

Solid-state Multi-functional Timers

H3CR-A AC24-48/DC12-48

Solid-state Timer, 11-pin, Time range: 0.05 s to 300 h, No-voltage input (NPN), Relay output (DPDT) Time-limit contact, 24 to 48 VAC/12 to 48 VDC



Image

Rated power supply voltage	24 to 48 VAC 50/60 Hz 12 to 48 VDC Ripple 20% max. (If power supply incorporates a single-phase full-wave rectifier)
Input signals	Start, Reset, Gate
Input method	No-voltage input
Control output (Type)	Time-limit: DPDT
Operating resetting	Time-limit operation/Self-reset/External reset
Connecting method	11-pin round socket

Ratings/Specifications

As of December 23, 2024

Rated power supply voltage	24 to 48 VAC 50/60 Hz 12 to 48 VDC Ripple 20% max. (If power supply incorporates a single-phase full-wave rectifier)
Allowable voltage variable range	85 to 110% of rated voltage (90 to 110% at 12 to 48 VDC)
Input signals	Start, Reset, Gate
Input method	No-voltage input
No-voltage input	Short-circuit (ON) impedance: 1 kΩ max. Short-circuit (ON) residual voltage: 1 V max. Open circuit impedance: 100 kΩ min.
Power consumption	Relay ON: Approx. 0.8 W (at 24 VDC)/Relay OFF: Approx. 0.2 W (at 24 VDC)
Reset voltage	10% max. of rated supply voltage
Number of time ranges	18
Operation mode	ON delay, Flicker OFF start, Flicker ON start, Signal ON/OFF delay, Signal OFF delay, Interval, Signal ON/OFF delay, One shot output
Control output (Type)	Time-limit: DPDT
Control output (Contact output)	Resistive load: 250 VAC 5 A (cosφ=1)/5 A at 30 VDC/0.15 A at 125 VDC Inductive load (Reference value): 2 A at 250 VAC (cosφ=0.4)/3 A at 30 VDC (L/R=7 ms) Minimum applicable load: 10 mA at 5 VDC (failure level: P Reference value)
Operating resetting	Time-limit operation/Self-reset/External reset
Ambient temperature range	Operating: -10 to 55 °C (with no icing) Storage: -25 to 65 °C (with no icing)
Ambient humidity range	Operating: 35 to 85 %
Accuracy of operating time	±0.2% FS max. ±0.2% ±10 ms in a range of 1.2 s and 3 s
Setting error	±5% FS ±50 ms max.
Reset time	0.1 s max.

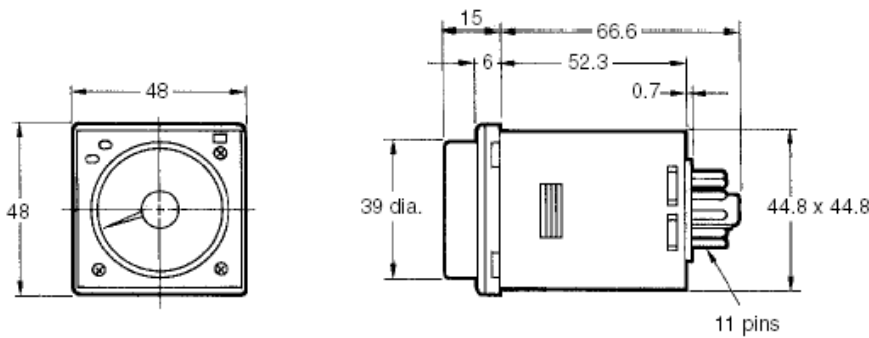
Influence of voltage	±0.2% FS max. ±0.2% ±10 ms in a range of 1.2 s and 3 s
Influence of temperature	±1% FS max. (±1% ±10 ms in a range of 1.2 s and 3 s)
Insulation resistance	100 MΩ min. (at 500 VDC)
Dielectric strength	Between current carrying metal parts and non-current carrying metal parts: 2,000 VAC 50/60 Hz 1 min Between control output terminals and operating circuit: 2,000 VAC 50/60 Hz 1 min Between contacts of different polarity: 2,000 VAC 50/60 Hz 1 min Between non-continuous contacts: 1,000 VAC 50/60 Hz 1 min
Impulse withstand voltage	Between power terminals: 1 kV Between current carrying terminals and exposed non-current carrying metal parts: 1.5 kV
Noise immunity	±1.5 kV (between power terminals) and ±600 V (between No-voltage input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Multifunction: 8 kV, Destruction: 15 kV
Vibration resistance	Destruction: 10 to 55 Hz, 0.75 mm single amplitude each in 3 directions for 2 h Malfunction: 10 to 55 Hz, 0.5 mm single amplitude each in 3 directions for 10 min
Shock resistance	Destruction: 1,000 m/s ² , 3 times each in 6 directions Malfunction: 100 m/s ² , 3 times each in 6 directions
Life expectancy (relay output)	Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1800 operations/h) Mechanical: 20 million operations min. (under no load at 1,800 operations/h)
Degree of protection	Panel surface: IP40 Terminals: IP00
Connecting method	11-pin round socket
Case color	Munsell 5Y7/1
Weight	Approx. 90 g
Accessories	Instruction manual, Compliance information sheet
Applicable socket	P2CF-11/ P2CF-11-E/ P3GA-11/ PL11/ PL11-Q/ PLE11-0

As of December 23, 2024

Dimensions

As of December 23, 2024

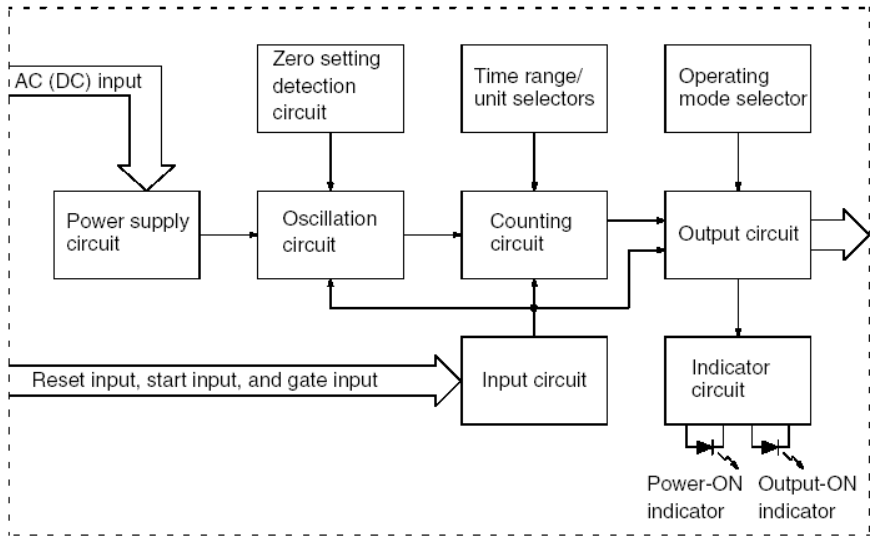
Outline drawing



As of December 23, 2024

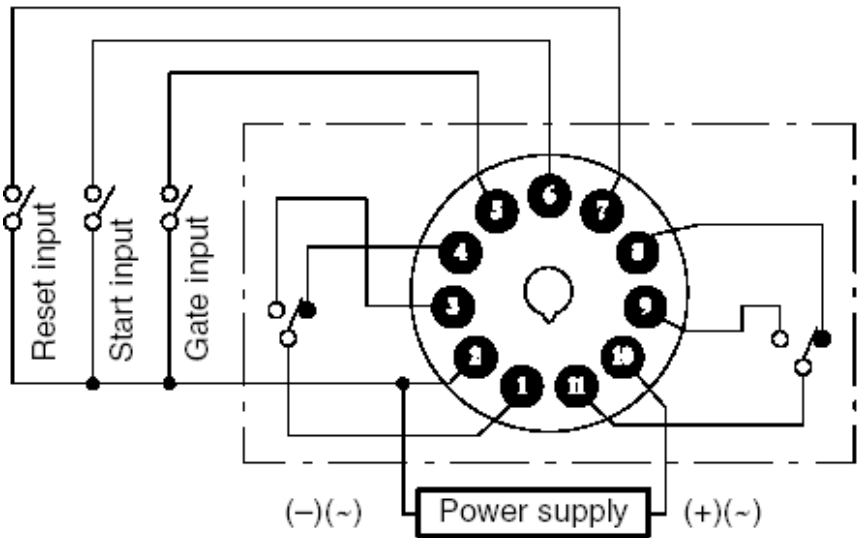
Internal connection

Internal connection



Terminal arrangement

Terminal arrangement



Input connections

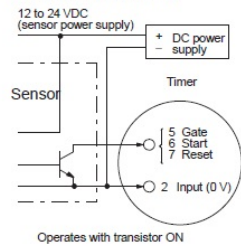
Input connections

H3CR-A/-AS/-A-301

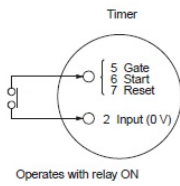
The inputs of the H3CR-A/-AS/-A-301 are no-voltage (short-circuit or open) inputs.

No-voltage Inputs

No-contact Input
(Connection to NPN open collector output sensor.)

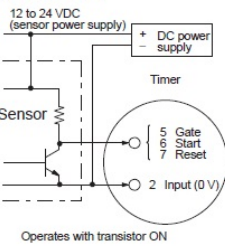


Contact Input



No-contact Input

(Connection to a voltage output sensor.)



No-voltage Input Signal Levels

No-contact input	1. Short-circuit level Transistor ON Residual voltage: 1 V max. Impedance when ON: 1 kΩ max.
	2. Open level Transistor OFF Impedance when OFF: 100 kΩ min.
Contact input	Use contacts which can adequately switch 0.1 mA at 5 V.

As of December 23, 2024

Time ranges

As of December 23, 2024

Time ranges

Standard (0.05-s to 300-h) Models

Time unit	s (sec)	×10 s (10 sec)	min (min)	×10 min (10 min)	h (hrs)	×10 h (10 hrs)
Full scale setting	1.2	0.05 to 1.2	1.2 to 12	0.12 to 1.2	1.2 to 12	1.2 to 12
	3	0.3 to 3	3 to 30	0.3 to 3	3 to 30	3 to 30
	12	1.2 to 12	12 to 120	1.2 to 12	12 to 120	12 to 120
	30	3 to 30	30 to 300	3 to 30	30 to 300	30 to 300

Note: When the time setting knob is turned below "0" until the point where the time setting knob stops, the output will operate instantaneously at all time range settings.

As of December 23, 2024

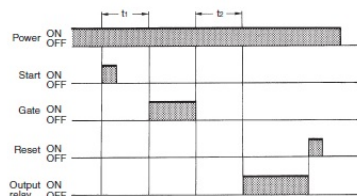
Operating chart

As of December 23, 2024

Operating chart

Operating mode	Timing chart
A: ON-delay	
B: Flicker OFF start	
B2: Flicker ON start	
C: Signal ON/ OFF-delay	
D: Signal OFF-delay	
E: Interval	
G: Signal ON/ OFF-delay	
J: One-shot output	

Gate Signal Input (This timing chart indicates the gate input in operating mode A (ON-delay operation).)



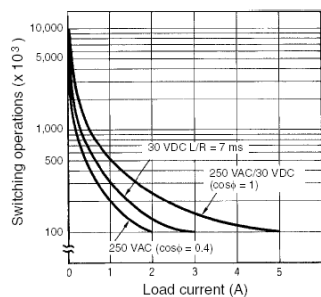
- Note:**
1. Allow at least 0.1 s for the Timer reset time if the power supply is reset due to an interruption in the power supply.
 2. The minimum input pulse width (for start, reset) is 0.05 s.
 3. The letter "t" in the timing charts indicates the set time, and "t-a" means that the period is less than the set time. ($t - a < t$)
 4. In J Mode, there will be only one output even if the start input is longer than the set time.
 5. H3CR-AP model incorporates start input only. As such, the power supply is reset.
 6. Model H3CR-AS only has operation equivalent to time-limit contact: NO.
 7. When the setting dial is turned all the way past 0 for instantaneous output, "t" (set time) in the above time chart is 0-sec operation.
 8. During timer operation, the flash frequency changes when 90% of the set time has been reached.

Note: The set time is the sum of t1 and t2.
Start and reset are also both enabled when the gate signal is ON.

Electrical life curve

As of December 23, 2024

Electrical life curve



Reference: A maximum current of 0.15 A can be switched at 125 VDC (cosφ = 1) and a maximum current of 0.1 A can be switched if L/R is 7 ms. In both cases, a life of 100,000 operations can be expected. The minimum applicable load is 10 mA (100 mA for H3CR-A8E) at 5 VDC (failure level: P).

As of December 23, 2024