Digital Counter

BC series

INSTRUCTION MANUAL

We appreciate you for purchasing HanYoung NUX Co.,Ltd product. Before using the product you have purchased, check to make sure that it is exactly what you ordered. Then, please use it following the instructions below.

MAIN PRODUCTS
- DIGITAL : Temperature Controller, Counter, Timer,Speedmeter, Tachometer, Panel Meter, Recorder
- SENSOR : Proximity Sensor/Photo Electric Sensor Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

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■ Safety information

Before you use, read safety precautions carefully, and use this product properly. The precautions described in this manual contains important contents related with safety; therefore, please follow the instructions accordingly. The precautions are composed of DANGER, WARNING and CAUTION.

⚠ DANGER

Do not touch or contact the input/output terminals because they may cause electric shock.

⚠ WARNING

1. If there is a possibility of an accident caused by errors or malfunctions of this product, install external protection circuit to prevent the accident.
2. This product does not contain an electric switch or fuse, so the user needs to install a separate electric switch or fuse externally. (Fuse rating : 250 V 0.5 A)
3. To prevent defection or malfunction of this product, supply proper power voltage in accordance with the rating.
4. To prevent electric shock or devise malfunction of this product, do not supply the power until the wiring is completed.
5. Since this product is not designed with explosion-protective structure, do not use it at any place with flammable or explosive gas.
6. Do not decompose, modify, revise or repair this product. This may cause malfunction, electric shock or fire.
7. Reassemble this product while the power is off. Otherwise, it may cause malfunction or electric shock.
8. It you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
9. Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.

⚠ CAUTION

1. The contents of this manual may be changed without prior notification.
2. Before using the product you have purchased, check to make sure that it is exactly what you ordered.
3. Check to make sure that there is no damage or abnormality of the product during delivery.
4. Do not use this product at any place with corrosive(especially noxious gas or ammonia) or flammable gas.
5. Do not use this product at any place with direct vibration or impact.
6. Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents. (Pollution level 1 or 2)
7. Do not polish this product with substances such as alcohol or benzene.
8. Do not use this product at any place with excessive induction trouble, static electricity or magnetic noise.
9. Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
10. Install this product at place under 2,000m in altitude.
11. When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
12. If there is excessive noise from the power supply, using insulating transformer and noise filter is recommended. The noise filter must be attached to a panel grounded, and the wire between the filter output side and power supply terminal must be as short as possible.
13. If gauge cables are arranged too closely, the effect on noise may occur.
14. Do not connect anything to the unused terminals.
15. After checking polarity of terminal, connect wires at the correct position.
16. When this product is connected to a panel, use a circuit breaker or switch approved with IEC847-1 or IEC947-3.
17. Install the circuit breaker or switch at near place for convenient use.
18. Write down on a label that the operation of circuit breaker or switch disconnects the power since the devise is installed.
19. For the continuous and safe use of this product, the periodical maintenance is recommended.
20. Some parts of this product have limited life span, and others are changed by their usage.
21. The warranty period for this product including parts is one year if this product is properly used.
22. When the power is on, the preparation period of contact output is required. In case of use for signals of external interlock circuit, use with a delay relay.

■ Model and Suffix code

MODEL	Suffix code				Description
BC □	□	□	□	□	BC1 / 3 / 6
	P				Preset
	T				Total
Digit		4			4 Digit
		6			6 Digit (Except BC1)
Stage			1		1 Stage setting
				E	Free scale function

■ Specifications

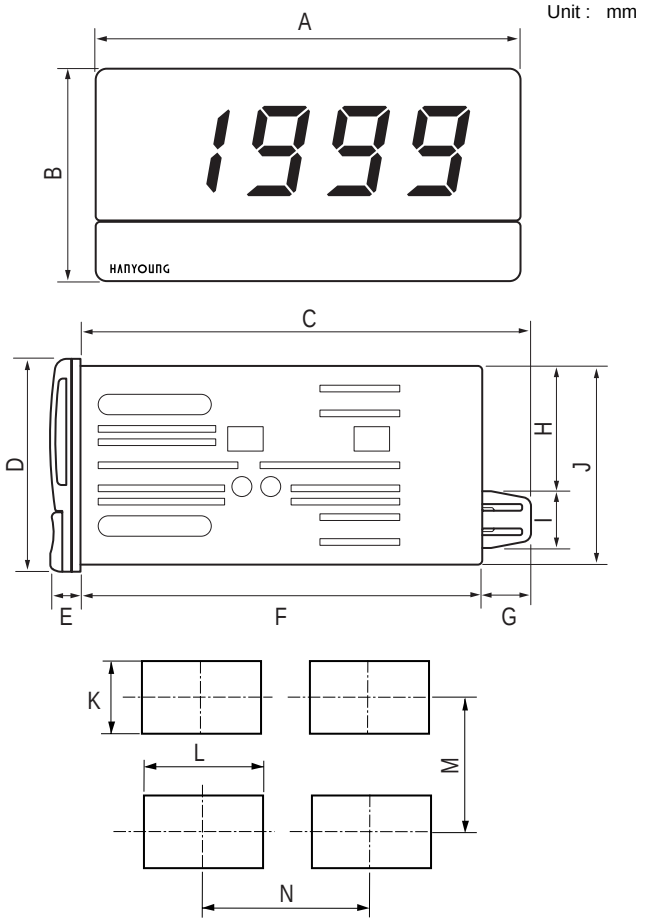
Rated Voltage	100 - 240 V AC 50 - 60 Hz
Voltage Fluctuation Rate	±10 % of rated voltage
Power Consumption	About 5 VA (With 220VAC 50Hz)
Maximum Counting Speed	30 / 1 k / 2 k / 5 kcps (Common for CP1, CP2)
Reset	External reset : minimum signal range 0.02 sec
One Short Time	10 ms / 50 ms / 100 ms / 200 ms / 500 ms / 1000 ms / 2000 ms / 5000 ms
Counter Input Reset Input	"H" level : 5 ~ 30 V DC, "L" level : 0 ~ 2 V DC
Control Output	Contact output : 250 V AC 3 A (resistive load) Open collector output : 30 V DC 100 mA Max
Power for Sensor	12 V DC 50 mA Max (Ripple Max. 5 %)
Ambient Temperature	-10 ~ 55 ℃
Storage Temperature	-20 ~ 65 ℃ (When no condensation)
Ambient Humidity	35 ~ 85 % RH

■ Capacity

Insulation resistance		100㏁ or more (up to 500 V DC mega) Between electronic conduction terminal and exposed non-charging metal
Dielectric strength		2000 V AC 50 - 60 Hz for 1 minute (Between electronic conduction terminal and exposed non-charging metal)
In-pulse voltage		2 kV (Between control power terminals 2 kV (Between electronic conduction terminal and exposed non-charging metal)
Noise		Square frequency noise caused by noise simulator ±2 kV (Between control power terminals) ±500 V (Between input terminals)
Vibration	Durability	10~55 Hz Double amplitude 0.75mm
	Malfunction	10~55 Hz Double amplitude 0.5mm
Impact	Durability	300 m/s(2) (about 30G)
	Malfunction	100 m/s(2) (about 10G)
Life span	Mechanical	Contact output : over 10 million times
	Electronic	Contact output : over 100,000 million times (250 V AC 3 A resistive load)

■ Dimension & Panel cutout

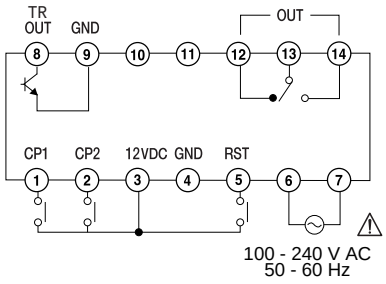
Unit : mm



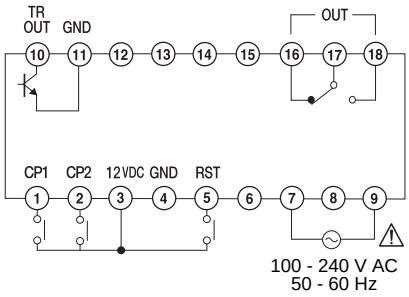
MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N
BC1	48	24	100	24	5.8	100				22	22.5	45.4	45	65
BC3	96	48	102	48	7	91	11	28	13	44.8	45	92	60	130
BC6	72	36	100	36	6.5	89	11	16	12	30.5	31	66.5	60	100

■ Connections

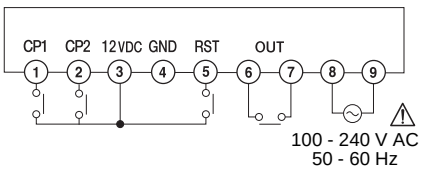
■ BC6



■ BC3

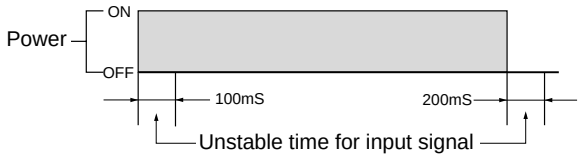


■ BC1



※However, in case of tatal counter, there is no-output.

■ Power supply



The voltage increase time for internal circuit is 100 ms after the power is ON, and the voltage decrease is 200 ms after the power is OFF.

■ Key functions

Type of key	Function
Mode key	Pressing this key for 2.5 seconds or more starts program mode.
Digit move key	Moves digit of setting value
Setting value increase key	Increases setting value
Reset key	Initializes the counting value and output

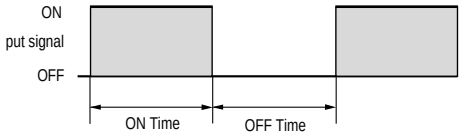
※ Initial setting

Function	Mode conditions
Input mode	U-A
Output mode	F
Output time	500 ms
Maximum counting speed	30 cps
Power failure memory	Yes
Scale	1 : 1

■ Maximum speed

· The rating value for maximum counting speed rate is the response time with ON and OFF ration of 1:1.
· Even for input signal under the maximum counting speed rate, it does not count when either ON or OFF time is one-sided under the rated minimum signal range.

●Minimum Signal Time
· Minimum signal time of 30 cps : over 16 ms
· Minimum signal time of 1 kcps : over 0.5 ms
· Minimum signal time of 2 kcps : over 0.25 ms
· Minimum signal time of 5 kcps : over 0.1 ms



■ Prescale Setting

■ What is Prescale function?

This refers the conversion of input coefficient into specific quantity.
If one pulse of input coefficient moves 0.02mm, the scale value is set with 0.02.
In case the system with 250 pulse for 0.5m movement is used, scale setting mode is set with 0.002(0.5/250) after moving the decimal to the 3rd digit for decimal point selection.

■ Example of Scale Setting

When the length of wire rolled on the drum is displayed or when the assigned length needs an output.

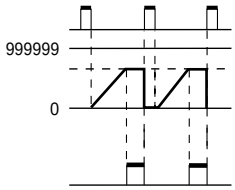
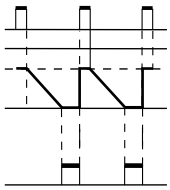
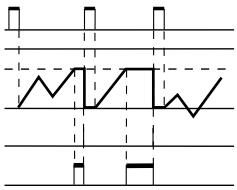
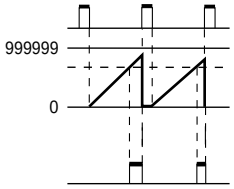
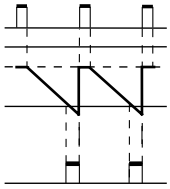
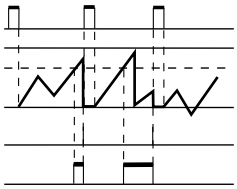
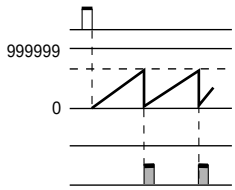
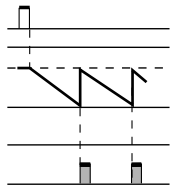
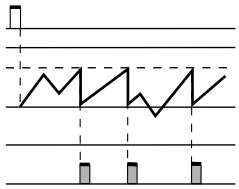
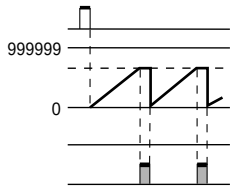
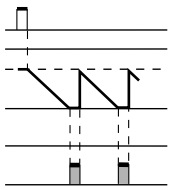
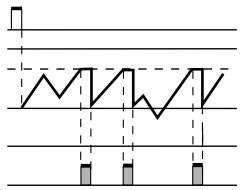
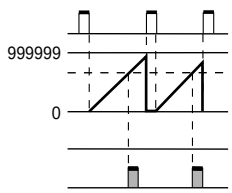
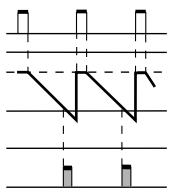
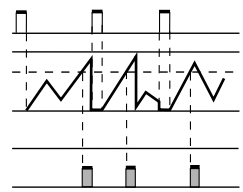
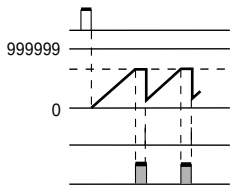
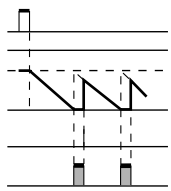
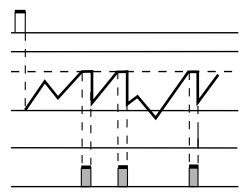
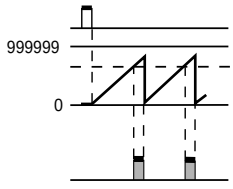
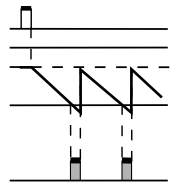
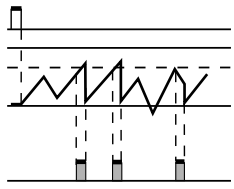
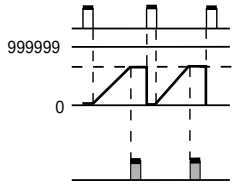
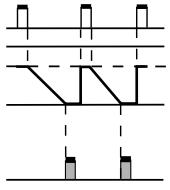
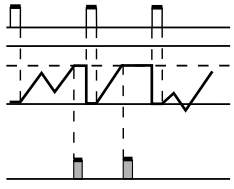
Roller diameter(D): 600mm
Using encoder : 20P/R
Unit : m
] to be

Circumference = D · π
600 × 3.1416=1884.96mm
1884.961 × 1/20=94.248 mm
The meter converted is 0.09424 m.

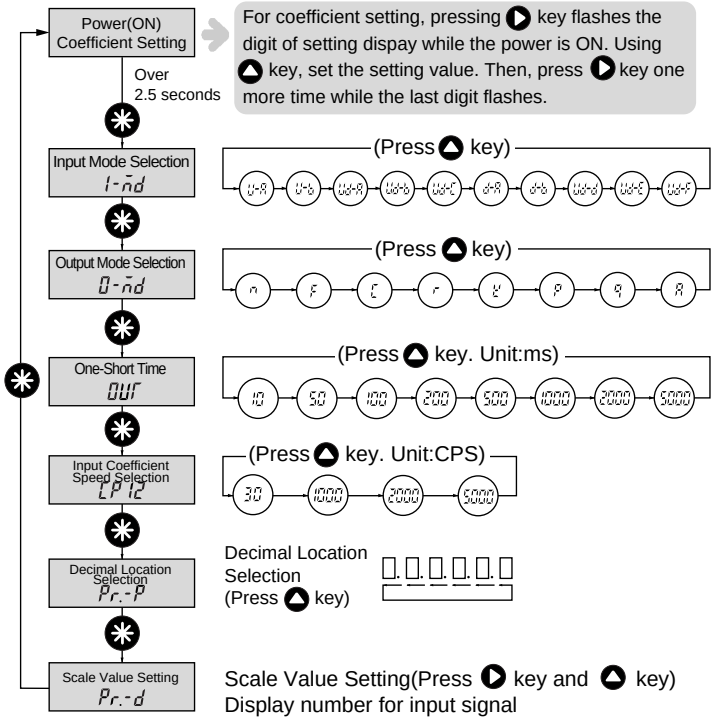
0.09424 will be set at the "Scale Value Setting" after selecting a decimal point.

■ Output Mode

Self-maintenance Output　　One-short Output

OUTPUT MODE	INPUT MODE: UP	INPUT MODE: DOWN	INPUT MODE: UP/DOWN A.B.C	Operation after Output ON
N				The ON status of Output and the display of counting value are maintained until reset.
F				The display of counting value is continuously progressed. The output is maintained until reset.
C				The display of current value returns to the reset start status immediately after the output ON. The output repeatedly operates in one-short.
R				The display of current value returns to the reset status immediately after one-short. The output repeatedly operates in one-short.
K				The display of current value is continuously progressed.
P				The display of current value is continuously maintained during one-short time but returns to the reset start status immediately after one-short. The output repeatedly operates in one-short.
Q				The display of current value is progressed during one-short time but returns to the reset start status immediately after one-short. The output repeatedly operates in one-short.
A				The display of current value is maintained until the reset input. The reset status does not calculate.

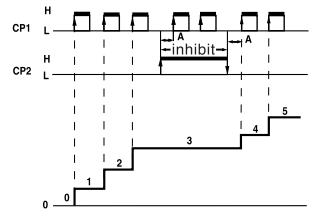
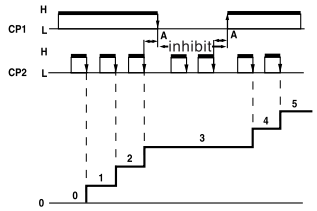
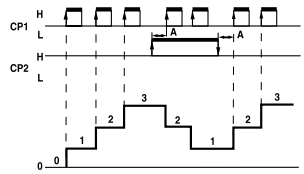
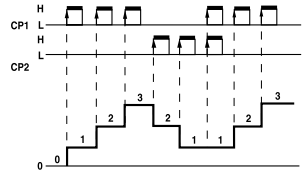
■ Mode selection method

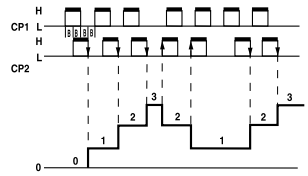
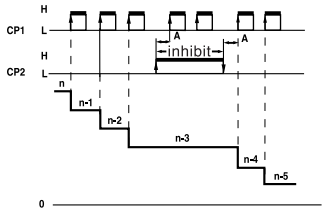
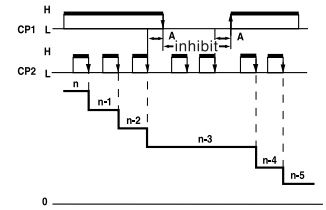
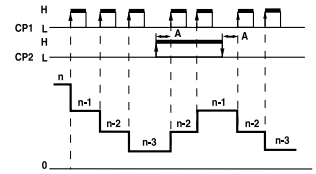
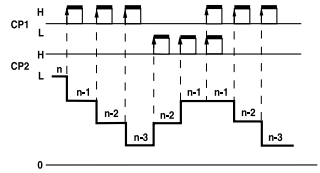


※One-short time must be set over 50 ms. Setting under 50ms may cause malfunction.

■ Input Mode

Notes : A needs to exceed the minimum signal range, and B requires at least 50 % of the minimum signal range.

INPUT MODE	UP A - Prohibition Input
U-A	
U-b	UP B - Prohibition Input 
Ud-A	UP/DOWN A - Command Input 
Ud-b	UP/DOWN B - Individual Input 

INPUT MODE	UP/DOWN C - Phase Difference Input
Ud-C	
d-A	DOWN A - Prohibition Input 
d-b	DOWN B - Prohibition Input 
Ud-d	UP/DOWN D - Command Input 
Ud-E	UP/DOWN E - Individual Input 
Ud-F	UP/DOWN F - Phase Difference Input