5kcps
- ●Selectable voltage input(PNP) or No voltage input(NPN)
- ●Addition of Up/Down input mode
- ●Wide range of power supply : 100−240VAC 50/60Hz
  12−24VAC/DC (Option)
- ●Selectable Counter/Timer by internal DIP switch
- ●Various time range
- ●Built−in Microprocessor

⚠ **Please read "Caution for your safety" in operation manual before using.**

c UL us

▣Specifications

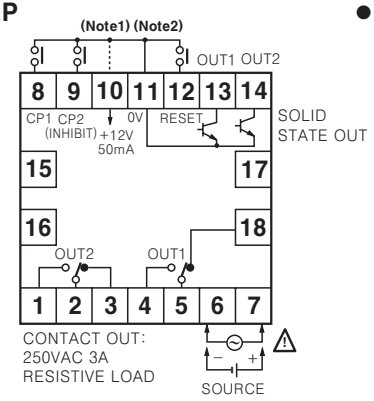
Model	Single preset		**FX4**	**FX6**	**FX4H**	———	———
	Dual preset		**FX4-2P**	**FX6-2P**	**FX4H-2P**	**FX4L-2P**	**FX6L-2P**
	Totalizer(Indicator)		**FX4-I**	**FX6-I**	**FX4H-I**	**FX4L-I**	**FX6L-I**
Digit			**4**	**6**	**4**	**4**	**6**
Digit size			W8×H14mm	W4×H8mm	W6×H10mm	W8×H14mm	
Power supply			100−240VAC 50/60Hz, 12−24VAC/DC (Option)				
Allowable voltage range			90 ~ 110% of rated voltage				
Power consumption			• Indicator : Approx. 6VA(240VAC 60Hz), Approx. 2.7W(24VDC), Approx. 5.8VA(24VAC 60Hz) • Single preset : Approx. 7VA(240VAC 60Hz), Approx. 3.3W(24VDC), Approx. 6.8VA(24VAC 60Hz) • Dual preset: Approx. 8VA(240VAC 60Hz), Approx. 3.8W(24VDC), Approx. 7.6VA(24VAC 60Hz)				
Max. counting speed for CP1, CP2			Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch				
Min. input signal width	RESET input		Approx. 20ms				
	INHIBIT input						
Input	CP1, CP2 input (INHIBIT)		Input logic is selectable [Voltage input] Input impedance : 5.4kΩ, "H" level : 5−30VDC, "L" level : 0−2VDC [No−voltage input] Impedance at short−circuit : Max. 1kΩ, Residual voltage at short−circuit : Max. 2VDC, Impedance at open−circuit : Min. 100kΩ				
	RESET input						
One−shot output time			• Single preset type ☞ 0.05~5sec • Dual preset type ☞ 1st. output 0.5sec fixed, 2st. output : 0.05~5sec				
Control output	Contact	Type	Single preset type : SPDT(1c), Dual preset type : 1st output SPDT(1c), 2nd output SPDT(1c)				
		Capacity	250VAC 3A at resistive load				
	Solid−state	Type	Single preset type : 1 NPN open collector Dual preset type : 1st output 1 NPN open collector, 2nd output 1 NPN open collector				
		Capacity	30VDC Max. 100mA Max.				
Memory protection			10 years(When using non−volatile semiconductor memory)				
External sensor power			12VDC±10% 50mA Max.				
Ambient temperature			−10 ~ +55℃(at non−freezing status)				
Storage temperature			−25 ~ +65℃(at non−freezing status)				
Ambient humidity			35 ~ 85%RH				
Insulation resistance			Min. 100MΩ(at 500VDC mega)				
Dielectric strength			2000VAC 50/60Hz for 1 minute				
Noise strength	AC power		±2kV the square wave noise(pulse width:1㎲) by the noise simulator				
	DC power		±500V the square wave noise(pulse width:1㎲) by the noise simulator				

▣Specifications

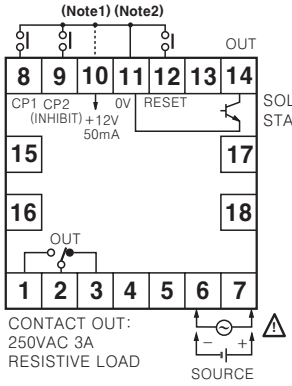
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour				
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes				
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions for 3 times				
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions for 3 times				
Relay life cycle	Mechanical	Min. 10,000,000 operations				
	Electrical	Min. 100,000 operations at 250VAC 2A(resistive load)				
Approval		c UL us				
Unit weight		FX4 : Approx. 295g FX4-2P : Approx. 305g FX4-I : Approx. 260g	FX6 : Approx. 305g FX6-2P : Approx. 315g FX6-I : Approx. 265g	FX4H : Approx. 325g FX4H-2P : Approx. 353g FX4H-I : Approx. 297g	FX4L-2P : Approx. 544g FX4L-I : Approx. 455g	FX6L-2P : Approx. 550g FX6L-I : Approx. 461g

▣Connections

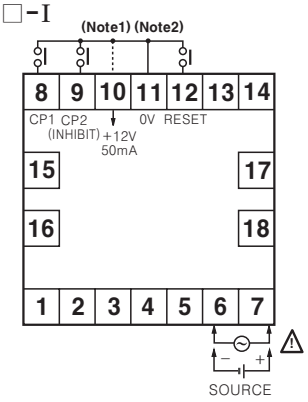
●FX□-2P



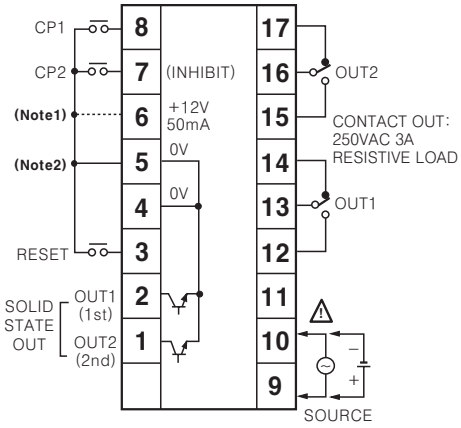
●FX□



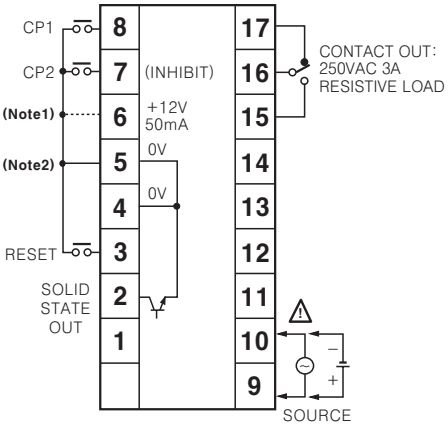
●FX□-I



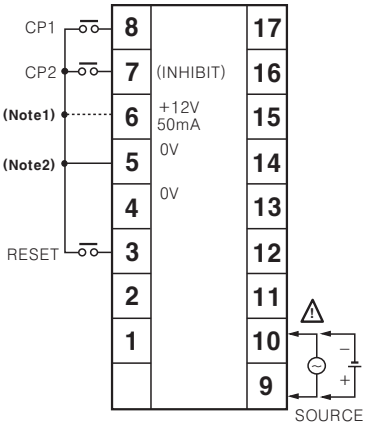
●FX4H-2P



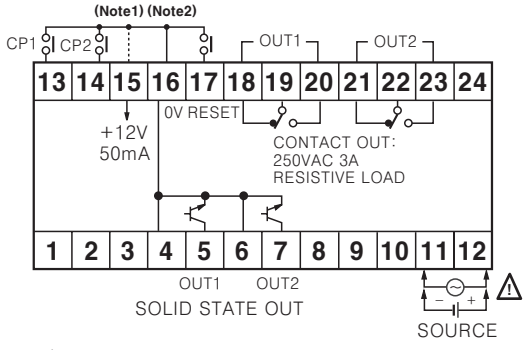
●FX4H



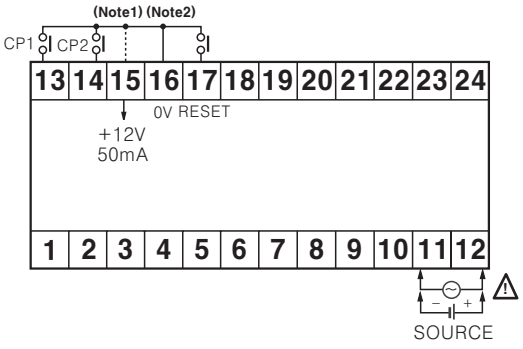
●FX4H-I



●FX□L-2P



●FX□L-I

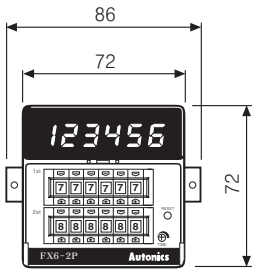


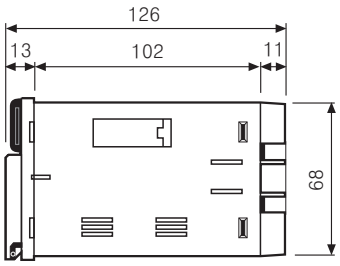
※CP2(INHIBIT) : Time hold terminal when using for timer.
※It is operated by power ON start type when using for timer.

※(Note1) : Connection for PNP input
(Note2) : Connection for NPN input

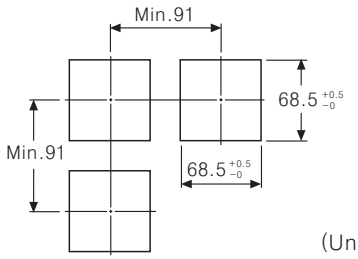
▣Dimensions

●FX Series



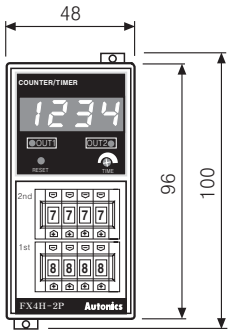


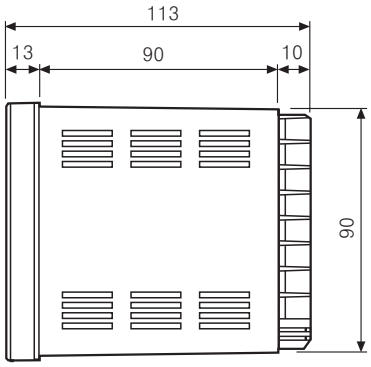
●Panel cut-out



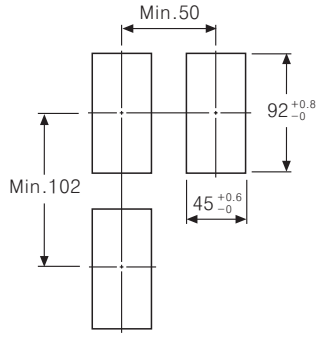
(Unit:mm)

●FXH Series



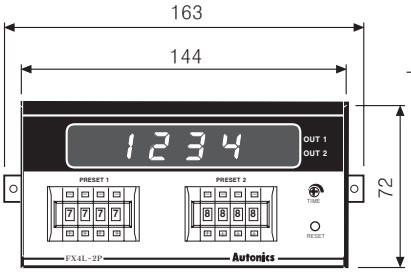


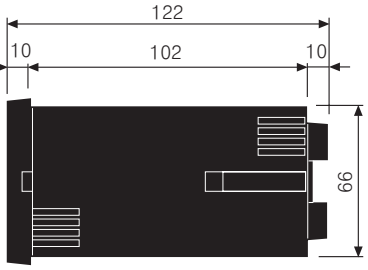
●Panel cut-out



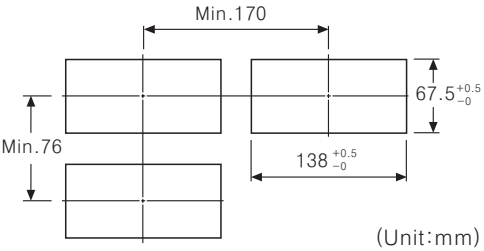
(Unit:mm)

●FXL Series





●Panel cut-out

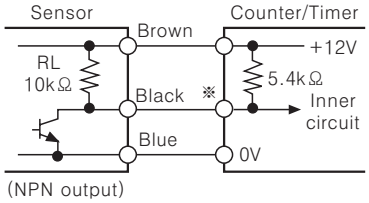


(Unit:mm)

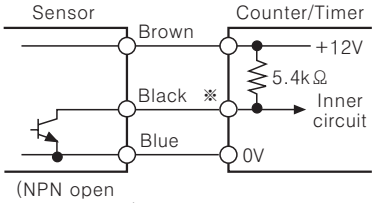
▣Input connections

◎No-voltage input(NPN)

●Solid-state input(Standard input sensor : NPN output type sensor)



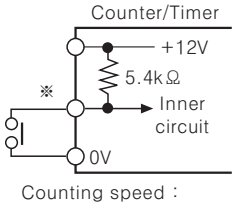
(NPN output)



(NPN open collector output)

※CP1, CP2(INHIBIT), RESET input

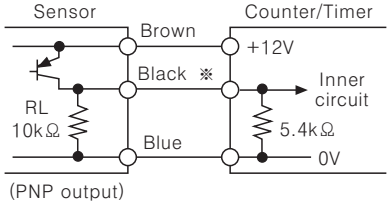
●Contact input



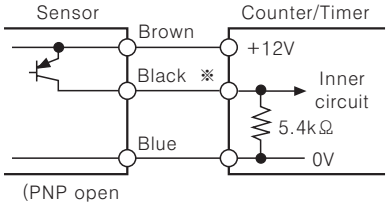
Counting speed :
1 or 30cps setting(Counter)

◎Voltage input(PNP)

●Solid-state input(Standard input sensor : PNP output type sensor)



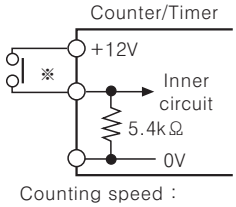
(PNP output)



(PNP open collector output)

※CP1, CP2(INHIBIT), RESET Input

●Contact input



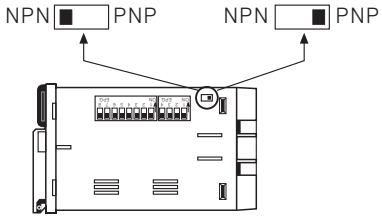
Counting speed :
1 or 30cps setting(Counter)

▣Input logic selection

●FX series

Input logic is changeable by input logic selection switch located at the one-side of case.

• No-voltage input • Voltage input(PNP) (NPN)

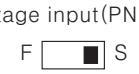


●FXL series

Input logic is changeable by input logic selection switch located at the terminal block.

• No-voltageinpu(NPN)

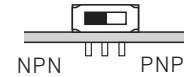
• Voltage input(PNP)



●FXH series

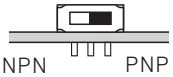
Input logic is changeable by input logic selection switch(SW3) located at inside of the case.

• No-voltage input (NPN)



Direction of front display

• Voltage input (PNP)

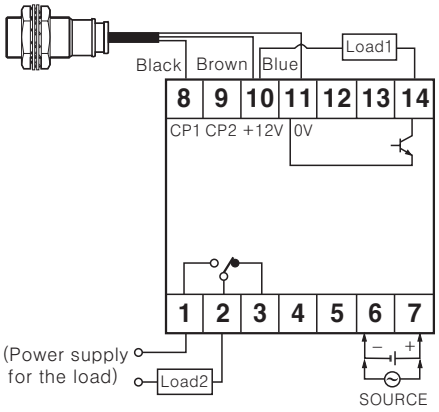


Direction of front display

※**Please be sure to turn power OFF before changing input logic.**

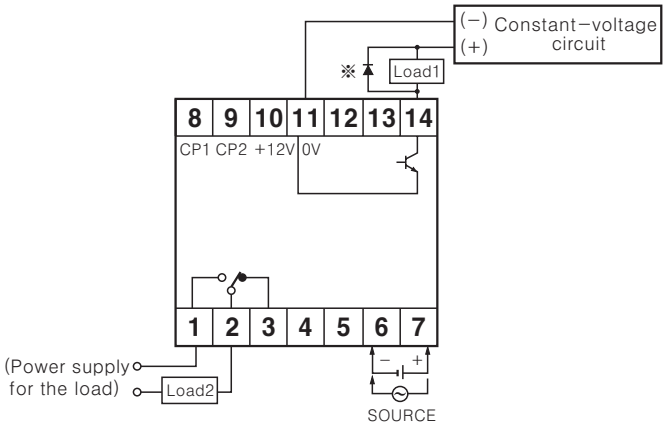
▣Input & output connections

◎In case of operating the load by power supply of the sensor



●Please select proper capacity of load, because total value of load capacity and current consumption should not be exceed current capacity.(Max. 50mA)

◎In case of operating the load by external power supply



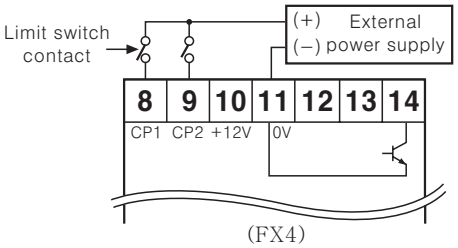
●The capacity of the load must not be exceed max. 30VDC, max. 100mA of the switching capacity of the transistor.

●Please do not supply the reverse polarity voltage.

※Please connector the surge absorber(Diode) at both terminals of the load, in case of using the inductive load. (Relay, etc.)

◎How to count by external power supply

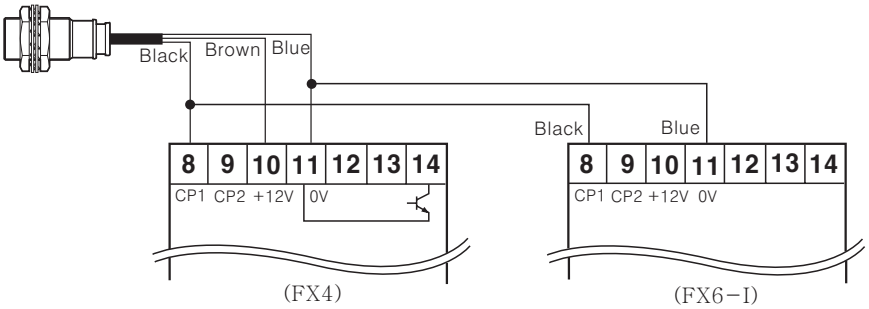
This unit starts to count when "High" level(5-30VDC) is applied at CP1 or CP2 after selecting PNP.



(FX4)

◎Using 2 counters with one sensor

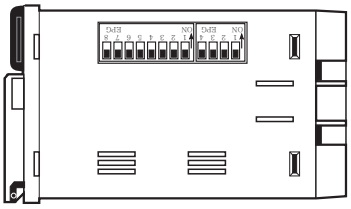
●Please connect as the power of sensor is supplied from only one of counters and design input logic with same way.



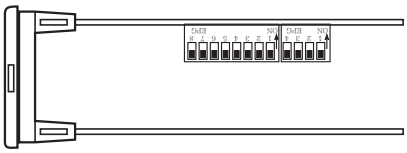
(FX4) (FX6-I)

▣Selection by DIP switches

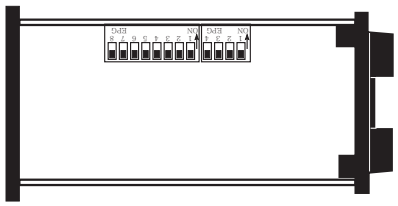
●72×72 DIP switch position

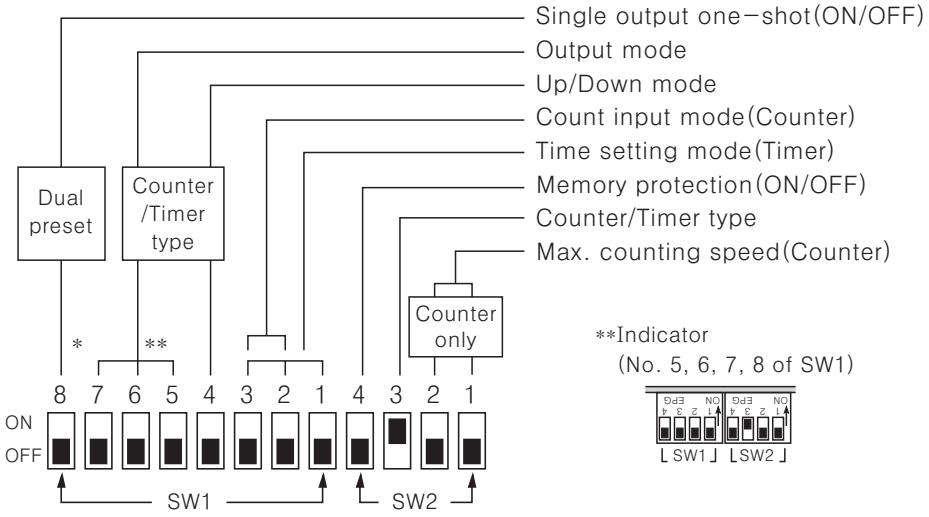


●48×96 DIP switch position



●144×72 DIP switch position





**Indicator
(No. 5, 6, 7, 8 of SW1)

*Single preset
(No. 8 of SW1)

●Max. counting speed

SW2	Functions
1 2 ON OFF	**1cps**
1 2 ON OFF	30cps
1 2 ON OFF	2kcps
1 2 ON OFF	**5kcps**

●Conter/Timer

SW2		Functions
3	ON OFF	Conter
	ON OFF	Timer

●Memory protection

SW2		Functions
4	ON OFF	Disable the memory protection
	ON OFF	Enable the memory protection

●Up/Down mode

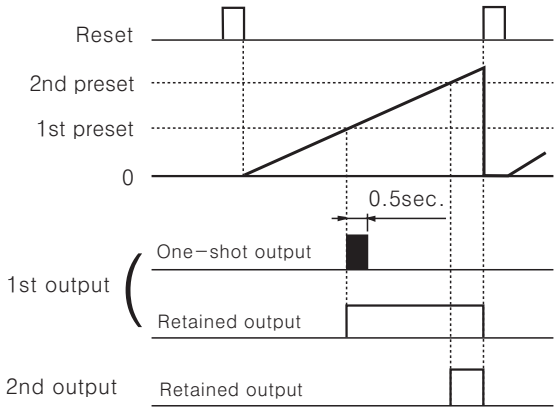
SW1		Functions
4	ON OFF	Down mode
	ON OFF	Up mode

●Selection of one-shot output or Retained output for 1st output.

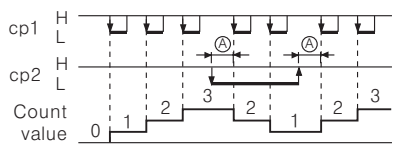
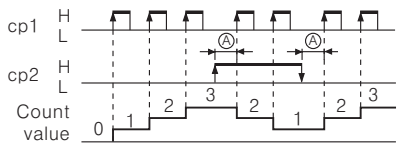
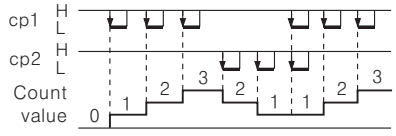
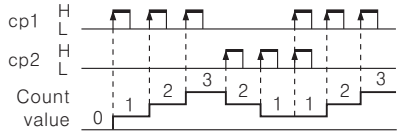
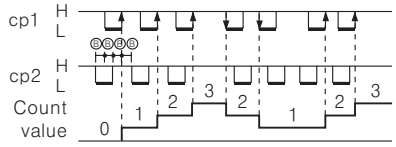
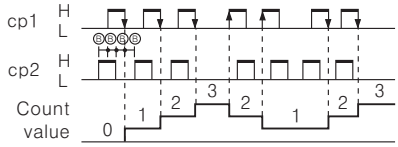
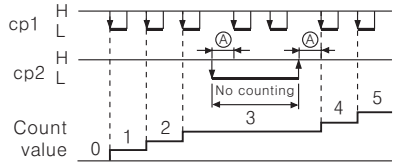
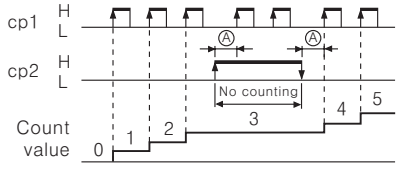
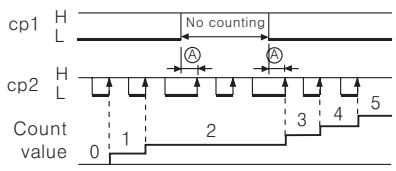
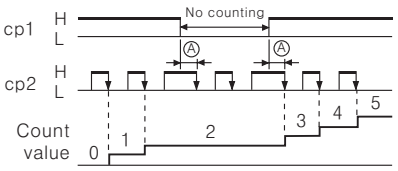
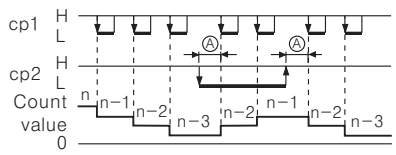
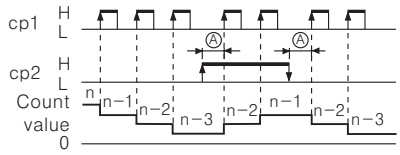
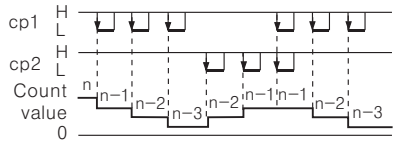
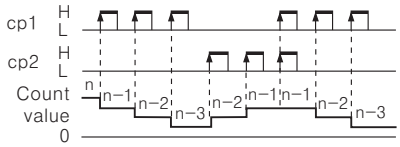
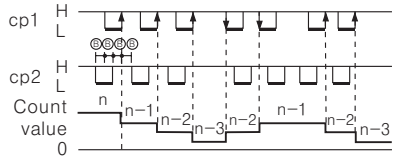
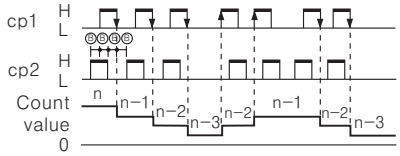
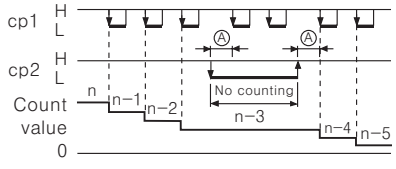
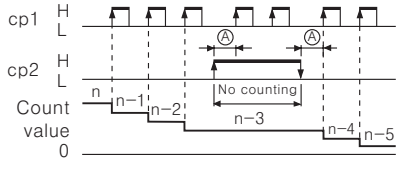
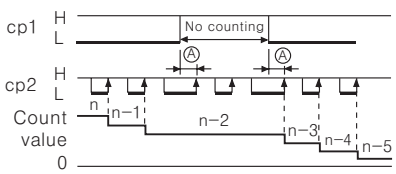
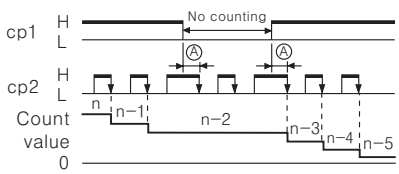
SW1		Function
8	ON OFF	1st output : One-shot output
	ON OFF	1st output : Retained output

※This mode selects a one-shot output(0.5sec fixed) or retained output(Until 2nd output turns off) for 1st output in the dual preset counter.

※Example of F output operation mode



▣Input operation(Counter)

Input mode		SW1	No-voltage input type(NPN)	Voltage input type(PNP)
ON 4 OFF	Up/Down-A (Command input)	ON 2 3 OFF		
	Up/Down-B (Individual input)	ON 2 3 OFF		
Up mode	Up/Down-C (Phase difference input)	ON 2 3 OFF		
	Up (Count up input)	ON 2 3 OFF		
				
ON 4 OFF	Up/Down-D (Command input)	ON 2 3 OFF		
	Up/Down-E (Individual input)	ON 2 3 OFF		
Down mode	Up/Down-F (Phase difference input)	ON 2 3 OFF		
	Down (Count down input)	ON 2 3 OFF		
				

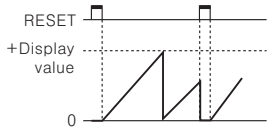
※Ⓐ : Over Min. signal width, Ⓑ : Over 1/2 of Min. signal width.
If the signal width of Ⓐ or Ⓑ is less than Min. signal width, ±1 of count error is occured.

▣Time setting mode(timer)

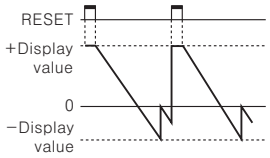
SW1	4Digit	6Digit
A	99.99sec	99999.9sec
B	999.9sec	999999sec
C	9999sec	99min 59.99sec
D	99min 59sec	999min 59.9sec
E	999.9min	99999.9min
F	99hour 59min	99hour 59min 59sec
G	999.9hour	9999hour 59min
H	9999hour	99999.9hour

▣Counting operation of indication type(Counter)

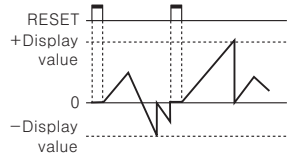
●Up mode



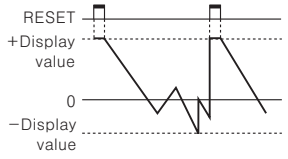
●Down mode



●Up / Down-A, B, C mode

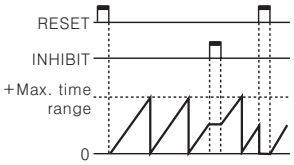


●Up / Down-D, E, F mode

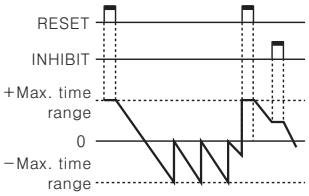


▣Time operation of indication type (Timer)

●Up mode

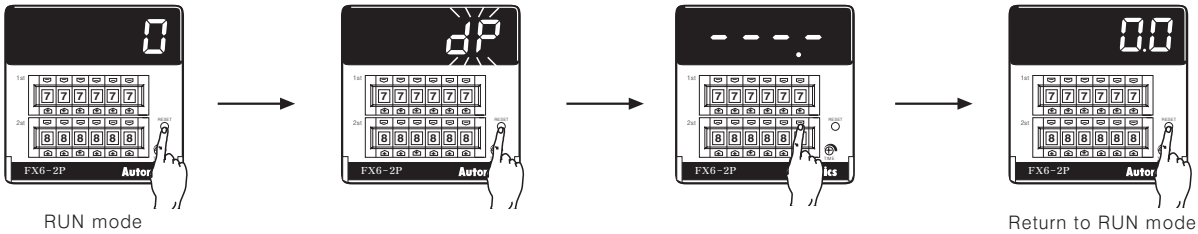


●Down mode



▣Decimal point setting

Display the decimal point.



RUN mode

※Press RESET button for over 3sec., it advances to decimal point setting mode.

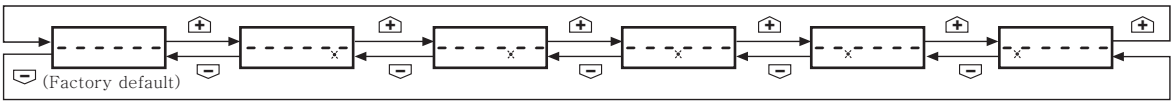
※When "dP" is flashing, one touch the Reset button.

※Set the position of decimal point using ▲, ▼ buttons of digital switch.

Return to RUN mode

※Press RESET button for over 3sec., it returns to RUN mode

●Changing the decimal point



※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point. Setting status.
※The decimal point setting is not existed in indication type.

▣Output operation mode

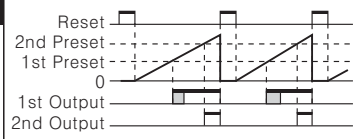
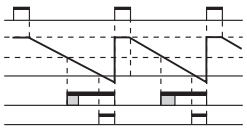
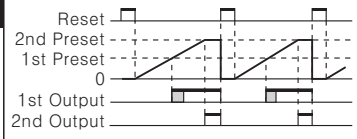
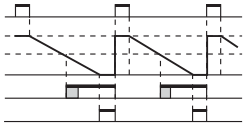
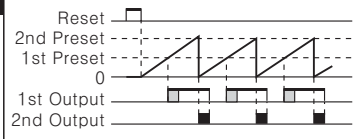
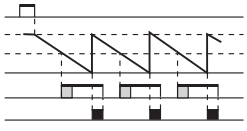
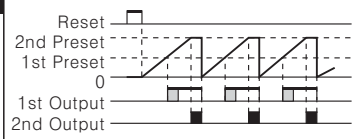
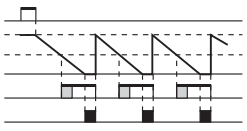
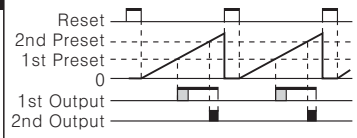
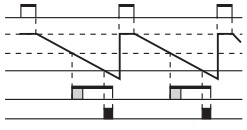
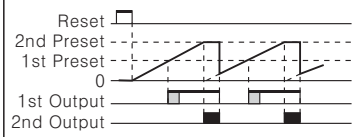
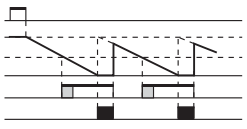
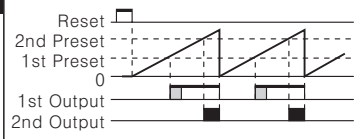
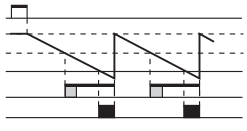
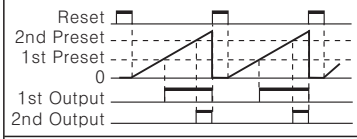
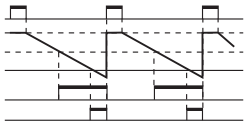
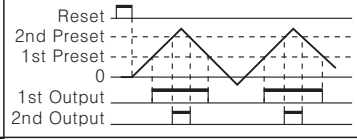
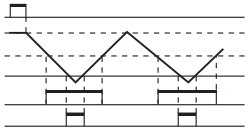
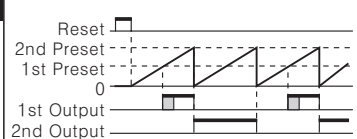
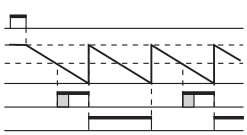
One-shot output **(0.05~5sec)** of 2nd output

Retained output

One-shot output(0.5sec) of 1st output

Retained output

※The output of single preset type is operated at the status of the second output mode

Output mode (SW1)	ON 4 OFF **Up mode**	ON 4 OFF **Down mode**	Operation after count up
	Up, Up / Down-A, B, C	**Down, Up / Down-D, E, F**	
F ON OFF 5 6 7			The display value continues until Reset signal applied and the output is held. • 1st retained output and 2nd output are maintained until Reset signal is applied. • When using 1st output as one-shot output, it will return after operating for 0.5sec.
N ON OFF 5 6 7			The display value and output will be held until Reset input is applied.
C ON OFF 5 6 7			The display value will be Reset Start status as soon as it reaches to 2nd setting value. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
R ON OFF 5 6 7			Display value will be maintained until 2nd output is Off, then it will be reset. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
K ON OFF 5 6 7			The display value continues until Reset signal applied. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
P ON OFF 5 6 7			The display value will be Reset Start status as soon as it reaches to 2nd setting value. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
Q ON OFF 5 6 7			The display continues until 2nd output is OFF. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec. not related to 2nd output.
S Counter ON OFF 5 6 7	**Up** 	**Down** 	• Up, Up/Down-A, B, C input mode -OUT1 is ON when(Display value) ≥ (1st setting value) -OUT2 is ON when(Display value) ≥ (Dual setting value) • Down, Up/Down-D, E, F input mode -OUT1 is ON when(Display value) ≤ (1st setting value) -OUT2 is ON when(Display value) ≤ (Zero)
	Up / Down-A, B, C 	**Up / Down-D, E, F** 	
S Timer ON OFF 5 6 7			When it is used as Timer, 1st output and 2nd output are flashing repeatedly.

※One-shot output time is set by front TIME adjuster.

▣Proper usage

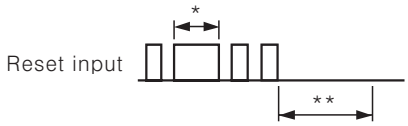
◎Reset

●Reset

In case of changing the input mode after supplying the power, please provide an external reset or manual reset. **If reset is not executed, the counter will be working in previous mode.**

●Reset signal width

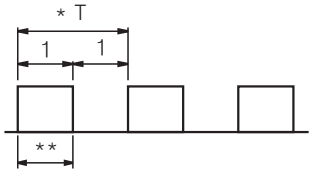
To guarantee proper reset, the signal must be supplied for a minimum of **min. 20ms** regardless the signal comes from a contact or a solid-state input.



*In case of a contact reset, contact chattering will not affect the reset as long as it is applied for a minimum of 20ms.

**Input signal at CP1 & CP2 must be applied for a minimum of 50ms after the reset is removed.

◎Minimum count signal width

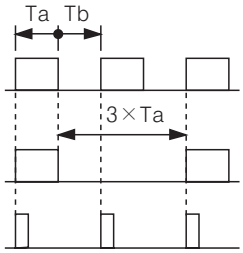


* Please make duty ratio(ON/OFF) as 1:1.

**Minimum signal width ┌ 30cps : Min. 16.7ms
└ 2kcps : Min. 0.25ms

◎Maximum counting speed

This is a response speed per 1 sec. when the duty ratio (ON:OFF) of input signal is 1:1. If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed will getting slower against input signal. If either ON or OFF signal is shorter than minimum signal width, this product may not respond.



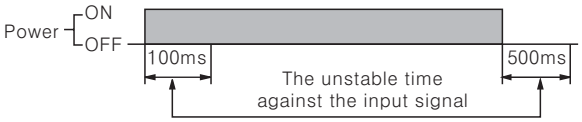
Therefore Ta(ON width) and Tb(OFF width) needed to be over min.signal width.

Max. counting speed is 1/2 value of catalog spec. when duty ratio is 1:3.

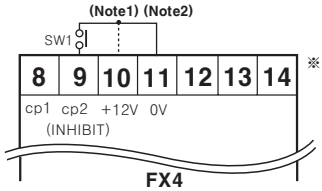
It can not respond because Max. signal width(1a) is small.

◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



◎INHIBIT(Only Timer)

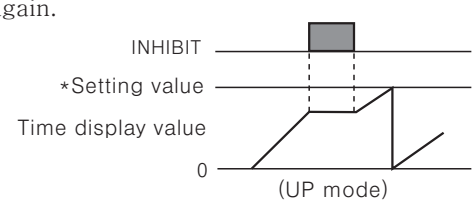


※(Note1):Connection for PNP
(Note2):Connection for NPN

●INHIBIT mode is active when SW1 turns ON. (Time Hold)

●When power is applied, it starts to progress and INHIBIT mode is used to stop the time is under the progress at the moment.

●When SW1 is OFF, timer starts to progress again.

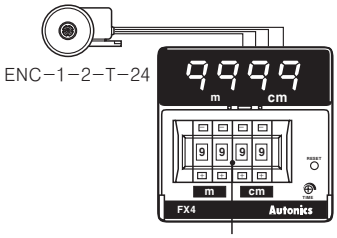


◎How to use the sticker

The below sticker can be found inside the box.

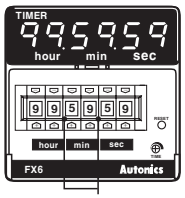
Use the sticker according to application as follow;

Ex1)Measurement of length by the rotary encoder



Please put black dot.

EX2)Timer[F mode]



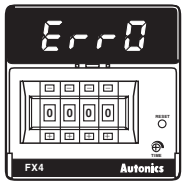
Please put black dot.

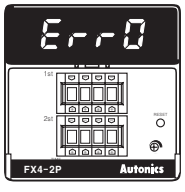
◎Error display

Error signal	Error description	Returning method
Err0	Zero setting status	Change the setting value to non zero status
	When 2nd setting value is smaller than 1st setting value	Make 2nd setting value bigger than 1st setting value

※There is no Error display function in indication type.

※There is no Error function in indicator.



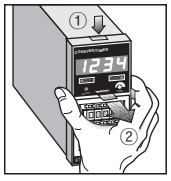


▣Case & DIP switch detachment

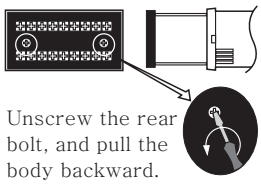
●**FXH Series**

①Push down the front guide.

②Pull out the front guide.



●**FXL Series**



Unscrew the rear bolt, and pull the body backward.

※Please be careful of the injury caused by tools.

DIN W48×H48mm 8Pin plug Counter

▣Features

- ●Upgraded counting speed : 1cps / 30cps / 2kcps / 5kcps
- ●Decimal point setting(Fixed decimal point of display)
- ●Wide range of power supply : 100−240VAC 50/60Hz
  12−24VAC/DC (Option)
- ●Memory protection for 10years(Using non−volatile semiconductor)
- ●Selectable Up/Down for counting value
- ●Built−in Microprocessor

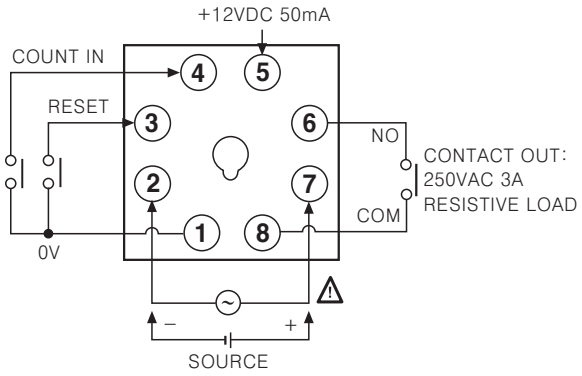
⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Specifications

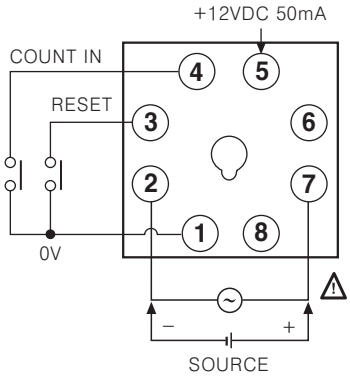
Model	Single preset		**FS4A**	———
	Totalizer(Indicator)		———	**FS5B**
Digit			4	5
Digit size			W4×H8mm	
Power supply			100−240VAC 50/60Hz, 12−24VAC/DC (Option)	
Allowable voltage range			90 ~ 110% of rated voltage	
Power consumption			• Indicator : Approx. 4.7VA(240VAC 60Hz), Approx. 2.8W(24VDC), Approx. 4.5VA(24VAC 60Hz) • Single preset : Approx. 5.7VA(240VAC 60Hz), Approx. 3W(24VDC), Approx. 5.5VA(24VAC 60Hz)	
Max. counting speed for CP1, CP2			Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. input signal width	RESET input		Approx.20ms	
Input	COUNT IN		No−voltage input • Impedance at short−circuit : Max. 470kΩ • Residual voltage at short−circuit : Max. 1VDC • Impedance at open−circuit : Min. 100kΩ	
	RESET			
One−shot output time			0.05 ~ 5sec	
Control output	Contact	Type	SPST(1a)	———
		Capacity	250VAC 3A resistive load	
Memory protection			10 years(When using non−volatile semiconductor memory)	
External power			12VDC ±10% 50mA max.	
Insulation resistance			100MΩ(at 500VDC mega)	
Dielectric strength			2000VAC 50/60Hz for 1 minute	
Noise strength	AC power		±2kV the square wave noise(pulse width:1㎲) by the noise simulator	
	DC power		±500V the square wave noise(pulse width:1㎲) by the noise simulator	
Vibration	Mechanical		0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction		0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical		300m/s² (Approx. 30G) in X, Y, Z directions 3 times	
	Malfunction		100m/s² (Approx. 10G) in X, Y, Z directions 3 times	
Relay life cycle	Mechanical		Min. 10,000,000 times	———
	Electrical		Min. 100,000 times (250VAC 3A at resistive load)	———
Ambient temperature			−10 ~ +55℃(at non−freezing status)	
Storage temperature			−25 ~ +65℃(at non−freezing status)	
Ambient humidity			35 ~ 85%RH	
Unit weight	AC power		Approx. 122g	Approx. 112g
	DC power		Approx. 130g	Approx. 120g

▣Connections

●FS4A

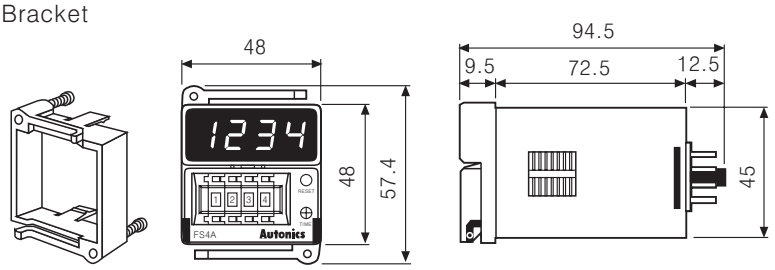


●FS5B

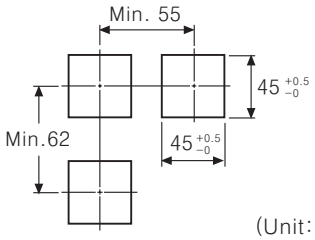


▣Dimensions

●Bracket



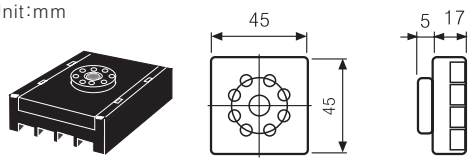
●Panel cut-out

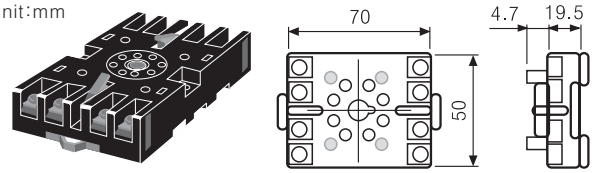


(Unit:mm)

●Socket(Sold separately)

PG-08	PS-08
Unit:mm	Unit:mm

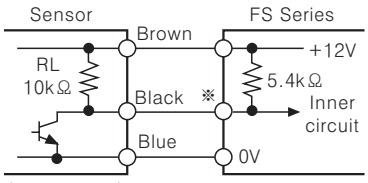




▣Input connections

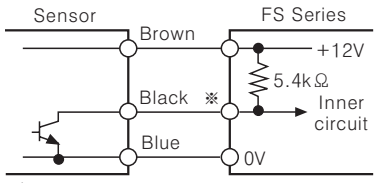
◎No-voltage input(NPN)

●Solid-state input(Standard input sensor : NPN output type sensor)



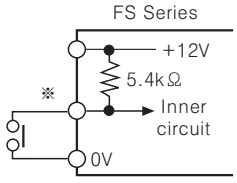
(NPN output)

※CP1, CP2(INHIBIT), RESET input



(NPN open collector output)

●Contact input

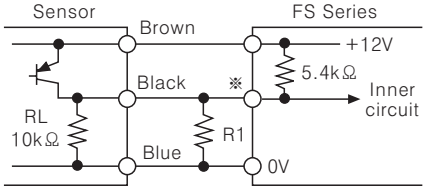


Counting speed :
1 or 30cps setting(Counter)

◎Voltage input(PNP)

FXY series is for no voltage input type, it is not available to count applying DC voltage from the external. For using PNP type sensor, please use as the following to count.

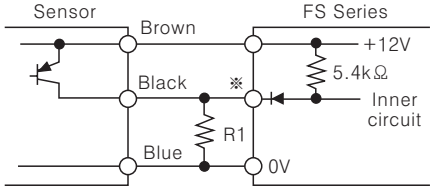
●PNP output sensor



※Please set R1 value to make the composed resistance of RL+R1 as Max. 470Ω is an impedance for short-circuit.

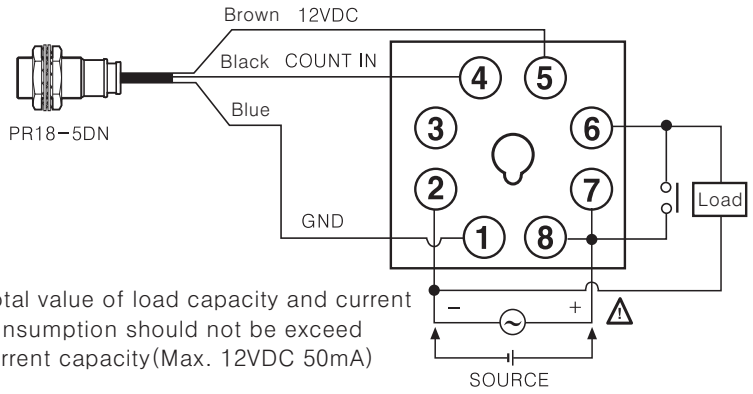
※CP1, CP2(INHIBIT), RESET input

●PNP open collector output type sensor



※In case of PNP open collector output type sensor, please connect lower than 470Ω of R1 to input terminal before using.

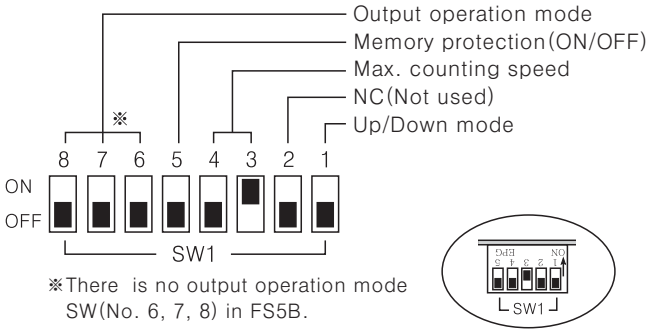
◎Input & output connections



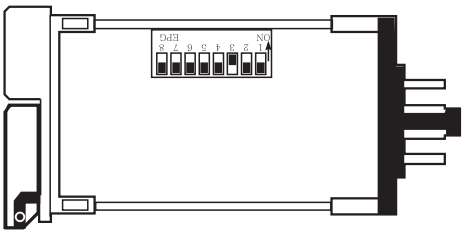
●Please select proper capacity of load not to exceed contact capacity.
Contact capacity : 250VAC 3A Max.
Contact type : 1a

●Total value of load capacity and current consumption should not be exceed current capacity(Max. 12VDC 50mA)

▣ Selection by DIP switches

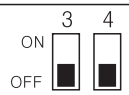
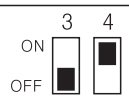
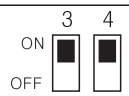


※There is no output operation mode SW(No. 6, 7, 8) in FS5B.



※The max. counting speed is upgraded as 8 DIP SW numbers.

●Max. counting speed

SW1	Function
	**1cps**
	30cps
	2kcps
	**5kcps**

●Up/Down mode

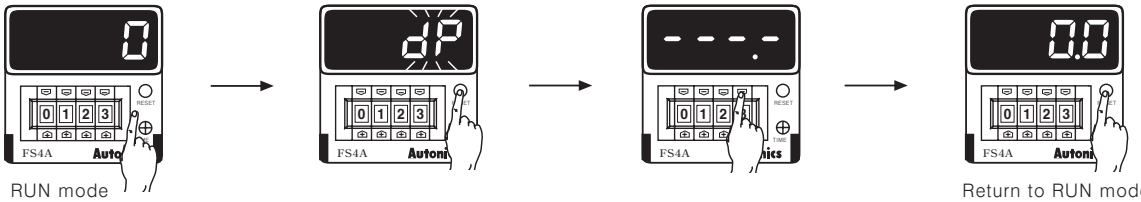
SW1	Function
1 ON / OFF	Down mode
1 ON / OFF	Up mode

●Memory protection

SW1	Function
5 ON / OFF	Disable the memory protection
5 ON / OFF	Enable the memory protection

▣ Decimal point setting

Display the decimal point.



RUN mode

※Press RESET button for over 3sec., it advances to decimal point setting mode.

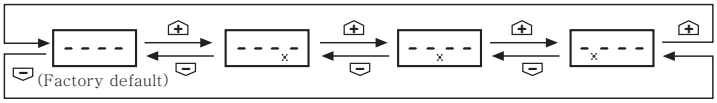
※When "dp" is flashing, one touch the Reset button.

※Set the position of decimal point using ▲, ▼button of digital switch.

Return to RUN mode

※Press RESET button for over 3sec., it returns to RUN mode.

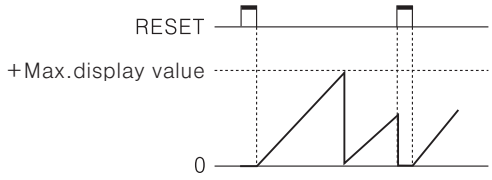
●Changing the decimal point



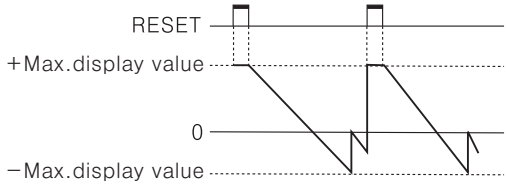
※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point setting status.
※The decimal point setting is existed in indication type.

▣Counting operation of indication mode(Indication model)

●Up mode

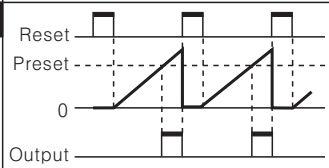
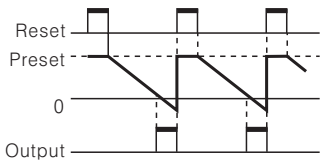
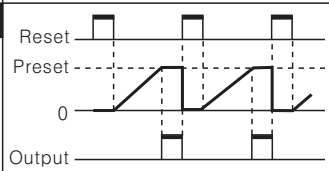
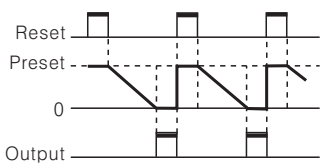
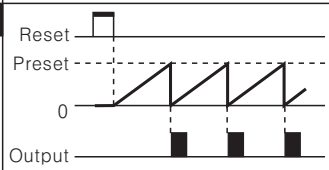
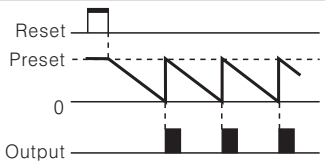
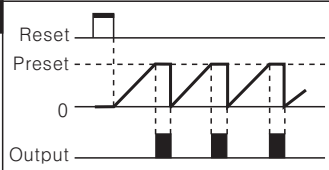
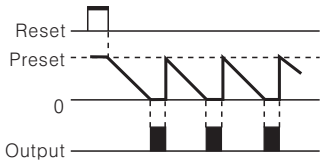
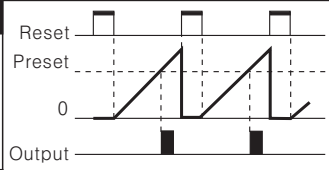
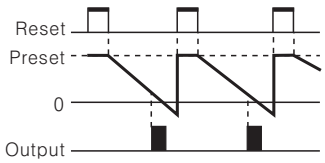
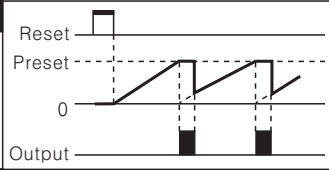
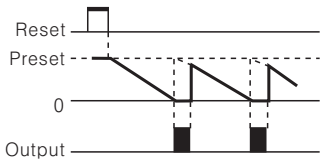
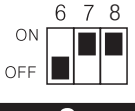
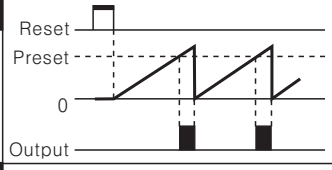
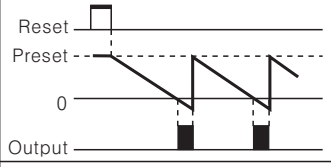
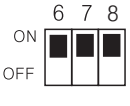
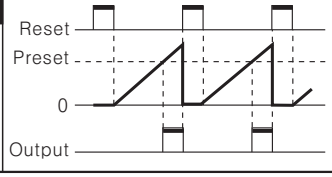
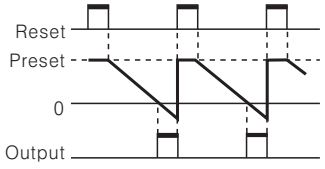


●Down mode



▣Output operation mode

One−shot output **(0.05 ~ 5sec)** ← ⊓ ← Retained output

Output mode (SW1)	4 ON OFF **Up mode**	4 ON OFF **Down mode**	Operation after count up
F 			The display value continues until reset signal is applied then output is held. • Retained output will be maintained until Reset signal is applied.
N 			Display value and retained output are maintained until Reset signal is applied.
C 			The display value returns to reset start status when display value is reached to setting value.
R 			The display value is held until output is OFF then returns to reset start status.
K 			The display value continues until reset signal is applied.
P 			The display value is held during one−shot output time, counting process is returned to reset start status as soon as output is ON.
Q 			The display value continues during one−shot output time.
S 			• Up input mode −Output is ON when (Display value) ≥ (Setting value) • Down input mode −Output is ON when (Display value) ≤ (Zero)

※One−shot output time is set by front TIME adjuster.

▣Proper usage

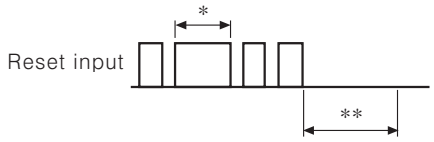
◎Reset function

●Reset

In case of changing the input mode after supplying the power, please take a external reset or manual reset. **If reset is not executed, the counter will be working as previous mode.**

●Reset signal width

It is reset perfectly when the reset signal is applied during **min. 20ms** regardless of the contact input & solid-state input.



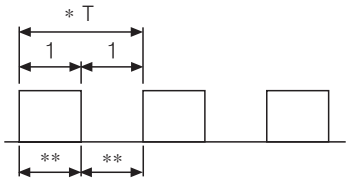
*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during min. 20ms even though chattering is occurred.

**It can be input the signal of CP1&CP2 after min. 50ms from closing time of reset signal.

◎Sensor power

The power 12VDC which is provided to sensor is built in it. Please use it under Max. 50mADC.

◎Min. signal width of CP1, CP2 input



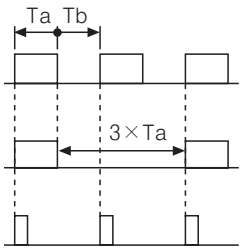
*Please make duty ratio(ON/OFF) 1:1.

** Min. signal width
- 1cps : Max. 0.5sec
- 30cps : Max.16.7ms
- 2kcps : Max. 0.25ms
- 5kcps : Max.0.1ms

◎Max. counting speed

This is a response speed per 1 sec. when the duty ratio (ON:OFF) of input signal is 1:1. If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed is getting slower against input signal.

If either ON or OFF signal is shorter than minimum signal width, this product may not respond.



Therefore Ta(ON width) and Tb(OFF width) needed to be over min.signal width.

Max. counting speed is 1/2 value of catalog spec. when duty ratio is 1:3.

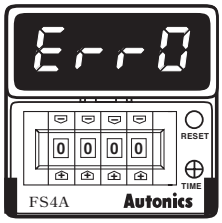
It can not respond because Max. signal width(1a) is little.

◎Error display

Error signal	Error description	Returning method
Err0	Zero setting status	Change the setting value to non zero status

※When Error is displayed, the output continues OFF state.

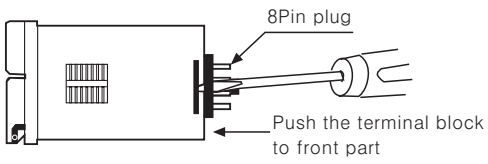
※There is no Error function in indicator.



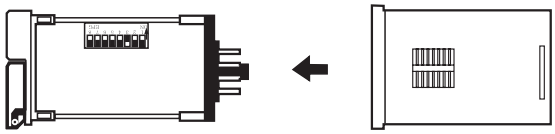
◎Detach the case from body

While pushing the Lock part with with driver to the front, push the terminal block.

1) Widen the lock device toward outside, push the plug to the front.



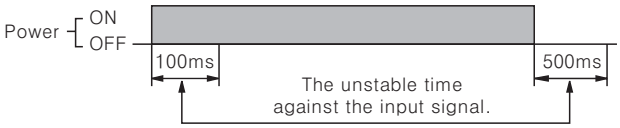
2) Detach the case.



※Please be careful to use with tools, it may cause injury.

◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



DIN W72×H72, W144×H72mm of 8 Digit Up/Down counter

▣Features

- ●8 Digits counter
- ●Selectable Up, Down, Up/Down mode
- ●Counting speed : 1cps, 30cps, 2kcps, 5kcps
- ●Selectable voltage input(PNP) or no-voltage input(NPN)
- ●Decimal point setting(Fixed decimal point of display)
- ●Wide range of power supply : 100-240VAC 50/60Hz
  12-24VAC/DC (Option)
- ●Built-in Microprocessor

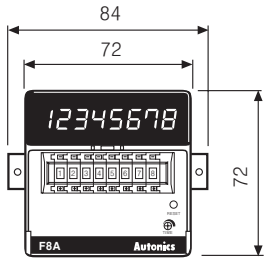
⚠ **Please read "Caution for your safety" in operation manual before using.**

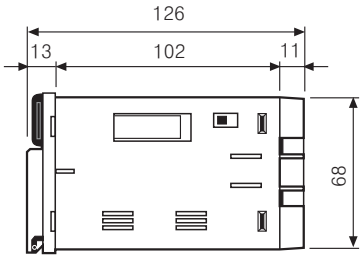
▣Specifications

Model	Single preset		**F8A**	**L8A**
	Totalizer(Indicator)		**F8B**	**L8B**
Digit			8(99999999)	8(99999999)
Digit size			W4×H8mm	W6.3×H10mm
Power supply			100-240VAC 50/60Hz, 12-24VAC/DC(Option)	
Allowable voltage range			90 ~ 110% of rated voltage	
Power consumption			• Single preset : Approx. 6.1VA(240VAC 60Hz), Approx. 3.1W(24VDC), Approx. 6.3VA(24VAC 60Hz) • Indicator : Approx. 5.4VA(240VAC 60Hz), Approx. 2.6W(24VDC), Approx. 5.5VA(24VAC 60Hz)	
Max.counting speed			Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch	
Min. signal width	RESET input		Approx. 20ms	
Input type	CP1, CP2 Input		[Voltage input] Input impedance : 5.4kΩ, "H" level voltage : 5-30VDC, "L" level voltage : 0-2VDC [No-Voltage input] Impedance at short-circuit : Max. 1kΩ, Residual voltage at short-circuit : Max. 2VDC, Impedance at open-circuit : Max. 100kΩ	
	RESET input			
Control output	Con-tact	Type	Single preset : SPDT(1c)	
		Capacity	250VAC 3A resistive load	
	Solid-state	Type	Single preset type : 1 NPN open collector	
		Capacity	30VDC Max. 100mA Max.	
Memory protection			10 years(When using non-volatile semiconductor memory)	
External power			12VDC±10% 50mA Max.	
Ambient temperature			-10 ~ +55℃(at non-freezing status)	
Storage temperature			-25 ~ +65℃(at non-freezing status)	
Ambient humidity			35 ~ 85%RH	
Insulation resistance			100MΩ(at 500VDC mega)	
Dielectric strength			2000VAC 50/60Hz for 1 minute	
Noise strength	AC power		±2kV the square wave noise(pulse width:1㎲) by the noise simulator	
	DC power		±500V the square wave noise(pulse width:1㎲) by the noise simulator	
Vibration	Mechanical		0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour	
	Malfunction		0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	Mechanical		300m/s² (Approx. 30G) in X, Y, Z directions 3 times	
	Malfunction		100m/s² (Approx. 10G) in X, Y, Z directions 3 times	
Relay life cycle	Mechanical		Min. 10,000,000 times	
	Electrical		Min. 100,000 times(250VAC 3A at resistive load)	
Unit weight	AC power		F8A : Approx. 287g, F8B : Approx. 253g	L8A : Approx. 500g, L8B : Approx. 446g
	DC power		F8A : Approx. 283g, F8B : Approx. 253g	L8A : Approx. 498g, L8B : Approx.444g

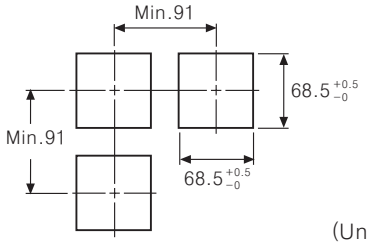
▣Dimensions

●F Series



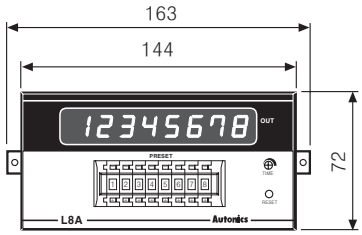


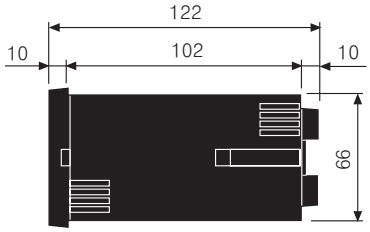
●Panel cut-out



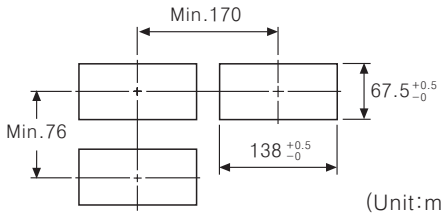
(Unit:mm)

●L Series





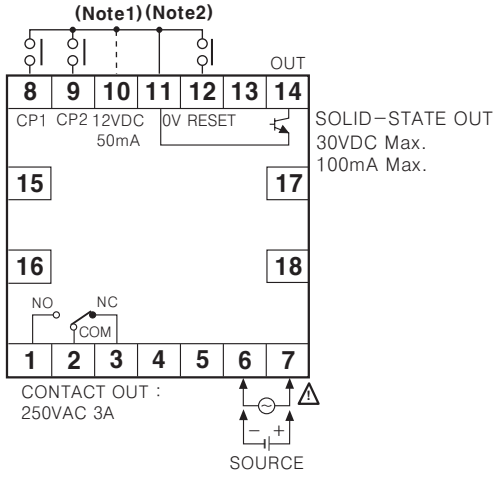
●Panel cut-out



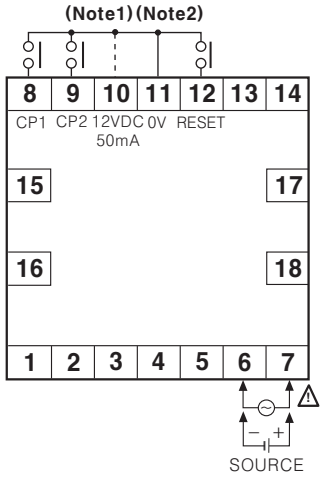
(Unit:mm)

▣Connections

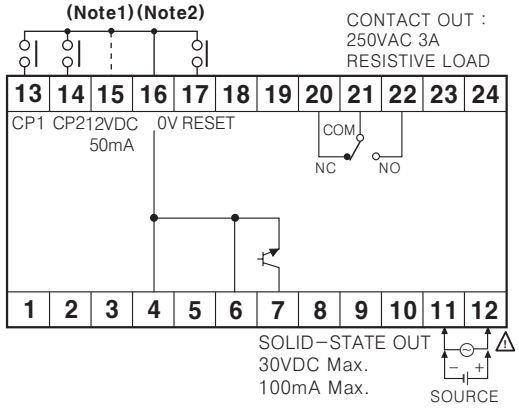
●F8A



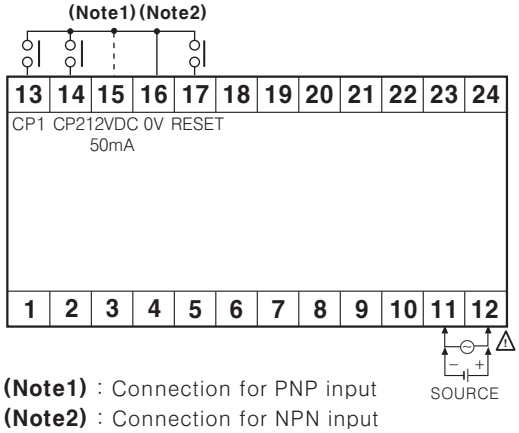
●F8B



●L8A



●L8B



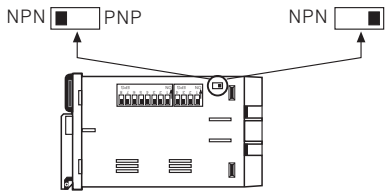
※**(Note1)** : Connection for PNP input
(Note2) : Connection for NPN input

▣Input logic selection

●F Series

Input logic is changeable by input logic selection switch located at the one-side of case.

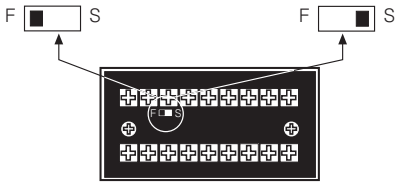
• No voltage input(NPN) • Voltage input(PNP)



●L Series

Input logic is changeable by input logic selection switch located at the terminal block.

• No voltage input(NPN) • Voltage input(PNP)

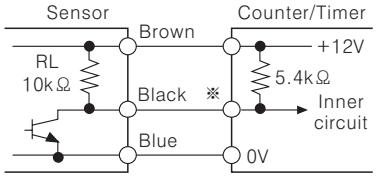


※Please be sure to turn OFF the power before changing input logic.

▣Input connections

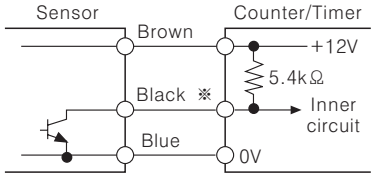
◎No voltage input(NPN)

●Solid-state input(Standard input sensor : NPN output type sensor)



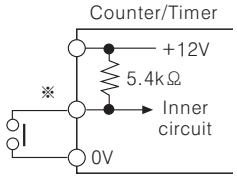
(NPN output)

※CP1, CP2, RESET input



(NPN open collector output)

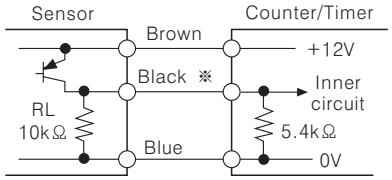
●Contact input



Counting speed : Set as 1 or 30cps

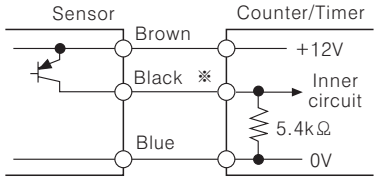
◎Voltage input(PNP)

●Solid-state input(Standard input sensor : PNP output type sensor)



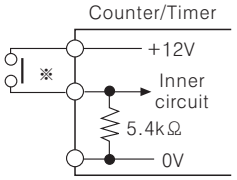
(PNP output)

※CP1, CP2(INHIBIT), RESET input



(PNP open collector output)

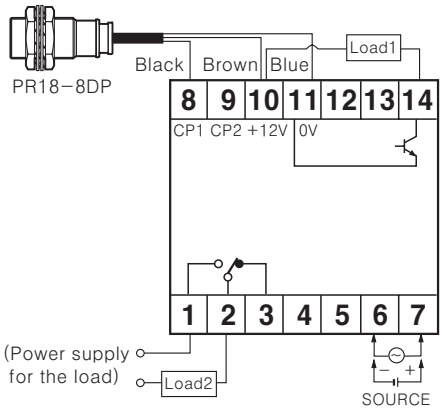
●Contact input



Counting speed : Set as 1 or 30cps

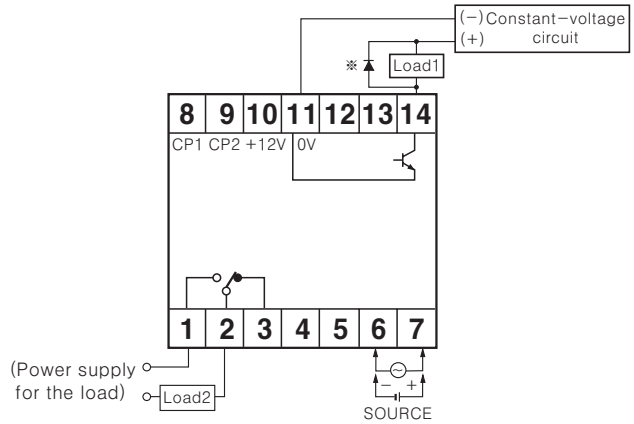
▣Input & output connections

◎In case of operating the load by power supply of the sensor



●Please select proper capacity of load, because total value of load capacity and current consumption should not be exceed current capacity(Max. 50mA).

◎In case of operating the load by external power supply



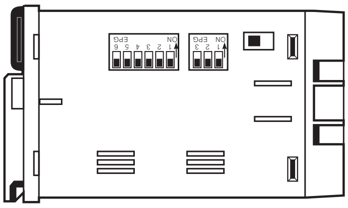
●The capacity of the load must not be exceed Max. 30VDC, Max. 100mA of the switching capacity of the transistor.

●Please do not supply the reverse polarity voltage.

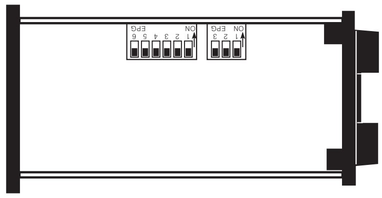
※In case of using the inductive load(Relay, etc.), please connector the surge absorber(Diode)at both terminals of the load, in case of using the inductive load.

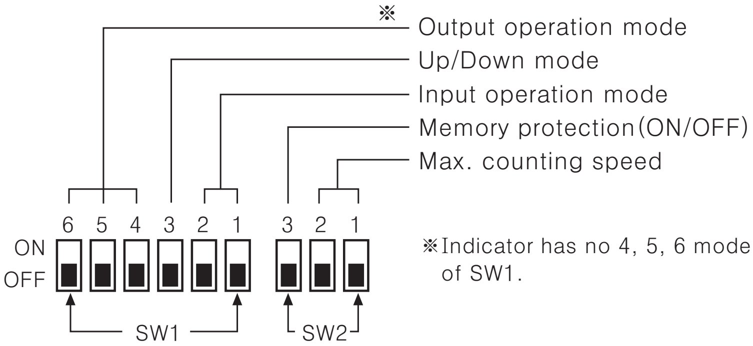
▣Selection by DIP switches

●W72×H72 DIP switch position



●W144×H72 DIP switch position





●Memory protection

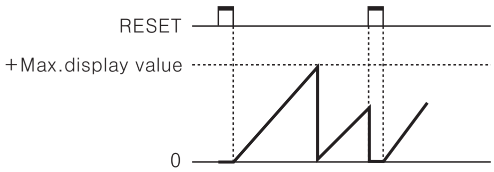
SW2	Function
3 ON OFF	Disable the memory protection
3 ON OFF	Enable the memory protection

●Selecting max. counting speed

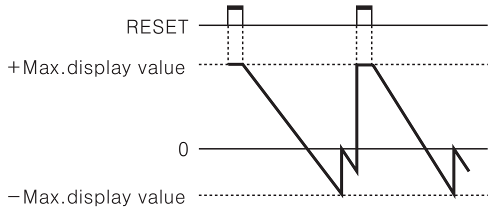
SW2	Max. counting speed
1 2 ON OFF	1cps
1 2 ON OFF	30cps
1 2 ON OFF	2kcps
1 2 ON OFF	5kcps

▣Counting function of indication type

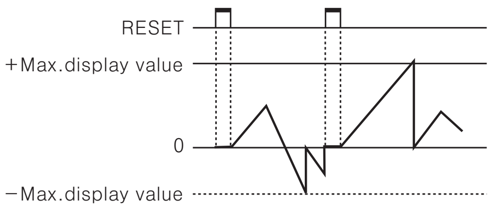
●Up mode



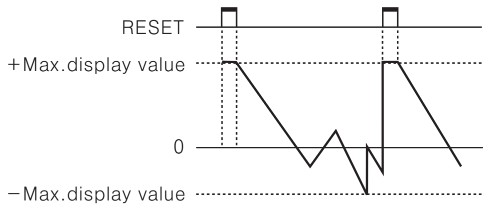
●Down mode



● Up / Down-A, B, C input mode

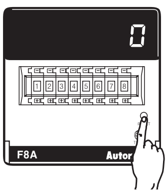


●Up / Down-D, E, F mode



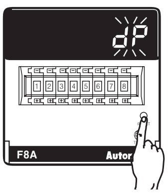
▣Decimal point setting

Dispaly the decimal point.

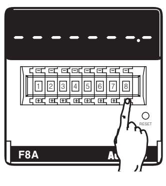


RUN mode

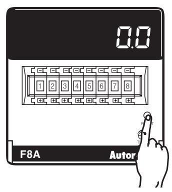
※Press RESET button for over 3sec., it advances to decimal point setting mode.



※When "dp" is flashing, one touch the Reset button.



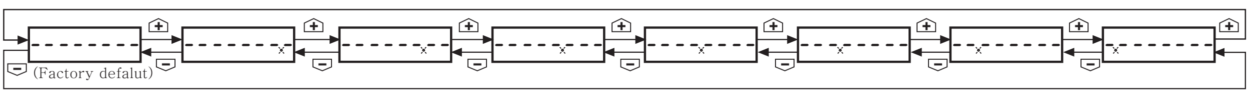
※Set the position of decimal point using ⊕, ⊖ button of digital switch.



Return to RUN mode

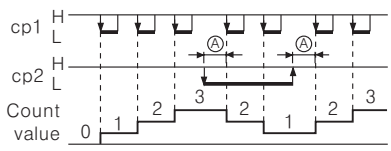
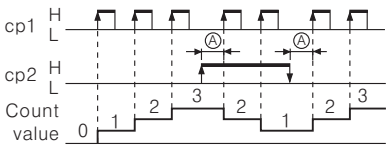
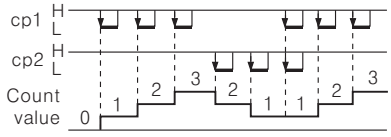
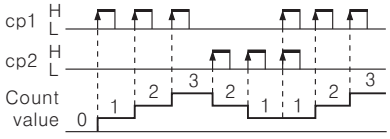
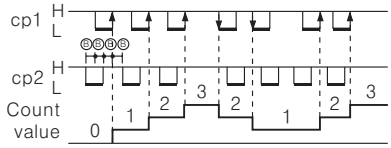
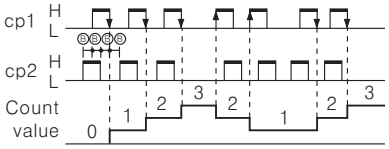
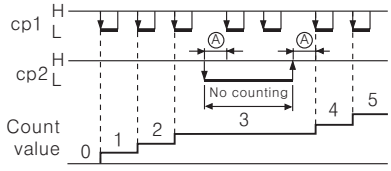
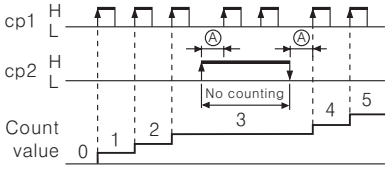
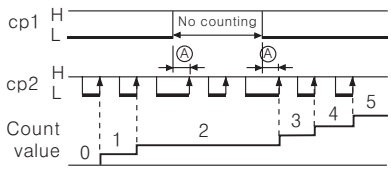
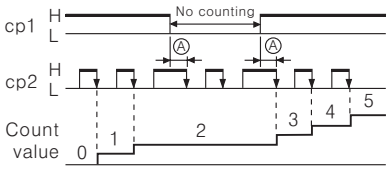
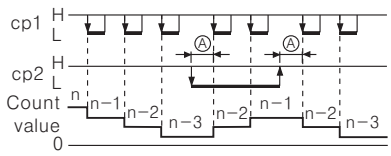
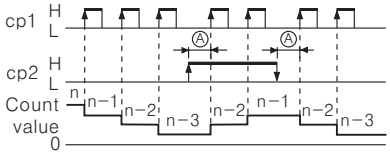
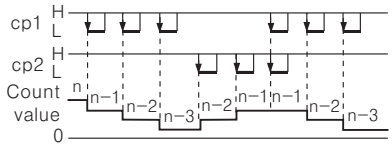
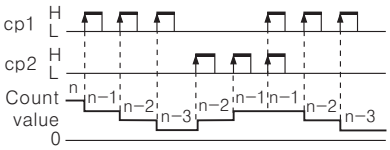
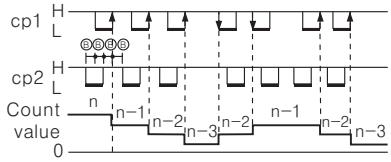
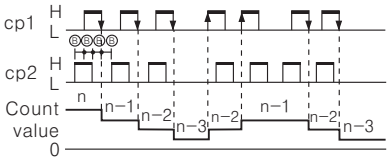
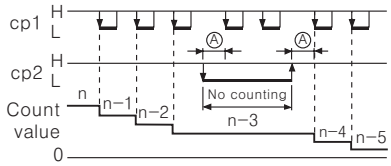
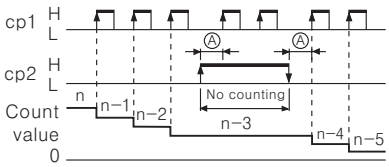
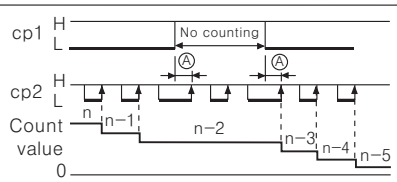
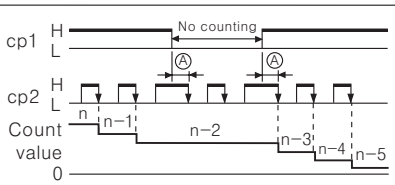
※Press RESET button for over 3sec., it returns to RUN mode.

●Changing the decimal point



※It returns to RUN mode if no RESET button or digital switch is applied for 60sec. in decimal point setting status.
※The decimal point setting is existed in indication type.

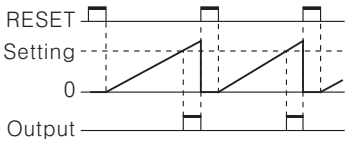
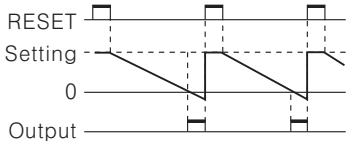
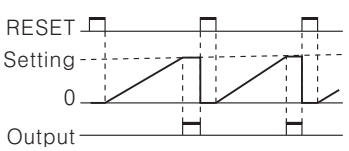
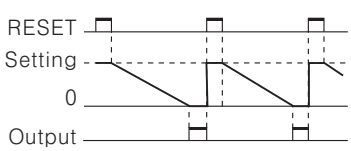
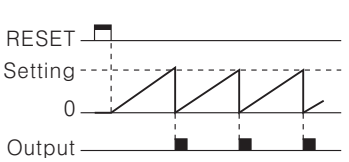
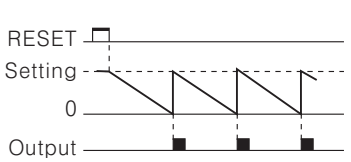
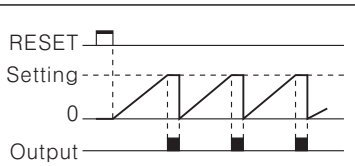
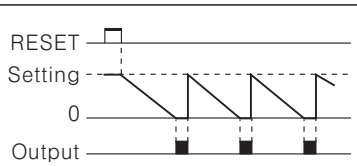
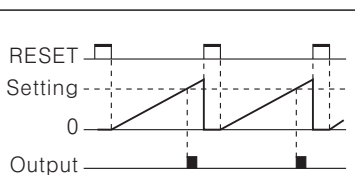
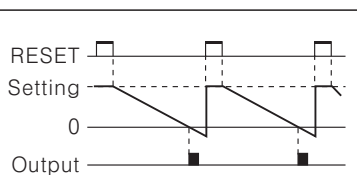
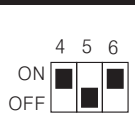
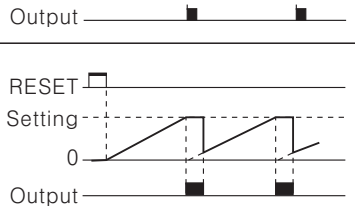
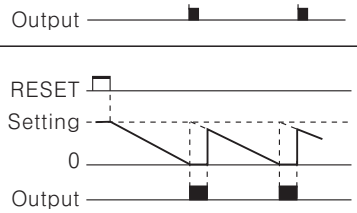
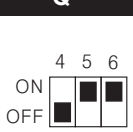
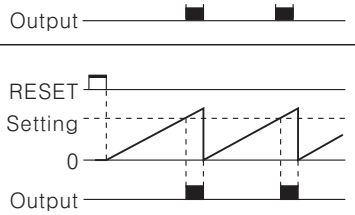
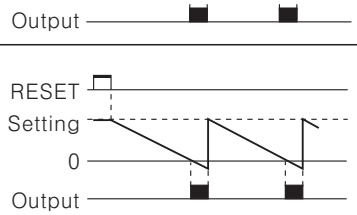
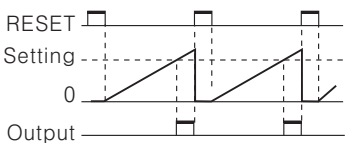
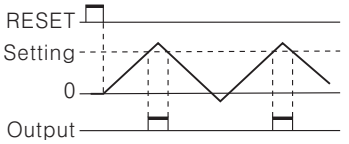
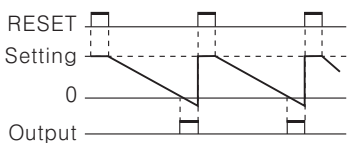
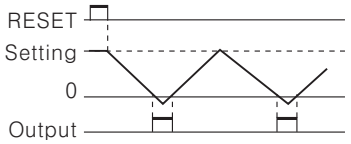
▣Input operation mode(Counter)

Input mode(SW1)		SW1	No-voltage input type(NPN)	Voltage input type(PNP)
Up mode	Up/Down-A (Command input)	1 2 ON OFF 3		
	Up/Down-B (Individual input)	1 2 ON OFF		
	Up/Down-C (Phase difference input)	1 2 ON OFF		
	Up (Count up input)	1 2 ON OFF		
				
Down mode	Up/Down-D (Command input)	1 2 ON OFF 3		
	Up/Down-E (Individual input)	1 2 ON OFF		
	Up/Down-F (Phase difference input)	1 2 ON OFF		
	Down (Count down input)	1 2 ON OFF		
				

※ Ⓐ: Over Min. signal width, Ⓑ: Over 1/2 of Min. signal width.
It the signal width of Ⓐ or Ⓑ is less than Min. signal width, ±1 of count error is occured.

▣Output operation mode

■ ← One-shot output **(0.05 ~ 5sec)** ⊓ ← Retained output

Output mode (SW1)	ON 3 OFF **Up mode**	ON 3 OFF **Down mode**	Operation after count up
	Up, Up / Down-A, B, C	**Down, Up / Down-D, E, F**	
F 			The display value continues until reset signal is applied and the output will be held. • Retained output will be maintained until Reset signal is applied.
N 			Display value and retained output are maintained until Reset signal is applied.
C 			The display value returns to reset start status when display value is reached to setting value.
R 			The display value is held until output is OFF then returns to reset start status.
K 			The display value continues until reset signal is applied.
P 			The display value is held during one-shot output time, counting process is returned to reset start status when output is ON.
Q 			The display value continues during one-shot output time.
S 	**Up input**  **Up, Up / Down-A, B, C** 	**Down input**  **Down, Up / Down-D, E, F** 	• Up, UP/Down-A, B, C input mode -Output is ON when (Display value) ≥ (Setting value) • Down, UP/Down-D, E, F input mode -Output is ON when (Display value) ≤ (Zero)

※One-shot output time is set by front TIME adjuster.

▣Proper usage

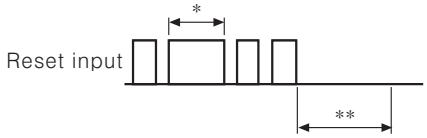
◎Reset function

●Reset

In case of changing the input mode after supplying the power, please take an external reset or manual reset. **If reset is not executed, the counter will be working as previous mode.**

●Reset signal width

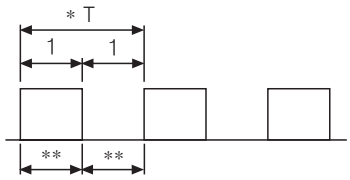
It is reset perfectly when the reset signal is applied during **max. 20ms** regardless of the contact input & solid-state input.



*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during max. 20ms even though a chattering is occurred.

**It can be input the signal of CP1 & CP2 after max. 50ms from closing time of reset signal.

◎Min.signal width of CP1, CP2 input



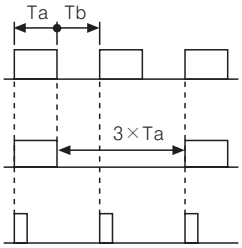
*Please make duty ratio(ON/OFF) as 1:1.

** Min. signal width
- 1cps : Max. 500ms
- 30cps : Max. 16.7ms
- 2kcps : Max. 0.25ms
- 5kcps : Max. 0.1ms

◎Max. counting speed

This is a response speed per 1 sec. when the duty ratio (ON:OFF) of input signal is 1:1. If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed is getting slower against input signal.

If either ON or OFF signal is shorter than minimum signal width, this product may not respond.



Therefore Ta(ON width) and Tb(OFF width) needed to be over min.signal width.

Max. counting speed is 1/2 value of catalog spec. when duty ratio is 1:3.

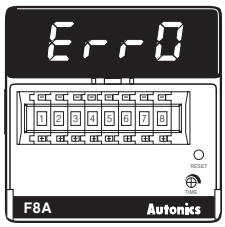
It can not respond because Max. signal width(1a) is small.

◎Error display

Error signal	Error description	Returning method
Err0	Zero setting status	Change the setting value to non zero status

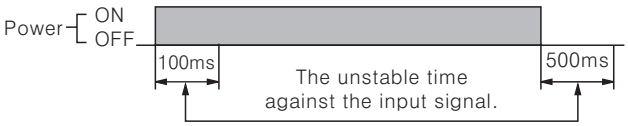
※When Error is displayed, the output continues OFF state.

※There is no Error function in indicator.



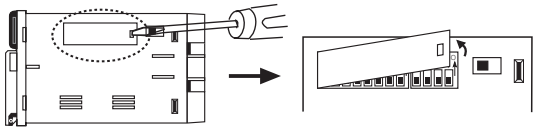
◎Power

The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



▣Case & DIP switch detachment

●**F Series**

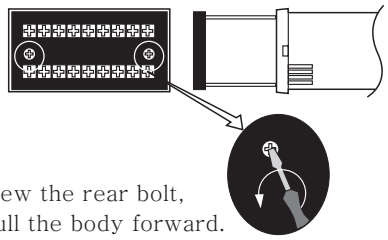


Push a lock part to front direction and widen it simultaneously.

※Please be careful to use with tools, it may cause injury.

●**L Series**

Please turn off the power before detaching the case.



Unscrew the rear bolt, and pull the body forward.

※Please be careful of the injury caused by tools.

DIN W72×H72, W144×H72mm of Up / Down / Up • Down measure counter

▣Features

- ●Selectable Multi / Divide function
- ●Upgrade counting speed : 1cps, 5kcps
- ●Selectable voltage input(PNP) or no-voltage input(NPN)
- ●Memory protection for 10years (Using non-voltage semiconductor)
- ●Decimal point setting(Fixed decimal point of display)
- ●Wide range of power supply : 100-240VAC 50/60Hz 12-24VAC/DC (Option)
- ●Built-in Microprocessor

⚠ **Please read "Caution for your safety" in operation manual before using.**

▣Specifications

F 4 A M - 2P

	Single preset
2P	Dual preset
M	Measure function
A	Preset
B	Totalizer(Indicator)
4	9999(Digit)
6	999999(Digit)
F	W72×H72mm
L	W144×H72mm

▣Specifications

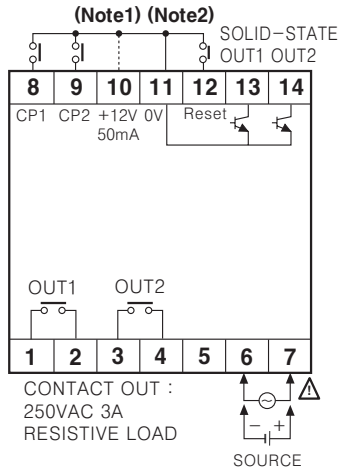
Model	Single preset		**F4AM**	**F6AM**	———	———
	Dual preset		**F4AM-2P**	**F6AM-2P**	**L4AM-2P**	**L6AM-2P**
	Totalizer(Indicator)		**F4B**	**F6B**	**L4B**	**L6B**
Digit			**4**	**6**	**4**	**6**
Digit size			W8×H14mm	W4×H8mm	W8×H14mm	
Power supply			100-240VAC 50/60Hz, 12-24VAC/DC(Option)			
Allowable voltage range			90 ~ 110% of rated voltage			
Power consumption			• Indicator:Approx. 4.7VA(240VAC 60Hz), Approx. 5.1VA(24VAC 60Hz), Approx. 2.7W(24VDC) • Single preset:Approx. 5.6VA(240VAC 60Hz), Approx. 6.0VA(24VAC 60Hz), Approx. 3.3W(24VDC) • Dual preset:Approx. 6.5VA(240VAC 60Hz), Approx. 6.5VA(24VAC 60Hz), Approx. 3.8W(24VDC)			
Max. counting speed			Selectable 1cps/30cps/2kcps/5kcps by internal DIP switch			
Min. signal width			Approx. 20ms(Reset input)			
Input type	CP1,CP2 input		[Voltage input]Input impedance : 5.4kΩ, "H" level voltage : 5-30VDC, "L" level voltage : 0-2VDC [No-Voltage input]Impedance at short-circuit : Max. 1kΩ, Residual voltage at short-circuit : Max. 2VDC, Impedance at open-circuit : Max. 100kΩ			
	RESET input					
One-shot output time			Single preset : 0.5sec, Dual preset : 0.05~5sec			
Control output	Con-tact	Type	Single preset : SPDT(1c) Dual preset : Single preset SPST(1a), Dual preset SPST(1a)		Dual preset : Single preset SPDT(1c), Dual preset SPDT(1c)	
		Capacity	250VAC 3A resistive load			
	Solid-state	Type	Single preset : 1 NPN open collector output, Dual preset : 2 NPN open collector output			
		Capacity	30VDC Max. 100mA Max.			
Memory protection			10 years(When using non-volatile semiconductor memory)			
External power			12VDC±10% 50mA Max.			

▣Specifications

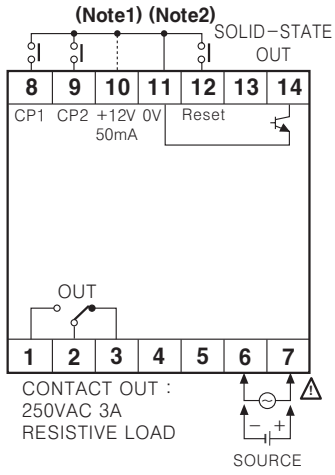
Insulation resistance		35 ~ 85%RH
Dielectric strength		100MΩ (at 500VDC mega)
Noise strength	AC power	±2kV the square wave noise(pulse width:1㎲) by the noise simulator
	DC power	±500V the square wave noise(pulse width:1㎲) by the noise simulator
Vibration	Mechanical	0.75mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 1 hour
	Malfunction	0.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 10 minutes
Shock	Mechanical	300m/s² (Approx. 30G) in X, Y, Z directions 3 times
	Malfunction	100m/s² (Approx. 10G) in X, Y, Z directions 3 times
Relay life cycle	Mechanical	Min. 10,000,000 times
	Electrical	Min. 100,000 times(250VAC 3A at resistive load)
Ambient temperature		−10 ~ +55℃ (at non−freezing status)
Storage temperature		−25 ~ +65℃ (at non−freezing status)
Ambient humidity		35 ~ 85%RH
Unit weight	AC power	F4AM:Approx. 273g, F6AM:Approx. 280g, F4AM−2P:Approx. 275g, F6AM−2P:Approx. 282g, F4BM:Approx. 229g, F6BM:Approx. 236g, L4AM:Approx. 505g, L6AM−2P:Approx. 533g, L4AM−2P:Approx. 438g, L6BM:Approx. 445g
	DC power	F4AM:Approx. 268g, F6AM:Approx. 275g, F4AM−2P:Approx. 270g, F6AM−2P:Approx. 287g, F4BM:Approx. 224g, F6BM:Approx. 231g, L4AM−2P:Approx. 511g, L6AM−2P:Approx. 538g, L4BM−2P:Approx. 444g, L6BM:Approx. 450g

▣Connections

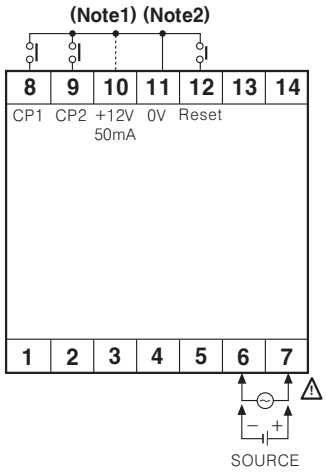
●F4AM-2P / F6AM-2P



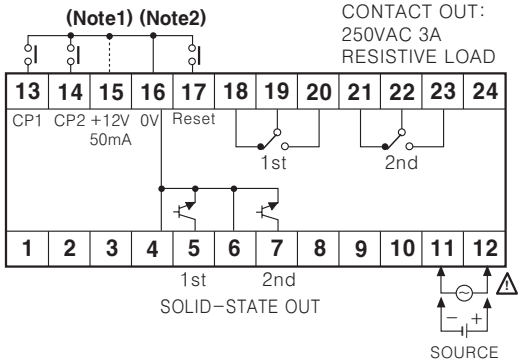
●F4AM / F6AM



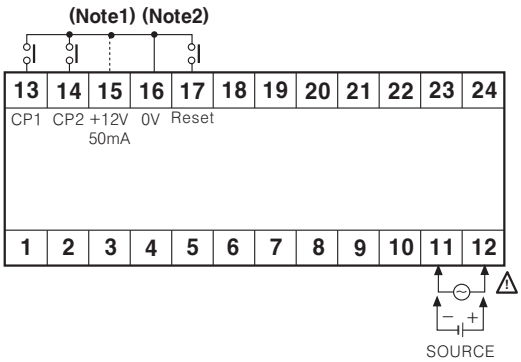
●F4BM / F6BM



●L4AM-2P / L6AM-2P



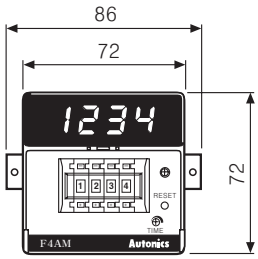
●L4BM / L6BM

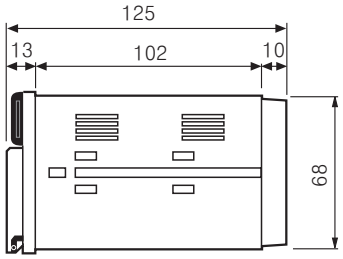


※**(Note1)** : Connection for PNP input in contact input
※**(Note2)** : Connection for NPN input in contact input

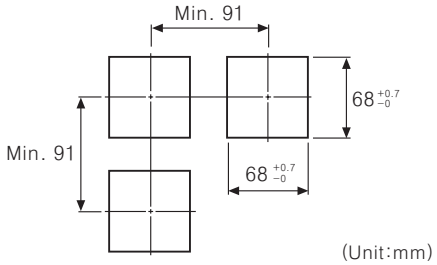
▣Dimensions

●FM-Series



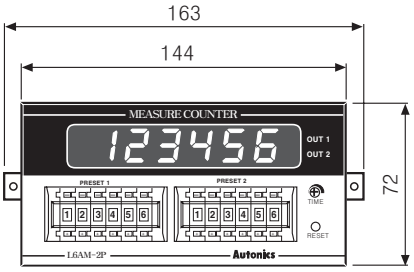


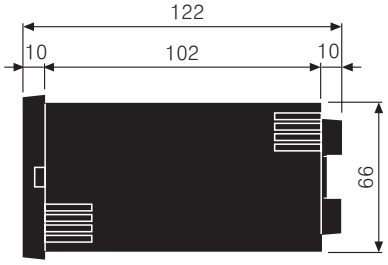
●Panel cut-out



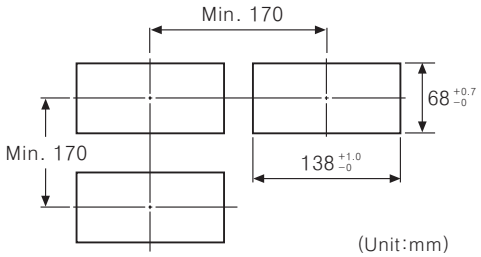
(Unit:mm)

●LM-Series





●Panel cut-out

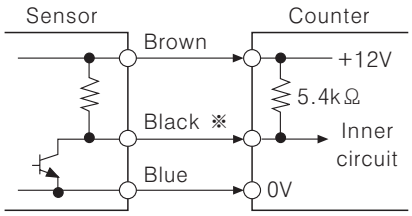


(Unit:mm)

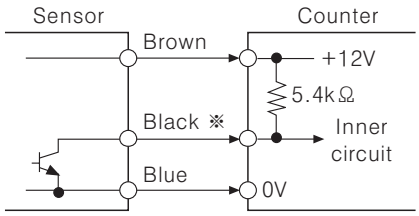
▣ Input connections

◎No-voltage input(NPN)

●Solid-state input(Standard input sensor : NPN output type sensor)



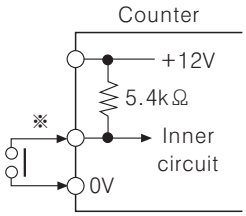
(NPN output)



(NPN open collector output)

※CP1, CP2, RESET input

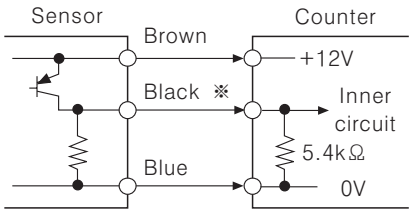
●Contact input



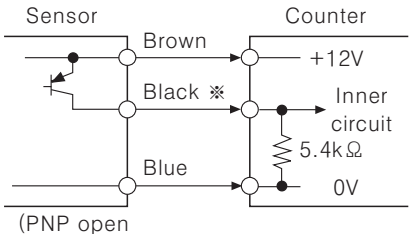
Counting speed : Set as 1 or 30cps

◎Voltage input(PNP)

●Solid-state input(Standard input sensor : PNP output type sensor)



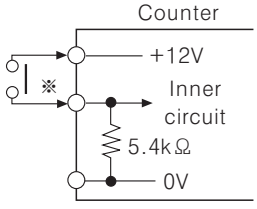
(PNP output)



(PNP open collector output)

※CP1, CP2, RESET input

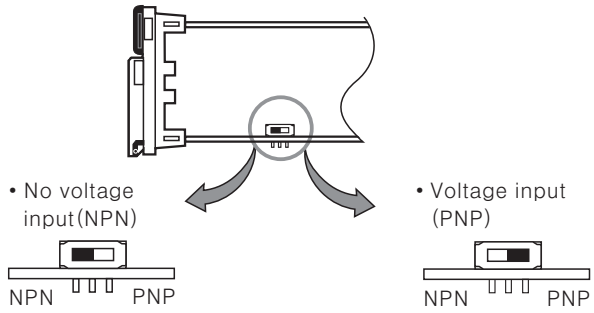
●Contact input



Counting speed : Set as 1 or 30cps

▣ Input logic selection

●FM Series



●LM Series

Input logic is changeable by input logic selection switch located at the terminal block.

• No voltage input(NPN)

(NPN) F ■ S (PNP)

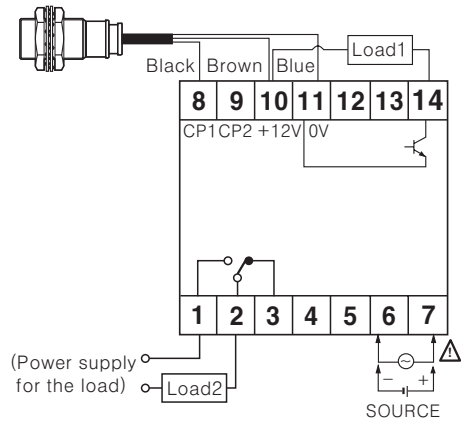
• Voltage input(PNP)

(NPN) F ■ S (PNP)

※Please be sure to turn OFF the power before changing input logic.

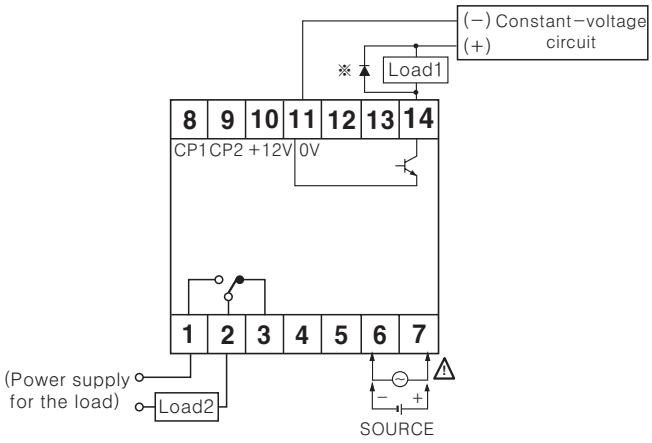
▣Input & output connections

◎In case of operating the load by power supply of the sensor



●Please select proper capacity of load, because total value of load capacity and current consumption should not be exceed current capacity(Max. 50mA).

◎In case of operating the load by external power supply



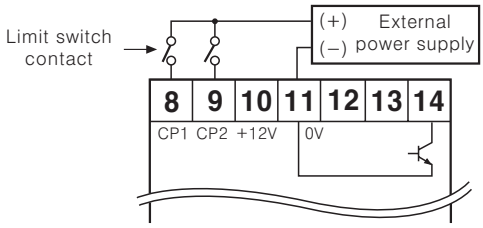
●The capacity of the load must not be exceed Max. 30VDC, Max. 100mA of the switching capacity of the transister.

●Please do not supply the reverse polarity voltage.

※In case of using the inductive load(Relay, etc.), please connector the surge absorber(Diode)at both terminals of the load, in case of using the inductive load.

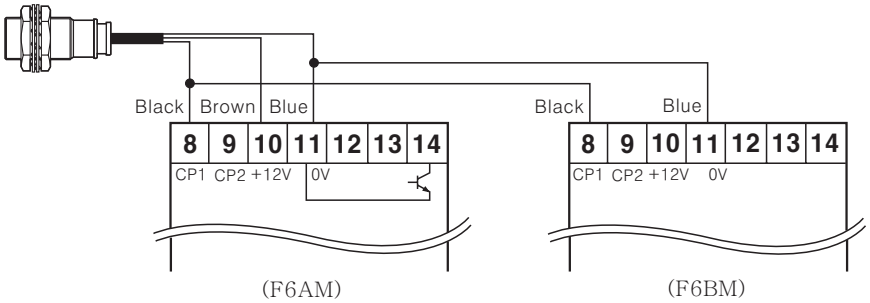
◎How to count by external power supply

This unit start to count when "High" level (5−30VDC) is applied at CP1 or CP2 after selecting PNP. ("Low level" : 0−2VDC)



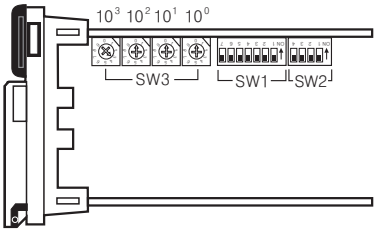
◎Using 2 counters with one sensor

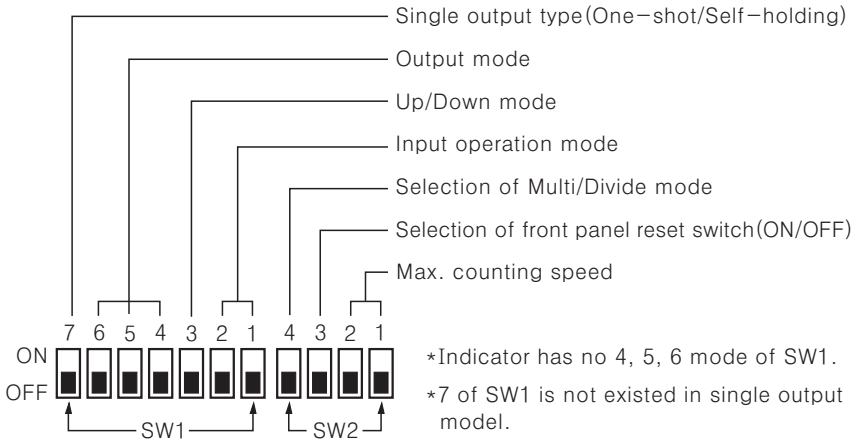
●Please connect as the power of sensor is supplied from only one of counters and design input logic with same way.



▣Selection by DIP switches

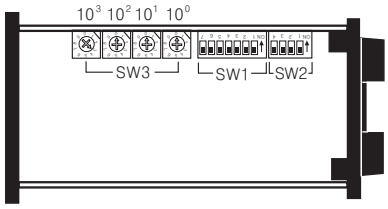
●FM Series





*Indicator has no 4, 5, 6 mode of SW1.
*7 of SW1 is not existed in single output model.

●LM Series



●Max. counting speed

SW2	Function
1 2 ON OFF	**1cps**
1 2 ON OFF	30cps
1 2 ON OFF	2kcps
1 2 ON OFF	**5kcps**

※Factory default : 30cps

●Reset switch of front panel

SW2		Function
3	ON OFF	Use
	ON OFF	Not used

※Factory default : Not used

●Measure function

SW2		Function
4	ON OFF	Multi mode
	ON OFF	Divide mode

※See A-70 for "▣Measure Counter".
※Factory default : Divide mode(SW3:0001)

●Up/Down mode selection

SW1		Function
3	ON OFF	Up mode
	ON OFF	Down mode

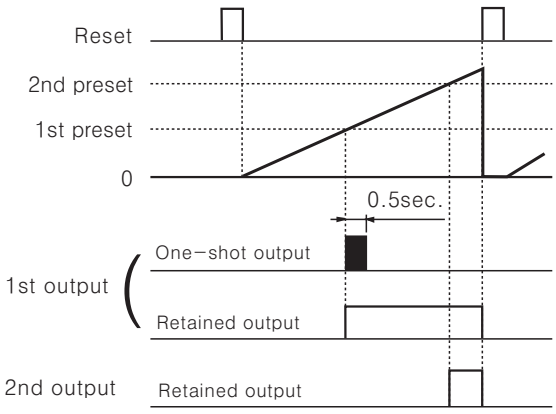
※Factory default : Up mode

●Single output type

SW1		Function
7	ON OFF	One-shot output
	ON OFF	Retained output

※Default : Retained output
※This mode selects one-shot output(0.5sec) or remained output (until 2nd output turns off) for 1st output in the dual preset counter.

※Example of F output operation mode



▣Measure Counter

Measure counter sets multiply or divide integer per 1 pulse input.

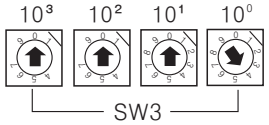
SW2		Function
4	ON OFF	Multi

SW2		Function
4	ON OFF	Divide

●Multi Mode

It multiplies the inner SW3 setting value at a count input signal and displays it.

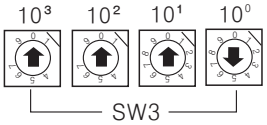
Input signal(N) × SW3 preset value=Indication value



∴N × 4= 4, 8, 12 · · · (N=1, 2, 3 · ·)

●Divide Mode

It displays as 1 when the count input signal is entered as preset value of inner SW3.

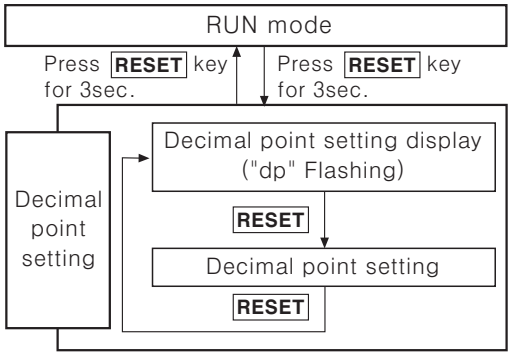


$$\frac{\text{Input signal(N)}}{\text{SW3 preset value}} = \text{Indication value}$$

$$\therefore \frac{N}{5} = 1, 2, 3 \cdots (N=5, 10, 15 \cdots)$$

(Note) Please be cautious the error can be occurred when down count is executed during up count.

▣ Decimal point setting



※It advances to "Decimal point setting mode" if press RESET key for 3sec.

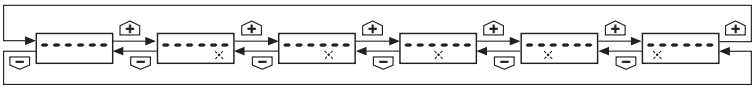
※It returns to RUN mode by press RESET key for 3sec in "Decimal point setting mode".

※It returns to RUN mode if no RESET button or digital switch (Dual−setting digital switch for dual preset type) is applied for 60sec. in the "Decimal point setting mode".

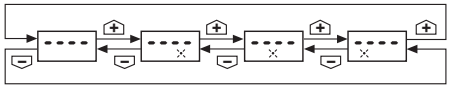
※The decimal point setting is not existed in indicator.

●**Decimal point setting**

• The decimal point setting of 6digits indicator



• The decimal point setting of 4digits indicator

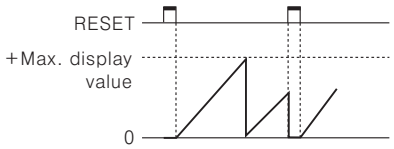


※When it enters to the "Decimal point of setting mode, the prior decimal setting status is displayed.

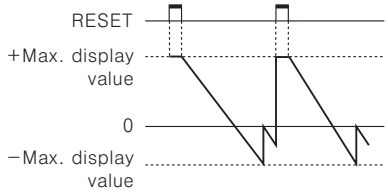
※In the decimal point setting mode, when pressing one of the Up(▲) button of digital switch(Dual−setting digital switch for dual preset type), the point is moved to left direction and it is moved to right direction when one of Down(▼) button of digital switch (Dual−setting digital switch for dual preset type).

▣Counting function(Indication type)

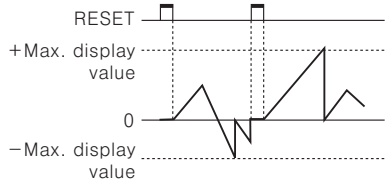
●**Up mode**



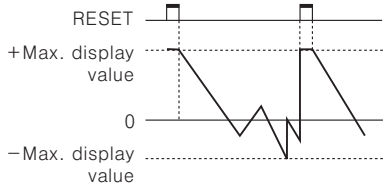
●**Down mode**



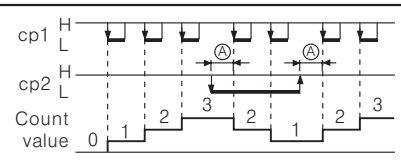
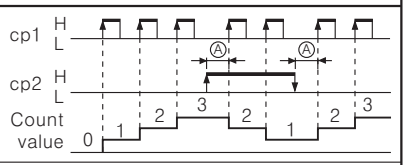
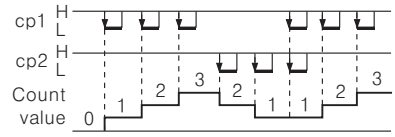
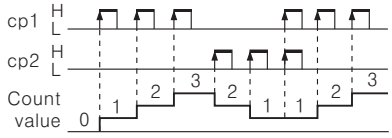
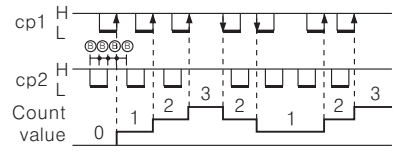
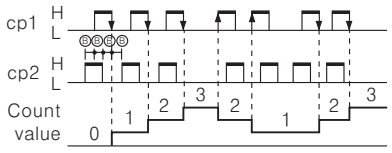
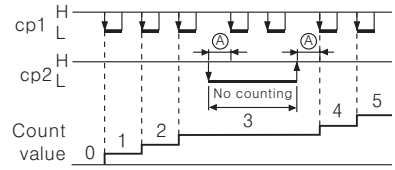
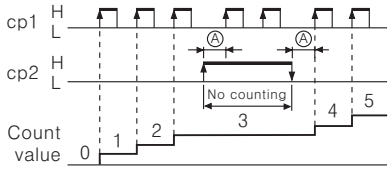
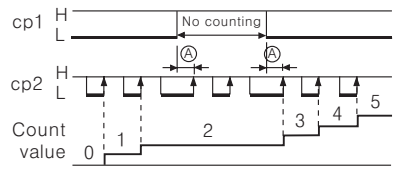
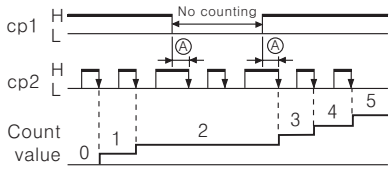
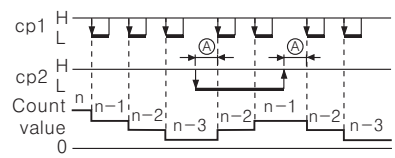
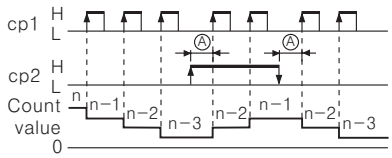
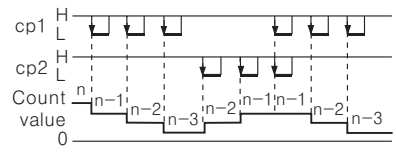
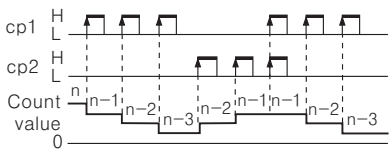
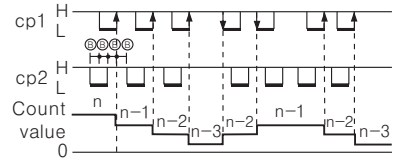
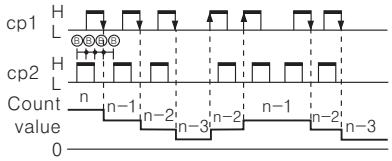
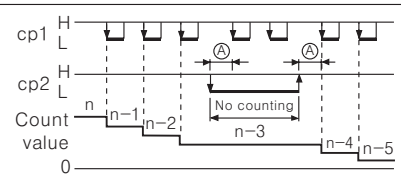
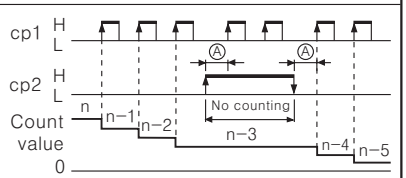
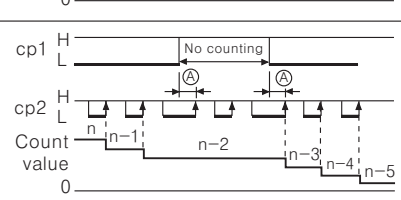
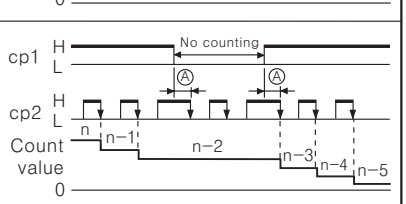
●**Up / Down-A, B, C mode**



●**Up / Down-D, E, F mode**



▣Input operation mode

Input mode(SW1)		SW1	No-voltage input type(NPN)	Voltage input type(PNP)
Up mode	Up/Down-A (Command input)	3 ON OFF 1 2 ON OFF		
	Up/Down-B (Individual input)	1 2 ON OFF		
	Up/Down-C (Phase difference input)	1 2 ON OFF		
	Up (Count up input)	1 2 ON OFF		
				
Down mode	Up/Down-D (Command input)	3 ON OFF 1 2 ON OFF		
	Up/Down-E (Individual input)	1 2 ON OFF		
	Up/Down-F (Phase difference input)	1 2 ON OFF		
	Down (Count down input)	1 2 ON OFF		
				

※ Ⓐ: Over Min. signal width, Ⓑ: Over 1/2 of Min. signal width.
It the signal width of Ⓐ or Ⓑ is less than Min. signal width, ±1 of count error is occured.

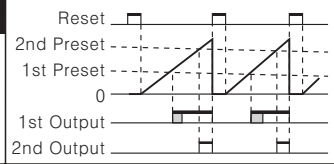
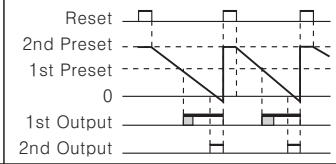
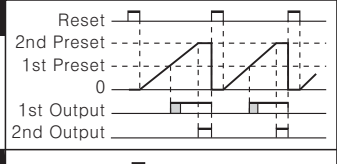
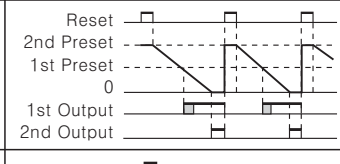
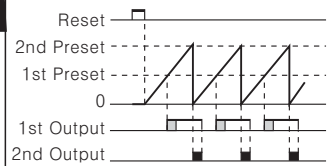
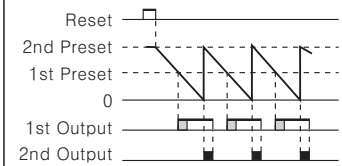
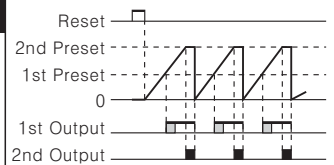
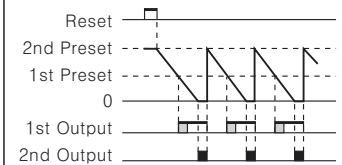
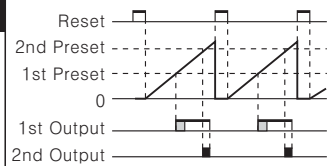
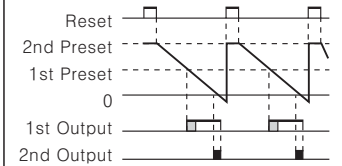
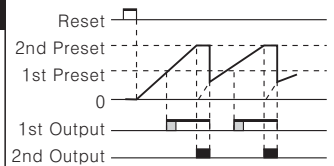
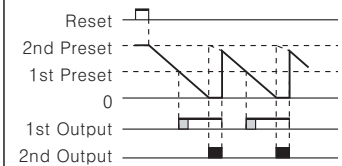
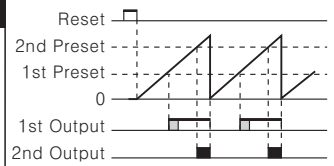
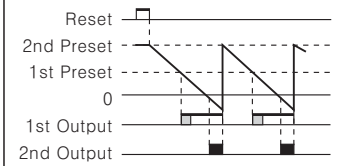
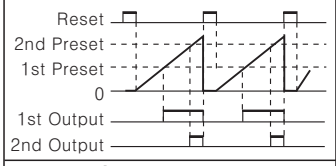
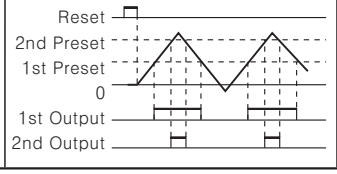
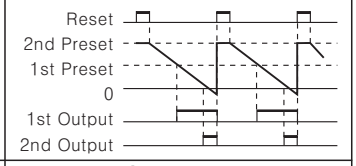
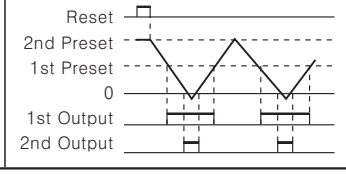
▣Output operation mode

■ ← One-shot output (0.05~5sec) of 2nd output

Retained output
One-shot output(0.5sec) of 1st output

Retained output

※The output of single preset type is operated at the status of the second output mode

Output mode (SW1)	ON OFF 3 Up mode Up, Up/Down-A, B, C mode	ON OFF 3 Down mode Down, Up/Down-D, E, F mode	Operation after count up
F ON OFF 4 5 6			The display value continues until Reset signal applied and the output is held. • 1st retained output and 2nd output are maintained until Reset signal is applied. • When using 1st output as one-shot output, it will return after operating for 0.5sec.
N ON OFF 4 5 6			Display value and retained output are maintained until Reset signal is applied. • When using 1st output as one-shot output, it will return after operating for 0.5sec.
C ON OFF 4 5 6			The display value will be Reset Start statusas soon as it reaches to 2nd setting value. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
R ON OFF 4 5 6			The display value will be held until 2nd output is OFF then reset. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
K ON OFF 4 5 6			The display value continues until Reset signal applied. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
P ON OFF 4 5 6			The display value will be Reset Start status as soon as it reaches to 2nd setting value. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec., and it is not related to 2nd output.
Q ON OFF 4 5 6			The display continues until 2nd output is OFF. • 1st retained output will be OFF after 2nd one-shot output. • 1st one-shot output will be reset after operating 0.5sec. not related to 2nd output.
S ON OFF 4 5 6	**Up input**  **Up/Down-A, B, C** 	**Down input**  **Up/Down-D, E, F** 	• Up, Up/Down-A, B, C input mode -OUT1 is ON when(Display value) ≥ (1st setting value) -OUT2 is ON when(Display value) ≥ (Dual setting value) • Down, Up/Down-D, E, F input mode -OUT1 is ON when(Display value) ≤ (1st setting value) -OUT2 is ON when(Display value) ≤ (Zero)

※One-shot output time is set by front TIME adjuster.

▣Proper usage

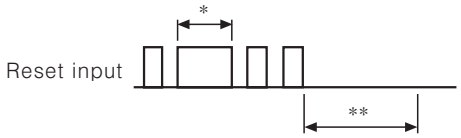
◎Reset function

●Reset

In case of changing the input mode after supplying the power, please take an external reset or manual reset. **If reset is not executed, the counter will be working as previous mode.**

●Reset signal width

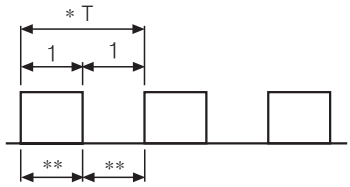
It is reset perfectly when the reset signal is applied during **max. 20ms** regardless of the contact input & solid-state input.



*In case of a contact reset, it is reset perfectly if the ON time of reset signal is applied during max. 20ms even though a chattering is occurred.

**It can be input the signal of CP1 & CP2 after max. 50ms from closing time of reset signal.

◎Min. signal width



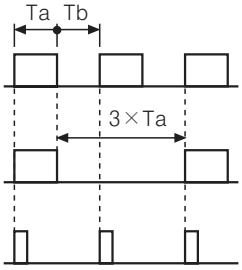
*Please make duty ratio(ON/OFF) 1:1.

** Min. signal width
- 1cps : Min. 500ms
- 30cps : Min. 16.7ms
- 2kcps : Min. 0.25ms
- 5kcps : Min. 0.1ms

◎Max. counting speed

This is a response speed per 1 sec. when the duty ratio (ON:OFF) of input signal is 1:1. If the duty ratio is not 1:1, the width between ON and OFF should be over min. signal width and the response speed is getting slower against input signal.

If either ON or OFF signal is shorter than minimum signal width, this product may not respond.



Ta(ON width) and Tb(OFF width) need to be over min.signal width.

Max. counting speed is 1/2 value of catalog spec. when duty ratio is 1:3.

It can not respond because Max. signal width(1a) is small.

◎Error display

Error signal	Error description	Returning method
Err0	Zero setting status	Change the setting value to non zero status

※When Error is displayed, the output continues OFF state.

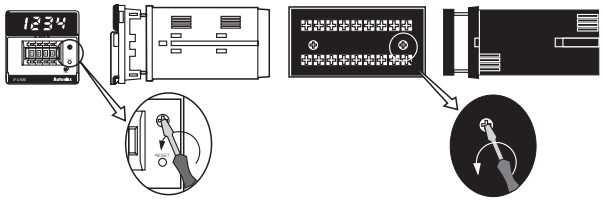
※1st output maintains OFF status by set 1st setting value as 0.

※There is no Error function in indicator.

◎Detach the case from body

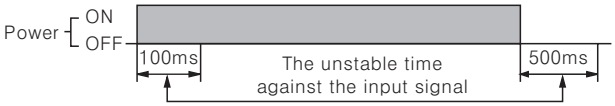
●FM Series
Unscrew the front bolt, and pull the body forward.

●LM Series
Unscrew the rear bolt, and pull the body forward.

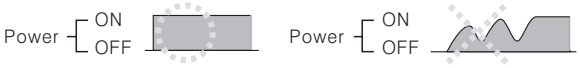


◎Power

●The inner circuit voltage starts to rise up for the first 100ms after power on, the input may not work at this time. And also the inner circuit voltage drops down for the last 500ms after power off, the input may not work at this time.



●Please use the power within rated power and apply or cut the power at once to prevent from chattering.



◎Input signal line

●Shorten the cable distance between the sensor and this product.

●Please use shield wire for input signal needed to be long.

●Please wire input signal line separated from power line.

◎Test circuit dielectric, impulse voltage and measure insulated resistor by installing in control panel,

●Separate the unit from control box circuit.

●Short-circuit all terminals in terminal block.

◎Do not use this unit at below places.

●Place where there are severe vibration or impact.

●Place where strong alkalis or acids are used.

●Place where there are direct rays of the sun

●Place where strong magnetic field or electric noise are generated.

◎Installation environment

●It shall be used indoor

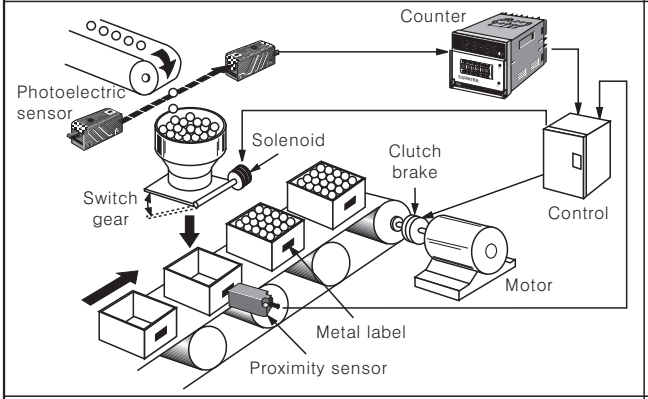
●Altitude Max. 2000m

●Pollution Degree 2

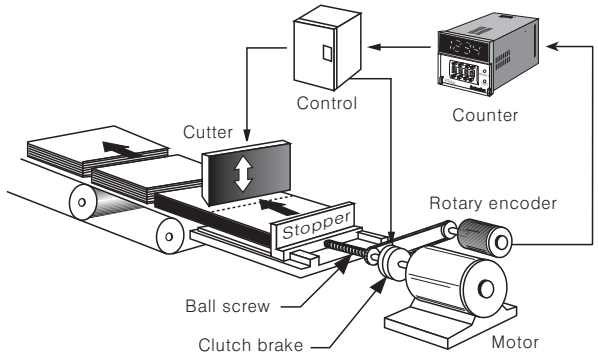
●Installation Category Ⅱ.

▣Applications

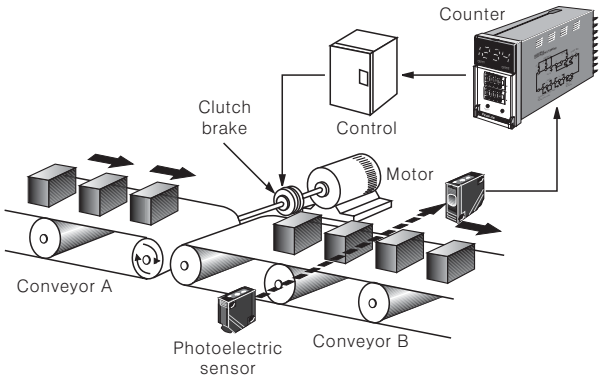
Quantity control



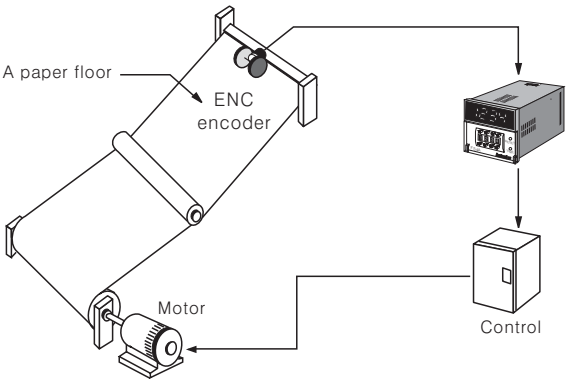
Length measurement



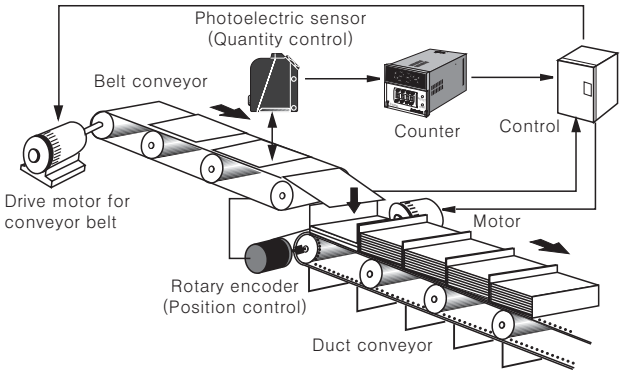
Quantity control



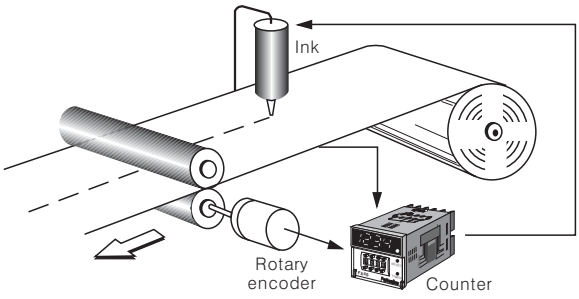
Length measurement



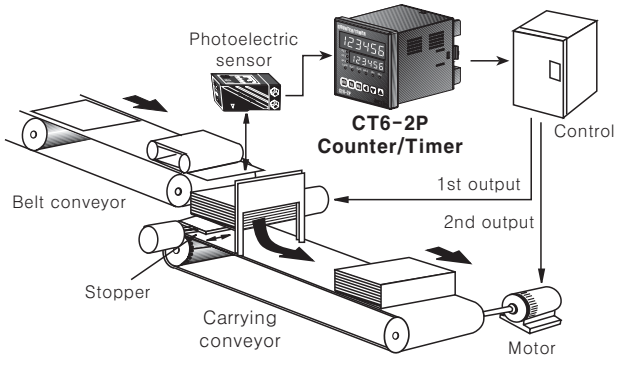
Quantity control



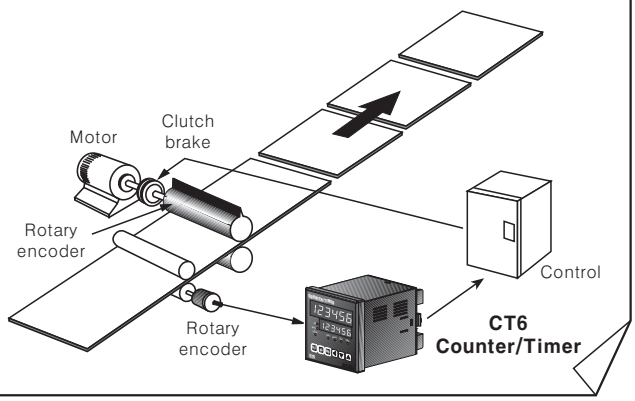
Length measurement



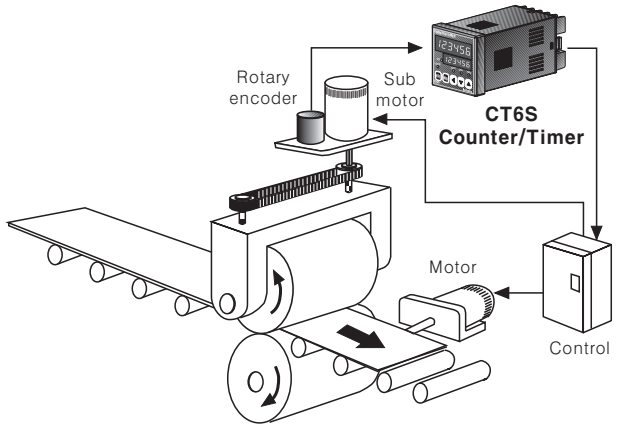
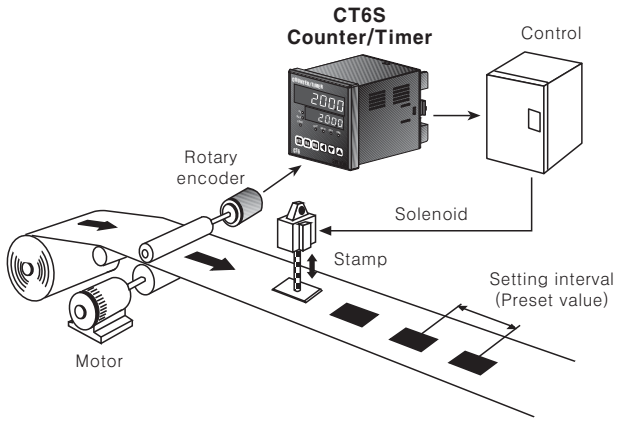
Quantity control



Length measurement



▣Applications

Position control	Position control
	

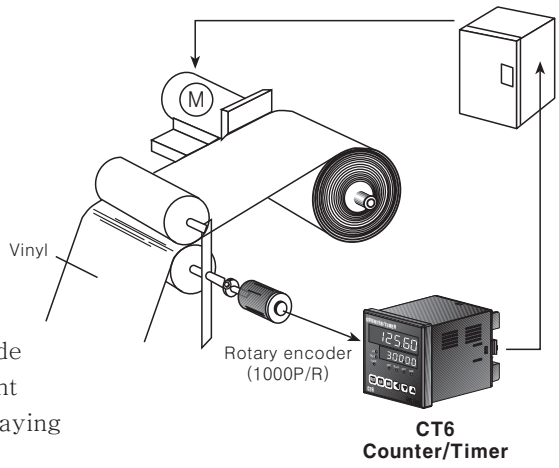
Length measurement

If you want to cut the vinyl in 300mm lengths using 1000P/R Encoder for roller(200mm diameter)

$$\text{●Prescale value} = \frac{\pi \times \text{Diameter of roller(D)}}{\text{The number of generating pulse per 1 revolution of Encoder}}$$

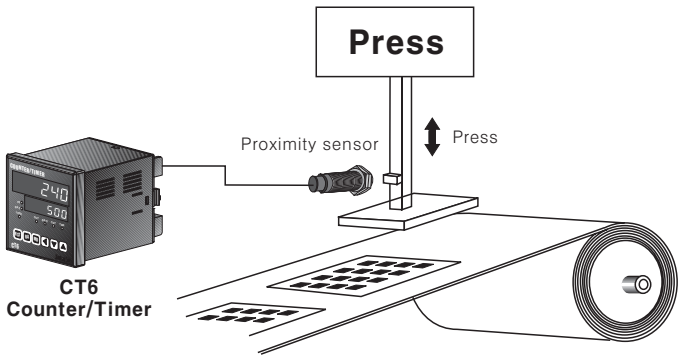
$$= \frac{3.1416 \times 200}{1000}$$

$$= 0.628\text{mm / Pulse}$$



- ●Set prescale value as 0.628 in function setting mode
- ●Select the second decimal point in function setting mode
- ●Setting preset value as 300.00(mm), this unit will count 0.628 per one input signal and output is operated displaying 300.18mm when 478 signals are inputted.

Quantity control



Using prescale value on counter to multiply.
In application of making 16pcs of the products each time the press machine operates, the prescale value should be set to 0016 on the counter, and then it will indicate 16, 32, 48,... each time the press machine operates 1, 2, 3 times,...