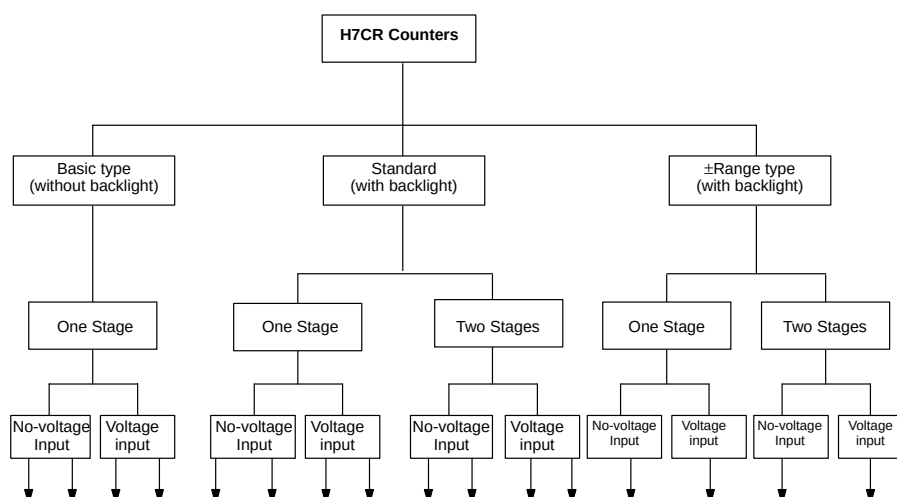


DIN 48 x 48 mm Counters with Easy-to-use Functions

- Designed with an emphasis on ease of operation.
- All models (except -A, and -SA type) equipped with prescale function which displays in units of actual physical parameters (length, volume, etc.).
- H7CR-C/SC large/small discrimination mode useful for positioning and production control.
- High-speed response allows 5,000 counts per second.
- High-visibility LCD display with built-in backlight.
- Online change of set value possible.
- Meets UL and CSA standards.
- Conforms to IEC1010-1/EN61010-1 standard.
- H7CR-S short type only 64 mm deep.
- H7CR-8/11 plug-in types can be DIN-track mounted.
- H7CR-8 has a built-in power supply reset function.
- Conforms to EMC standards.
- Six-language instruction manual provided.

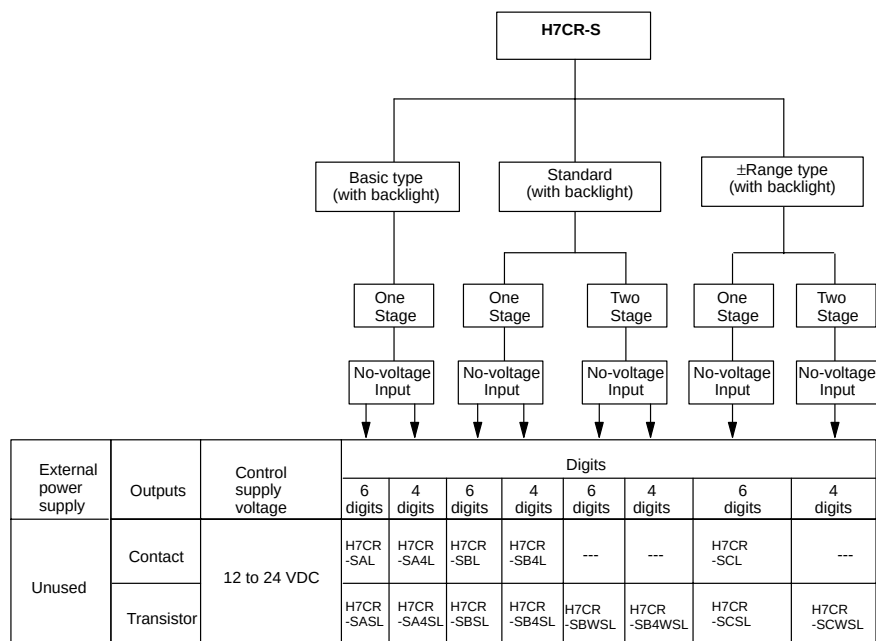


H7CR-A/B/C

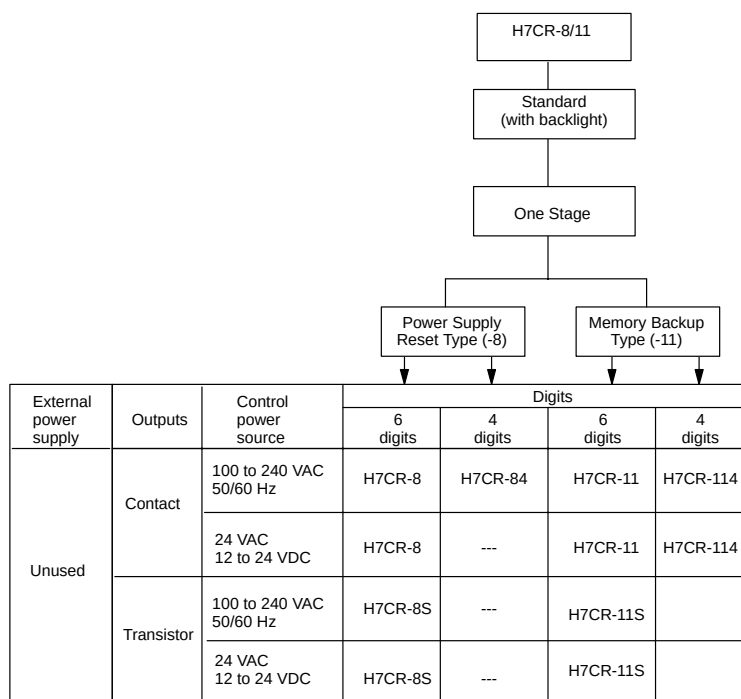


External power supply	Outputs	Control supply voltage	Digits																
			6 digits	4 digits	6 digits	4 digits	6 digits	4 digits	6 digits	4 digits	6 digits	4 digits	6 digits	4 digits	6 digits	4 digits	6 digits	4 digits	
Unused	Contact	100 to 120/200 to 240 VAC 50/60 Hz	H7CR-A	H7CR-A4	H7CR-AV	---	---	---	---	---	---	---	---	---	---	---	---	---	
		24 VAC	H7CR-A	H7CR-A4	H7CR-AV	---													
	Transistor	100 to 120/200 to 240 VAC 50/60 Hz	H7CR-AS	H7CR-A4S	H7CR-AVS	---													---
		24 VAC	H7CR-AS	---	H7CR-AVS	---													
12 VDC (100 mA)	Contact	100 to 240 VAC 50/60 Hz	---	---	---	---	H7CR-B	H7CR-B4	H7CR-BV	H7CR-B4V	H7CR-BW	H7CR-BW	H7CR-BWV	H7CR-BWV	H7CR-C	H7CR-CV	H7CR-CW	H7CR-CWV	
		24 VAC 12 to 24 VDC					H7CR-B	---	H7CR-BW	H7CR-B4W	H7CR-BW	H7CR-BW	H7CR-BWV	H7CR-BWV	H7CR-C	H7CR-CV	H7CR-CW	H7CR-CWV	
	Transistor	100 to 240 VAC 50/60 Hz					H7CR-BS	H7CR-B4S	H7CR-BVS	H7CR-B4VS	H7CR-BWS	H7CR-BWS	H7CR-BWVS	H7CR-BWVS	H7CR-CS	H7CR-CVS	H7CR-CWS	H7CR-CWVS	
		24 VAC 12 to 24 VDC					H7CR-BS	---	H7CR-BVS	H7CR-BVS	H7CR-BWS	H7CR-BWS	H7CR-BWVS	H7CR-BWVS	H7CR-CS	H7CR-CVS	H7CR-CWS	H7CR-CWVS	
24 VDC (50 mA)	Contact	100 to 240 VAC 50/60 Hz	---	---	---	---	H7CR-BG	H7CR-B4G	H7CR-BVG	H7CR-B4VG	H7CR-BWG	H7CR-BWG	H7CR-BWVG	H7CR-BWVG	H7CR-CG	H7CR-CVG	H7CR-CWG	H7CR-CWVG	
		24 VAC 12 to 24 VDC					H7CR-BG	---	H7CR-BVG	H7CR-B4VG	H7CR-BWG	H7CR-BWG	H7CR-BWVG	H7CR-BWVG	H7CR-CG	H7CR-CVG	H7CR-CWG	H7CR-CWVG	
	Transistor	100 to 240 VAC 50/60 Hz					H7CR-BSG	H7CR-B4SG	H7CR-BVSG	H7CR-B4VSG	H7CR-BWSG	H7CR-BWSG	H7CR-BWVSG	H7CR-BWVSG	H7CR-CSG	H7CR-CVSG	H7CR-CWSG	H7CR-CWVSG	
		24 VAC 12 to 24 VDC					H7CR-BSG	---	H7CR-BVSG	H7CR-BVSG	H7CR-BWSG	H7CR-BWSG	H7CR-BWVSG	H7CR-BWVSG	H7CR-CSG	H7CR-CVSG	H7CR-CWSG	H7CR-CWVSG	

H7CR-S (Short Body)



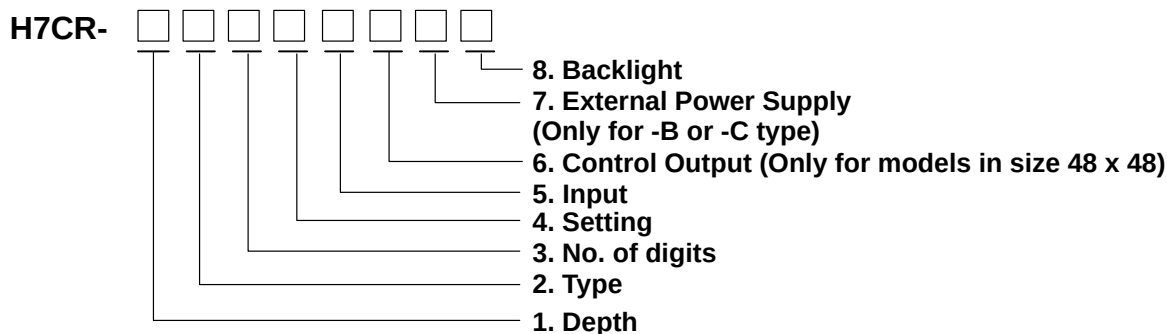
H7CR-8/11 (Plug-in Socket)



Note: Specify both the model and control supply voltage when ordering.
 With shock prevention cover types are named "H7CR-□□□□-500."

■ Model Number Legend

This model legend does not mean that all combinations of the following features are available.



1. Depth

S: Short (Only for models in size 48 x 48)
---: Not short

2. Type

A: Basic type (Only for models of size 48 x 48)
B: Standard type
C: $\pm$ Range type (Only for 6-digit display models)
8: Plug-in power reset (Only for models of size 48 x 48)
11: Plug-in power failure backup (Only for models of size 48 x 48)

3. No. of digits

4: 4 (Only for models of size 48 x 48)
---: 6

4. Setting

W: 2-stage setting (Only for -B or -C type)
---: 1-stage setting

5. Input

V: Voltage input (Not for short body or plug-in type models)
---: No-voltage input

6. Control Output (Only for models of size 48 x 48)

S: Transistor output
---: Contact output

7. External Power Supply (Only for -B or -C type)

G: 24-VDC power supply
---: Other than 24-VDC power supply

8. Backlight

L: Short body with backlight (Only for models of size 48 x 48)
---: Other than short body with backlight

■ Accessories (Order Separately)

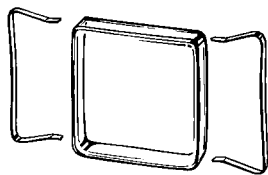
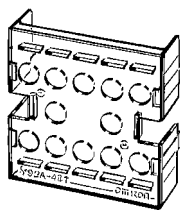
Name	Model
Soft Cover (with two mounting clips)	Y92A-48F1
Shock Prevention Cover	Y92A-48T
Panel Mounting Bracket	Y92F-30
Surface Mounting Bracket	P2CF-08
Flush Mounting Bracket	P3G-08

Operating Environment

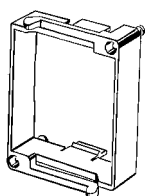
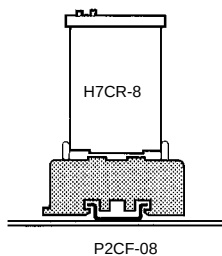
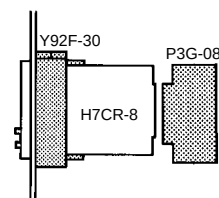
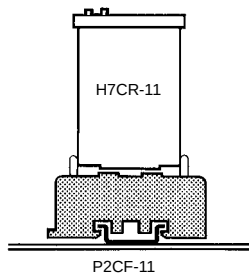
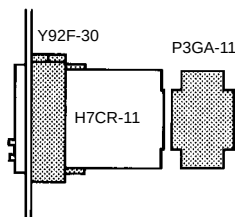
The counter has a water-resistive structure, thus preventing the internal circuitry from drops of water that may penetrate through the space between the keys and operating panel. Before operating with wet or oily hands, however, put a soft cover (sold separately) onto the operating panel. Although the soft cover protects the instrument to IPS4, avoid places where the counter is directly exposed to water or oil.

A Y92F-30 Panel Mounting Adaptor is supplied with each counter. (It can also be ordered independently.)

Soft Cover/Y92A-48F1

Shock Prevention Cover/Y92A-48T
Conforms to VDE 106/P100

Panel Mounting Bracket/Y92F-30

Surface Mounting Bracket/
P2CF-08Flush Mounting Bracket/
P3G-08Surface Mounting Bracket/
P2F-11Flush Mounting Bracket/
P3GA-11

Note: Models with a Shock Prevention Cover can be ordered by adding "-500" to the end of the model number.
Example: H7CR-BW-500 (100 to 240 VAC, 50/60 Hz) (except plug-in type, H7CR-8/11)

Specifications

H7CR-A/B/C

Model	H7CR-A/A4 (Basic type)	H7CR-B/B4 (Standard type)	H7CR-C ($\pm$ Range type)
Classification	Digital preset counter		
Mounting method	Flush mounting		
External connections	Screw terminals		
Enclosure ratings	IP54 (panel surface)		
Approved standards	UL508, CSA C22.2 No.14, conforms to EN61010-1/IEC61010-1, conforms to EN50081-2 and EN50082-2		
Input modes*	Up (incrementing), Down (decrementing), and reversible (Up/Down) Up/Down A (command inputs), Up/Down B (individual inputs), Up/Down C (phase difference inputs)	Reversible Up/Down A (command inputs), Up/Down B (individual inputs), Up/Down C (phase difference inputs)	
Output modes*	N, F	N, F, C, R, K, P, Q, A	K, D, L, H
Reset system	External and manual resets	External, manual and automatic resets (internal according to C, R, P, and Q mode operation)	External and manual resets
Prescaling function	---	Yes (0.001 to 99.999)	
Decimal point adjustment	---	Yes (Rightmost 3 digits)	
Sensor power supply	---	12 VDC or 24 VDC (according to model)	
Input signals	Count and reset	Count, reset, and key protection	
Input method	No-voltage input: Via opening and closing of contact Voltage input: Via high and low signal voltages	No-voltage input: Via opening and closing of contact Voltage input: Via high and low signal voltages (key protection is no-voltage input only)	
Control outputs	SPST-NO contact or transistor (NPN open collector) output	1 stage model: SPST-NO contact or transistor (NPN open collector) output 2 stage model: 2 stages of SPST-NO contact or transistor (NPN open collector) output	
Display	LCD	LCD with backlight	
Digits	6 digits (0 to 999,999), 4 digits (0 to 9,999)		5 digits negative and 6 digits positive (-99,999 to 999,999)
Memory backup	Backup time for power interruption: Approx. 10 years at 20°C		

*Refer to timing charts for input and output mode operation.

H7CR-S/8/11

Model	H7CR-SA/SA4 (Basic type)	H7CR-SB/SB4 (Standard type)	H7CR-SC (±Range type)	H7CR-8/84 (Standard type)	H7CR-11/114 (Standard type)
Classification	Digital preset counter				
Mounting method	Flush mounting			Flush mounting, surface mounting	
External connections	Screw terminals			Socket	
Enclosure ratings	IP54 (panel surface)				
Approved standards	UL508, CSA C22.2 No.14, conforms to EN61010-1/IEC61010-1, EN50081-2 and EN50082-2				
Input modes*	Up (incrementing), Down (decrementing), and reversible (Up/Down) Up/Down A (command inputs), Up/Down B (individual inputs), Up/Down C (phase difference inputs)		Reversible Up/Down A (command inputs), Up/Down B (individual inputs), Up/Down C (phase difference inputs)	Incrementing, decrementing, and reversible (Up/Down) Up/Down A (command inputs), Up/Down B (individual inputs), Up/Down C (phase difference inputs)	
Output modes*	N, F	N, F, C, R, K, P, Q, A	K, D, L, H	N, F, C, R, K, P, Q, A	
Reset system	External and manual resets	External, manual, automatic resets (internal according to C, R, P, and Q mode operation)	External and manual resets	External, manual, power supply, and automatic resets (internal according to C, R, P, and Q mode operation)	External, manual, automatic resets (internal according to C, R, P, and Q mode operation)
Prescaling function	---	Yes (0.001 to 99.999)			
Decimal point adjustment	---	Yes (Rightmost 3 digits)			
Input signals	Count and reset	Count, reset, and key protection		Count and reset	Count, reset, and key protection
Input method	No-voltage input:	Via opening and closing of contact			
Control outputs	SPST-NO contact or transistor (NPN open collector) output	1 stage model: SPST-NO contact or transistor (NPN open collector) output 2 stage model: DPST-NO contact or transistor (NPN open collector) output	SPST-NO contact or transistor (NPN open collector) output		SPDT-NO contact or transistor (NPN open collector) output
Display	LCD with backlight				
Digits	6 digits (0 to 999,999) 4 digits (0 to 9,999)		5 digits negative and 6 digits positive (-99,999 to 999,999)	6 digits (0 to 999,999) 4 digits (0 to 9,999)	
Memory backup	Backup time for power interruption: Approx. 10 years at 20°C				

■ Ratings

H7CR-A/B/C

Model	H7CR-A/A4 (Basic type)	H7CR-B/B4 (Standard type)	H7CR-C/C4 (±Range type)
Rated supply voltage	100 to 120 VAC/200 to 240 VAC, 50/60 Hz, 24 VAC	100 to 240 VAC, 50/60 Hz, 24 VAC/12 to 24 VDC (ripple: 20% max.)	
Operating voltage range	85% to 110% of rated voltage		
Current consumption	Approx. 6.0 VA (at 50 Hz, 240 VAC); approx. 1.3 VA (at 25 VAC) *	Approx. 6.6 VA (at 50 Hz, 240 VAC); approx. 3.2 W (at 24 VDC)**	
Max. counting speeds	30/1k/5kcps (same setting for CP1 and CP2)		
Reset	Min. pulse width for external reset: 20 ms, manual reset	Min. pulse width for external reset: 1 or 20 ms, manual reset	
Key protection	---	Response time: 1 s	
One-shot time	---	10, 50, 100, 200, and 500 ms (separate setting for stages 1 and 2)	
Count, reset inputs	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 2 V max. OFF impedance: 100 kΩ max. Voltage input (input resistance: approx. 4.7 kΩ) High level: 4.5 to 30 VDC Low level: 0 to 2 VDC		
Key protection input	---	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 1 V max. OFF impedance: 100 kΩ min.	
Control outputs	Contacts: 3 A at 250 VAC, resistance load (cos ϕ = 1) Transistor output: Open collector 100mA at 30 VDC max. residual voltage 2 V max. (Approx. 1 V)		
External power supply	---	100 mA, 12 VDC ±10% (5% ripple max.) 50 mA, 24 VDC ±10% (5% ripple max.)	

*When power is turned ON, approx. 2 A (24 VAC) inrush current flows for about 2 ms.

**When power is turned ON, approx. 5 A (240 VAC), 8 A (24 VDC, 24 VAC) inrush current flows for about 2 ms.

H7CR-S/8/11

Model	H7CR-SA/SA4 (Basic type)	H7CR-SB/SB4 (Standard type)	H7CR-SC (±Range type)	H7CR-8/84 (Standard type)	H7CR-11/114 (Standard type)
Rated supply voltage	12 to 24 VDC (contains 20% ripple max.)			100 to 240 VAC, 50/60 Hz, 24 VAC/12 to 24 VDC (ripple: 20% max.)	
Operating voltage range	85% to 110% of rated voltage				
Current consumption	Approx. 1.3 W (at 24 VDC) *			Approx. 2.8 VA (at 50 Hz, 240 VAC) * approx. 1.3 W (at 24 VDC) **	
Max. counting speeds (CP1, CP2 count input)	30/1k/5kcps (same setting for CP1 and CP2)				
Reset	Min. pulse width for external reset: 20 ms manual reset	Min. pulse width for external reset: 1 or 20 ms manual reset	Min. pulse width for external reset: 1 or 20 ms, manual reset, power reset: 0.5 s	Min. pulse width for external reset: 1 or 20 ms manual reset	
Key protection	---	Response time: approx. 1 s			
One-shot time	---	10, 50, 100, 200, and 500 ms (separate setting for stages 1 and 2)		10, 50, 100, 200, and 500 ms	
Count, reset inputs	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 2 V max. OFF impedance: 100 kΩ max.				
Key protection input	---	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 1 V max. OFF impedance: 100 kΩ min.	---	No-voltage input ON impedance: 1 kΩ max. (Approx. 2 mA when 0 Ω) ON residual voltage: 1 V max. OFF impedance: 100 kΩ min.	
Control outputs	Contacts: 3 A at 250 VAC, resistance load (cos φ= 1) Transistor output: Open collector 100mA at 30 VDC max. residual voltage 2 V max. (Approx. 1 V)				

*When power is turned ON, approx. 5 A (24 VDC, 240 VAC) inrush current flows for about 2 ms.

**When power is turned ON, approx. 8 A (24 VDC, 24 VAC) inrush current flows for about 2 ms.

■ Characteristics

Insulation resistance	100 MΩ min. (at 500 VDC) (between current-carrying terminal and exposed non-current-carrying metal parts, and between non-continuous contacts)
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC type 1,000 VAC for 24VAC/12 to 24 VDC type and for transistor output type
Impulse withstand voltage	3 kV (between power terminals) for 100 to 240 VAC type, 1 kV for 24 VAC/12 to 24 VDC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts for 100 to 240 VAC type, 1.5 kV for 24 VAC/12 to 24 VDC.
Noise immunity	±2 kV (between power terminals) and ±600 V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±480 V (between power terminals) for H7CR-S type
Static immunity	Destruction: 15 kV Malfunction: 8 kV
Vibration resistance	Destruction: 10 to 55 Hz with 0.75-mm single amplitude each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude each in three directions
Shock resistance	Destruction: 300 m/s ² (Approx. 30G) each in three directions. Malfunction: 100 m/s ² (Approx. 10G) each in three directions.
Life expectancy	Mechanical: 10 million operations min. Electrical: 100,000 operations min. 5A at 250 VAC in load resistance
Ambient temperature	Operating: -10°C to 55°C (with no icing) Storage: -25°C to 65°C (with no icing)
Ambient humidity	Operating: 35% to 85%
EMC	(EMI): EN50081-2 Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS): EN50082-2 Immunity ESD: EN61000-4-2: 4 kV/contact discharge 8 kV air discharge Immunity RF-interference: ENV50140: 10 V/m (Amplitude-modulated, 80 MHz to 1 GHz) 10 V/m (Pulse-modulated, 900 MHz) Immunity Conducted Disturbance: ENV50141 10 V (0.15 to 80 MHz) Immunity Burst: EN61000-4-4: 2 kV power-line 2 kV I/O signal-line
Case color	Light gray (Munsell 5Y7/1)
Weight	H7CR-A/A4 (AC type): approx. 230 g; H7CR-B/B4/C: approx. 170 g H7CR-S/S4: approx. 120 g; H7CR-8/84/11/114: approx. 150 g

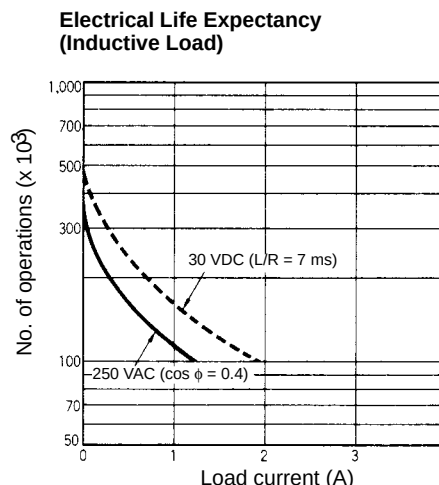
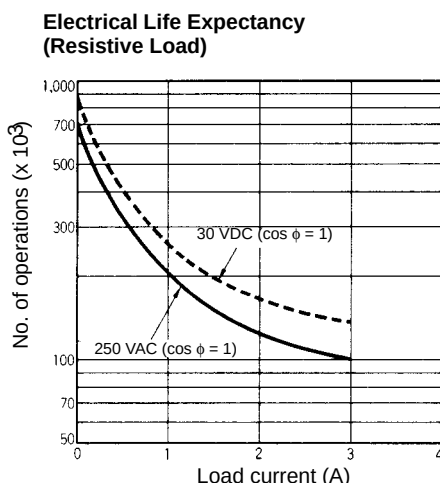
■ I/O Functions

Inputs	CP1/CP2	Count signal inputs. Up, Down, and Up/Down (command, individual, or phase difference) inputs accepted.
	Reset	Resets present value. (to zero in Up modes, to preset with 1-stage models in Down mode, and to preset with 2-stage models.) Count inputs are not accepted while reset input is ON. Reset indicator lit while reset input is ON.
	Key protection (See note)	Makes keys inoperative according to key protection level. Key protection indicator lit while key protection input is ON. Effective when power supply is turned off. Effective when protect terminals are shorted.
Outputs	OUT 1.2	Outputs made according to designated output mode when corresponding preset is reached.

Note: Not set for the Basic type and H7CR-8.

Engineering Data

Life Expectancy of Contacts

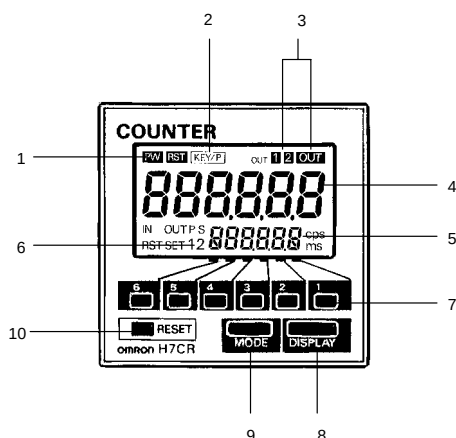


Reference: A current of 0.15 A max. can be switched at 125 VDC (cos φ = 1) and a current of 0.1 A max. can be switched if L/R = 7 ms. In both cases, a life of 100,000 operations can be expected.

Nomenclature

Indicator

1. Power indicator
2. Key protection indicator
3. Control output indicator
OUT: 1 stage
OUT1, OUT2: 2 stages
4. Present value
(character height: 8 mm)
(Zeroes suppressed)
5. Set value
(character height: 4 mm)
(Indicates data in function setting mode)
6. Set value 1,2 stage indicator.

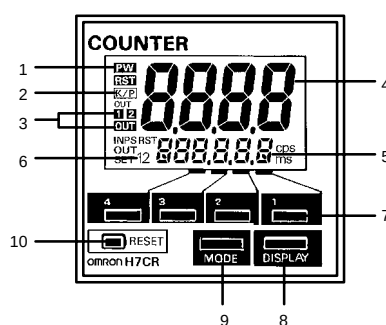


Operation Key

7. Increment Keys (1 to 6)
(Used to change the corresponding digit of the set value. Increment Key (6) of H7CR-C/SC also can be switching for $\pm$ code. Used to change data in the function setting mode.)
8. Display Key
(Switches to the setting displays. For 2 stage model, switch set value 1,2.)
9. Mode Key
(Switches from run mode to function setting mode. Changes items in the function setting mode.)
10. Reset Key
(Resets present value and outputs.)

Indicator

1. Power indicator
2. Key protection indicator
3. Control output indicator
OUT: 1 stage
OUT1, OUT2: 2 stages
4. Present value
(character height: 12 mm)
(Leading zeros suppressed)
5. Set value
(character height: 4.5 mm)
(Indicates value in function Setting Mode)
6. Set value stage 1 and 2 indicators.



Operation Key

7. Increment Keys (1 to 4)
(Used to change the corresponding digit of the set value. Used to change data in the function Setting Mode.)
8. Display Key
(Switches to the setting displays. For 2-stage models, switches set value 1 and 2.)
9. Mode Key
(Switches from Run Mode to Setting Mode. Changes items in the Setting Mode.)
10. Reset Key
(Resets present value and outputs.)

Operation

■ Factory Settings

The following table shows the timer settings when it is shipped. Please change the settings as necessary to suit the system before operation. Settings and the display receive power from the internal battery and are therefore unaffected by external power interruptions.

H7CR-A/B/C

Model	H7CR-A/A4 (Basic type)	H7CR-B/B4 (Standard type)	H7CR-C ($\pm$ Range type)
Present value	0	0	0
Presets	0	0	0
Input mode	Up	Up	Up/Down C (phase difference)
Output mode	N	N	K
Output 2 time	(HOLD)	(HOLD)	500 ms
Output 1 time	---	HOLD	500 ms
Counting speeds	30 cps	30 cps	30 cps
Min. reset time	(20 ms)	20 ms	20 ms
Decimal point	(no fractions)	Far right (no fractions)	Far right (no fractions)
Prescale	(1,000)	1,000	1,000
Key protection level	---	KP-1	KP-1

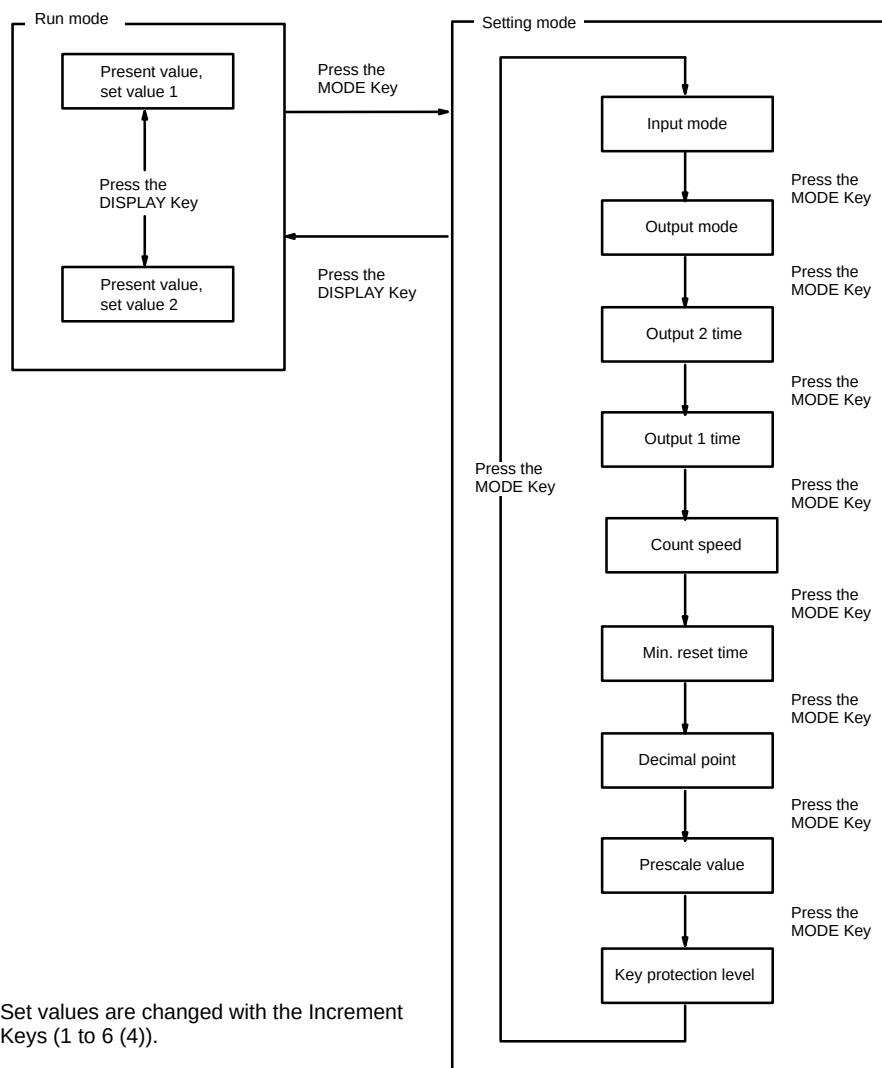
Note: With the initial settings, there will be no output even if the power supply is connected. External inputs and outputs cannot be used without a power supply.

H7CR-S/8/11

Model	H7CR-SA/SA4 (Basic type)	H7CR-SB/SB4 (Standard type)	H7CR-SC ($\pm$ Range type)	H7CR-8/11/84/114 (Standard type)
Present value	0	0	0	0
Presets	0	0	0	0
Input mode	Up	Up	Up/Down C (phase difference)	Up
Output mode	N	N	K	N
Output 2 time	(HOLD)	(HOLD)	500 ms	(HOLD)
Output 1 time	---	HOLD	500 ms	---
Counting speeds	30 cps	30 cps	30 cps	30 cps
Min. reset time	(20 ms)	20 ms	20 ms	20 ms
Decimal point	(no fractions)	Far right (no fractions)	Far right (no fractions)	Far right (no fractions)
Prescale	(1,000)	1,000	1,000	1,000
Key protection level	---	KP-1	KP-1	KP-1 (H7CR-11 only)

Note: With the initial settings, there will be no output even if the power supply is connected. External inputs and outputs cannot be used without a power supply.

■ Operational Overview



Note: Set values are changed with the Increment Keys (1 to 6 (4)).

■ Setting Item Table

Mode	Setting item	Applicable model H7CR					Description	Setting procedure
		-A/ A4/ SA/ SA4	-B/ B4/ SB/ SB4	-C/ SC	-8 /84	-11/ 114		
Run mode	Set value 1, 2	No	Yes	Yes	No	No	Compared to the present value. Determines the timing of the control output according to the output mode. The DISPLAY Key switches between set value 1 and 2. (2-stage model only.)	Sequence when changing a digit using the Increment Keys (1 to 6 (4)). Note: (-) is H7CR-C and -SC type (Increment Key 6) only.
Function setting mode	Input mode	Yes	Yes	Yes	Yes	Yes	Determines the input mode selecting from Up, Down, Up/Down modes.	Press keys 1 to 6 (4) to change the displayed mode. (Up) (Down) (Up/Down A) (Up/Down B) (Up/Down C) *No input mode for -C/SC type.

Mode	Setting item	Applicable model H7CR					Description	Setting procedure
		-A/ A4/ SA/ SA4	-B/ B4/ SB/ SB4	-C/ SC	-8 /84	-11/ 114		
Function setting mode	Output mode	Yes	Yes	Yes	Yes	Yes	Determines the form of the control output. (Refer to the present value vs. output diagrams on pages 16 to 18.) Determines the output time for control output (Output 2).	Press keys 1 to 6 (4) to change the displayed mode. H7CR-A/SA H7CR-B/SB/8/11 H7CR-C/SC *2-stage model only. Press keys 1 to 6 (4) to change the Output 2 time. (Applicable to output modes C, R, K, P, Q, and A only.)
	Output time 1 (2-stage model only)	No	Yes	Yes	No	No	Determines the output time of the control output (OUT 1) for 2-stage model counters.	Press keys 1 to 6 (4) to change the displayed mode. *H7CR-BW/SBW only.
	Count speed	Yes	Yes	Yes	Yes	Yes	Switches the count input filter to protect against errant counts due to interference.	Press keys 1 to 6 (4) to change the displayed mode.
	Min. reset time	No	Yes	Yes	Yes	Yes	Determines the initial signal width of the external reset.	Press keys 1 to 6 (4) to change the displayed mode.
	Decimal point	No	Yes	Yes	Yes	Yes	Determines the decimal point position of the present and set values.	Move the decimal point position from left to right with keys, 1 to 6 (4).
	Prescale value	No	Yes	Yes	Yes	Yes	Can calculate and display a physical parameter (volume, length, etc.) from the present value. For example, if one count input represented a movement of 0.02 mm, the prescale value would be 0.02. Values from 0.001 to 99.999 are possible.	Change the value of the digits with the corresponding keys, 1 to 6 (4).
	Key protection level	No	Yes	Yes	No	Yes	Locks certain keys to prevent accidental operation. The key protection level, kP-1 to kP-4, determines which keys are locked when the key protection input is ON. The locked keys are crossed out in the diagram on the right.	Sequence when changing the key protection level using the Increment Keys (1 to 6 (4)).

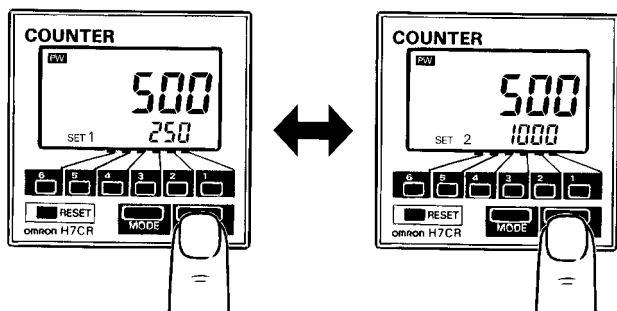
Note: Settings changed in setting mode are not effective until run mode is entered.

■ Examples

Run Mode

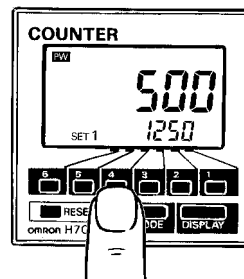
Changing the Set Value

1. Press the DISPLAY Key to change the displayed preset value 1 and 2 during operation.



2. Change the set value from 250 to 1,250.

- Pressing keys 1 through 6 (1 through 4 for 4-digit models) increments the corresponding column by 1.
- Non-significant zeros are normally not shown on the set value display.

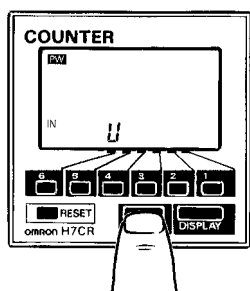


Setting Mode

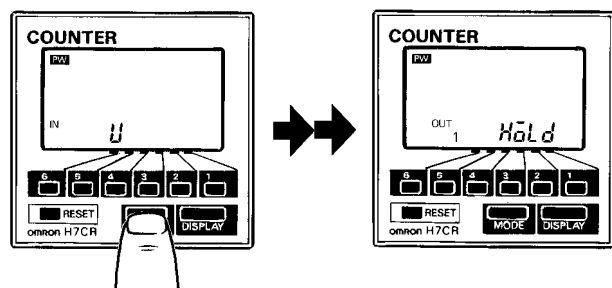
Changing Settings in the Function Setting Mode

1. Press the MODE Key to switch from run mode to setting mode.

- The Counter will continue operation if switched from run mode to function setting mode during operation.
- The MODE Key will be locked if the key protection function is enabled.
- Settings changed in the function setting mode are not effective until run mode is entered. As the operating conditions will change in this case, always reset operation with the RESET Key or a reset input.

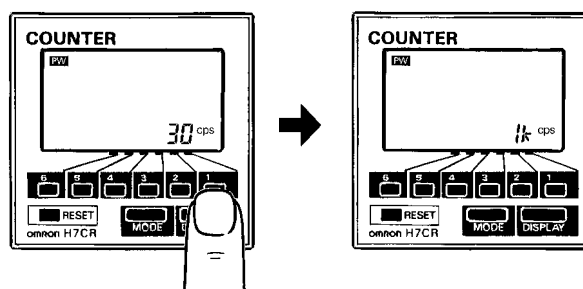


2. Press the MODE Key to scroll successively through the items that can be set. Release the MODE Key to select the desired item.

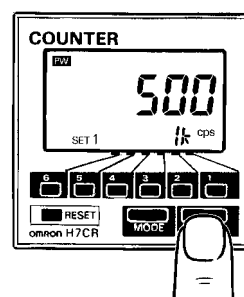


3. Changing the selected item

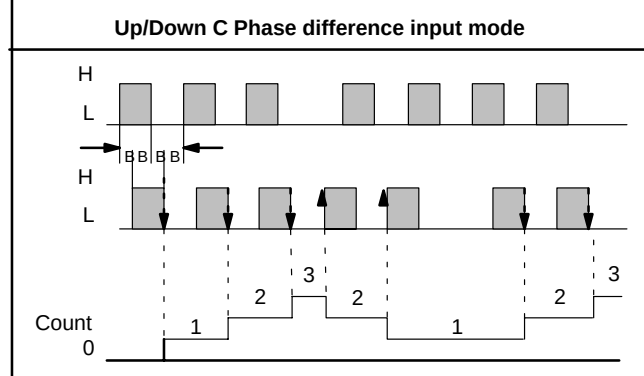
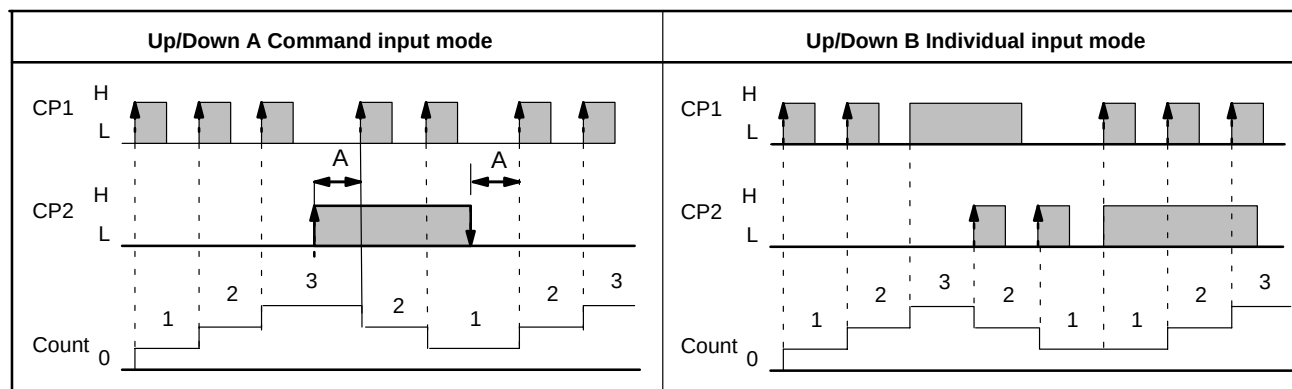
- Press the MODE Key until the desired item appears
- Change the item setting by pressing keys 1 through 6 (1 through 4 for 4-digit models). (Press the DISPLAY Key to switch back from function setting mode to run mode.)



- Press the DISPLAY Key to return to Run mode from Setting mode.



Up (increment) mode		Down (decrement) mode	
Count input CP1 Gate input CP2 Count	Count input CP1 Gate input CP2 Count		
Gate input CP1 Count input CP2 Count	Gate input CP1 Count input CP2 Count		



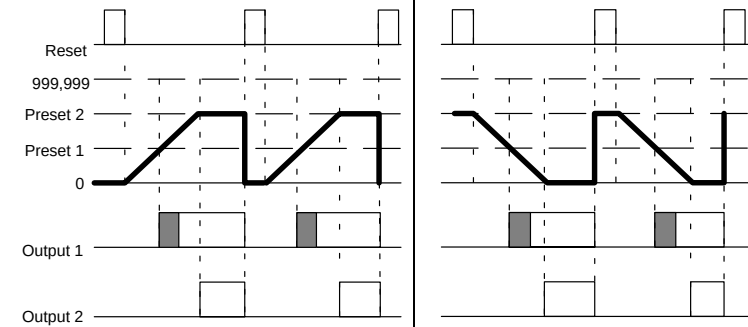
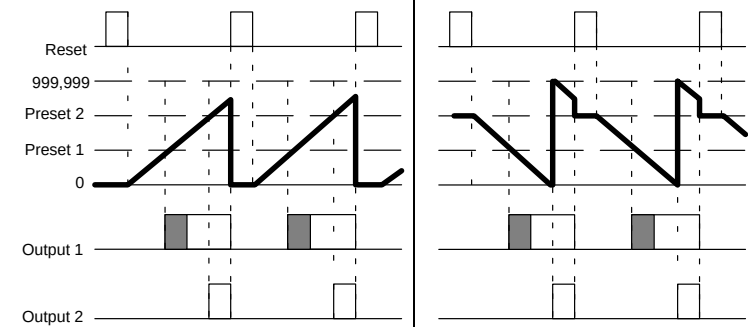
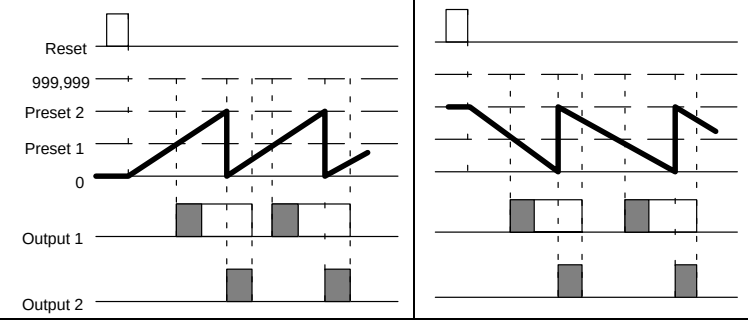
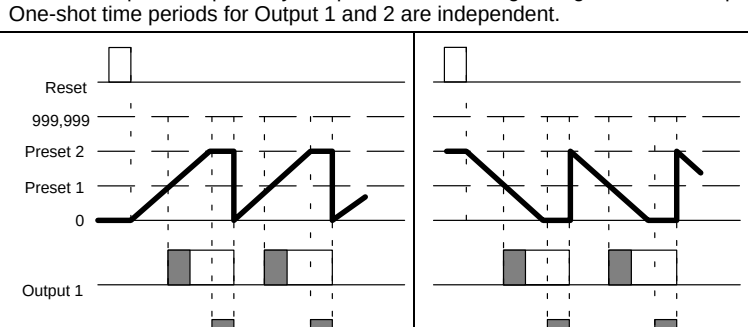
Note 3 H and L

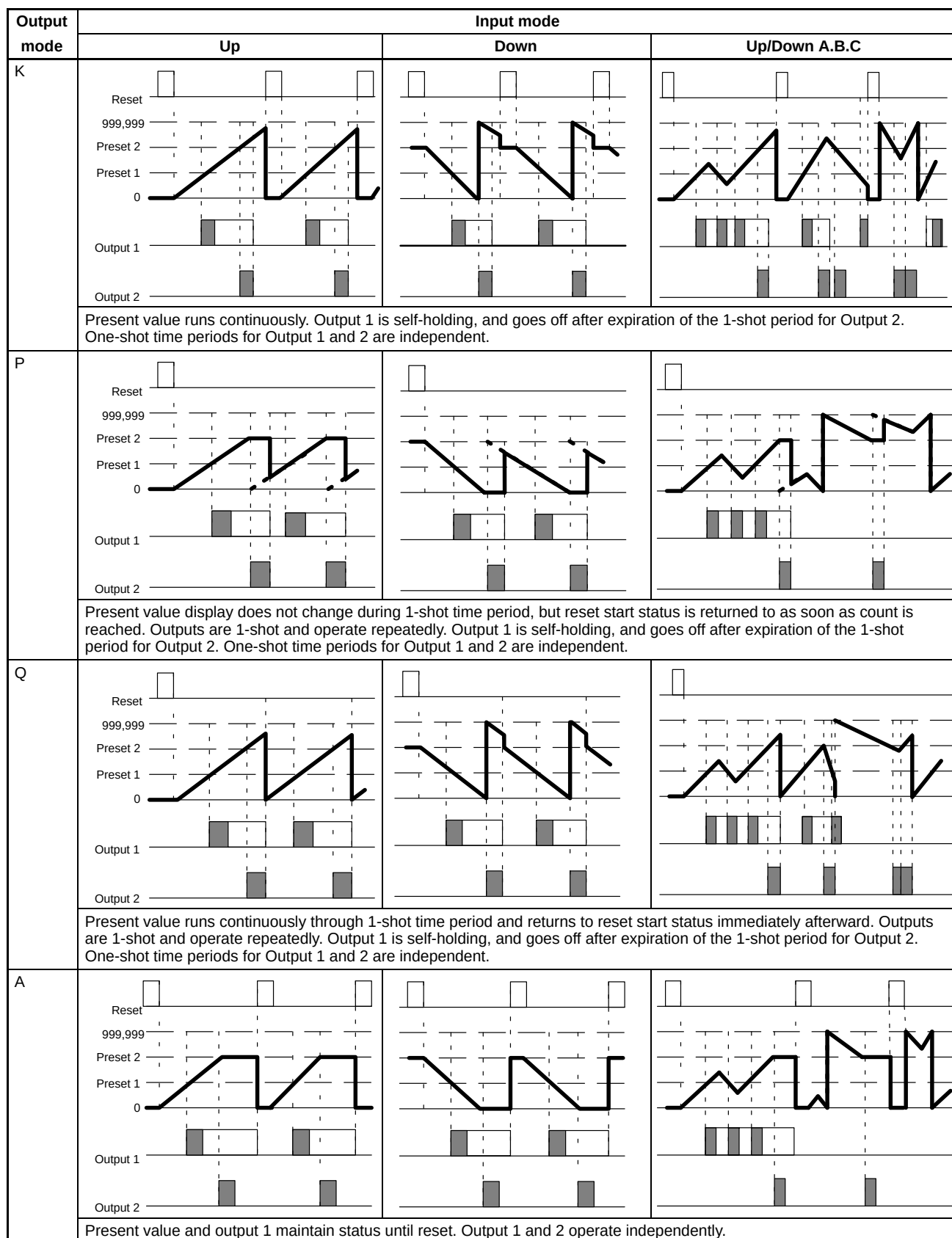
Signal	No-voltage input	Voltage input
H	Short circuit	4.5 to 30 VDC
L	Open circuit	0 to 2 VDC

■ Input/Output Mode Setting

H7CR-A/A4/B/B4/SA/SA4/SB/SB4/8/84/11/114 (N and R modes only apply to the -A and -SA types.)

Output 2 operation applies for 1-stage models only.

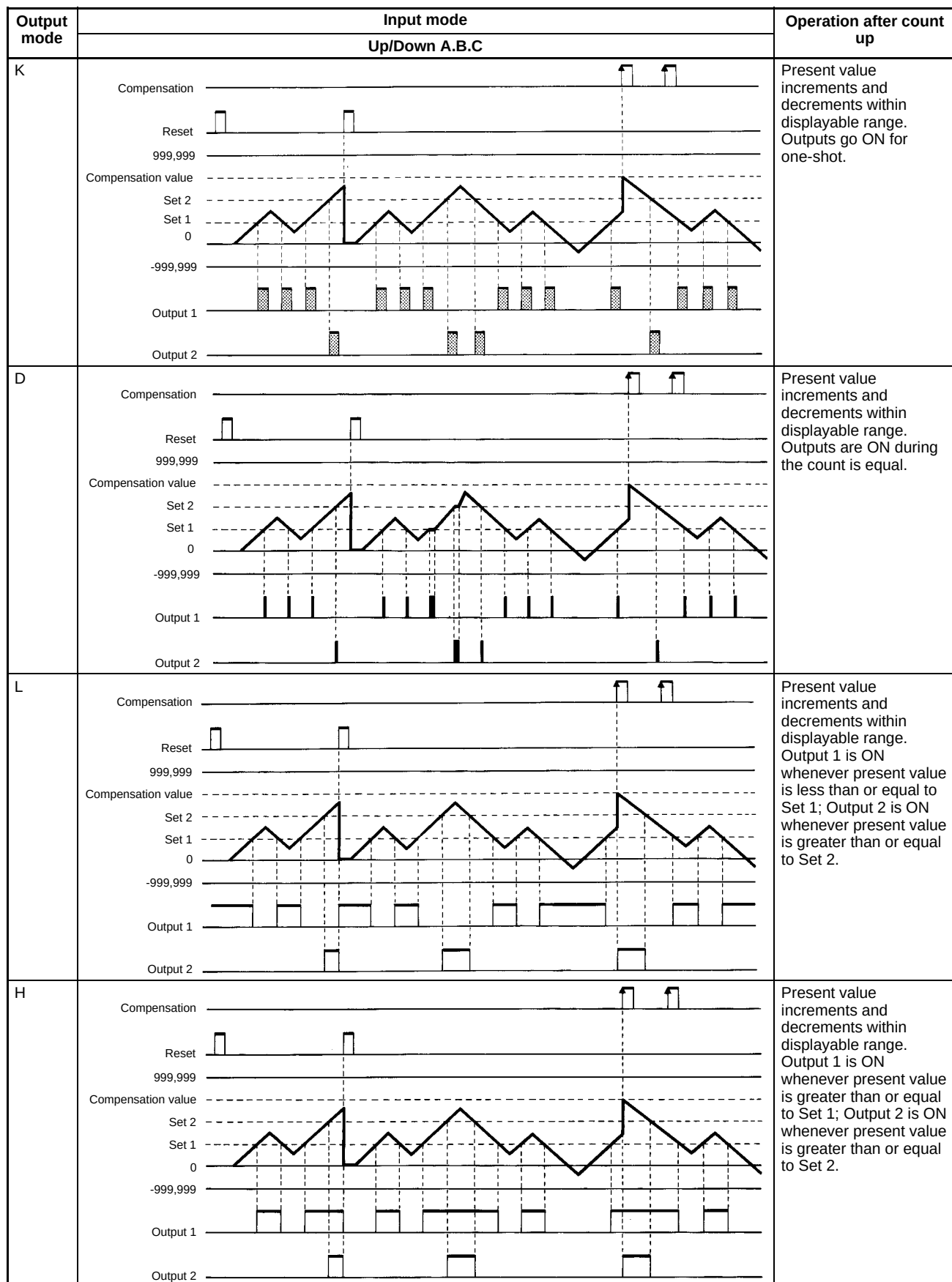
Output mode	Input mode		
	Up	Down	Up/Down A.B.C
N	 Outputs and present value display are maintained until reset.		
F	 Present value display runs continuously. Outputs are maintained until reset.		
C	 Present value is placed in reset start status as soon as count up is reached. The count up is not displayed. Outputs are 1-shot and operate repeatedly. Output 1 is self-holding, and goes off after expiration of the 1-shot period for Output 2. One-shot time periods for Output 1 and 2 are independent.		
R	 Present value is placed in reset start status as soon as count up is reached. Outputs are 1-shot and operate repeatedly. Output 1 is self-holding, and goes off after expiration of the 1-shot period for Output 2. One-shot time periods for Output 1 and 2 are independent.		

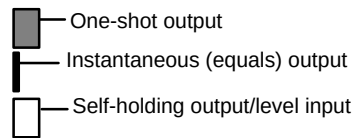
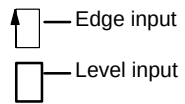


One-shot outputs can be set to between 10 and 500 ms.

H7CR-C/SC

Output 2 operation applies for 1-stage models only.





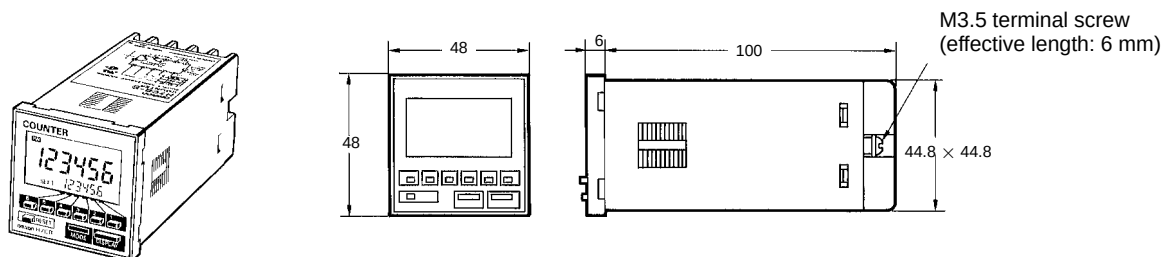
One-shot outputs can be set to between 10 and 500 ms.

- Note:**
1. Counting inputs are not applied while the reset input is ON.
 2. One-shot outputs, when ON, are turned OFF when the reset input goes ON.
 3. One-shot outputs, when ON, are reset and the one-shot output is restarted if a preset designating the output is reached.

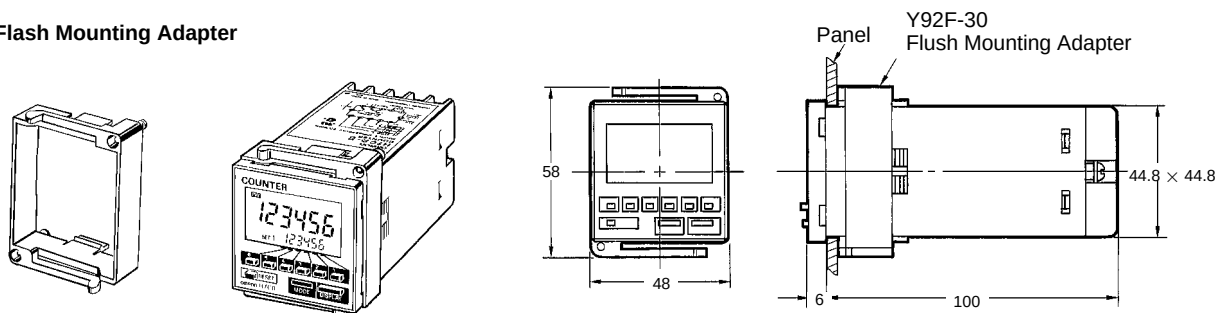
Dimensions

Note: All units are in millimeters unless otherwise indicated.
The dimensions are the same for both the 4-digit and 6-digit models.

H7CR-A/B/C

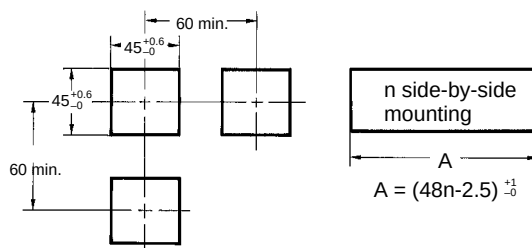


Flash Mounting Adapter



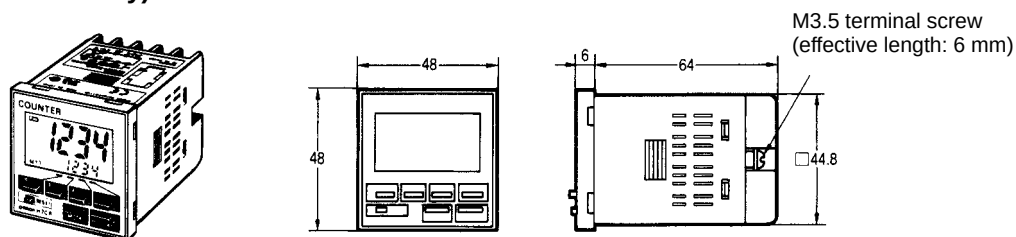
Panel Cutouts

Panel cutouts are as shown at right.
(according to DIN43700).

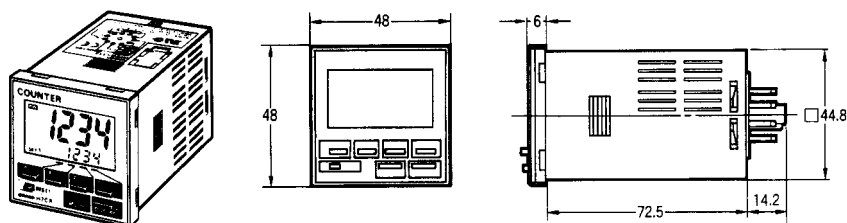


- Note 1. The mounting panel thickness should be 1 to 4 mm.
2. It is possible to mount Counters side by side, but one way only.

H7CR-S (Short Body)

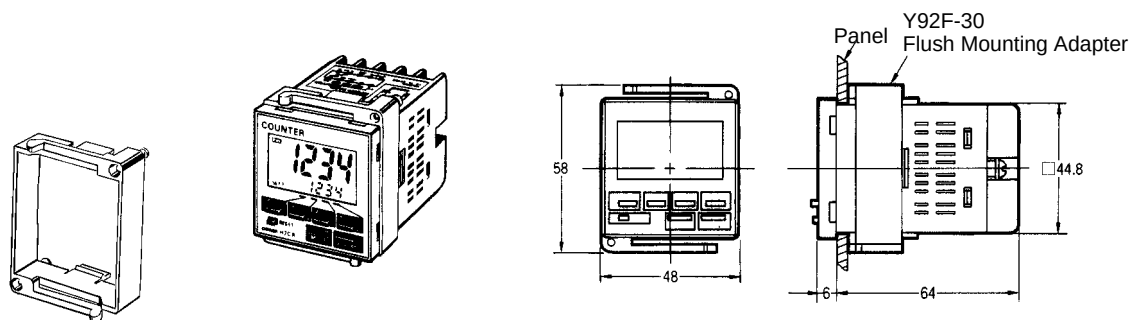


H7CR-8/11

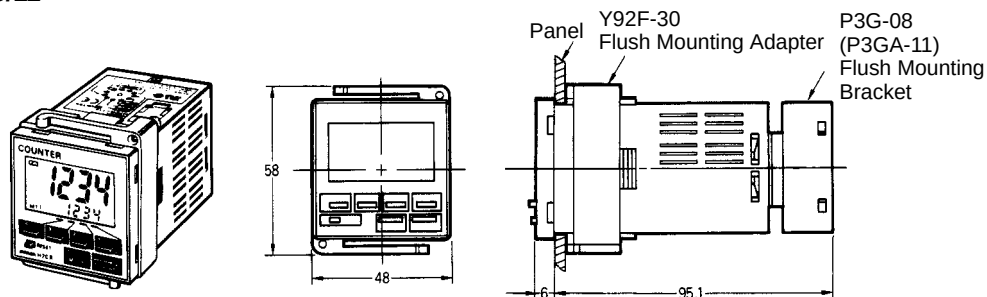


Flash Mounting Adapter

H7CR-S

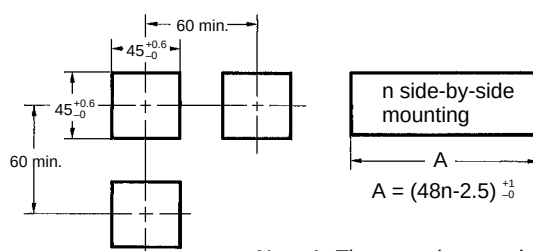


H7CR-8/11



Panel Cutouts

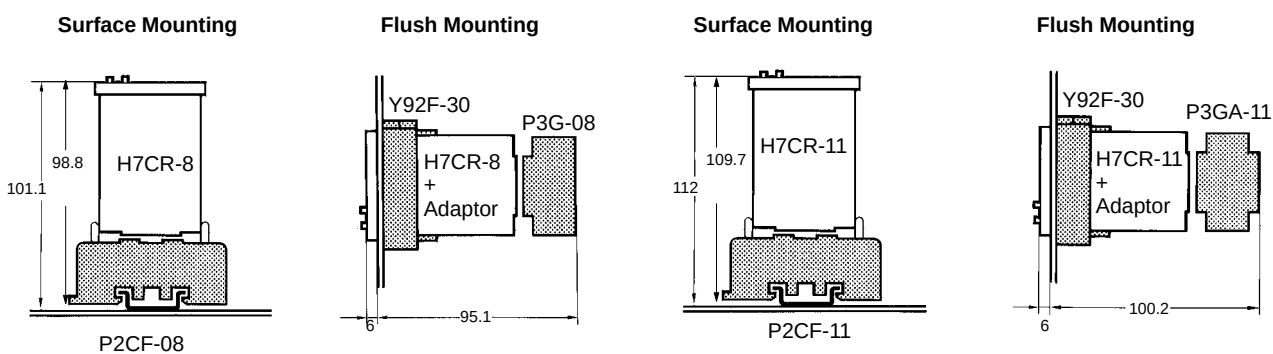
Panel cutouts are as shown at right. (according to DIN43700).



Note 1. The mounting panel thickness should be 1 to 4 mm.

2. It is possible to mount Counters side by side, but only horizontally.

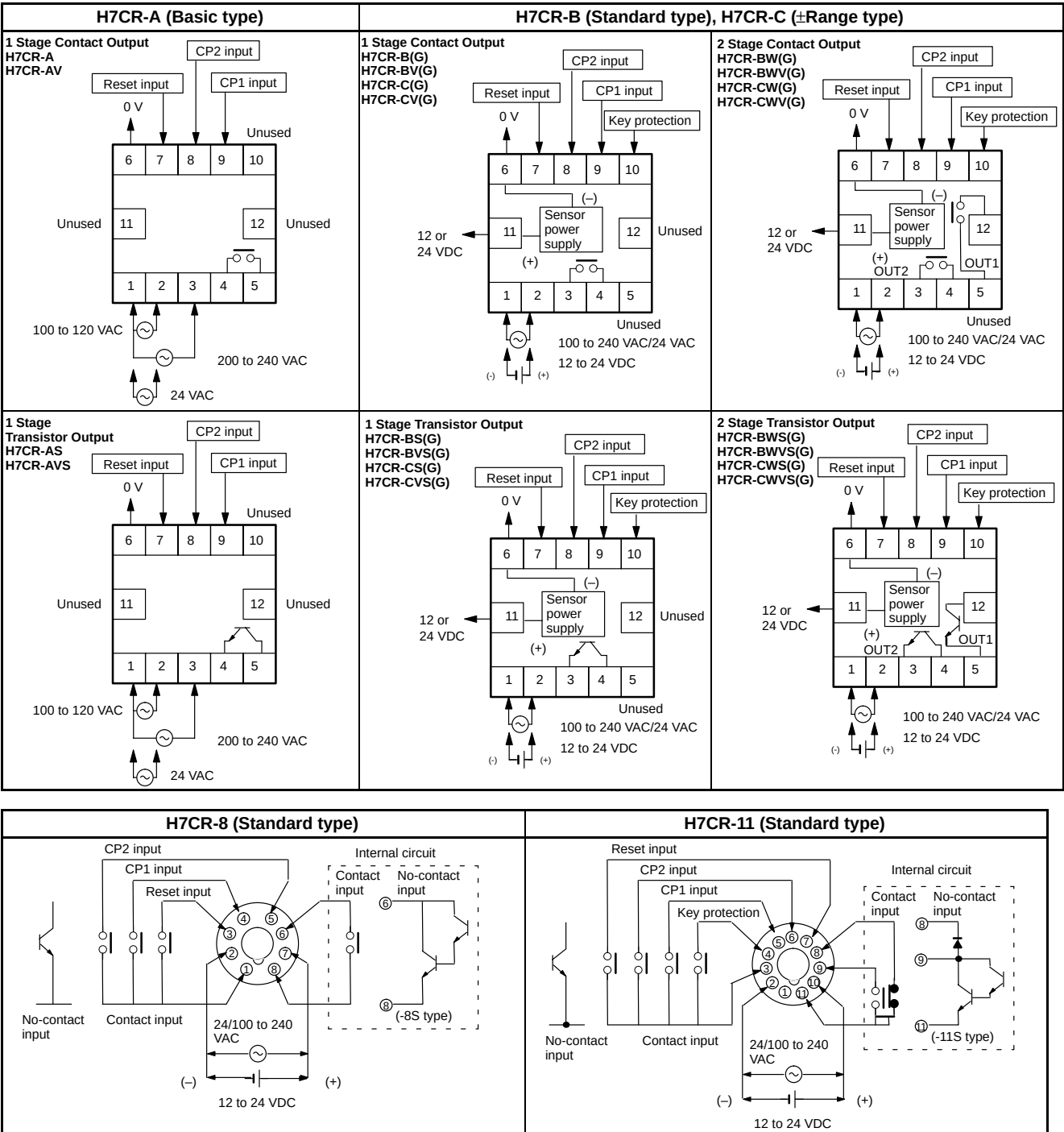
H7CR-8/11 Mounting Styles

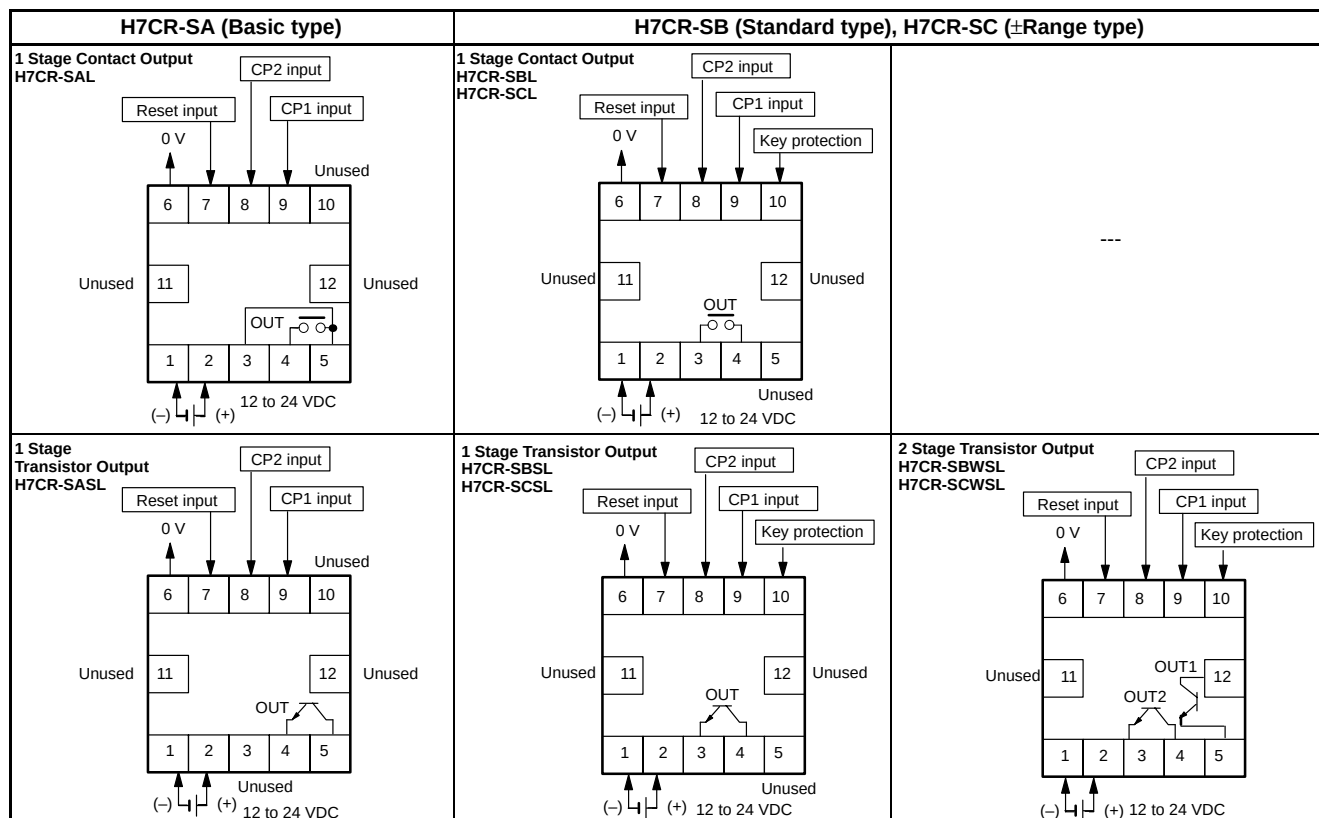


Installation

■ Terminal Arrangement

Terminal arrangements for the 4-digit models are the same as those shown below.



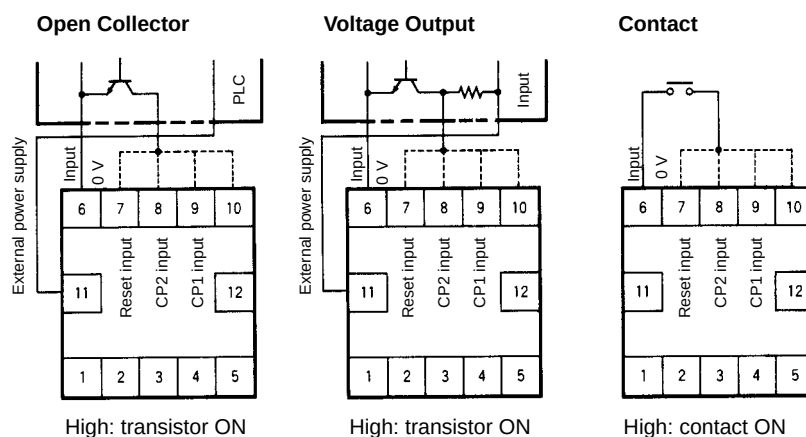


Note: Do not connect unused terminals.

■ Connections

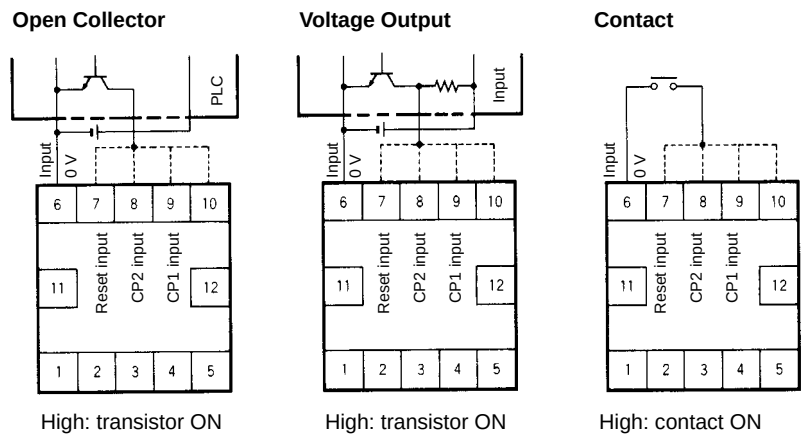
The inputs of the H7CR are no-voltage (short circuit or open) inputs and voltage inputs. (Key protection only for no-voltage inputs)

No-voltage Inputs (With an External Power Supply)



Note: The DC power supply must be 30 VDC max.

No-voltage Inputs (Without an External Power Supply)

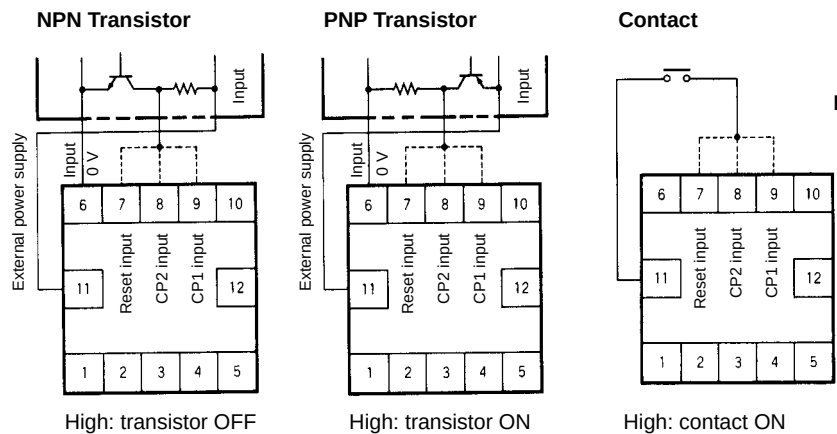


Note: The DC power supply must be 30 VDC max.

No-voltage Input Signal Levels

No-contact input	1. High level Transistor ON Residual voltage: 2 V max. Impedance when ON: 1 kΩ max.
	2. Low level Transistor OFF Impedance when OFF: 100 kΩ max.
Contact input	Use contacts which can adequately switch 2 mA at 5 V

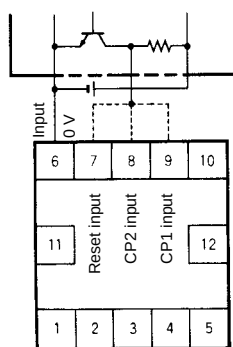
Voltage Inputs (With an External Power Supply)



Note: The DC power supply must be 30 VDC max.

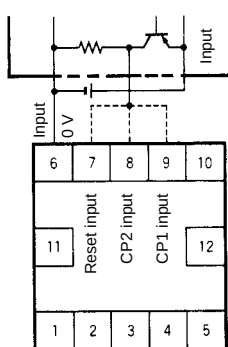
Voltage Inputs (Without an External Power Supply)

NPN Transistor



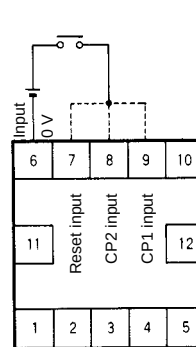
High: transistor OFF

PNP Transistor



High: transistor ON

Contact



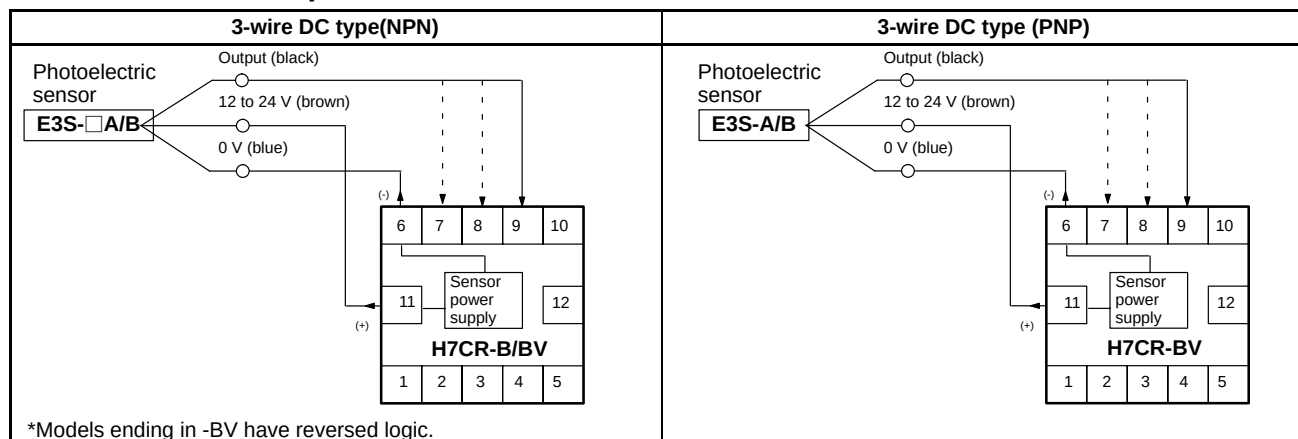
High: contact ON

Note: The DC power supply must be 30 VDC max.

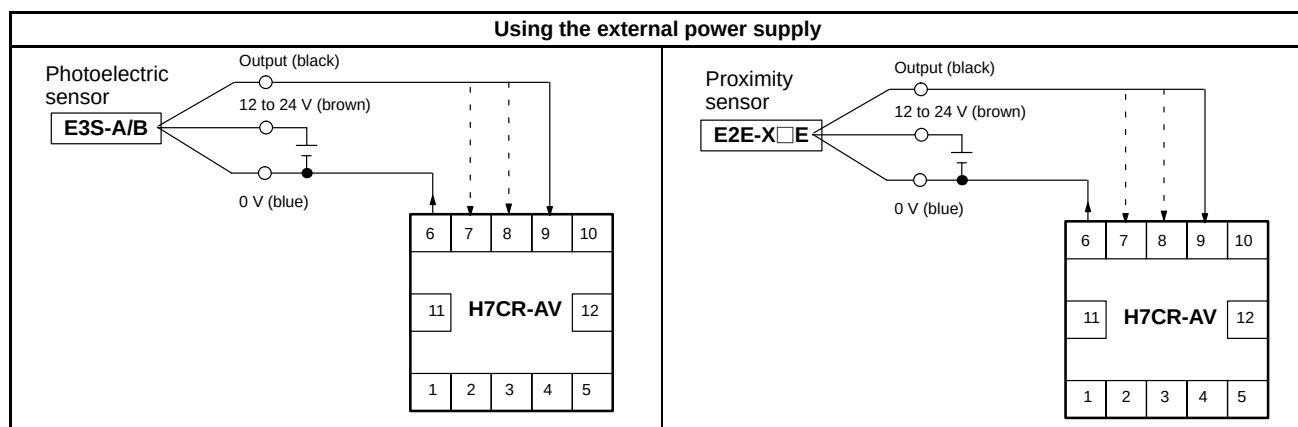
Voltage Input Signal Levels

1. High level 4.5 to 30 VDC
2. Low level 0 to 2 VDC

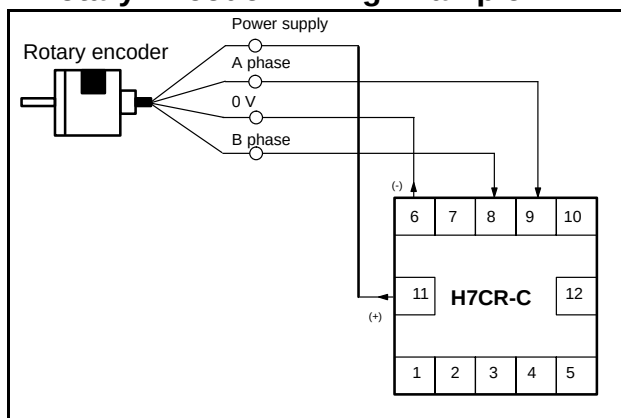
■ Connection Examples with OMRON Sensors



*Models ending in -BV have reversed logic.



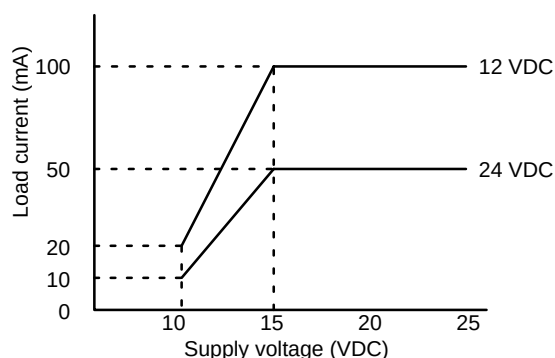
■ Rotary Encoder Wiring Example



Precautions

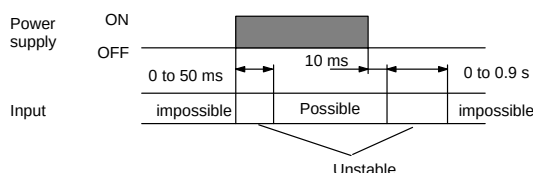
■ Sensor Power Supply

- The capacity of the external power supply is 100 mA at 12 V/50 mA at 24 V. When using a 24 VAC/12 to 24 VDC power supply, reduce the load with the power supply voltage, as shown in the following diagram (DC power supplies only).



■ Power Supplies

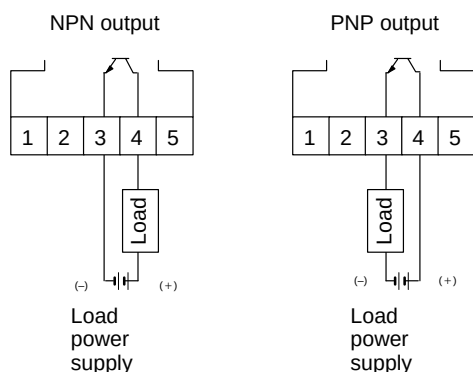
- When turning the power ON and OFF, input signal reception is possible, unstable, or impossible as shown in the diagram below. The unstable period will vary with power supply voltage, and the load conditions on external power supplies.



- A switching regulator is used in the internal circuits of counters with 100-to-240-VAC or 12-to-24-VAC specifications, causing an inrush current (approx. 1.5 A) to flow when power is turned on. If the capacity of the power supply to the counter is insufficient, the counter may not start operation. Be sure to provide adequate capacity (recommended supply capacity; H7CR: 15 W min. and H7CR-S: 5 W min.)
- Connect the power supply voltage through a relay or switch in such a way that the voltage reaches a fixed value immediately.

■ Transistor Output

- The H7CR transistor output is insulated from the internal circuitry by a photocoupler, so either NPN or PNP output is possible.



■ DIP Switch Setting Changes

Any changes in the DIP switch settings while power is being supplied is invalid. Restart the power supply.

■ Self-diagnostic Function

- The following displays will appear if an error occurs. The present value and output enter the same status as after pressing the RESET Key.

Display	Error	Output status	Correction	Function setting
000000	Present value below min.	No change	Press RESET Key	No change
FFFFFF**	Present value above max.		or reset input	
E1	CPU	OFF	Press RESET Key	
E2	Memory			Set at the factory

*Displayed when the present value has fallen below the min. value in the H7CR-C/SC (±range type).

**Displayed when the present value has exceeded the max. value in the H7CR-C/SC (±range type).

■ Operating Environment

- When using the Counter in an area with much electronic noise, separate the Timer, wiring, and the equipment which generates the input signals as far as possible from the noise sources. It is also recommended to shield the input signal wiring to prevent electronic interference.
- Organic solvents (such as paint thinner), as well as very acidic or basic solutions might damage the outer casing of the Counter.

■ Using the Prescale Function

- When setting the prescale value, be sure that the set value satisfies this equation: set value "max. value - prescale value". (if the prescale value is 1,250, 999.999 - 1,250 = 998.749 max.)
- If a higher value is used, the output may be affected, so make sure that the output is produced before starting operation.

■ Changing Set Values

- When changing the set value while the Counter is operating, the output will be produced if the set value ever equals the present value. To avoid triggering the output, begin by incrementing a higher digit to a large number.

■ Resetting with a Set Value of 0

- When resetting is performed with the set value set to "0," no output will be given for the safety reasons once the reset is turned OFF (except for the H7CR-C).

■ Output Delay

- The following table shows the delay from when the present value passes the set value until the output is produced. (The delay is the result of output control time, signal transmission time, relay switching time, etc.)

Actual measurements in N and K modes.

Control output	Max. counting speed	Output delay*
Contact output 1, 2	30 cps	18 to 24 ms
	1 kcps	4.7 to 5.8 ms
	5 kcps	4.4 to 5.4 ms
Transistor output 1, 2	30 cps	13.5 to 20 ms
	1 kcps	0.59 to 0.81 ms
	5 kcps	0.29 to 0.44ms

*The variation in delays is due to different modes and conditions. For systems where the delay is a problem, take actual measurements under operating conditions.

■ Other

- When the Counter is installed in a control box and tests are conducted which may damage the Counter's internal circuitry (for example, a test measuring the maximum voltage difference between the control circuit and metal components), remove the Counter from the control box or short circuit the terminals.



Caution

This product contains a lithium battery. Lithium batteries explode if incinerated. Dispose of the Digital Counter as a non-combustible item.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. M012-E1-1B In the interest of product improvement, specifications are subject to change without notice.

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