



# DIGITAL THERMOSTATS

## Networked / Temperature Display & Controls Series

# 460

### FEATURES

- RS485 MODBUS/RTU PROTOCOL COMMUNICATION
- FOR 2-PIPE OR 4-PIPE FAN-COIL UNIT APPLICATION
- THE FAN SPEED CAN BE OPERATED IN THE MODE OF AUTO CHANGEOVER OR CONTINUOUS
- ROOM TEMPERATURE DIGITAL DISPLAY AND USER SELECTED TEMPERATURE SETTING ON DEMAND
- PROPORTIONAL PLUS INTEGRAL (PI) ALGORITHM APPLIED TO ON/OFF CONTROL
- ENERGY SAVING MODE : EXTERNAL ENERGY SAVINGS INPUT (ESI) FROM HOTEL CARD KEY , OCCUPANCY SENSORS OR LIGHTING INTERLOCK SIGNAL
- ADJUSTABLE UNOCCUPIED SET-POINT FOR HEATING AND COOLING MODE CONTROL
- OPTIONAL REMOTE SENSOR (RS) FUNCTION
- TIMER OFF (0 TO 24 HOURS) CONTROL OUTPUT FUNCTION
- SLEEP MODE CONTROL
- NON-VOLATILE MEMORY (EEPROM) RETAINS USER SETTINGS DURING POWER LOSS
- SELF-DIAGNOSTIC FEATURES
- 10 ICONS, 4 DIGIT AND 1 DECIMAL POINT LCD DISPLAY
- °C OR °F DISPLAY
- CONTROL " ON " DISPLAY
- CONTROL OFF OUTPUT WHEN SYSTEM SWITCH AT " OFF " POSITION
- ADJUSTABLE HEATING AND COOLING CONTROL MODE
- ADJUSTABLE MAXIMUM AND MINIMUM SETPOINT LIMITS
- ADJUSTABLE MINIMUM OFF-TIME FOR SHORT-CYCLE PROTECTION
- MOUNTED DIRECTLY ONTO STANDARD 2 X 4 INCH VERTICAL JUNCTION BOX OR STANDARD 65MM X 65MM JUNCTION BOX.
- CUSTOM LOGOS AVAILABLE
- 24VAC OR 120VAC OR 230VAC MODELS AVAILABLE



The 460 Series thermostat is a Modbus/RTU protocol networked, microprocessor based thermostat with 10 icons and 4-digit LCD display. The thermostats are designed to control the fans, valves, compressors or electric heaters in fan-coil unit and air-conditioner applications.

The fan operation could be as "AUTO" (automatic 3 speed changeover) or selectable H/M/L continuous fan speed.

The models are available for heating /cooling control of 2-pipe or 4-pipe fan-coil units. The thermostats can receive an external energy saving input that overrides the heating /cooling temperature setting for energy savings.

## SPECIFICATIONS

MODEL	Control Outputs		Inputs		Features		Inputs	
	On / Off	RC*	ESI	RS	Heating / Cooling	Deadband	2-Pipe	4-Pipe
460□-110	Single		●	●	Cooling		●	
460□-510	Single		●	●	Heating or Cooling		●	
460□-211	Dual		●	●	Heating or Cooling			●
460□-311	Dual		●	●	Heating & Cooling	●		●

Note : If need "RC (Remote Control Contact)", please contact with sales

**Supply Voltage :**

24, 120, 230 VAC ( 10%), 50/60 Hz

**Setpoint Range :**

0 to 50°C (32 to 122°F), default 18 to 30°C or 64 to 90°F

**Display Range :**

0 to 50.0°C (32.0 to 122.0°F)

**Display :**

10 icons, 4-digit and 1 decimal point LCD display

**Display Resolution :** 0.1°C (0.1°F)

**Setting Unit :** 0.5°C (0.5°F) / step

**Indication Accuracy :** ±0.5°C (±0.9°F)

**Setpoint Adjustment :**

Up-and-down arrow keys or Mode Selection

**Electrical Rating :** 2A run, 12A inrush

**Thermostat Output :**

- 1 SPST relay for 2-pipe models,
- 2 SPST relays for 4-pipe models

**Minimum off Time :**

The least time between two control ONs

**Communication:**

RS485 Modbus/RTU protocol

**Optional Remote Sensor (RS) :**

NTC Thermistor 3K

**Control Performance :**

Proportional plus integral (PI) algorithm applied to on/off control

**Minimum Operating Life :**

Thermostat contacts : 100,000 cycles

Manual switches : 10,000 operations

**Energy Savings Input (ESI) :**

To save energy by entering into unoccupied mode when ESI is triggered

Normally open (N.O.) or normally close (N.C.) dry contact

**Operating Rating :**

0 ~ 50°C, 5 ~ 95% RH (non-condensation)

**Dimensions :** 75x120x26 mm (WxHxD)

**Mounting :**

Wall Mounting, standard 65x65 mm junction box (hole pitch 60 mm) or standard 2x4 inch vertical junction box (hole pitch 83.5 mm)

**Wiring :**

16 screw-in terminals, each terminal is suitable for 14 to 22 AWG wires or 1.5 mm<sup>2</sup> wires

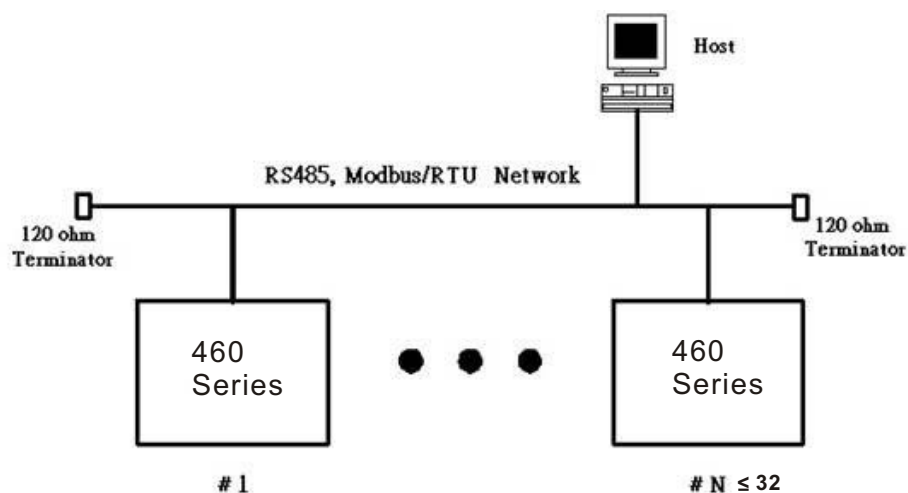
**Timer :**

Selectable 0~24 hours timer to turn off control outputs

**Sleep :**

Selectable to provide sleep mode control

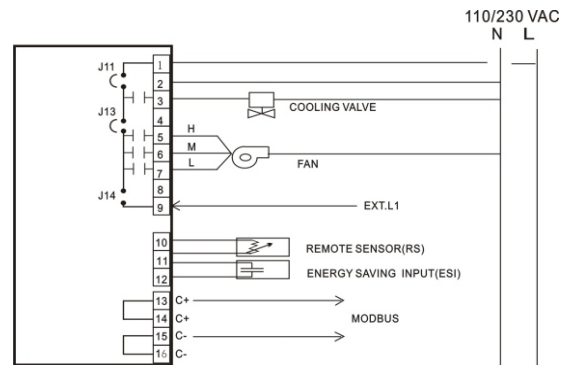
## SYSTEM CONFIGURATION



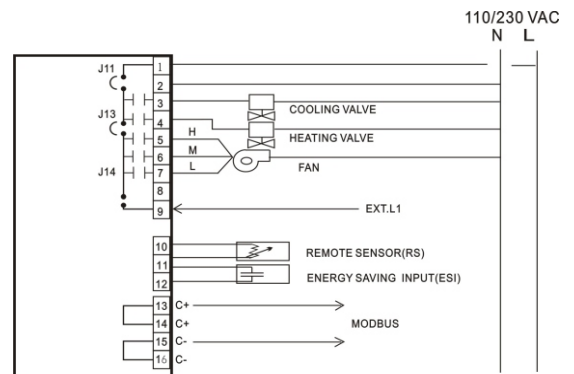
## MODEL SELECTION

ITEMS	CODE	SPECIFICATION
① MODEL	460A	DIGITAL THERMOSTAT WITHOUT LCD BACKLIT
	460B	DIGITAL THERMOSTAT WITH LCD BACKLIT
	460C	To be specified
② APPLICATION	-0	Temperature display only
	-1	Cooling controls
	-2	4-pipe heating or cooling (manual selectable)
	-3	Heating & Cooling controls
	-4	Heating only
	-5	2-pipe heating or cooling (manual selectable)
	-6	To be specified
③ COOLING OUTPUT (CH-1)	0	Not required
	1	1-SPDT
	2	To be specified
④ HEATING OUTPUT (CH-2)	0	Not required
	1	1-SPDT
	2	To be specified
⑤ FAN CONTROL	-A	Not required
	-B	Automatic fan control (ON-OFF)
	-C	Automatic fan control (3-speed)
⑥ POWER SUPPLY	A	24V AC
	B	110V AC
	C	230V AC
	D	To be specified
⑦ COLOR FOR HOUSING	A	Ivory
	B	Pure white
	C	To be specified

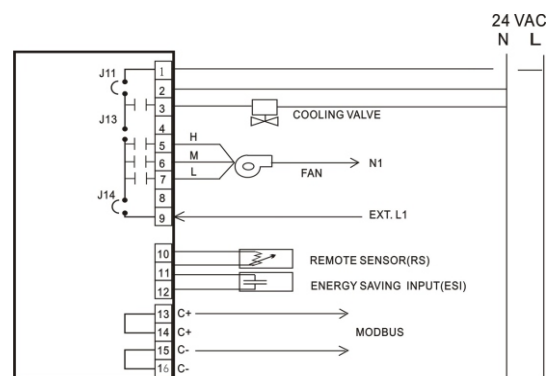
## WIRING EXAMPLE



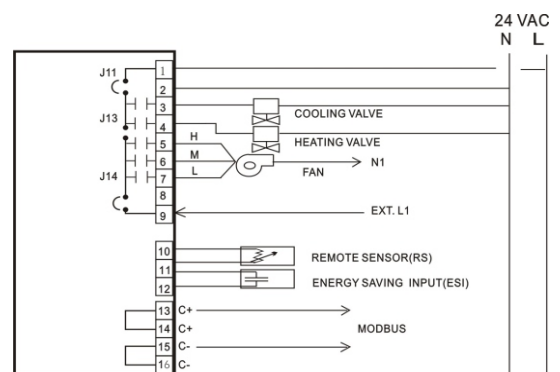
120/230VAC Input, 2-pipe Control



120/230VAC Input, 4-pipe Control



24VAC Input, 2-pipe Control



24VAC Input, 4-pipe Control

The specifications are subject to change without prior notice.

## DOERS TECHNOLOGY CORPORATION

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ISO 9001 : 2000

Certificate No. EQAICC-Q-R5164