Solid-state Timer

H3DS

DIN Track Mounted, Standard 17.5-mm Width Timer Range

- A wide AC/DC power supply range (24 to 230 VAC/ 24 to 48 VDC) reduces the number of timer models kept in stock. (24 to 230 VAC/VDC with H3DS-XL□)
- Smart Dial/Selector-locking Mechanism: Prevents the dials and selectors on the Timer's front panel from being inadvertently operated or being operated without authorization. The lock can only be unlocked and locked with an optional pen-type Lock Key.
- Screw-Less Clamp type available. (H3DS-□LC)
- Sticker provided for easy timer identification and management.
- Terminal clamp left open when delivered (screw terminal type).
- Finger protection terminal block to meet VDE0106/P100.
- Enables easy sequence checks through instantaneous outputs for a zero set value at any time range.
- Incorporates environment-friendly, cadmium-free contacts.
- Conforms to EN61812-1 and IEC60664-1 4 kV/2 for Low Voltage, and EMC Directives.

■ Broad Line-up of H3DS Series

H3DS

H3DS-M/S/A

Standard Timer
H3DS-M (eight multi-modes)
H3DS-S (four multi-modes)
H3DS-A (single mode)

H3DS-F

Twin Timer
H3DS-F

H3DS-G

Star-delta Timer
H3DS-G

H3DS-X

Two-wired Timer
H3DS-X

Contents

Solid-state Multi-functional Timer

H3DS-M/-S/-A

- Eight operating modes (H3DS-M) and four operating modes (H3DS-S) cover a wide range of applications.
- A wide time setting range of 0.10 s to 120 h.
- Two LEDs indicate power and relay status respectively.

Model Number Structure

■ Model Number Legend

H3DS - □ **L** □
1 2 3

1. M: Multi-function type
   S: Standard type
   A: Single-function type
2. L: Smart lock mechanism
3. None: Screw terminal type
   C: Screw-Less Clamp type

Ordering Information

■ List of Models

Supply voltage	Control output	Input type	Operating mode (see note)	Model	
				Screw terminal type	Screw-Less Clamp type
24 to 230 VAC (50/60Hz)/ 24 to 48 VDC	Contact output: SPDT (time-limit output SP-DT)	Voltage input	Eight multi-modes: A, B, B2, C, D, E, G, J	H3DS-ML	H3DS-MLC
		No-input available	Four multi-modes: A, B2, E, J	H3DS-SL	H3DS-SLC
			Single mode: A	H3DS-AL	H3DS-ALC

Note: The operating modes are as follows:
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

Specifications

■ General

Item	H3DS-ML□	H3DS-SL□	H3DS-AL□
Operating mode	A: ON-delay (Signal or Power) B: Flicker OFF start (Signal or Power) B2: Flicker ON start (Signal or Power) C: Signal ON/OFF-delay D: Signal OFF-delay E: Interval (Signal or Power) G: Signal ON/OFF-delay J: One-shot (Signal or Power)	A: ON-delay B2: Flicker ON start E: Interval J: One-shot	A: ON-delay (fixed)
Input type	Voltage input	---	
Output type	Relay: SPDT		
External connections	Screw terminal, Screw-Less Clamp		
Terminal block	Screw terminal type: Clamps two 2.5-mm^2 max. bar terminals without sleeves. Screw-Less Clamp type: Clamps two 1.5-mm^2 max. bar terminals without sleeves.		
Terminal screw tightening torque	0.98 N·m max.		
Mounting method	DIN track mounting (see note)		
Attachment	Nameplate label		
Approved standards	UL508, CSA C22.2 No.14 Conforms to EN61812-1, IEC60664-1 4 kV/2, VDE0106/P100 Output category according to IEC60947-5-1 (AC-13; 250 V 5 A/AC-14; 250 V 1 A/AC-15; 250 V 1 A/DC-13; 30 V 0.1 A/DC-14; 30 V 0.05 A)		

Note: Can be mounted to 35-mm DIN Track with a plate thickness of 1 to 2.5 mm.

■ Time Ranges

Time scale display	Time range
0.1 s	0.1 to 1.2 s
1 s	1 to 12 s
0.1 m	0.1 to 1.2 min
1 m	1 to 12 min
0.1 h	0.1 to 1.2 h
1 h	1 to 12 h
10 h	10 to 120 h

Note: When the time setting dial is set to “0” for any time scale, the output will operate instantaneously.

■ Ratings

Rated supply voltage (see notes 1 and 2)	24 to 230 VAC (50/60 Hz)/24 to 48 VDC
Operating voltage range	85% to 110% of rated supply voltage
Power reset	Minimum power-off time: 0.1 s
Reset voltage	2.4 VAC/DC max.
Power consumption (see note 3)	AC: 32 VA max./3.0 W max. (typical: 30 VA/2.7 W) at 230 VAC 14 VA max./2.2 W max. (typical: 13 VA/2.1 W) at 100 to 120 VAC DC: 0.7 W max. (typical: 0.6 W) at 24 VDC 1.4 W max. (typical: 1.3 W) at 48 VDC
Voltage input	Max. permissible capacitance between inputs lines (terminals B1 and A2): 2,000 pF Load connectable in parallel with inputs (terminals B1 and A1). H-level: 20.4 to 253 VAC/20.4 to 52.8 VDC L-level: 0 to 2.4 VAC/DC
Control output	Contact output: 5 A at 250 VAC with resistive load ($\cos\phi = 1$) 5 A at 30 VDC with resistive load ($\cos\phi = 1$)
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%

Note: 1. DC ripple rate: 20% max.

2. Since an inrush current of 0.5 A will occur when using the power supply voltage at 24 VDC, pay careful attention when turning on or off the power supply to the Timer with a solid-state output such as a sensor.

3. The power consumption is for mode A after the Timer counts the time-up time and for the AC input at 50 Hz. The power consumption of the H3DS-ML includes the input circuit with the B1 and A1 terminals short-circuited.

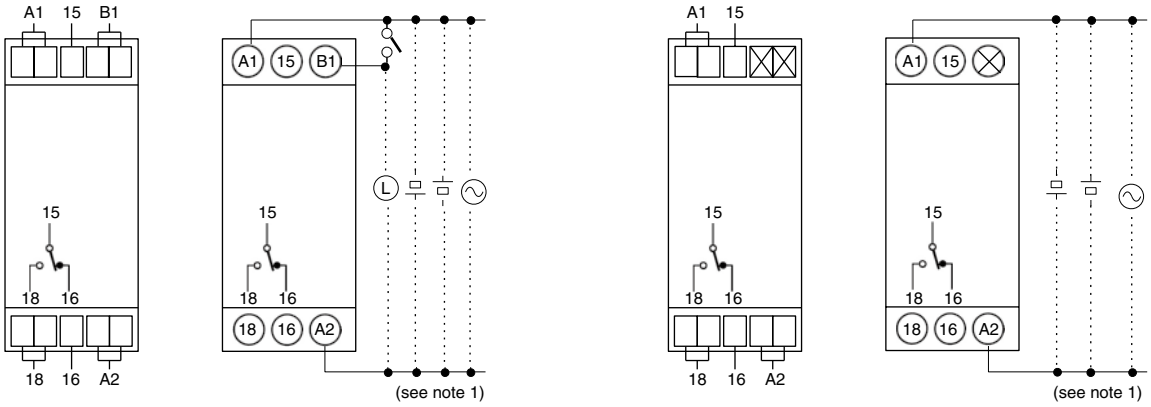
■ Characteristics

Accuracy of operating time	±1% max. of FS (±1% ±10 ms max. at 1.2-s range)
Setting error	±10% ±50 ms max. of FS
Signal input time	50 ms min.
Influence of voltage	±0.7% max. of FS (±0.7% ±10 ms max. at 1.2-s range)
Influence of temperature	±5% max. of FS (±5%±10 ms max. at 1.2-s range)
Insulation resistance	100 MΩ min. at 500 VDC
Dielectric strength	Between current-carrying metal parts and exposed non-current-carrying metal parts: 2,000 VAC for 1 min. Between control output terminals and operating circuit: 2,000 VAC for 1 min. Between contacts not located next to each other: 1,000 VAC for 1 min.
Vibration resistance	Malfunction: 0.5-mm single amplitude at 10 to 55 Hz Destruction: 0.75-mm single amplitude at 10 to 55 Hz
Shock resistance	Malfunction: 100 m/s^2 3 times each in 6 directions Destruction: 1,000 m/s^2 3 times each in 6 directions
Impulse withstand voltage	3 kV (between power terminals) 4.5 kV (between current-carrying metal parts and exposed non-current-carrying metal parts)
Noise immunity	Square-wave noise generated by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise) ±1.5 kV
Static immunity	Malfunction: 4 kV Destruction: 8 kV
Life expectancy	Mechanical: 10 million operations min. (under no load at 1,800 operations/h) Electrical: 100,000 operations min. (5 A at 250 VAC, resistive load at 360 operations/h) (see note)
EMC	(EMI) EN61812-1 Emission Enclosure: EN55011 Group 1 class B Emission AC Mains: EN55011 Group 1 class B Harmonic Current: EN61000-3-2 Voltage Fluctuation and Flickering: EN61000-3-3 (EMS) EN61812-1 Immunity ESD: EN61000-4-2: 6 kV contact discharge (level 3) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: EN61000-4-3: 10 V/m (80 MHz to 1 GHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power port and output port (level 3) 1 kV control port with capacitive clamp (level 3) Immunity Surge: EN61000-4-5: 2 kV common mode (level 3) 1 kV differential mode (level 3)
Case color	Light gray (5Y7/1)
Degree of protection	IP30 (Terminal block: IP20)
Weight	Approx. 70 g

Note: For reference:
A maximum current of 0.15 A can be switched at 125 VDC ($\cos\phi=1$).
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 (failure level: P).

■ Terminal Arrangement

H3DS-MLC **H3DS-ML** **H3DS-SLC/-ALC** **H3DS-SL/-AL**



(DIN notation) **(DIN notation)**

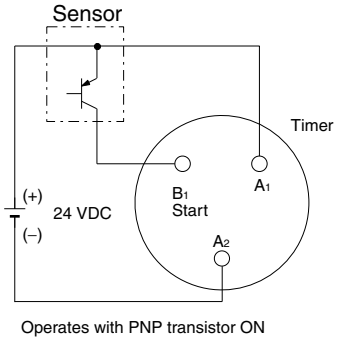
Note: 1. DC supply voltage does not require the designation of polarity.

2. The contact symbol for the H3DS is indicated with  because it offers multiple operating modes and is different from the delayed contact for conventional timers.

■ Input Connections

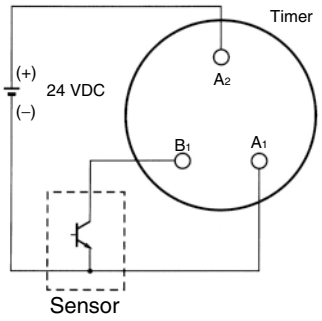
The inputs of the H3DS-ML□ are voltage (voltage imposition or open) inputs.

No-contact Input
(Connection to PNP output sensor.)



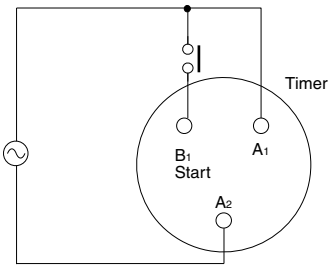
Operates with PNP transistor ON

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



Operates with NPN transistor ON

Contact Input



Operates with relay ON

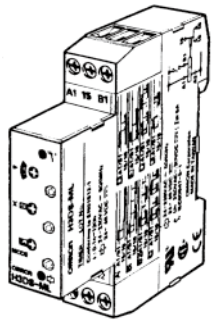
Voltage Input Signal Levels

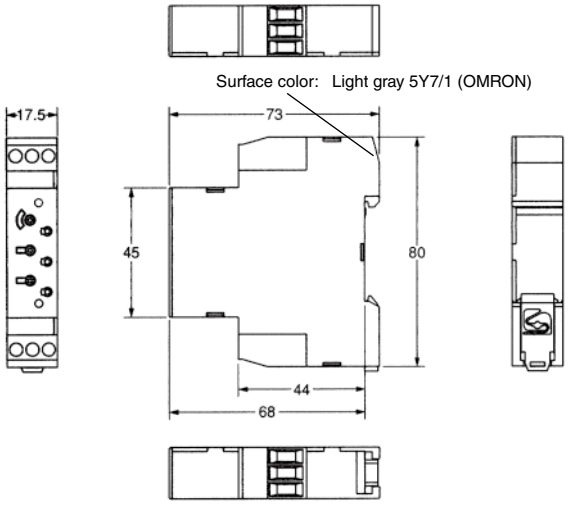
No-contact input	1. Transistor ON Residual voltage: 1 V max. (Voltage between terminals B_1 and A_2 must be more than the rated "H-level" voltage (20.4 VDC min.).)
	2. Transistor OFF Leakage current: 0.01 mA max. (Voltage between terminals B_1 and A_2 must be less than the rated "L-level" voltage (2.4 VDC max.).)
Contact input	Use contacts that can adequately switch 0.1 mA at each voltage to be imposed. (When the contacts are ON or OFF, voltage between terminals B_1 and A_2 must be within the following ranges: When contacts are ON: 20.4 to 253 VAC/20.4 to 52.8 VDC When contacts are OFF: 0 to 2.4 VAC/DC

Dimensions

Note: All units are in millimeters unless otherwise indicated.

H3DS-ML/-SL/-AL





H3DS-MLC/-SLC/-ALC