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You can read the recommendations in the user guide, the technical guide or the installation guide for OMRON H3CR. You'll find the answers to all your questions on the OMRON H3CR in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual OMRON H3CR
User guide OMRON H3CR
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OMRON

Solid-state Timer H3CR

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments. Refer to *Warranty and Application Considerations* (page 52), and *Safety Precautions* (page 22, 44, 51).

DIN 48 x 48-mm Multifunctional Timer Series

- Conforms to EN61812-1 and IEC60664-1 4 kV/2 for Low Voltage, and EMC Directives.
- Approved by UL and CSA.
- Lloyd's/NK approvals.
- Six-language instruction manual provided.

■ Broad Line-up of H3CR Series

H3CR

H3CR-A
Multifunctional Timer

H3CR-A
H3CR-AS
H3CR-AP
H3CR-AS
H3CR-ABS
H3CR-ABE

11-pin model
8-pin model
8-pin with instantaneous contact output model

H3CR-F
Twin Timer

H3CR-F
H3CR-FN
H3CR-F-300
H3CR-FN-300
H3CR-F8
H3CR-F8N
H3CR-F8-300
H3CR-F8N-300

11-pin model
8-pin model

H3CR-G
Star-delta Timer

H3CR-G8L
H3CR-G8EL

8-pin model
11-pin model

H3CR-H
Power OFF-delay Timer

H3CR-HRL
H3CR-HBL
H3CR-H8RL

11-pin model
8-pin model

Note: H3CR-AS, H3CR-ABS: Transistor output models

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Solid-state Timer **H3CR** 1



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Manual abstract:

Lloyds/NK approvals. @@H3CR-F

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H3CR-G

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..... 45 47 51 Solid-state Timer H3CR 1 Solid-state Multi-functional Timer H3CR-A DIN 48 × 48-mm State-of-the-art Multifunctional Timer · A wider power supply range reduces the number of timer models kept in stock. · A wide range of applications through six or four operating modes. · Reduced power consumption.

(Except for H3CR-A8E) · Enables easy sequence checks through instantaneous outputs for a zero set value at any time range. · Length, when panel-mounted with a Socket, of 80 mm or less. · Time Setting Rings enable consistent settings and limit the setting range. · Panel Covers enable various panel designs. · PNP input models available. · Rich variety of inputs: Start, reset, and gate functions (11-pin models and -AP models) Model Number Structure Model Number

Legend Note: This model number legend includes combinations that are not available. Before ordering, please check the List of Models on page 3 for availability. H3CR-A@ @ @ - @ @ 1 2 3 4 5 1. Number of Pins None: 11-pin models 8: 8-pin models 2. Input Type for 11-pin Models None: No-voltage input (NPN type) P: Voltage input (PNP type) 3.

Output None: Relay output (DPDT) S: Transistor output (NPN/PNP universal use) E: Relay output (SPDT) with instantaneous relay output (SPDT) 4. Suffix 300: Dual mode models (signal ON/OFF-delay and one-shot) 301: Double time scale (range) models (0.1 s to 600 h) 5. Supply Voltage 100-240AC/100-125DC: 100 to 240 VAC/100 to 125 VDC 24-48AC/12-48DC: 24 to 48 VAC/12 to 48 VDC 24-48AC/DC: 24 to 48 VAC/VDC (Only for H3CR-A8E) 2 Solid-state Multi-functional Timer H3CR-A Ordering Information List of Models Note: 1. Specify both the model number and supply voltage when ordering.

Example: H3CR-A 100-240AC/100-125DC Supply voltage 2. The operating modes are as follows A: ON-delay D: Signal OFF-delay B: Flicker OFF start E: Interval B2: Flicker ON start G: Signal ON/OFF-delay C: Signal ON/OFF-delay J: One-shot 11-pin Models Output Contact Supply voltage 100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC 24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC 100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC 24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC 100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC 24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC 100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC 24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC 0.05 s to 300 h H3CR-AS No-voltage input 0.1 s to 600 h H3CR-A-301 Voltage input Six multi-modes: A, B, B2, C, D, E H3CR-AP Dual-modes: G, J H3CR-A-300 Input type No-voltage input Time range 0.05 s to 300 h Operating mode (See note 2) Six multi-modes: A, B, B2, C, D, E Model (See note 1).

) H3CR-A 8-pin Models Output Contact Supply voltage 100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC 24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC 100 to 240 VAC (50/60 Hz)/ 100 to 125 VDC 24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC Transistor (Photocoupler) 24 to 48 VAC (50/60 Hz)/ 12 to 48 VDC 0.05 s to 300 h H3CR-A8S H3CR-A8E 0.1 s to 600 h Input type Time range Operating mode (See note 2) Four multi-modes: A, B2, E, J (Power supply start) Model (See note 1.) H3CR-A8 No-input available 0.05 s to 300 h H3CR-A8-301 Time-limit contact and 100 to 240 VAC (50/60 Hz)/ instantaneous contact 100 to 125 VDC 24 to 48 VAC/VDC (50/60 Hz) Solid-state Multi-functional Timer H3CR-A 3 Accessories (Order Separately) Name/specifications Flush Mounting Adapter Y92F-30 Y92F-73 Y92F-74 Mounting Track 50 cm (l) × 7.3 mm (t) 1 m (l) × 7.3 mm (t) 1 m (l) × 16 mm (t) End Plate Spacer Protective Cover Track Mounting/ Front Connecting Socket 8-pin 8-pin, finger safe type 11-pin 11-pin, finger safe type Back Connecting Socket 8-pin 8-pin, finger safe type 11-pin 11-pin, finger safe type Time Setting Ring Panel Cover (See note 2) Setting a specific time Limiting the setting range Light gray (5Y7/1) Black (N1.5) Medium gray (5Y5/1) Hold-down Clip (See note 3) For PL08 and PL11 Sockets For PF085A Socket PFP-50N PFP-100N PFP-100N2 PFP-M PFP-S Y92A-48B P2CF-08 P2CF-08-E P2CF-11 P2CF-11-E P3G-08 P3G-08 with Y92A-48G (See note 1) P3GA-11 P3GA-11 with Y92A-48G (See note 1) Y92S-27 Y92S-28 Y92P-48GL Y92P-48GB Y92P-48GM Y92H-7 Y92H-8 Models Note: 1. Y92A-48G is a finger safe terminal cover which is attached to the P3G-08 or P3GA-11 Socket. 2.

The Time Setting Ring and Panel Cover are sold together. 3. Hold-down Clips are sold in sets of two. Specifications General Item Operating mode H3CR-A/-AS H3CR-AP H3CR-A8/-A8S H3CR-A8E 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 (Only for H3CR-A-300) J: One-shot (Only for H3CR-A-300) 11-pin No-voltage input Voltage input A: ON-delay (power supply start) B2: Flicker ON start (power supply start) E: Interval (power supply start) J: One-shot (power supply start) Pin type Input type Time-limit output type 8-pin --Relay output (SPDT) Relay output (SPDT) H3CR-A/-A8/-AP: Relay output (DPDT) H3CR-AS/-A8S: Transistor output (NPN/PNP universal)* DIN track mounting, surface mounting, and flush mounting UL508, CSA C22.2 No.14, NK, Lloyds Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1 for Timers with Contact Outputs. Output category according to EN60947-5-2 for Timers with Transistor Outputs. Instantaneous output type --Mounting method Approved standards *The internal circuits are optically isolated from the output. This enables universal application as NPN or PNP transistor.

4 Solid-state Multi-functional Timer H3CR-A Time Ranges 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. Standard (0.05-s to 300-h) Models Time unit Full scale setting 1.2 3 12 30 0.05 to 1.2 0.3 to 3 1.2 to 12 3 to 30 s (sec) min (min) 0.12 to 1.2 h (hrs) 3 to 30 12 to 120 30 to 300 ×10 h (10 h) 1. 2 to 12 Double (0.1-s to 600-h) Models Time unit Full scale setting 2.4 6 24 60 0.1 to 2.4 0.6 to 6 2.4 to 24 6 to 60 s (sec) min (min) 0.24 to 2.4 h (hrs) 6 to 60 24 to 240 60 to 600 ×10 h (10 h) 2.4 to 24 Ratings Rated supply voltage (See notes 1, 2, and 5).

) 100 to 240 VAC (50/60 Hz)/100 to 125 VDC, 24 to 48 VAC (50/60 Hz)/12 to 48 VDC (24 to 48 VAC/VDC for H3CRA8E) (See note3.) Operating voltage range Power reset Input 85% to 110% of rated supply voltage (90% to 110% at 12 VDC) Minimum power-opening time: 0.1 s No-voltage Input ON impedance: 1 k max. ON residual voltage: 1 V max. OFF impedance: 100 k min. Voltage Input Max. permissible capacitance between inputs lines (terminals 6 and 7): 1,200 pF Load connectable in parallel with inputs (terminals 6 and 7). · 100 to 240 VAC/100 to 125 VDC High (logic) level: 85 to 264 VAC/85 to 137.



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5 VDC Low (logic) level: 0 to 10 VAC/0 to 10 VDC · 24 to 48 VAC/12 to 48 VDC High (logic) level: 20.4 to 52.8 VAC/10.8 to 52.8 VDC Low (logic) level: 0 to 2.4 VAC/0 to 1.2 VDC H3CR-A/A8 · 100 to 240 VAC/100 to 125 VDC (When at 240 VAC, 60 Hz) Relay ON: approx. 2.0 VA (1.6 W) · 24 to 48 VAC/12 to 48 VDC (When at 24 VDC) Relay ON: approx. 0.8 W H3CR-AP (See note 3) · 100 to 240 VAC/100 to 125 VDC (When at 240 VAC, 60 Hz) Relay ON: approx. 2.5 VA (2.2 W) (See note 4.) · 24 to 48 VAC/12 to 48 VDC (When at 24 VDC) Relay ON: approx. 0.9 W (See note 4.) H3CR-A8E · 100 to 240 VAC/100 to 125 VDC (When at 240 VAC, 60 Hz) Relay ON/OFF: approx. 2 VA (0.9 W) · 24 to 48 VAC/VDC (When at 24 VDC) Relay ON/OFF: approx. 0.9 W H3CR-AS/A8S · 24 to 48 VAC/12 to 48 VDC (When at 24 VDC) Output ON: 0.3 W Output OFF: 0.2 W Time limit contacts: Transistor output: Power consumption Relay OFF: approx. 1.3 VA (1.1 W) Relay OFF: approx. 0.2 W Relay OFF: approx. 1.8 VA (1.7 W) (See note 4.) Relay OFF: approx. 0.3 W (See note 4.) Control outputs 5 A at 250 VAC/30 VDC, 0.15 A at 125 VDC, resistive load (cos = 1) Open collector (NPN/PNP), 100 mA max., residual voltage: 2 V max. Instantaneous contact: 5 A at 250 VAC/30 VDC, 0.15 A at 125 VDC, resistive load (cos = 1) Note: 1. DC ripple rate: 20% max. if the power supply incorporates a single-phase, full-wave rectifier. 2. Do not use an inverter output as the power supply. @3. Models with 24-to-48-VAC or 12-to-48-VDC power supply have inrush current. Caution is thus required when turning ON and OFF power to the Timer with a non-contact output from a device such as a sensor. (Models with an inrush current of approximately 50 mA and a 24VDC power supply are available (the H3CR-A-302 and H3CR-A8-302).) 4. The values are for when the terminals 2 and 7 and terminals 10 and 6 are short-circuited, and include the consumption current of the input circuit.

5. Refer to Power Supplies in Safety Precautions for All Timers on page 51 when using the Timer together with a 2-wire AC proximity sensor. Solid-state Multi-functional Timer H3CR-A 5 Characteristics Accuracy of operating time Setting error Reset time Reset voltage Influence of voltage Insulation resistance Dielectric strength ±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s) ±5% FS ±50 ms (See note 1) Min. power-opening time: 0.1 s max. Min. pulse width: 0.05 s (H3CR-A/A8) 10% max. of rated supply voltage ±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s) 100 M min. (at 500 VDC) 2,000 VAC (1,000 VAC for H3CR-A@S), 50/60 Hz for 1 min (between current-carrying metal parts and exposed noncurrent-carrying metal parts) 2,000 VAC (1,000 VAC for H3CR-A@S), 50/60 Hz for 1 min (between control output terminals and operating circuit) 2,000 VAC, 50/60 Hz for 1 min (between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other) 2,000 VAC, 50/60 Hz for 1 min (between input and control output terminals and operation circuit) for H3CR-AP 3 kV (between power terminals) for 100 to 240 VAC/100 to 125 VDC, 1 kV for 24 to 48 VAC/12 to 48 VDC 4. 5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC/100 to 125 VDC, 1.5 kV for 24 to 48 VAC/12 to 48 VDC and 24 to 48 VAC/VDC Influence of temperature ±1% FS max. (±1%±10 ms max. in a range of 1.2 s) Impulse withstand voltage Noise immunity Static immunity Vibration resistance Shock resistance Ambient temperature Ambient humidity Life expectancy EMC ±1.5 kV (between power terminals) and ±600 V (between no-voltage indicated as The contact symbol of the H3CR-A is indicated as because its operating mode is six multi-modes (four multi-modes for the H3CR-A8). 11-pin Models H3CR-A/A-300/A-301 (Contact Output) 8-pin Models H3CR-A8/A8-301 (Contact Output) Reset input Gate input Start input Power supply Power supply H3CR-A8S (Transistor Output) H3CR-AS (Transistor Output) Reset input Gate input Start input Power supply Note: Terminals 1, 3, 4, and 5 are empty. Terminals 2 and 7 are the same as for the H3CR-A8. H3CR-A8E (Contact Output) Power supply Note: Terminals 1, 3, 4, and 8 are empty. Terminals 2, 5, 6, 7, and 10 are the same as for the H3CR-A.

H3CR-AP (Contact Output) Start input Power supply Power supply Note: 1. Terminal 5 is empty. 2. Separate power supplies can be used for the Timer and inputs. 10 Solid-state Multi-functional Timer H3CR-A Input Connections H3CR-A/A8 The inputs of the H3CR-A/A8 are no-voltage (short-circuit or open) inputs. No-voltage Inputs No-contact Input (Connection to NPN open collector output sensor.) 12 to 24 VDC (sensor power supply) + DC power - supply Timer Timer Contact Input No-contact Input (Connection to a voltage output sensor.) 12 to 24 VDC (sensor power supply) + DC power - supply Timer Sensor Sensor 5 Gate 6 Start 7 Reset 2 Input (0 V) 5 Gate 6 Start 7 Reset 2 Input (0 V) 5 Gate 6 Start 7 Reset 2 Input (0 V) Operates with transistor ON Operates with relay ON Operates with transistor ON No-voltage Input Signal Levels No-contact input 1. Short-circuit level Transistor ON Residual voltage: 1 V max. Impedance when ON: 1 k max. 2. Open level Transistor OFF Impedance when OFF: 100 k min. Contact input Use contacts which can adequately switch 0.1 mA at 5 V Solid-state Multi-functional Timer H3CR-A 11 H3CR-AP The start input of the H3CR-AP is voltage input. (Voltage imposition or open) Voltage Inputs No-contact Input (Connection to PNP open collector output sensor) 12 to 24 VDC (sensor power supply) Sensor + DC power - supply Timer 10 Power supply (+) 6 Start 7 2 Input 0V Power supply (-) No-contact Input (Connection to NPN open collector output sensor) 12 to 24 VDC (sensor power supply) Sensor + DC power - supply Timer Contact Input 10 Power supply (+) 6 Start 7 2 Input 0V Power supply (-) DC power supply AC power supply Timer 10 Power supply (+) 6 Start 7 2 Input 0V Power supply (-) Operates with PNP transistor ON Operates with NPN transistor ON Operates with relay ON Note: The input circuit is isolated from the power supply circuit. Thus, an NPN transistor can be connected. Voltage Input Signal Levels No-contact input 1. Transistor ON Residual voltage: 1 V max. The voltage between terminals 6 and 7 must be 10.8 VDC min. 2. Transistor OFF Leakage current: 0.01 mA max. The voltage between terminals 6 and 7 must be 1.2 VDC max. Contact input Use contacts that can adequately switch 0.1 mA at each operating voltage. The voltage between terminals 6 and 7 with contacts ON or OFF must satisfy the specified value. Contacts ON 100-to-240-VAC and 100-to-125-VDC models: 85 to 264 VAC or 85 to 137.5 VDC 24-to-48-VAC and 12-to-48-VDC models: 20. 4 to 52.8 VAC or 10.8 to 52.8 VDC Contacts OFF 100-to-240-VAC and 100-to-125-VDC models: 0 to 10 VAC or 0 to 10 VDC 24-to-48-VAC and 12-to-48-VDC models: 0 to 2.



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4 VAC or 0 to 1.2 VDC Note: Refer to the signal levels in the following table and be aware of the minimum applicable load of the relay. 12 Solid-state Multi-functional Timer H3CR-A Operation Timing Chart Note: 1. 2. 3. 4.

5. The minimum power-opening time ("Rt") is 0.1 s. The minimum input pulse width (for start, reset) is 0.05 s.

The letter "t" in the timing charts stands for the set time and "ta" means that the period is less than the time set. Power supply start in mode J is also possible for H3CR-A8/-A8E/-A8S/-A8-301 models. Refer to page 19 for application examples. H3CR-A/-AS/-AP* *H3CR-AP model incorporates start input only.

Operating mode A: ON-delay Power Start Reset Output relay (NC) Output relay (NO) (Output indicator) Power indicator Power Start (See note) Output t t

Timing chart Basic operation t Note: Start input is invalid while the Timer is in operation.

Basic operation B: Flicker OFF start Power Start Reset Output relay (NC) Output relay (NO) (Output indicator) Power indicator Output Power Start (See note) t t t t Note: Start input is invalid while the Timer is in operation. Basic operation B2: Flicker ON start Power Power Start Reset Output relay (NC)

Output relay (NO) (Output indicator) Power indicator Start (See note) Output t t t t Note: Start input is invalid while the Timer is in operation. Basic operation C: Signal ON/ OFFdelay Power Start Reset Output relay (NC) Output relay (NO) (Output indicator) Power indicator Power Start (See note)

Output t t t t Note: Start input is valid and retriggerable while the Timer is in operation. Solid-state Multi-functional Timer H3CR-A 13 Operating mode D: Signal OFFdelay Power Start Reset Output relay (NC) Timing chart Basic operation Power Start (See note) Output Output relay (NO) (Output indicator)

Power indicator t Note: Start input is valid and re-triggerable while the Timer is in operation. Basic operation E: Interval Power Start Reset Output relay (NC) Output relay (NO) (Output indicator) Power indicator Power Start (See note) Output t Note: Start input is valid and re-triggerable while the Timer is in operation. Basic operation G: Signal ON/ OFFdelay Power Start Reset Output relay (NC) Output relay (NO) (Output indicator) Power indicator Output

Power Start (See note) t t t t Note: Start input is valid and re-triggerable while the Timer is in operation. Basic operation J: One-shot output Power Start Reset Output relay (NC) Output relay (NO) (Output indicator) Power indicator 1±0.6 s (Fixed) 1±0.6 s (Fixed) Output Power Start (See note) t 1±0.6 s

(Fixed) Note: Start input is valid and retriggerable while the Timer is in operation.

Gate Signal Input t1 ON Power OFF Start ON OFF Gate ON OFF Reset ON OFF Output ON relay OFF t2 Note: 1. This timing chart indicates the gate input in operating mode A (ON-delay operation). 2. The set time is the sum of t1 and t2. 3. H3CR-AP model incorporates start input only. 14 Solid-state Multi-functional Timer H3CR-A H3CR-A8/-A8S Operating mode A: ON-delay Power Output relay (NC) Output relay (NO) (output indicator) Power indicator

Timing chart Basic operation Power t Output B 2: Flicker ON start Power Output relay (NC) Output relay (NO) (output indicator) Power indicator Basic operation Power t Output t t t E: Interval Power Output relay (NC) Output relay (NO) (output indicator) Power indicator Basic operation Power t Output J: One-shot output Power Output relay (NC) Output relay (NO) (output indicator) Power indicator 1±0.6 s (Fixed) 1±0.6 s (Fixed) Basic operation Power t

Output 1±0.6 s (Fixed) Note: 1.

The minimum power-opening time ("Rt") is 0.1 s. 2. The letter "t" in the timing charts stands for the set time and "ta" means that the period is less than the time set. Solid-state Multi-functional Timer H3CR-A 15 H3CR-A8E Operating mode A: ON-delay Power Output relay (NC) Output relay (NO) (output indicator) Instantaneous output relay (NC) Instantaneous output relay (NO) Power indicator Timing chart Basic operation Power t Output B2: Flicker ON

start Power Output relay (NC) Output relay (NO) (output indicator) Instantaneous output relay (NC) Instantaneous output relay (NO) Power indicator Basic operation Power t Output t t t E: Interval Power Output relay (NC) Output relay (NO) (output indicator) Instantaneous output relay (NC) Instantaneous output relay (NO) Output Power indicator Basic operation Power t J: One-shot output Power Output relay (NC) Output relay (NO) (output indicator)

Instantaneous output relay (NC) Instantaneous output relay (NO) Output Power indicator (Fixed) (Fixed) Basic operation Power t 1±0.

6 s (Fixed) Note: 1. The minimum power-opening time ("Rt") is 0.1 s. 2. The letter "t" in the timing charts stands for the set time and "ta" means that the

period is less than the time set.

16 Solid-state Multi-functional Timer H3CR-A Nomenclature Power indicator (green) (Flashes when Timer operates; lit when Timer stops operating) Operating mode display window Output indicator (orange) (Lit when output) Operating mode selector Select a mode from: A, B, B2, C, D, and E (H3CR-A, -AP, and -AS) A, B2, E and J (H3CR-A8, -A8S, and -A8E) G and J (H3CR-A-300) Scale range display windows Time range selector (select one from 1.2, 3, 12, and 30 at full scale; with the H3CR-A@-301, select from 2.4, 6, 24, or 60 at full scale.) Time unit display window Time unit selector (select one from sec, min, hrs, and 10h) Time setting knob (set time) Solid-state Multi-functional Timer H3CR-A 17 Dimensions Note: All units are in millimeters unless otherwise indicated. H3CR-A H3CR-AP H3CR-AS 48 15 6 66.6 52.3 0.7 48 39 dia. 44.8 × 44.

8 11 pins H3CR-A8 H3CR-A8S H3CR-A8E 48 15 6 66.6 52.3 0.7 48 39 dia. 44.8 × 44.8 8 pins Dimensions with Set Ring 50 16.5 50 42 dia. Time Setting Ring Panel cover Dimensions with Front Connecting Socket P2CF-08-@/P2CF-11-@ Dimensions with Back Connecting Socket P3G-08/P3GA-11 15 81.5 80 15 81.

5 75 100.8* H3CR-A H3CR-AS H3CR-AP H3CR-A8@ 98.5 89.9* 87.6 H3CR-A H3CR-AS H3CR-AP + Adapter H3CR-A8@ + Adapter Y92F-30 P2CF-11 P2CF-11-E 2.

3* P2CF-08 P2CF-08-E 2.3* P3GA-11 (When Y92A-48G mounted) Y92F-30 P3G-08 (When Y92A-48G mounted) *These dimensions vary with the kind of DIN track (reference value). 18 Solid-state Multi-functional Timer H3CR-A Application Examples (H3CR-A) A Mode: ON-delay ON-delay operation (A mode) is a basic mode. 1. Power-ON Start/Power-OFF Reset The Power-ON start/Power-OFF reset operation is a standard operating method.

t 3.



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Control of Integrated Time with Gate Signal With a gate signal, the Power-ON start operation and Signal start operation can be controlled (the operation can be interrupted). t1 Power (2 and 10) Start (2 and 6) Gate (2 and 5) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) t2 t1 + t2: set time Power (2 and 10) Start (2 and 6) Reset (2 and 7) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Power indicator Flashing Externally short-circuited Lit Power indicator Flashing Lit Gate signal (The operation is interrupted with the gate signal if the Timer detects an abnormal signal.) Externally short-circuited Power supply 2. Signal Start/Signal Reset The Signal start/Signal reset operation is useful for remote control of the Timer. Power supply B/B2 Mode: Flicker The flicker operation in the B and B2 modes can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display. Power (2 and 10) Start (2 and 6) Reset (2 and 7) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Power indicator Lit Flashing Lit 1. Power-ON Start/Power-OFF Reset (in B Mode) Power (2 and 10) Start (2 and 6) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Power indicator Flashing Start signal (remote control possible) Reset signal (remote control possible) Externally short-circuited Power supply (Power continuously supplied) Power supply Solid-state Multi-functional Timer H3CR-A 19 2. Signal Start/Signal Reset (in B Mode) If there is an abnormal signal, flashing starts. When the abnormal condition is restored, a reset signal stops the display flashing.

t t 2. Signal-ON-OFF Start/Instantaneous Operation/Time-limit Reset Power (2 and 10) Start (2 and 6) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Power indicator Lit Lit Lit Flashing Flashing Flashing Lit Lit Power (2 and 10) Start (2 and 6) Reset (2 and 7) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Power indicator Lit Start signal Reset signal Flashing Lit Start signal (The operation starts with the signal ON or OFF) Power supply Power supply (Power continuously supplied) (Power continuously supplied) C Mode: Signal ON/OFF-delay The Signal ON-/OFF-delay operation (C mode) is useful for the control of distribution of products on a production line into boxes by the specified number or time. D Mode: Signal OFF-delay Signal OFF-delay operation (D mode) can be effectively used to keep a load operating for a certain period. For example, this function enables the cooling fan for a lamp or heater to operate for a certain period after the lamp or heater is switched OFF. 1. Power-ON Start/Instantaneous Operation/ Time-limit Reset A set of these functions is useful for the operation of a machine for a specified period when power is ON. 1. Power-ON Start/Instantaneous Operation/ Time-limit Reset Power (2 and 10) Start (2 and 6) Power (2 and 10) Start (2 and 6) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Power indicator Lit Flashing Externally short-circuited Start signal (NC to NO) Power supply Power supply 20 Solid-state Multi-functional Timer H3CR-A 2. Signal Start/Instantaneous Operation/ Time-limit Reset This function is useful for the repetitive control such as the filling of liquid for a specified period after each Signal start input.

t Power (2 and 10) Start (2 and 6) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) t Start signal (NO to NC to NO) Start signal Power supply (Power continuously supplied) Power supply (Power continuously supplied) E Mode: Interval 1. Power-ON Start/Instantaneous Operation/ Time-limit Reset This function is useful for the operation of a machine for a specified period after power is ON. Power (2 and 10) Start (2 and 6) Control output: NC (8 and 11) NC (1 and 4) Control output: NO (9 and 11) NO (1 and 3) Externally short-circuited Power supply Solid-state Multi-functional Timer H3CR-A 21 Safety Precautions (H3CR-A) Note: The undermentioned is common for all H3CR-A models. Power Supplies For the power supply of an input device of the H3CR-A@/-A@S/AP, use an isolating transformer with the primary and secondary windings mutually isolated and the secondary winding not grounded. Input/Output Relationship between Input and Power Supply Circuits (except for H3CR-A8E) The H3CR-A (except for H3CR-A8E) uses transformerless power supply.

When connecting a relay or transistor as an external signal input device, pay attention to the following points to prevent short-circuiting due to a sneak current to the transformerless power supply. If a relay or transistor is connected to two or more Timers, the input terminals of those Timers must be wired properly so that they will not differ in phase, otherwise the terminals will be short-circuited to one another. Correct H3CR-A G, S, R 5, 6, 7 Input terminal 2 10 2 Power supply Incorrect Contact or transistor for external input signal Isolation transformer is required. Short-circuit current H3CR-A Input device Input terminal Power supply Incorrect G, S, R 5, 6, 7 2 H3CR-A 10 Input terminal 2 Power supply Input terminal Correct Input terminal Input device Isolation transformer Power supply The H3CR-A@/-A@S/AP's power supply terminal 2 is a common terminal for input signals to the Timer. Do not disconnect the wires on terminal 2, otherwise the internal circuitry of the Timer will be damaged.

Input terminal 5, 6, 7 G, S, R Input terminal 10 It is impossible to provide two independent power switches as shown below regardless of whether or not the Timers are different in phase. H3CR-A Input terminal Power supply 2 Make sure that the voltage is applied within the specified range, otherwise the internal elements of the Timer may be damaged. Input terminal 22 Solid-state Multi-functional Timer H3CR-A Relationship between Input and Power Supply Circuits (H3CR-A@/-A@S) An appropriate input is applied to the input signal terminals of the H3CR-A@/-A@S when one of the input terminals is short-circuited with the common terminal (terminal 2) for the input signals. Never use terminal 10 as the common terminal for this purpose, otherwise the internal circuit of the Timer will be damaged. If a relay or transistor is connected to two or more Timers, the input terminals of those Timers must be wired properly so that they will not be different in phase or the terminals will be short-circuited to one another (refer to the figures below).



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Incorrect Contact or transistor for external input signal 10 6 H3CR-AP 7 Power supply Incorrect 10 2 H3CR-A 5, 6, 7 G, S, R Input terminal 2 6 H3CR-AP Short-circuit current 10 AC or DC power supply 7 Correct 5, 6, 7 G, S, R Input terminal AC or DC power supply 10 2 Correct Contact or transistor for external input signal 10 6 H3CR-A 2 7 H3CR-AP Power supply 2 Do not connect a relay or any other load between input terminals, otherwise the internal circuit of the Timer will be damaged due to the high-tension voltage applied to the input terminals. 10 6 10 Ry AC or DC power supply Input contact H3CR-A 7 H3CR-AP Short-circuit current 5, 6, 7 G, S, R Input terminal 2 2 Common to All H3CR-A Models With the H3CR-AP, input wires must be as short as possible. If the floating capacity of wires exceeds 1,200 pF (approx. 10 m for cables with 120 pF/m), the operation will be affected. Pay particular attention when using shielded cables.

The H3CR-A@S transistor output is isolated from the internal circuitry by a photocoupler. Therefore, either NPN or PNP output is possible. Relationship between Input and Power Supply Circuits (H3CR-AP) H3CR-AP AC/DC power supply Input circuit Power supply circuit Since the input circuit and the power supply circuit are configured independently, the input circuit can be turned ON or OFF irrespective of the ON/OFF state of the power supply. It must be noted that a voltage equivalent to the power supply voltage is applied to the input circuit. Solid-state Multi-functional Timer H3CR-A 23 Solid-state Twin Timers H3CR-F DIN 48 × 48-mm Twin Timers · Wide power supply ranges of 100 to 240 VAC and 48 to 125 VDC respectively. · ON- and OFF-times can be set independently and so combinations of long ON- or OFF-time and short OFF- or ON-time settings are possible. · Fourteen time ranges from 0.05 s to 30 h or from 1.2 s to 300 h depending on the model to be used. · Models with a flicker ON start or flicker OFF start are available.

· Easy sequence checks through instantaneous outputs for a zero set value at any time range. · Length, when panel-mounted with a Socket, of 80 mm or less. · 11-pin and 8-pin models are available. Model Number Structure Model Number Legend H3CR - F @ @ - @ @ 12 3 4 5 1. Classification F: Twin timers 2. Configuration None: 11-pin socket 8: 8-pin socket 3. Twin Timer Mode None: Flicker OFF start N: Flicker ON start 4. Time Range None: 0.05 s to 30 h models 300: 1.2 s to 300 h models 5.

Supply Voltage 100-240AC: 100 to 240 VAC 24AC/DC: 24 VAC/VDC 12DC: 12 VDC 48-125DC: 48 to 125 VDC Ordering Information List of Models Operating modes Flicker OFF start Supply voltage 100 to 240 VAC 24 VAC/DC 12 VDC 48 to 125 VDC Flicker ON start 100 to 240 VAC 24 VAC/DC 12 VDC 48 to 125 VDC 0.05 s to 30 h models 11-pin models H3CR-F 100-240AC H3CR-F 24AC/DC H3CR-F 12DC H3CR-F 48-125DC H3CR-FN 100-240AC H3CR-FN 24AC/DC H3CR-FN 12DC H3CR-FN 48-125DC 8-pin models H3CR-F8 100-240AC H3CR-F8 24AC/DC H3CR-F8 12DC H3CR-F8 48-125DC H3CR-F8N 100-240AC H3CR-F8N 24AC/DC H3CR-F8N 12DC H3CR-F8N 48-125DC 1.2 s to 300 h models 11-pin models H3CR-F-300 100-240AC H3CR-F-300 24AC/DC H3CR-F-300 12DC H3CR-F-300 48-125DC H3CR-FN-300 100-240AC H3CR-FN-300 24AC/DC H3CR-FN-300 12DC H3CR-FN-300 48-125DC 8-pin models H3CR-F8-300 100-240AC H3CR-F8-300 24AC/DC H3CR-F8-300 12DC H3CR-F8-300 48-125DC H3CR-F8N-300 100-240AC H3CR-F8N-300 24AC/DC H3CR-F8N-300 12DC H3CR-F8N-300 48-125DC Note: Specify both the model number and supply voltage when ordering.

Example: H3CR-F 100-240AC Supply voltage 24 Solid-state Twin Timers H3CR-F Accessories (Order Separately) Name/specifications Flush Mounting Adapter Y92F-30 Y92F-73 Y92F-74 Mounting Track 50 cm (l) × 7.3 mm (t) 1 m (l) × 7.3 mm (t) 1 m (l) × 16 mm (t) End Plate Spacer Protective Cover Track Mounting/ Front Connecting Socket 8-pin 8-pin, finger safe type 11-pin 11-pin, finger safe type Back Connecting Socket 8-pin 8-pin, finger safe type 11-pin 11-pin, finger safe type Hold-down Clip (See note 2) For PL08 and PL11 Sockets For PF085A Socket PFP-50N PFP-100N PFP-100N2 PFP-M PFP-S Y92A-48B P2CF-08 P2CF-08-E P2CF-11 P2CF-11-E P3G-08 P3G-08 with Y92A-48G (See note 1) P3GA-11 P3GA-11 with Y92A-48G (See note 1) Y92H-7 Y92H-8 Models Note: 1. Y92A-48G is a finger safe terminal cover which is attached to the P3G-08 or P3GA-11 Socket. 2. Hold-down Clips are sold in sets of two. Specifications General Item Operating mode Pin type Operating/Reset method Output type Mounting method Approved standards 11-pin Relay output (DPDT) DIN track mounting, surface mounting, and flush mounting UL508, CSA C22.

2 No.14, NK, Lloyds Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1. H3CR-F Flicker OFF start 8-pin Time-limit operation/Time-limit reset or self-reset H3CR-F8 11-pin H3CR-FN Flicker ON start 8-pin H3CR-F8N Time Ranges 0.05 s to 30 h Models Time unit Setting 1.2 3 12 30 0.05 to 1.2 0.3 to 3 1.2 to 12 3 to 30 s (sec) 3 to 30 12 to 120 30 to 300 ×10 s (10 s) 1.

2 to 12 0.3 to 3 1.2 to 12 3 to 30 min (min) 0.12 to 1.2 h (hrs) Note: Instantaneous output is available at any time range.

To obtain instantaneous output, set to below 0. 1.2 s to 300 h Models Time unit Setting 1.2 3 12 30 3 to 30 12 to 120 30 to 300 ×10 s (10 s) 1.2 to 12 ×10 min (10 min) 1.

2 to 12 3 to 30 12 to 120 30 to 300 0.3 to 3 1.2 to 12 3 to 30 h (hrs) 0.12 to 1.2 3 to 30 ×10 h (10 h) 1.2 to 12 12 to 120 30 to 300 Note: Instantaneous output is available at any time range. To obtain instantaneous output, set to below 0. Solid-state Twin Timers H3CR-F 25 Ratings Rated supply voltage (See notes 1, 2, and 3.) 100 to 240 VAC (50/60 Hz), 12 VDC, 24 VAC/DC (50/60 Hz), 48 to 125 VDC Operating voltage range Power reset Power consumption 85% to 110% of rated supply voltage; 90% to 110% with 12-VDC models Minimum power-opening time: 0.1 s 100 to 240 VAC: approx.

10 VA (2.1 W) at 240 VAC 24 VAC/VDC: approx. 2 VA (1.7 W) at 24 VAC approx. 1 W at 24 VDC 48 to 125 VDC: approx. 1.5 W at 125 VDC 12 VDC: approx. 1 W at 12 VDC Contact output: 5 A at 250 VAC/30 VDC, resistive load (cos = 1) Control outputs Note: 1. A power supply with a ripple of 20% max. (single-phase power supply with full-wave rectification) can be used with each DC Model.

2. Do not use an inverter output as the power supply. @ @3. Refer to Power Supplies in Safety Precautions for All Timers on page 51 when using the Timer together with a 2-wire AC proximity sensor. Characteristics Accuracy of operating time Setting error Reset time Reset voltage Influence of voltage Insulation resistance Dielectric strength ±0.

2% FS max. (±0.2% FS ±10 ms max. in ranges of 1.2 and 3 s) ±5% FS ±50 ms max.

0.1 s max. 10% max. of rated voltage ±0.2% FS max. (±0.



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2% FS ±10 ms max. in ranges of 1.2 and 3 s) 100 M min. (at 500 VDC) 2,000 VAC, 50/60 Hz for 1 min (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit) 2,000 VAC, 50/60 Hz for 1 min (between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other) 3 kV (between power terminals) for 100 to 240 VAC, 48 to 125 VDC 1 kV for 12 VDC, 24 VAC/DC 4.

5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 240 VAC, 48 to 125 VDC 1.5 kV for 12 VDC, 24 VAC/DC Influence of temperature ±1% FS max. (±1% FS ±10 ms max. in ranges of 1.2 and 3s) Impulse withstand voltage Noise immunity Static immunity Vibration resistance Shock resistance Ambient temperature Ambient humidity Life expectancy EMC ±1.5 kV (between power terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±400 V for 12 VDC Malfunction: 8 kV Destruction: 15 kV Destruction: 10 to 55 Hz with 0.75-mm single amplitude for 2 hrs each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude for 10 min each in three directions Destruction: 980 m/s² three times each in six directions Malfunction: 98 m/s² three times each in six directions Operating: Storage: Operating: -10°C to 55°C (with no icing) -25°C to 65°C (with no icing) 35% to 85% Mechanical: 20 million operations min. @ (5 A at 250 VAC, resistive load at 1,800 operations/h) (See note) (EMI) Emission Enclosure: Emission AC Mains: (EMS) Immunity ESD: EN61812-1 EN55011 Group 1 class A EN55011 Group 1 class A EN61812-1 IEC61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: IEC61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity RF-interference from Pulse-modulated Radio Waves: IEC61000-4-3: 10 V/m (900±5 MHz) (level 3) Immunity Conducted Disturbance: IEC61000-4-6: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: IEC61000-4-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4) Immunity Surge: IEC61000-4-5: 1 kV line to line (level 3) 2 kV line to ground (level 3) Case color Degree of protection Weight Light Gray (Munsell 5Y7/1) IP40 (panel surface) Approx.

100 g Note: Refer to the Life-test Curve. 26 Solid-state Twin Timers H3CR-F Life-test Curve 10,000 Switching operations (x 103) 5,000 1,000 500 30 VDC L/R = 7 ms 250 VAC/30 VDC (cos = 1) Reference: A maximum current of 0.15 A can be switched at 125 VDC (cos = 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 reset time requires a minimum of 0.1 s. 2. @@@@ON indicator (orange) Lit when the output is ON. @@@@Classification G: Star-delta timer 2.

Configuration 8: 8-pin socket 3. @Dimensions L: Long-body model 5. @@@@. The Time Setting Ring and Panel Cover are sold together. 3. @@@@6 VA (2.6 W) at 120 VAC 200 to 240 VAC: approx. @Do not use an inverter output as the power supply. @2. @±5% FS ±50 ms max.

±25% FS + 5 ms max. 10% max. of rated voltage ±0.2% FS max. ±1% FS max. 100 M min. @@@@110 g; H3CR-G8EL: approx. @In both cases, a life of 100,000 operations can be expected. @Do not use them as relay terminals. Note: Leave terminal 4 open.

Do not use them as relay terminals. 34 Solid-state Star-delta Timer H3CR-G Operation Timing Chart t1: t2: Star operation time setting Star-delta transfer time Model H3CR-G8L-G8EL Power (2 - 7) ON OFF ON OFF t1 Star operation output (8 - 5) ON OFF ON OFF Lit Not lit Lit Not lit t2 Timing chart 0.5 s min. Instantaneous output (1 - 3) (-E models) Delta operation output (8 - 6) Star operation indicator Delta operation indicator Nomenclature Star operation indicator (green) Delta operation indicator (orange) Time unit display (sec is fixed) Time setting knob (for setting star operation time) Star-delta transfer time selector (select one from 0.05 s, 0.

1 s, 0.25 s, and 0.5 s) Star-delta transfer time display window Scale range display windows Star operation time range selector (select one from 6, 12, 60, and 120 at full scale) Solid-state Star-delta Timer H3CR-G 35 Dimensions Note: All units are in millimeters unless otherwise indicated. 48 15 6 (78.0) 63.

7 0.7 48 39 dia. 44.8 × 44.8 8 pins Dimensions with Set Ring 50 16.5 50 42 dia. Time setting ring Panel cover Dimensions with Front Connecting Socket P2CF-08-@ Dimensions with Back Connecting Socket P3G-08 15 92.9 86.4 101.3* H3CR-G8@L 99 H3CRG8@L Y92F-30 P2CF-08 P2CF-08-E 2.

3* P3G-08 (When Y92A-48G mounted) *These dimensions vary with the kind of DIN track (reference value). 36 Solid-state Star-delta Timer H3CR-G Solid-state Power OFF-delay Timer H3CR-H DIN 48 × 48-mm Power OFF-delay Timer · Long power OFF-delay times; S-series: up to 12 seconds, M-series: up to 12 minutes. · Models with forced-reset input are available. · 11-pin and 8-pin models are available. Model Number Structure Model Number Legend Note: This model number legend includes combinations that are not available. Before ordering, please check the List of Models on page 37 for availability. H3CR - H @ @ L @ @ 12 345 6 1. Classification H: Power OFF-delay timer 2. Configuration None: 11-pin socket 8: 8-pin socket 3. Input None: Without reset input R: With reset input 4.

Dimensions L: Long-body model 5. Supply Voltage 100-120AC: 100 to 120 VAC 200-240AC: 200 to 240 VAC 48DC: 48 VDC 100-125DC: 100 to 125 VDC 6. Time Range S: 0.05 to 12 s M: 0.05 to 12 min List of Models Input Output Supply voltage 11-pin models With- DPDT out reset input 100 to 120 VAC --200 to 240 VAC 24 VAC/DC 48 VDC 100 to 125 VDC With reset input 200 to 240 VAC H3CR-HRL 200-240AC S 24 VAC/DC 48 VDC SPDT H3CR-HRL 24AC/DC S H3CR-HRL 48DC S S-series 8-pin models H3CR-H8L 100-120AC S H3CR-H8L 200-240AC S H3CR-H8L 24AC/DC S H3CR-H8L 48DC S H3CR-H8L 100-125DC S H3CR-HRL 200-240AC M H3CR-HRL 24AC/DC M H3CR-HRL 48DC M H3CR-HRL 100-125DC M H3CR-H8L 100-120AC S --H3CR-H8L 200-240AC S H3CR-H8L 24AC/DC S H3CR-H8L 48DC S H3CR-H8L 100-125DC S H3CR-H8L 100-120AC M H3CR-H8L 200-240AC M M-series 11-pin models --8-pin models H3CR-H8L 100-120AC M H3CR-H8L 200-240AC M H3CR-H8L 24AC/DC M H3CR-H8L 48DC M H3CR-H8L 100-125DC M H3CR-HRL 100-120AC M --- 100 to 120 VAC H3CR-HRL 100-120AC S --- 100 to 125 VDC H3CR-HRL 100-125DC S 100 to 120 VAC --200 to 240 VAC 24 VAC/DC 48 VDC 100 to 125 VDC H3CR-H8L 24AC/DC M H3CR-H8L 48DC M H3CR-H8L 100-125DC M Note: Specify the model number, supply voltage, and time range (S or M) when ordering.

Example: H3CR-H8L 100-120AC S Time range Supply voltage Solid-state Power OFF-delay Timer H3CR-H 37 Accessories (Order Separately) Name/specifications Flush Mounting Adapter Y92F-30 Y92F-70 Y92F-71 Mounting Track 50 cm (l) × 7.



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3 mm (t) 1 m (l) × 7.3 mm (t) 1 m (l) × 16 mm (t) End Plate Spacer Protective Cover Track Mounting/ Front Connecting Socket 8-pin 8-pin, finger safe type 11-pin 11-pin, finger safe type Back Connecting Socket 8-pin 8-pin, finger safe type 11-pin 11-pin, finger safe type Hold-down Clip (See note 2) For PL08 and PL11 Sockets For PF085A Socket PFP-50N PFP-100N PFP-100N2 PFP-M PFP-S Y92A-48B P2CF-08 P2CF-08-E P2CF-11 P2CF-11-E P3G-08 P3G-08 with Y92A-48G (See note 1) P3GA-11 P3GA-11 with Y92A-48G (See note 1) Y92H-1 Y92H-2 Models Note: 1. Y92A-48G is a finger safe terminal cover which is attached to the P3G-08 or P3GA-11 Socket. 2.

Hold-down Clips are sold in sets of two. Specifications General Item Operating/Reset method Pin type Input type Output type Mounting method Approved standards H3CR-H8L H3CR-H8RL H3CR-HRL Instantaneous operation/Time-limit Instantaneous operation/Time-limit reset/Forced reset reset 8-pin --Relay output (DPDT) No-voltage Relay output (SPDT) Relay output (DPDT) 11-pin DIN track mounting, surface mounting, and flush mounting UL508, CSA C22.2 No.14, NK, Lloyds Conforms to EN61812-1 and IEC60664-1 (VDE0110) 4kV/2. Output category according to EN60947-5-1. Time Ranges Time unit Setting 0.6 1.2 6 12 Min. power ON time Time-up operation repeat period Forced-reset repeat period 0.05 to 0.

6 0.12 to 1.2 0.6 to 6 1.2 to 12 0.1 s min. 3 s min. 3 s min. 2 s min. S-series s (sec) M-series min (min) Note: 1.

If the above minimum power ON time is not secured, the H3CR may not operate. Be sure to secure the above minimum power ON time. 2. Do not use the Timer with a repeat period of less than 3 s. Doing so may result in abnormal heating or burning.

Refer to Safety Precautions (H3CR-H) on page 44 for details. 38 Solid-state Power OFF-delay Timer H3CR-H Ratings Rated supply voltage (See notes 1 and 2.) 100 to 120 VAC (50/60 Hz), 200 to 240 VAC (50/60 Hz), 24 VAC/VDC (50/60 Hz), 48 VDC, 100 to 125 VDC Operating voltage range No-voltage input (See note 3.) 85% to 110% of rated supply voltage ON-impedance: 1 k max. ON residual voltage: 1 V max.

OFF impedance: 500 k min. 100 to 120 VAC: approx. 0.23 VA (0.22 W) at 120 VAC 200 to 240 VAC: approx. 0.35 VA (0.3 W) at 240 VAC 24 VAC/DC: approx. 0.17 VA (0.

15 W) at 24 VAC approx. 0.1 W at 24 VDC 48 VDC: approx. 0.18 W at 48 VDC 100 to 125 VDC: approx. 0.5 W at 125 VDC Contact output: 5 A at 250 VAC/30 VDC, resistive load (cos = 1) Power consumption Control outputs Note: 1. A power supply with a ripple of 20% max. (single-phase power supply with full-wave rectification) can be used with each DC Model. 2.

Do not use an inverter output as the power supply. @ @3. For contact input, use contacts which can adequately switch 1 mA at 5 V. Characteristics Accuracy of operating time Setting error Operation start voltage Influence of voltage Insulation resistance Dielectric strength ±0.2% FS max.

(±0.2% FS ±10 ms max. in ranges of 0.6 and 1.2 s) ±5% FS ±50 ms max.

30% max. of rated voltage ±0.2% FS max. (±0.2% FS ±10 ms max. in ranges of 0.6 and 1.2 s) 100 M min. (at 500 VDC) 2,000 VAC, 50/60 Hz for 1 min (between current-carrying metal parts and exposed non-current-carrying metal parts) 2,000 VAC, 50/60 Hz for 1 min (between control output terminals and operating circuit) 2,000 VAC, 50/60 Hz for 1 min (between contacts of different polarities) 1,000 VAC, 50/60 Hz for 1 min (between contacts not located next to each other) 3 kV (between power terminals) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1 kV for 24 VAC/DC, 48 VDC 4.5 kV (between current-carrying terminal and exposed non-current-carrying metal parts) for 100 to 120 VAC, 200 to 240 VAC, 100 to 125 VDC; 1.

5 kV for 24 VAC/DC, 48 VDC Influence of temperature ±1% FS max. (±1% FS ±10 ms max. in ranges of 0.6 and 1.2 s) Impulse withstand voltage Noise immunity Static immunity Vibration resistance Shock resistance Ambient temperature Ambient humidity Life expectancy EMC ±1.5 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); ±1 kV (between power terminals) for 48 VDC Malfunction: 8 kV, Destruction: 15 kV Destruction: 10 to 55 Hz with 0.75-mm single amplitude for 2 hrs each in three directions Malfunction: 10 to 55 Hz with 0.5-mm single amplitude for 10 min each in three directions Destruction: 980 m/s² three times each in six directions Malfunction: 98 m/s² three times each in six directions Operating: Storage: Operating: -10°C to 55°C (with no icing), -25°C to 65°C (with no icing) 35% to 85% Mechanical: 10 million operations min. (under no load at 1,200 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 1,200 operations/h) (See note) (EMI) Emission Enclosure: Emission AC Mains: (EMS) Immunity ESD: EN61812-1 EN55011 Group 1 class A EN55011 Group 1 class A EN61812-1 IEC61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: IEC61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity RF-interference from Pulse-modulated Radio Waves: IEC61000-4-3: 10 V/m (900±5 MHz) (level 3) Immunity Conducted Disturbance: IEC61000-4-6: 10 V (0.

15 to 80 MHz) (level 3) Immunity Burst: IEC61000-4-4: 2 kV power-line (level 3) 2 kV I/O signal-line (level 4) Immunity Surge: IEC61000-4-5: 1 kV line to line (level 3) 2 kV line to ground (level 3) Light Gray (Munsell 5Y7/1) IP40 (panel surface) Approx. 120 g Case color Degree of protection Weight Note: Refer to the Life-test Curve. Solid-state Power OFF-delay Timer H3CR-H 39 Life-test Curve 10,000 Switching operations (× 10³) 5,000 1,000 500 30 VDC L/R = 7 ms 250 VAC/30 VDC (cos = 1) 100 250 VAC (cos = 0.4) Reference: A maximum current of 0.15 A can be switched at 125 VDC (cos = 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 at 5 VDC for H3CR-H8L/H8RL and 100 mA at 5 VDC for H3CR-H8RL (failure level: P). Load current (A) Connections Block Diagrams Without Reset Input (H3CR-H8L) Time range/ unit selector AC (DC) input Power supply circuit Oscillation circuit Counting circuit Output circuit Power failure detection circuit LCD LCD Indicator circuit Output indicator With Reset Input (H3CR-H8RL/H8L) Time range/ unit selector AC (DC) input Power supply circuit Oscillation circuit Counting circuit Output circuit Power failure detection circuit Indicator circuit Output indicator Reset input Input circuit I/O Functions Inputs Outputs Reset Control output Turns off the control output and resets the elapsed time. Operates instantaneously when the power is turned on and time-limit resets when the set time is up after the power is turned off.



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40 Solid-state Power OFF-delay Timer H3CR-H Terminal Arrangement Note: DC models, including 24 VAC/DC models, have polarity. 8-pin Models Without Reset Input (H3CR-H8L) With Reset Input (H3CR-H8RL) Reset input Power supply Power supply Note: Leave terminal 3 open. Do not use them as relay terminals. 11-pin Model With Reset Input (H3CR-HRL) Reset input Power supply Note: Leave terminal 6 open. Do not use them as relay terminals. Solid-state Power OFF-delay Timer H3CR-H 41 Operation Timing Chart t: Set time Rt: Minimum power ON time (S-series: 0.1 s min.; M-series: 2 s min.) If the power ON time is less than this value, the Timer may not operate (i.e.

, output may not turn ON). Model H3CR-H8L Power (See note) ON OFF Rt Timing chart t Rt t Output (1 - 3) Output (1 - 4) Output (8 - 6) Output (8 - 5) Output indicator Lit Not lit Rt Rt t 0.05 s min. t 0.05 s min. H3CR-H8RL Power (See note) ON OFF ON (Short-circuited) Reset input OFF (Open) Output (8 - 6) Output (8 - 5) Output indicator Lit Not lit Rt Rt t t 0.05 s min. ON OFF 0.05 s min. H3CR-HRL Power (See note) Reset input Output (1 - 3) Output (1 - 4) Output (11 - 9) Output (11 - 8) Output indicator Lit Not lit Note: If the power is turned ON until the set time is up, the timer will be retrIGGERED.

42 Solid-state Power OFF-delay Timer H3CR-H Nomenclature Output indicator (red) Scale range display windows Time setting knob (for setting power OFF-delay time) Time range selector (select one from 0.6, 1.2, 6, and 12 at full scale) Time unit display S-series: sec M-series: min Dimensions Note: All units are in millimeters unless otherwise indicated. H3CR-H8L H3CR-H8RL 48 15 6 78.0 63.

7 0.7 48 39 dia. 44.8 × 44.8 8 pins H3CR-HRL 48 15 6 78.

0 63.7 0.7 48 39 dia. 44.8 × 44.8 11 pins Dimensions with Front Connecting Socket P2CF-08-@/P2CF-11-@ Dimensions with Back Connecting Socket P3G-08/P3GA-11 92.9 86.4 92.9 91.4 15 H3CR-H8@L 101.

3* 99 112.2* H3CR-HRL 109.9 15 H3CRH8@L H3CR-HRL Y92F-30 P2CF-08 P2CF-08-E 2.3* P2CF-11 P2CF-11-E 2.3* P3G-08 (When Y92A-48G mounted) Y92F-30 P3GA-11 (When Y92A-48G mounted) *These dimensions vary with the kind of DIN track (reference value). Solid-state Power OFF-delay Timer H3CR-H 43 Safety Precautions (H3CR-H) Note: The undermentioned is common for all H3CR-H models. Power Supplies The H3CR-H has a large inrush current; provide sufficient power supply capacity. If the power supply capacity is too small, there may be delays in turning ON the output. With the H3CR-H@RL, for the power supply of an input device, use an isolating transformer, of which the primary and secondary windings are mutually isolated and the secondary winding is not grounded. Wiring The H3CR-H has a high impedance circuit.

Therefore, the H3CR-H may not be reset if the H3CR-H is influenced by inductive voltage. In order to eliminate any influence of inductive voltage, the wires connected to the H3CR-H must be as short as possible and should not be installed alongside power lines. If the H3CR-H is influenced by inductive voltage that is 30% or more of the rated voltage, connect a CR filter with a capacitance of approximately 0.1 µF and a resistance of approximately 120 Ω or a bleeder resistor between the power supply terminals. If there is any residual voltage due to current leakage, connect a bleeder resistor between the power supply terminals.

Correct H3CR-H@RL Input terminal 10 7* 4*, 7 1*, 5 2 2* Power supply Operation An interval of 3 s minimum is required to turn on the H3CR-H after the H3CR-H is turned off. If the H3CR-H is turned on and off repeatedly with an interval of shorter than 3 s, abnormal heating or burning may occur in internal elements. *: H3CR-H8RL Power 3 s min. Input device Isolation transformer is required. Output state 1 10, 7* Input terminal Power supply Incorrect H3CR-H@RL 4*, 7 Output state 2 1*, 5 2, 2* *: H3CR-H8RL After the forced reset function of the H3CR-H is activated, an interval of 3 s minimum is required to activate the forced reset function again.

If the forced reset function is activated repeatedly with an interval of shorter than 3 s, the internal parts of the H3CR-H may deteriorate and the H3CR-H may malfunction. Power Input device Isolation transformer 3 s min. Reset input 3 s min. Input/Output (H3CR-H@RL) An appropriate input is applied to the input signal terminal of the Timer when the input terminal for the input signal is short-circuited. Do not attempt to connect any input terminal to any terminal other than the input terminal or to apply voltage across other than the specified input terminals or the internal circuits of the Timer may be damaged. The H3CR-H@RL uses transformerless power supply. When connecting a relay or transistor as an external signal input device, pay attention to the following points to prevent short-circuiting due to a sneak current to the transformerless power supply. If input is made simultaneously from one input contact or a transistor to the H3CR-H and a Timer whose common input terminals are used as power terminals, such as the H3CR-A, a short-circuit current will be generated. Either input through isolated contacts, or isolate the power supply for one of the Timers. 4* 7 1* 5 G.

S. R. 5 67 H3CR-A H3CR-H@RL 10 7* 2 2* Short-circuit current 10 2 Output If it is required that the output be turned on repeatedly with an interval of shorter than 3 s, consider use of the H3CR-A in mode D (signal OFF-delay). Others If the H3CR-H is dropped or experiences some other kind of shock, because a latching relay is used for output, contacts may be reversed or go into a neutral state. If the H3CR-H is dropped, reconfirm correct operation. *: H3CR-H8RL 44 Solid-state Power OFF-delay Timer H3CR-H Operation (Common) Note: The undermentioned is common for all H3CR models. Basic Setting Setting of Selectors The selectors can be turned clockwise and counterclockwise to select the desired time unit, time range, or operating mode. Each selector has a snap mechanism that secures the selector at a given position. Set the selector at a position at which it is secured. Do not set it midway between two securing positions or a malfunction could result from improper setting.

H3CR-F Twin Timers A time range (0 to 1.2, 0 to 3, 0 to 12, or 0 to 30) is selected for ON and OFF-time using the time range selector at the lower left corner of the front panel, and the selected time range appears within the plastic frame of the time setting knob (= scale range display windows). Selection of Operating Mode H3CR-A Multifunctional Timer Turn the operating mode selector with a screwdriver until the desired operating mode (H3CR-A/AP/AS: A, B, B2, C, D, or E, H3CR-A8/ A8S/A8E: A, B2, E or J, H3CR-A-300: G or J) appears in the display window located above the selector.



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Operating mode selector Operating mode display window Time range selector For ON-time, the desired time unit (sec, 10 s, min, and hrs, or 10 s, 10 min, hrs, and 10 h) is indicated in the ON-time unit display window at the lower right corner of the front panel and can be changed by turning the ON-time unit selector located below the ON-time unit display window. Groove for screwdriver (i.

e., H3CR-A) Selection of Time Unit and Time Range · H3CR-A Multifunctional Timer The desired time unit (sec, min, hrs, or 10h) is displayed in the window below the time setting knob by turning the time unit selector located at the lower right corner of the front panel. A time range (1.2, 3, 12, or 30/2.4, 6, 24, or 60 for H3CR-A@-301) is selected with the time range selector at the lower left corner of the front panel, and the selected time range appears (in the window at the lower right part) within the plastic frame of the time setting knob.

ON-time unit selector Time setting knob Scale range display window Time unit selector For OFF-time, the desired time unit (sec, 10 s, min, and hrs, or 10 s, 10 min, hrs, and 10 h) is indicated in the OFF-time unit display window at the upper right corner of the front panel and can be changed by turning the OFF-time unit selector located below the OFF-time unit display window. Time range selector Time unit display window OFF-time unit selector Solid-state Timer H3CR (Common) 45 · H3CR-G Star-delta Timers A star operation time range (0 to 6, 0 to 12, 0 to 60, or 0 to 120 seconds) is selected with the star operation time range selector at the lower left corner of the front panel. · H3CR-H Power OFF-delay Timers A time range (0 to 0.6, 0 to 1.2, 0 to 6, and 0 to 12) is selected with the time range selector at the lower left corner of the front panel. No time unit selector is available. When ordering the H3CR-H, specify S (for the second unit) or M (for the minute unit) for your H3CR-H. Star operation time range selector Time range selector The time required for switching (0.05, 0.1, 0.

25, or 0.5 second) from the star operation to the delta operation of the H3CR-G can be selected with the star-delta transfer time selector at the lower right corner of the front panel. Setting of Time Use the time setting knob to set the desired time. Star-delta transfer time selector Using the Time Setting Ring for H3CR-A/-G Setting a Specific Time Mount the Panel Cover on the Timer, set the desired time with the time setting knob, and place Time Setting Ring A onto the time setting knob so that the time setting notch of Time Setting Ring A is in the center of the reset lock position of the Panel Cover. Time setting notch

Reset lock position Limiting the Setting Range Example: To set a range of 10 and 20 s. Mount the Panel Cover on the Timer, set the time setting knob to 10 s (the lower limit of the setting range), and place Time Setting Ring C onto the time setting knob so that the stopper of Time Setting Ring C is on the right edge of the reset lock position of the Panel cover. Next, set the time setting knob to 20 s (the upper limit of the setting range), place Time Setting Ring B onto the time setting knob so that the stopper of Time Setting Ring B is on the left edge of the reset lock position of the Panel Cover. Stopper Reset lock position Time Setting Ring A Panel cover Time setting notch Setting position Time Setting Ring B Time Setting Ring C Panel cover Range Example: To set the time to 10 s.

46 Solid-state Timer H3CR (Common) Accessories (Order Separately) (Common) Note: The undermentioned is common for all H3CR models. Note: All units are in millimeters unless otherwise indicated.

Flush Mounting Adaptor Panel Y92F-30 P3G Back Connecting Socket 58 52 42 48 Panel Cutout Note: The adapters for two or more timers mounted in a vertical line are different in orientation from those mounted in a horizontal line. N can be obtained as follows (n: the number of H3CR models arranged side by side) Without a Cover: $N = (48n - 2.5) + 1/0$ With the Protective Cover: $N = (51n - 5.5) + 1/0$ With the Panel Cover: $N = (50n - 4.5) + 1/0$ 0.

5 R max. 45+0.6 -0 (N) 45+0.6 -0 Y92F-70/73 Panel P3G Back Connecting Socket Panel Cutout Adapter mounting hole Two, 4.5 dia. R0.5 max. 88 45±0.15 52 to 53 65 to 66 45±0.15 58 52.3 (63.7) (See note.) 76±0.2 Note: The value shown in parentheses is for the Y92F-70. Y92F-71/-74 56 Panel Note: The mounting panel thickness should be 1 to 3.

2 mm. P3G Back Connecting Socket R0.5 max. 45+0.5 -0 58 45±0.2 68 55+0.5 -0 43±0.2 50 +0.2 -0 52.3 (63.7) (See note.) Note: The mounting panel thickness should be 1 to 3.2 mm. Note: The value shown in parentheses is for the Y92F-71. Solid-state Timer H3CR (Common) 47 Track Mounting/Front Connecting Socket P2CF-08 Eight, M3.

5 × 7.5 sems 7.8 3 4.5 70 max. Two, 4. 5 dia. holes 4 50 max. 20.3 max. 35.4 Terminal Arrangement/ Internal Connections (Top View) Surface Mounting Holes Two, 4.5 dia. or two, M4 P2CF-08-E (Finger Safe Terminal Type) Conforming to VDE0106/P100 Eight, M3.5 × 7.5 sems 7.

8 5 3 70 max. 1.3 Two, 4.5 dia. holes 4 40±0.2 50 max. 19 20.3 21.5 max. 35. 4 4.5 40±0.2 Track Mounting/Front Connecting Socket P2CF-11 Eleven, M3.5 × 7.5 sems 3 7.

8 4.5 70 max. 35.4 Terminal Arrangement/ Internal Connections (Top View) Surface Mounting Holes Two, 4.5 dia. or two, M4 4 50 max. 31.2 max. 40±0.2 P2CF-11-E (Finger Safe Terminal Type) Conforming to VDE0106/P100 Eleven, M3.5 × 7.5 sems 7.8 3 1.2 70 max. Two, 4.

5 dia. holes 4 40±0.2 50 max. 30 31.2 max. 35.4 5 4.5 48 Solid-state Timer H3CR (Common) Back Connecting Socket P3G-08 27 dia. Terminal Arrangement/ Internal Connections (Bottom View) 45 45 4.9 17 P3GA-11 27 dia.

Terminal Arrangement/ Internal Connections (Bottom View) 25.6 45 45 4.5 16.3 6.2 Finger Safe Terminal Cover Conforming to VDE0106/P100 Y92A-48G (Attachment for P3G-08/P3GA-11 Socket) 34 Twelve, 6. 4 dia. holes 47.7 × 47.7 48 × 48 16.5 24.

6 27.6 47.4 Mounting Track PFP-100N, PFP-50N PFP-100N2 16 7.3±0.15 4.5 35±0.3 15 25 10 25 1,000 (500) (See note) 25 10 25 15 (5) (See note) 27±0.15 15 1 25 10 25 1,000 25 10 25 15 4.5 35±0.3 27 24 1 29.

2 1.5 Note: The value shown in parentheses are for the PFP-50N. End Plate PFP-M 10 6.2 1.8 Spacer PFP-S 5 16 12 1 50 1.8 35.5 35.3 44.3 34.8 11. 5 10 M4 x 8 pan head screw 1.3 4.8 16.5 Solid-state Timer H3CR (Common) 49 Protective Cover Y92A-48B The protective cover protects the front panel, particularly the time setting section, against dust, dirt, and water. It also prevents the set value from being altered due to accidental contact with the time setting knob.

Note: 1. The Y92A-48B Protective Cover is made of a hard plastic and therefore it must be removed to change the timer set value.



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