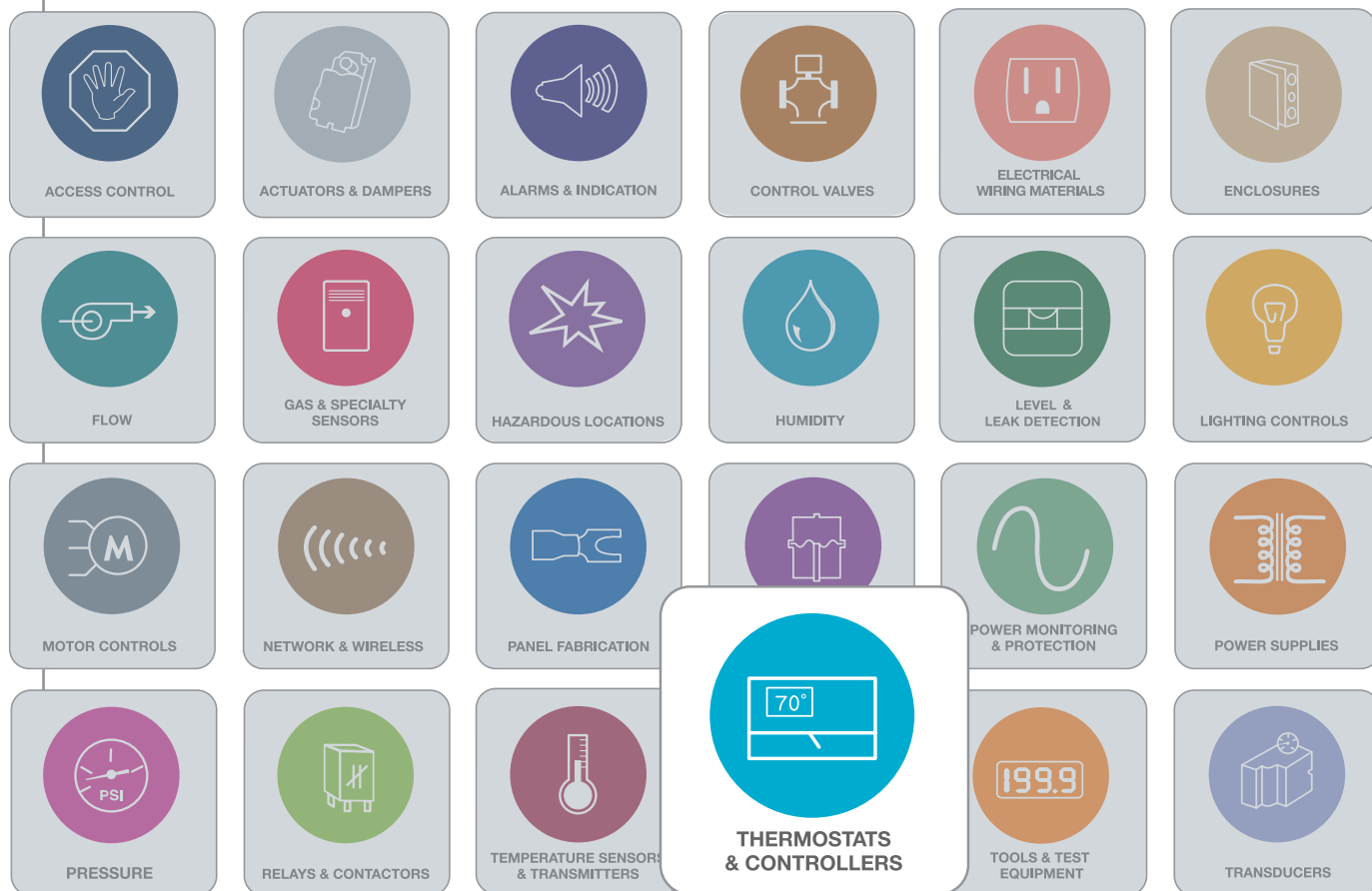


THERMOSTATS & CONTROLLERS



Offering Mechanical, Digital, and Communicating Thermostats to Complete your Projects.

Prestige IAQ | p. 1305 Series

Honeywell



VT7600 | p. 1327 Series

VICONICS



UT8001 | p. 1367

TE



Thermostat | p. 1392 Guards

Kele



1F80 Series | p. 1338

White Rodgers



PXR4 Series | p. 1359

FE





Products manufactured
in the United States



Products that are
new to the catalog



TOOLS & TEST
EQUIPMENT

A19/A28/ | p. 1378
A319/A419

Johnson
Controls



T170 Series | p. 1372

PECO
AUTOMATION AND CONTROLS



Zip Economizer |
p. 1354

BELIMO



kele.com

MODEL/SERIES

PAGE

Accessories

Testing Devices and Tools — Thermostat Tools and Change-Over Thermostats	1390
Sensor Mounting Accessories — Thermostat Remote Sensor Accessories	1391
Thermostat Guards — Thermostat Guards	1393

Bulb/Aqua Stats

A19, A28, A319, A419 Series — Bulb Thermostats	1378
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Communicating Thermostats

Prestige IAQ — Programmable/Wireless Thermostats	1305
VT7200, VT7300 Communicating — Zone and FCU Communicating Thermostats (BACnet, LON, N2)	1321
VT7600 Communicating — AHU Communicating Thermostat Single and Multistage, Programmable and Non-programmable (BACnet, LON, N2)	1312
T7350, W7350 Series — T7350 Series Programmable Commercial Thermostats and W7350 Controller	1315

Fan Coil Thermostats

VT7200, VT7300 Series — Zone Thermostats and FCU Thermostats	1310
TB7100A100 MultiPro™ Series — MultiPro™ Multispeed and Multipurpose Thermostats	1332
TB6575, TB8575 SuitePro™ Series — Digital Fan Coil Thermostats	1346
T158, T168 Series — Floating and Proportional Thermostats	1370
T170 Series — Fan Coil Thermostat with ADA-Compliant Digital Display	1372
T180 Series — Programmable Fan Coil Thermostats	1374
T155, T167 Series — Line and Low Voltage Two-Position and Proportional Thermostats	1376

Low/High Limit Thermostats

A11 Series — Low Temperature Limit Controls	1380
A70 Series — Low & High Temperature Limit Controls	1381
L480 Series — Low Limit Temperature Controls	1382
TSA, TF142 — Low-Limit Temperature Controls	1384
TC-105, TC-100 — Duct High Temperature Limits	1385

Mechanical Thermostats

ET Series, UT8001 — Two-Position Room Thermostats	1367
T22, T25, T26, T46 — Line-Voltage Thermostats	1368
TF115, TH109, and TRF115 Series — NEMA 4X Industrial Controls Thermostats	1386
T631F/G, TW155/255 Series — NEMA 4X Rated Thermostats	1388
TC-1100 Series — Two Position Room Thermostats	1389

Programmable/Non-Programmable Thermostats

1F95, 1F95EZ and 1F97 Series Thermostats — Big Blue™ and Blue™ Universal and Single Stage Programmable/Non-programmable Thermostats	1323
VT7600 Series — Single and Multistage Programmable and Non-programmable Thermostats	1327
T87, TH3000, and TH4000 Series — Residential Thermostats, Programmable and Non-programmable	1330
TH5000, TH6000, TB7000 Series — FocusPro™ Residential and Light Commercial Thermostats	1334
TH8000 Series, TB8220 Series — VisionPro™ Programmable Thermostats	1336
1F80 Series — Residential and Light Commercial Thermostats	1338
T4000, T8000, and T12000 Series Thermostats — Digital Display Programmable Thermostats	1342
1F72, 1E78 and 1F78 Series Thermostats — Residential LCD Display Programmable/Non-Programmable Thermostats	1344

Proportional Room Thermostats (No Fan Control)

TB6980 and TB7980 Series — Floating and Proportional Zone Thermostats	1348
RTC-2P — Proportional Room Thermostats	1365

Stand Alone Controllers and Temperature Switches

T775 Series — Single or Multi-Loop Standalone Controller	1350
System 450 — System 450 Modular Controls	1352
ZIP Economizer Series — Economizer	1354
PXR4 — Setpoint Controllers	1359
R820 Series — SCR Power Controller	1361
UCM-420A — Setpoint Controllers	1363

THERMOSTATS & CONTROLLERS

PROGRAMMABLE/WIRELESS THERMOSTAT PRESTIGE IAQ



Honeywell

DESCRIPTION

The **Prestige** High Definition (HD) Color Touchscreen Thermostat provides control of 24 VAC of heating and cooling systems. RedLINK™ enabled to work with compatible wireless accessories. These newly updated thermostats come in a variety of colors and can be accessed via the internet or through the mobile app available from Honeywell. The new Prestige is on the leading edge of design and remote access when it comes to thermostats for both residential and light commercial applications. Check out the entire line for one that fits your application.

FEATURES

- **60% smaller than Prestige 2.0 and available in 4 colors**
- **Delta T Alerts and Diagnostics inform customers when their system is not operating as expected**
- **Residential or light commercial use**
- **User Interaction Log provides a searchable history of setting changes**
- **Assignable outputs for indoor air quality and staging control**
- **Selectable staging options**
- **Customizable service reminders**
- **Up to 4H/2C heat pump or 3H/2C conventional systems**

NEW!



Prestige IAQ-EIM



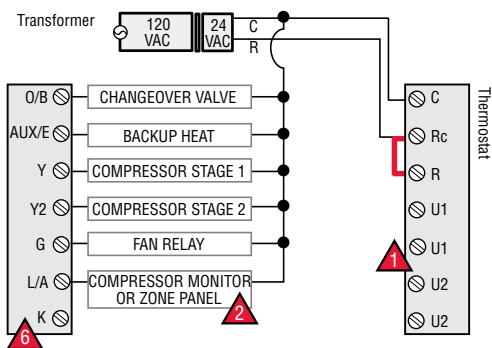
SPECIFICATIONS

Supply Voltage	24 VAC	Temperature Setting Range	Heating 40° to 90°F (4.5° to 32°C) Cooling 50° to 99°F (10° to 37°C)
System Type	4 heat/2 cool heat pump and up to 3 heat/2 cool conventional	Operating Temperature	Thermostat 32° to 120°F (0° to 48.9°C) EIM -40° to 165°F (-40° to 73.8°C)
Sensor Type		Operating Humidity	Thermostat 5% to 90% condensing, EIM 5% to 95% non-condensing
Temperature	Onboard 20kΩ NTC	Dimensions	
Humidity	Capacitive	Thermostat	4-1/2"W x 3-1/2"H x 7/8"D (11.5 x 8.9 x 2.2 cm)
Communication	RedLINK devices	Prestige IAQ	6-13/16"W x 3-7/8"H x 1-7/16"D (17.3 x 9.9 x 3.6 cm)
Baud Rate	900 MHz frequency range	EIM	9.34"H X 4.83"W X 1.6"D (23.7 x 12.3 x 4.1 cm)
Analog Input	EIM 2 Universal inputs, temperature or dry contact selectable (not available with single- piece thermostat)	Measurement Range	Building material and content dependent
Output		Weight	2.0 lb (maximum item)
EIM	7	Approvals	This device complies with Part 15 of the FCC Rules. (15.19, 15.21, 15.105)
Standalone	6 (USB on some models)	RoHS Statement	Yes
Contact Rating		Warranty	5 years (excludes batteries)
EIM terminals W-O/B, Y, W3-Aux2, A-L/A	Maximum Current 1.0A,		
EIM terminals G, U1, U2, U3	Maximum Current 0.5A		
EIM terminals W2-Aux1, Y2	Maximum Current 0.6A		
Temperature Sensor Accuracy	± 1.5° at 70°F (0.75° at 21°C)		

PROGRAMMABLE/WIRELESS THERMOSTAT PRESTIGE IAQ

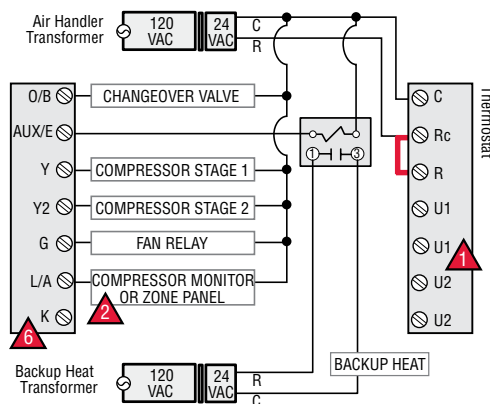
WIRING - THX9321 & THX9421

Typical wiring of a 3-heat / 2-cool heat pump system with one transformer.



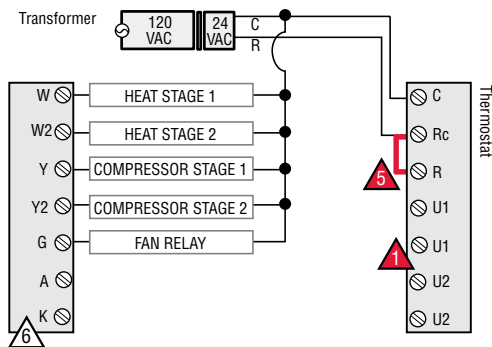
Prestige THX9321 and heat pump system with one transformer

Typical wiring of a 3-heat / 2-cool heat pump system with two transformers.



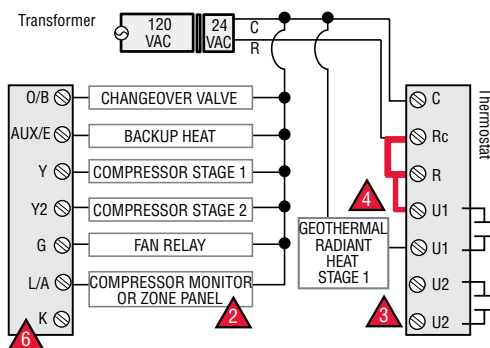
Prestige THX9321 and heat pump system with two transformers

Typical wiring of a 2-heat / 2-cool conventional system with one transformer.



Prestige THX9321 and 2-heat / 2-cool conventional system with one transformer

Typical wiring for geothermal radiant heat, geothermal forced-air and backup heat with one transformer.



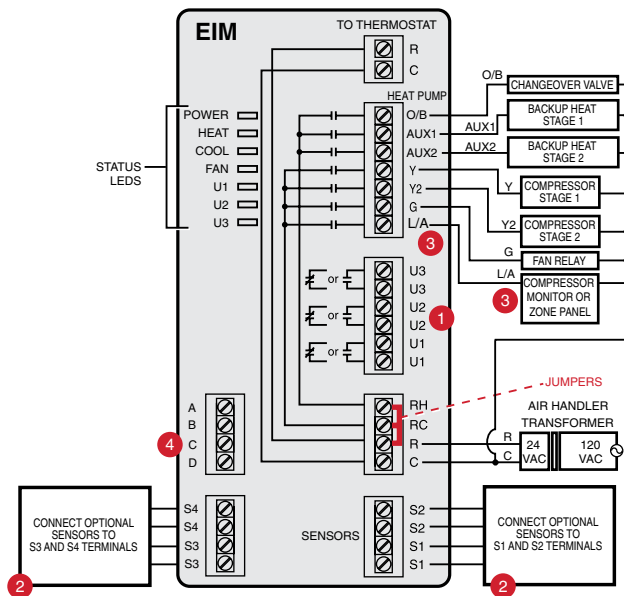
Prestige THX9321 and geothermal radiant heat, geothermal forced-air and backup heat with one transformer

- 1 U1 and U2 terminals are dry contacts.
- 2 L/A terminal sends continuous output when thermostat is set to EM HEAT mode except when set up for Economizer or TOD. See "Economizer Module Wiring Diagrams" beginning on page 151.
- 3 U1 or U2 terminals must be used for geothermal radiant heat (ISU 2010). Thermostat allows 2 stages of radiant heat—geothermal (stage 1) and boiler (stage 2).
- 4 "U" terminals are normally open dry contacts when set up for geothermal radiant heat. You must install a field jumper if radiant heat is powered by system transformer. Do NOT install a field jumper if radiant heat has its own transformer.
- 5 Remove jumper if using separate transformers.
- 6 Connect the THP9045 Wiresaver Module to the K terminal in heating/cooling applications that do not have a common wire at the thermostat. The K terminal cannot be used in heat-only applications. See THP9045 installation instructions for more information.

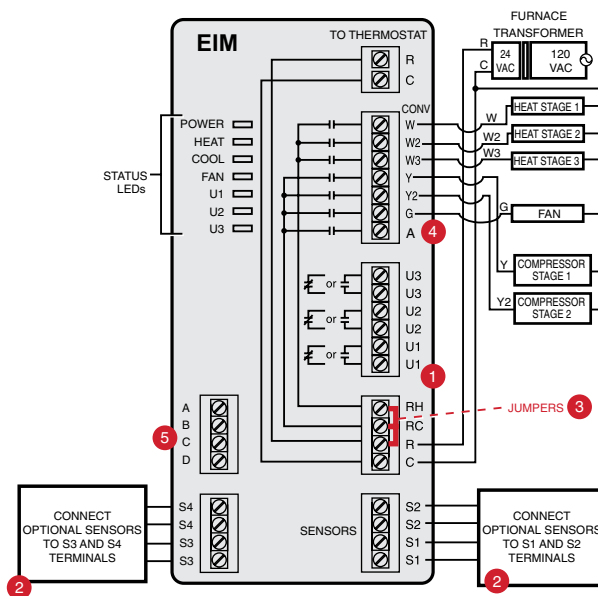
NOTE: For additional set-up, wiring, and operation, see installation manual.

WIRING - EIM

Typical wiring of a heat pump system with up to 4-stage heat and 2-stage cool with one transformer



Typical wiring of a conventional system with up to 3-stage heat and 2-stage cool with one transformer



See installation instructions for additional wiring options.

NOTES

The RedLINK Internet Gateway requires a physical Ethernet connection to an open port on a user-supplied router. The router must be connected to the internet via a user's Internet Provider for access to the Honeywell server. There is no need for a static IP address. To date, there have been no reported issues with port blocking or firewalls preventing access.

In order to guard against possible wireless signal overload, assure that all wireless RedLINK devices including the RedLINK Internet Gateway are spaced a minimum of 2 feet apart from each other for proper operation.

REDLINK WIRELESS GATEWAY (THM6000R1002) CONTRACTOR SETUP

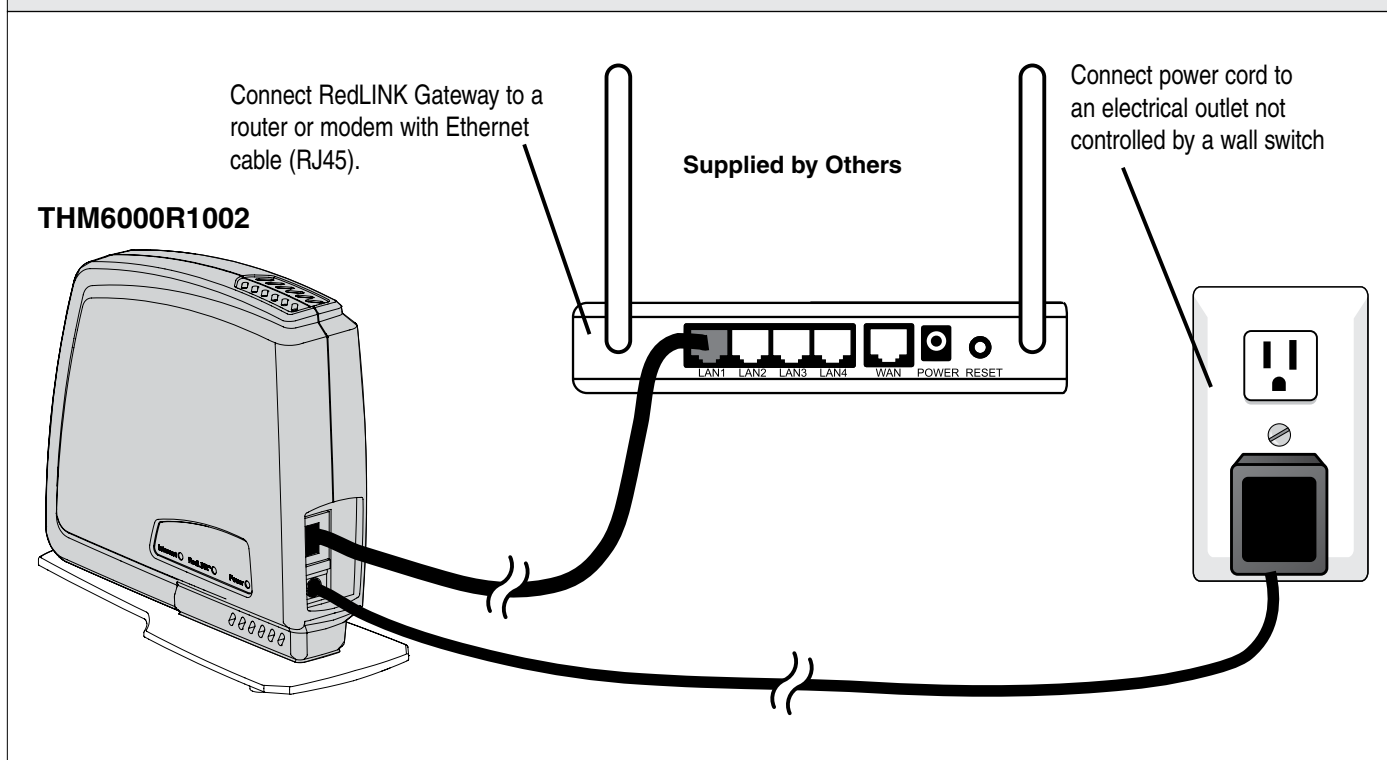
1. Connect power to the RedLINK Internet Gateway using the supplied 120VAC power supply wall module.
2. Connect the supplied Ethernet cable from the RedLINK Internet Gateway to an available port on a designated Router (router supplied by others).
3. Using the Prestige Thermostat Contractor Installation Options Menu select Wireless Device Manager, then select Add Device.
4. Press and release the Connect button located on the bottom of the RedLINK Internet Gateway. The device will appear on the Thermostat. Exit the menu.
5. Note the Device MAC ID and Device CRC information on the bottom of the device (required for account assignment).



THERMOSTATS & CONTROLLERS

PROGRAMMABLE/WIRELESS THERMOSTAT *PRESTIGE IAQ*

GATEWAY SETUP



ACCOUNT SETUP

1. Visit www.mytotalconnectcomfort.com and click "Create an Account." There is no charge for this service.
2. Enter required account information including email, password and security questions/answers.
3. Account verification email will be sent to account email - log into email and validate account to return to www.mytotalconnectcomfort.com
4. Enter New Location for RedLINK Internet Gateway including location type (commercial or residential) and alert email accounts
5. Assign RedLINK Internet Gateway to location by entering the unique device MAC ID and device CRC information (Found on bottom of THM6000R1002)

Account is now active and may be accessed via any supported web browser or smart phone application.

THERMOSTATS & CONTROLLERS

PROGRAMMABLE/WIRELESS THERMOSTAT

PRESTIGE IAQ



ORDERING INFORMATION

PRESTIGE KITS		
Kit Part Number	Included in Kit	
	Part Number	Description
Prestige IAQ Kit YTHX9421R5101WW	THX9421R5021WW	Thermostat - White Front, White Side
	THM5421R1021	Equipment Interface Module
	C7089R1013	Wireless Outdoor Sensor
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige IAQ Kit YTHX9421R5101BB	THX9421R5021BB	Thermostat - Black Front, Black Side
	THM5421R1021	Equipment Interface Module
	C7089R1013	Wireless Outdoor Sensor
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige IAQ Kit YTHX9421R5101SG	THX9421R5021SG	Thermostat - Silver Front, Gray Side
	THM5421R1021	Equipment Interface Module
	C7089R1013	Wireless Outdoor Sensor
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige IAQ Kit YTHX9421R5101WG	THX9421R5021WG	Thermostat - White Front, Gray Side
	THM5421R1021	Equipment Interface Module
	C7089R1013	Wireless Outdoor Sensor
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige IAQ Kit YTHX9421R5085WW	THX9421R5021WW	Thermostat - White Front, White Side
	THM5421R1021	Equipment Interface Module
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige IAQ Kit YTHX9421R5085BB	THX9421R5021BB	Thermostat - Black Front, Black Side
	THM5421R1021	Equipment Interface Module
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige IAQ Kit YTHX9421R5085SG	THX9421R5021SG	Thermostat - Silver Front, Gray Side
	THM5421R1021	Equipment Interface Module
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige IAQ Kit YTHX9421R5085WG	THX9421R5021WG	Thermostat - White Front, Gray Side
	THM5421R1021	Equipment Interface Module
	50062329-001	Discharge/Return Sensors (Qty. 2)
Prestige 2.0 Kit YTHX9321R5061	THX9321R5030	Thermostat
	REM5000R1001	Portable Comfort Control
Prestige 2.0 Kit YTHX9321R5079	THX9321R5030	Thermostat
	C7089R1013	Wireless Outdoor Sensor
Note: Part numbers can be ordered separately.		

THERMOSTATS & CONTROLLERS

ZONE AND FCU COMMUNICATING THERMOSTAT (BACNET, LON)

VT7200, VT7300 COMMUNICATING

DESCRIPTION

VT7200 Zone thermostats are digital-display, heating/cooling, with outputs for two-position, floating, and proportional terminal unit control. They are ideal for baseboard heat, unit heaters, radiant panels, reheat, or VAV box (pressure-dependent) control. **VT7300 Fan Coil Unit (FCU)** thermostats are digital-display, heating / cooling, with outputs for two-position, floating, or proportional control. In addition, they include multi-speed fan relays for high, medium, and low fan speed control. Both thermostats offer remote temperature sensor and remote digital inputs configured for night setback, filter alarm, motion sensor, door/window switch, or service indication. All models offer standard BACnet or LON open-protocol communications.

FEATURES

- **BACnet or LON communication models**
- **Stand-alone operation on communication loss**
- **Two-position, floating, or proportional models**
- **Remote room sensor option**
- **Adjustable deadband**
- **Single setpoint adjustment**
- **Setpoint range limits (heating and cooling)**
- **Three configurable inputs for night setback, setback override, motion sensor, door or window switch, filter alarm, service advisory, heat/cool changeover °F/°C (configurable)**
- **Display offset**
- **Adjustable temporary occupied time**
- **Heat, cool, and reheat time base outputs are configurable**
- **Direct or reverse acting (proportional models)**
- **Keypad lockout functions**
- **Dehumidification control models**
- **Three-speed fan control (FCU model)**
- **Selectable system control (FCU model)**
- **PIR cover sensor (Optional)**



VT7200C5031B
BACnet Zone
Thermostat



VT7305C5031B
BACnet FCU
Thermostat



SPECIFICATIONS

Supply Voltage	19-30 VAC, 50/60 Hz	Universal Input	Dry contact or 10K Type 2 Model 24 thermistor
Supply VA	2 VA	Remote Sensor	Thermistor, 10K Type 2 Model 24
Display	Two line backlit LCD, $\pm 0.2^{\circ}\text{F}$ ($\pm 0.1^{\circ}\text{C}$)	Control Type	Proportional plus integral (PI)
Control Accuracy	Temperature, $\pm 0.9^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$)	Proportional Band	Heating and cooling, 2°F (1.1°C)
VT7350C50xx, VT7350F50x	Dehumidification, $\pm 5\%$ RH from 20% to 80% RH	Floating Time Base	Adjustable, 0.5 to 9 minutes
Thermostat Type	Zone (VT7200) or FCU (VT7300)	Cycles Per Hour	Adjustable 3 to 8
Cover Controls		Override Timer	0 to 24 hours, 1-hour increments, pushbutton reset
Zone Models	Up/down/override buttons	Sensor Offset	Adjustable $\pm 5^{\circ}\text{F}$ ($\pm 2.5^{\circ}\text{C}$), $\pm 15\%$ RH (humidity models)
FCU Models	Heat/Cool "on" LEDs	Deadband	Adjustable 2° to 5°F (1° to 2.5°C)
Control Outputs	Up/down/ $^{\circ}\text{C}$ -or- $^{\circ}\text{F}$ /fan/mode buttons	Setpoint	Adjusted depending on heating or cooling mode, heating and cooling setpoints are changed simultaneously with respect to the deadband
VT7200C50xx	Fan/Heat/Cool "on" LEDs	Cooling limits	54° to 100°F (12°C to 37.7°C)
VT7200F50xx	See terminal designation table	Heating limits	40° to 90°F (4.5° to 32°C)
VT7300C50xx, VT7350C50xx	5 triacs (H/C, 2-position or floating control)	Keypad Lockout	Selectable system/fan/unoccupied
VT7300F50xx, VT7350F50xx	1 triac, 2 analog outputs (H/C proportional 0 to 10 VDC)	System Setting	O=off, H=heating, C=cooling, A=automatic changeover
Triacs and relays	3 relays (fan), 5 triacs (H/C, 2-position or floating control)	(FCU models)	O/C, O/H, O/A/H/C, H/O/C
Analog outputs	30 VAC, 1A, 3A inrush	Fan Setting	L=low, M=medium, H=high, A=auto
Auxiliary Inputs	0-10 VDC, 2K Ω minimum impedance, direct or reverse acting	(FCU models)	L/M/H, L/H, L/M/H/A, L/H/A, On/A
Configurable as	2 digital inputs, 1 universal input, 1 remote sensor	Wiring	18 AWG maximum, 22 AWG recommended
Digital Inputs	Service/status reminders	Enclosure	UL FR1, flame retardant plastic
	Door/window/motion sensor switch	Color	White
	Filter alarm	Mounting	Standard vertical, 2" x 4" box
	Central night setback clock	Operating Temperature	32° to 122°F (0° to 50°C)
	Remote occupied override switch	Operating Humidity	0 to 95% RH (non-condensing)
	Heat/Cool changeover, contact or sensor	Dimensions	4.94"H x 3.38"W x 1.13"D (12.5 x 8.6 x 2.9 cm)
	Dry contact	Weight	0.75 lb (0.34 kg)
		Approvals	UL Listed File #E234137, cULus, CE, LonMark
		RoHS Statement	Yes
		Warranty	1 year

THERMOSTATS & CONTROLLERS

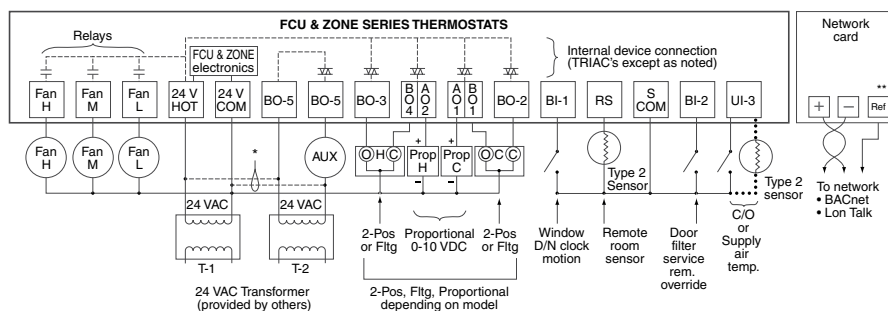
ZONE AND FCU COMMUNICATING THERMOSTAT (BACNET, LON)

VT7200, VT7300 COMMUNICATING



WIRING

TABLE 1. TERMINAL DESIGNATIONS BY THERMOSTAT (FCU & ZONE)								** Terminals and function are not present on every thermostat	
ZONE THERMOSTATS		FAN COIL UNIT (FCU) THERMOSTATS							
VT7200C-E VT7200C-B 2-position/ floating	VT7200F-E VT7200F-B Proportional	VT7300A-E VT7300A-B 2-position	VT7300C-E VT7300C-B 2 position/ floating	VT7350C-E VT7350C-B 2 position/ floating/RH	VT7300F-E VT7300F-B Proportional	VT7350F-E VT7350F-B Proportional/ RH	< LON < BACnet Terminal**	Thermostat Function**	
		X	X	X	X	X	1	High speed fan (FCU)	
		X	X	X	X	X	2	Medium speed fan (FCU)	
		X	X	X	X	X	3	Low speed fan (FCU)	
X	X	X	X	X	X	X	4	24 VAC hot power for thermostat, fan and BO-(1,2,3,4) AO-(1,2)	
X	X	X	X	X	X	X	5	24 VAC common for thermostat, fan and BO-(1,2,3,4) AO-(1,2)	
X	X	X	X	X	X	X	6	BO-5, aux output, configurable (reheat, occupied/un-occupied)	
X	X	X	X	X	X	X	7	BO-5, aux output, configurable (reheat, occupied/un-occupied)	
X		X	X	X			8	BO-3, open heating	
X			X	X			9	BO-4, close heating	
	X				X	X	9	AO-2, heating	
X			X	X			10	BO-1, open cooling	
	X				X	X	10	AO-1, cooling	
X		X	X	X			11	BO-2, close cooling	
X	X	X	X	X	X	X	12	BI-1, configurable (night set back clock, motion detector, window switch)	
X	X	X	X	X	X	X	13	RS, remote sensor, 10 KΩ thermistor	
X	X	X	X	X	X	X	14	Scom, common for remote sensor, BI-(1,2), and UI-1	
X	X	X	X	X	X	X	15	BI-2, configurable (door, filter, service, remote override)	
X	X	X	X	X	X	X	16	UI-3, configurable (change over contact or sensor, supply air sensor)	



Note: Terminals are Thermostat Dependent See Table 1.

** Common device reference on BACnet networks as needed.

*One Transformer Wiring (Delete T2)
...Alternate Device Based on Set-up

ORDERING INFORMATION

MODEL	THERMOSTAT TYPE
VT7200	Zone controller
VT7300	Fancoil controller commercial (override occupancy)
VT7305	Fancoil controller hospitality (hotel/lodging with temp scale)
VT7350	Fancoil controller commercial (override occupancy) with humidity sensor
VT7355	Fancoil controller hospitality (hotel/lodging with temp scale) with humidity sensor
OUTPUTS	
C	2 floating + 1 digital (for VT7200), 2 floating + 1 auxiliary (for VT73xx)
F	2 analog + 1 digital (for VT7200), 2 analog + 1 auxiliary (for VT73xx)
COVER	
5000	Viconics logo
5031	Blank cover (no logo)
5500	PIR cover with Viconics logo
5531	PIR cover blank (no logo)
COMMUNICATION PROTOCOL	
E	Echelon/LONworks
B	BACnet
P	Wireless/Zigbee Pro
W	Wireless

VT7305 C 5031 W Example: VT7305C5031W Hospitality fancoil controller with 2 floating + 1 auxiliary outputs in a blank cover case with wireless communication protocol

COV-PIR-FCU-C-5031
COV-PIR-ZN-5031
TG511A1000

ACCESSORIES
PIR cover for FCU thermostat
PIR cover for Zone thermostat
Thermostat guard- clear-medium size

PAGE

1392

THERMOSTATS & CONTROLLERS

AHU COMMUNICATING THERMOSTAT SINGLE AND MULTISTAGE, PROGRAMMABLE AND NON-PROGRAMMABLE, (BACNET, LON)

VT7600 COMMUNICATING

DESCRIPTION

The VT7600 Communicating Thermostats are digital display, single or multistage, seven-day programmable or nonprogrammable PI thermostats (°F or °C) for use with AHU controls and heat pumps for both heating and cooling applications. The VT7600 has both system and fan switching with internal sensor or remote sensor capabilities. Five buttons control a simplified menu for over 20 configurable parameters. A communication card is added for multiple protocols, including BACnet and LON. Other control features are listed below.

FEATURES

ALL MODELS

- No logo on thermostat cover
- 1H/1C, 2H/2C (3H/2C heat pump) models
- Fan switching (on/auto/smart)
- System switching (O/A/C/H)
- Two line 8 digit backlit LCD Display
- Three status LEDs (Fan, Clg, Htg)
- Five control keys
- Remote sensor and OSA sensor inputs
- Adjustable deadband

- PIR cover available
- Permanent program retention
- Two configurable DI inputs
- Two line LCD display (°F or °C)
- Proportional + Integral control

ECONOMIZER MODELS

- Mixed-air (0-10V) control outputs
- Mixed-air sensor input
- Mixed-air setpoint (SP)
- Economizer changeover S.P. temperature
- OSA damper minimum position in %

VT7600A5031B
BACnet Thermostat



PROGRAMMABLE MODELS

- Two or four configurable events per day
- Progressive recovery or none
- 12 or 24 hour clock
- Six hour clock retention
- Occ/Unocc auxiliary contact out

COMMUNICATION MODELS

- BACnet
- LON
- Wireless
- Wireless/ Zigbee Pro

SPECIFICATIONS

Supply Voltage	20-30 VAC, 50/60 Hz	Control Output	1A relays 30 VAC, 3A surge maximum
Supply VA	2 VA	Auxiliary Contact Output	1A relay 30 VAC, N.O./N.C. follows occupied schedule
Display	Two-line backlit LCD	Mixed Air Output	Proportional 0-10V DC, 2 kΩ minimum (economizer model)
Controls	Five menu-driven push buttons – up, down, menu, no, yes/scroll	Control Type	Proportional plus integral
Thermostat Type	Seven-day programmable models, non-programmable models	Deadband	Adjustable 2° to 4°F (1° to 2°C)
Optimal Start	Progressive recovery (enable/disable)	OSA Lockout Limits	
Heat Pump High/Low	OSA lockout (emer heating/comp. heating)	Heating	15° to 120°F (26° to 49°C), 5°F increments
Stages	(Dependent upon model) 1H/1C, 2H/2C, (3H/2C heat pump) 2H/2C + proportional mixed-air economizer	Cooling	-40° to 95°F (-40° to 35°C), 5°F increments
Memory (schedule)	Permanent EEPROM	Low Limit Protection	Enable/disable, heating @ 47°F (5.5°C)
Clock (12 or 24 hour)	Six-hour power fail retention	Power Up Delay	10 to 120 seconds
System Switching	Off/Auto/Cool/Heat	Keypad Lockout	Three levels (full, none, partial)
Fan Switching	On-continuous Auto-on demand Smart-on/occupied, off/unoccupied	Cycles Per Hour	Adjustable, heating 3-8 CPH, cooling 3-4 CPH
Control Accuracy	±0.9°F (±0.5°C) @ 70°F (21°C)	Display Offset	Adjustable ±5°F (2.5°C), 1°F increments
Setpoint Range		LED Indicators	Three green on (fan, cooling, heating)
Heating	40° to 90°F (4.5° to 32°C)	Wiring	18 AWG max, 22 AWG recommended
Cooling	54° to 100°F (12° to 37.5°C)	Operating Temperature	32° to 122°F (0° to 50°C)
Setpoint High/Low Limits	Individually adjustable, H/C	Operating Humidity	0% to 95% RH (non-condensing)
Remote Sensor		Enclosure	ULFR1 flame-retardant plastic
Room Sensor	Room sensor input auto-detected 10K Type 2 thermistors	Color	White
Outside Air	Outside air input auto-detected 10K Type 2 thermistors	Mounting	Standard vertical 2" x 4" box
Mixed Air	Mixed air input auto-detected (economizer model only) 10K Type 2 thermistors	Dimensions	4.94"H x 3.38"W x 1.13"D (12.5 x 8.6 x 2.9 cm)
Auxiliary Inputs	Two dry contact digital inputs	Weight	0.75 lb (0.34 kg)
Four Types	Service/status reminders Filter alarm Central night setback clock Remote occupied override timer	Approvals	UL Listed File #E234137, cUL, CE, LonMark
		RoHS Statement	Yes
		Warranty	1 year

THERMOSTATS & CONTROLLERS

AHU COMMUNICATING THERMOSTAT SINGLE AND MULTISTAGE,
PROGRAMMABLE AND NON-PROGRAMMABLE, (BACNET, LON)

VT7600 COMMUNICATING

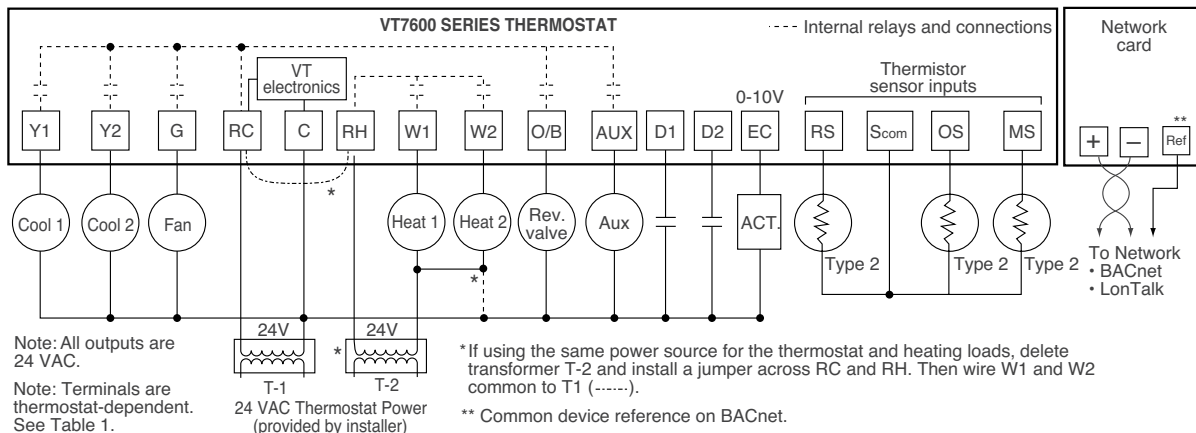


WIRING

TABLE 1. TERMINAL DESIGNATION BY THERMOSTAT MODEL

THERMOSTAT MODEL VT7600								LON BACNET	Function
VT7600A-E VT7600A-B	VT7600B-E VT7600B-B	VT7605B-E VT7605B-B	VT7600H-E VT7600H-B	VT7652A-E VT7652A-B	VT7652B-E VT7652B-B	VT7656B-E VT7656B-B	VT7652H-E VT7652H-B		
•	•	•	•	•	•	•	•	Y1	Energizes on a call for first stage cooling (first stage heating HP)
•	•	•	•	•	•	•	•	Y2	Energizes on a call for second stage cooling (second stage heating HP)
•	•	•	•	•	•	•	•	G	Energizes fan in accordance with the selected fan mode
•	•	•	•	•	•	•	•	RC	24 VAC from equipment transformer
•	•	•	•	•	•	•	•	C	24 VAC (common) from equipment transformer
•	•	•	•	•	•	•	•	RH	RH24 VAC for heating stages (jumper to RC for single power systems)
•	•	•	•	•	•	•	•	W1	W1Energizes on a call for first stage heating (third stage heating HP)
•	•	•	•	•	•	•	•	W2	W2Energizes on a call for second stage heating
•	•	•	•	•	•	•	•	O/B	O/BHP reversing valve configurable (O = on or B = on)
•	•	•	•	•	•	•	•	AUX	AUXConfigurable auxiliary output (follows schedule)
•	•	•	•	•	•	•	•	D1	D1Configurable digital input
•	•	•	•	•	•	•	•	D2	D2Configurable digital input
•	•	•	•	•	•	•	•	EC	EC0 - 10 VDC economizer actuator output
•	•	•	•	•	•	•	•	RS	RSRemote room sensor
•	•	•	•	•	•	•	•	Scom	ScomSensor common
•	•	•	•	•	•	•	•	OS	OSOutdoor air sensor
•	•	•	•	•	•	•	•	MS	MSMixed air sensor

Note: Terminals and functions are not present on every thermostat





THERMOSTATS & CONTROLLERS

AHU COMMUNICATING THERMOSTAT SINGLE AND MULTISTAGE, PROGRAMMABLE AND NON-PROGRAMMABLE, (BACNET, LON) *VT7600 COMMUNICATING*

ORDERING INFORMATION

MODEL	THERMOSTAT TYPE
VT7600	RTU controller, no local schedule
VT7605	RTU + economizer controller, no local schedule
VT7606	RTU + IAQ + economizer controller, no local schedule
VT7607	RTU + humidity controller, no local schedule
VT7652	RTU controller, local schedule
VT7656	RTU + economizer controller, local schedule
VT7657	RTU + humidity controller, local schedule
OUTPUTS	
A	1H/1C (VT7600 and VT7652 only)
B	2H/2C (Not available on VT7606)
E	2H/2C + IAQ + economizer controller (VT7606 and VT7656 only)
F	2C + Analog heat controller (VT7600 and VT7652 only)
H	3H/3C Heatpump controller (VT7600 and VT7652 only)
W	2H/2C + humidity +watersource heatpump controller (VT7600 and VT7652 only)
COVER	
5000	Viconics logo
5031	Blank cover (no logo)
5500	PIR cover w/ Viconics logo
5531	PIR cover blank (no logo)
COMMUNICATION PROTOCOL	
E	Echelon/LONworks
B	BACnet
P	Wireless/Zigbee Pro
W	Wireless

VT7605 B 5031 W **Example: VT7605B5031W** RTU + economizer with 2 heat/2 cool, blank cover, wireless

TG511A1000
COV-PIR-HPUMP-5031
COV-PIR-RTU-5032

ACCESSORIES

Thermostat guard- clear-medium size
PIR cover for HP thermostat
PIR cover for RTU thermostat

PAGE
1392

THERMOSTATS & CONTROLLERS

T7350 SERIES PROGRAMMABLE COMMERCIAL THERMOSTATS AND W7350 CONTROLLER T7350, W7350 SERIES



DESCRIPTION

The **T7350 Commercial Programmable Thermostat** controls 24 VAC single zone heating, ventilating and air conditioning (HVAC) equipment. The **T7350** consists of a thermostat and a subbase. The thermostat includes the keypad and display for 7-day programming and the subbase includes equipment control connections. **T7350M** models have 2 modulating outputs for heat and/or cool, and the **T7350H** models have LonWorks® capability.

The **W7350 WebStat** is a web-based building manager that allows contractors and facility managers to view and command **T7350H Commercial Programmable Thermostats**. It communicates over the LonWorks® network to perform building management control of the **T7350H** thermostats through a web browser. It runs building management applications such as trending, scheduling and alarming. The WebStat Bundle (W7350A1000) includes the WebStat controller, a LON® card, and a power supply.

NEW!



T7350 Series

Honeywell



FEATURES

- 7-day programming with two Occupied and two Not Occupied periods per day
- Individual heat and cool setpoints for Occupied and Not Occupied periods
- Advanced configuration using TStatSpec software or PDA
- PID control minimizes temperature fluctuations
- Recovery ramp control automatically optimizes equipment start times based on building load
- Keypad multi-level lockout available with all models
- Remote sensor capability for temperature (including outdoor air and discharge air) and humidity sensors
- T7350M provides 2 modulating heat and/or cool outputs
- T7350H provides networking capability on LonWorks® bus using Free Topology Transceiver (FTT)
- T7350H conforms to LonMark® Space Comfort Profile for rooftop applications
- W7530 web-based controller supports up to 20 W7350H thermostats

SPECIFICATIONS

T7350 Models		All Relay Outputs (at 30 Vac)	
Mounting Means	Mounts on subbase; subbase mounts on wall using two 5/8" long #6-32 screws (included).	Running	1.5A maximum
Throttling Range for Modulating Outputs	Automatically adjusts based on heat/cool stages. Manually adjustable with TStatSpec software or PDA	Inrush	7.5A maximum
		Modulating Output	4 to 20 mA with 510 ohm maximum terminating resistance
		System Current Draw (without load)	5 VA maximum at 30 Vac, 50/60 Hz
Clock Accuracy (at 77°F [25°C])	±1 min./month (30 days)	NOTE: Relays are N.O. Single-Pole, Single-Throw (SPST).	
Minimum Stage Operation Time (fixed)		Outdoor Sensor Wiring	Requires 18 gauge wire
Minimum On	Heat: 1 minute; cool: 3 minutes	Humidity Ratings	5% to 90% RH, noncondensing.
Minimum Off (Cool and Heat Pump)	1 minute	Emergency Heat Indication	Display indicates when Emergency Heat is activated (Em)
Power	24 VAC, 50/60 Hz.; 20 to 30 VAC, 50/60 Hz	Temperature Ratings	
Input		Operating Ambient	30° to 110°F (-1° to 43°C)
		Shipping	-30° to +150°F (-34°C to +66°C)
		Display Accuracy	±1°F (±1°C)
		Setpoint	
		Range	Heating: 40° to 90°F (4° to 32°C)
Temperature	20KΩ	Cooling	45° to 99°F (7° to 37°C)
Humidity	0-10 VDC	Deadband	2°F (1°C)
Outdoor	3000 PTC	Loss of Power	The thermostat maintains programmed times and temperatures for the life of the product. Clock and day information is retained for a minimum of 48 hours.
Discharge Air	20KΩ	NOTE: To achieve the 48-hour power-loss clock retention, the T7350 must be powered for at least 5 minutes.	
Occupancy Sensor	Dry contact switching 30 VDC at 1 mA		



THERMOSTATS & CONTROLLERS

T7350 SERIES PROGRAMMABLE COMMERCIAL THERMOSTATS AND W7350 CONTROLLER

T7350, W7350 SERIES

SPECIFICATIONS (continued)

Communicating Model T7350H:

Connection Terminals for the LonWorks Bus.
Network jack for quick access by personal computer based tools.
Communications service-pin pushbutton to simplify startup.

LonMark Functional Profile

8500_20 Space Comfort Controller.

LonMark SCC Object Type

8504 Rooftop See Fig. 2.

LonMark Program Identifier

80:00:0C:55:04:03:04:2E.

LonMark Application Interoperability

Version 3.3

Honeywell LonMark Plug-In file downloads:

plugin.ge51.honeywell.de/index.htm#

TStat Spec System Requirements

Windows XP or Windows 7

PDA System Requirements

Palm OS® 3.5.x to 5.2.1

Dynamic Heap 256K bytes

Free RAM Space 1000K bytes

Serial Communications RS-232

Approvals

European Community Mark (CE) Listed.
UL 873 Recognized, NEC Class 2.FCC
Part 15 subpart J Class A.cUL.

Dimensions

T7350 models 6-3/4"W x 4-1/2"H x 2-3/16"D
(17.1 x 11.4 x 5.6 cm)

W7350 model 6-23/32"W x 4"H x 2-3/16"D
(17.1 x 10.2 x 5.6 cm)

Weights

T7350 models 1.25 lb (0.57 kg)

W7350 model 1.25 lb (0.57 kg)

Warranty

1 year

Note: For more specification data on the W7350 please see manufacturer's specification sheet. (www.kele.com)

T7350 THERMOSTAT FEATURES

Model	Applications	Maximum Stages ^a		Features	Auxiliary Relay	LONWORKS® Capability?
		Heat	Cool			
T7350A	Conventional or Heat Pump	1 ^b	1 ^b		Yes	No
T7350B		2 ^b	2 ^b	Outdoor, Discharge Air Capability	Yes	No
T7350D		3 (2) ^c	3 (4) ^c	Humidity, Occupancy, Outdoor, Discharge Air Capability	Yes	No
T7350H1009					Isolated Normally Open	Yes
T7350H1017	Modulating	2 modulating, 2 ^b relay	Humidity, Occupancy, Outdoor, Discharge Air Capability, 4-20 mA output (2-10 VDC with 500 ohm resistor)	Yes		
T7350M				Yes		No

^a All models are down-selectable and can be configured to control fewer stages than the maximum allowed.

^b One extra stage (of either heat or cool) can be configured using the auxiliary relay.

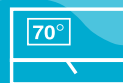
^c Heat pump applications for these models have a maximum of two heat stages and two cool stages.

DEFAULT SETPOINTS

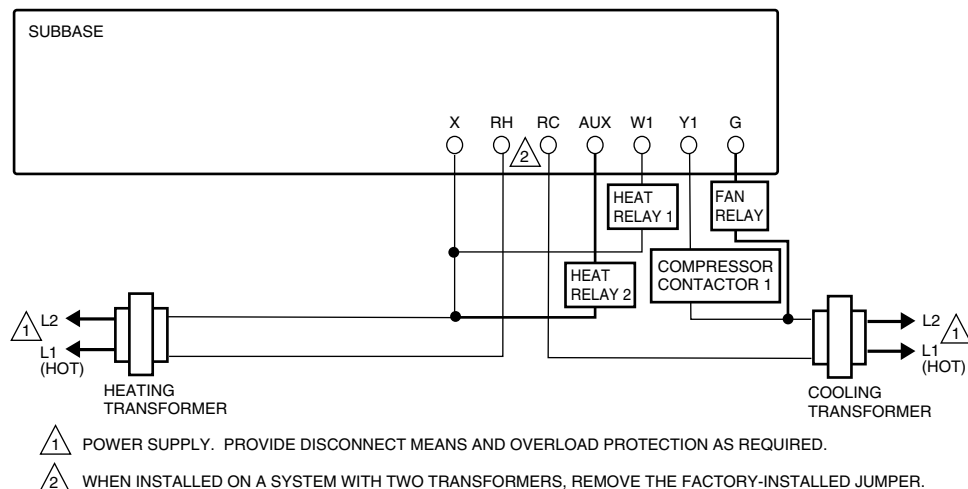
Control	Occupied	Not Occupied	Standby
Heating	70°F (21°C)	55°F (13°C)	67°F (19°C)
Cooling	75°F (24°C)	85°F (29°C)	78°F (26°C)

THERMOSTATS & CONTROLLERS

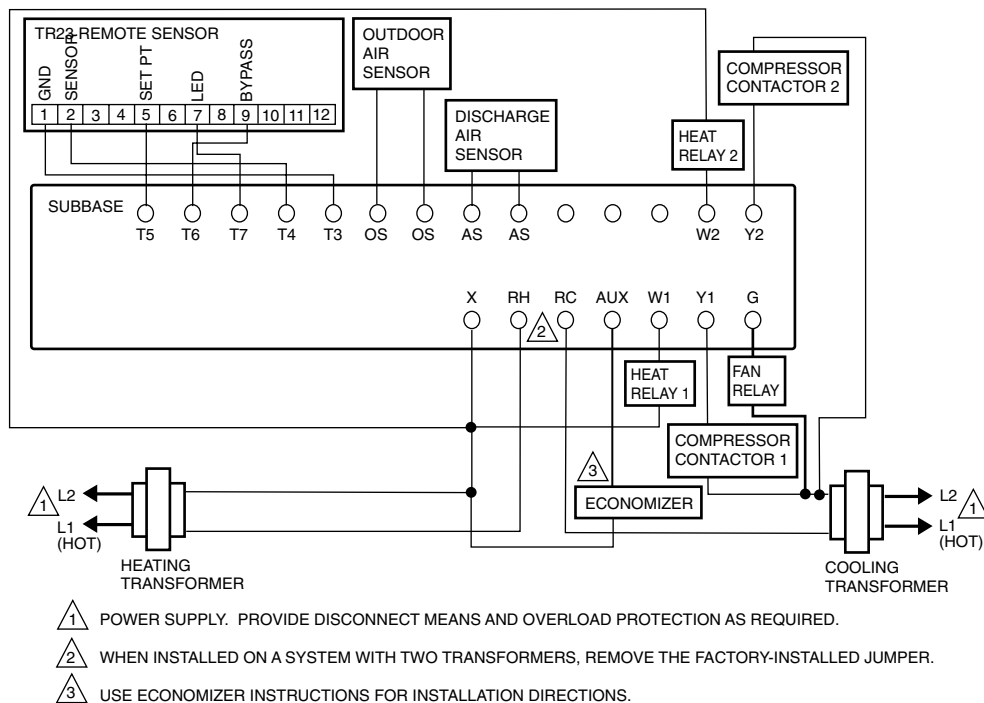
T7350 SERIES PROGRAMMABLE COMMERCIAL THERMOSTATS AND W7350 CONTROLLER *T7350, W7350 SERIES*



WIRING



Typical hookup of T7350A in two-stage heat and one-stage cool conventional system with two transformers



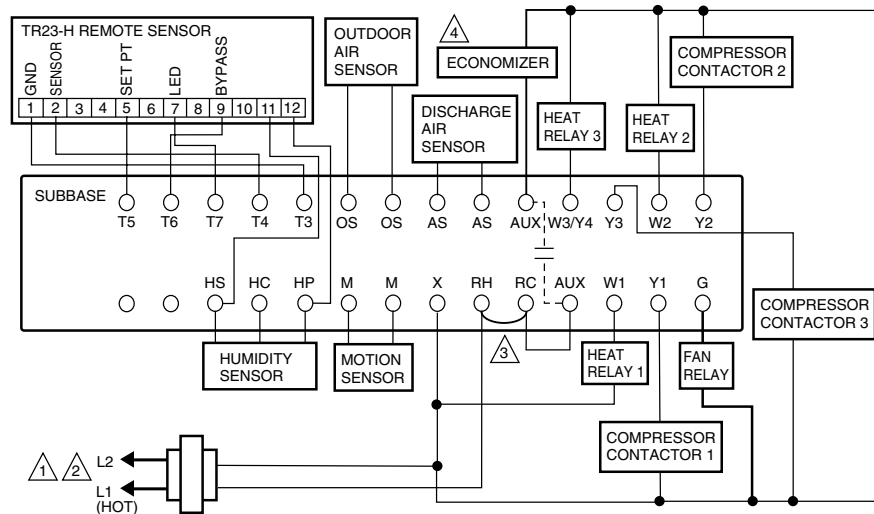
Typical hookup of T7350B in two-stage heat and two-stage cool conventional system with two transformers

THERMOSTATS & CONTROLLERS

T7350 SERIES PROGRAMMABLE COMMERCIAL THERMOSTATS AND W7350 CONTROLLER

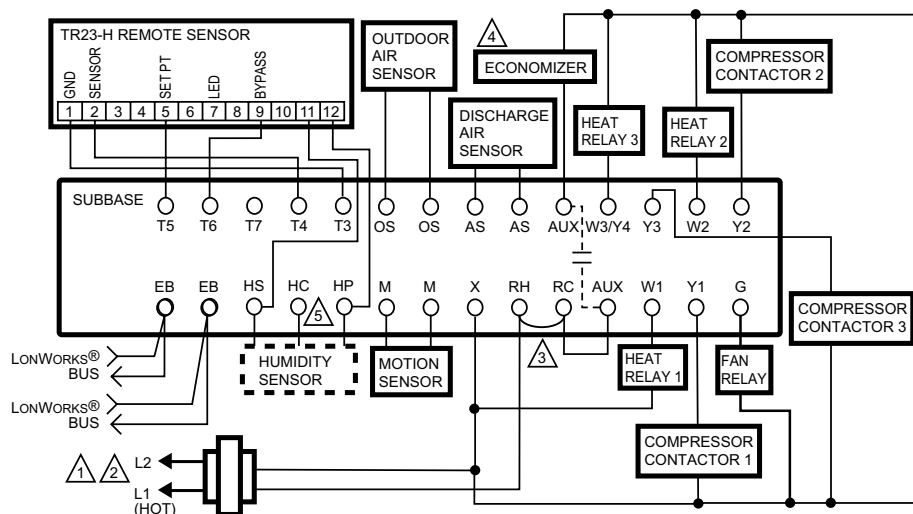
T7350, W7350 SERIES

WIRING



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 ENSURE TRANSFORMER IS SIZED TO HANDLE THE LOAD.
- 3 HEAT/COOL SYSTEMS WITH ONE TRANSFORMER REQUIRE THE FACTORY-INSTALLED JUMPER.
- 4 USE ECONOMIZER INSTRUCTIONS FOR INSTALLATION DIRECTIONS.
- 5 NO NEED TO WIRE HC TERMINAL BECAUSE THE T3 TERMINAL IS INTERNALLY TIED TO HC, WHICH IS ALSO TIED TO TERMINAL 1 COMMON AT THE SENSOR.

Typical hookup of T7350D in three-stage heat and three-stage cool conventional system with one transformer.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 ENSURE TRANSFORMER IS SIZED TO HANDLE THE LOAD.
- 3 HEAT/COOL SYSTEMS WITH ONE TRANSFORMER REQUIRE THE FACTORY-INSTALLED JUMPER.
- 4 USE ECONOMIZER INSTRUCTIONS FOR INSTALLATION DIRECTIONS.
- 5 WHEN USING THE TR23-H FOR HUMIDITY SENSING THERE IS NO NEED TO WIRE HC TERMINAL BECAUSE THE T3 TERMINAL IS INTERNALLY TIED TO HC, WHICH IS ALSO TIED TO TERMINAL 1 COMMON AT THE SENSOR.

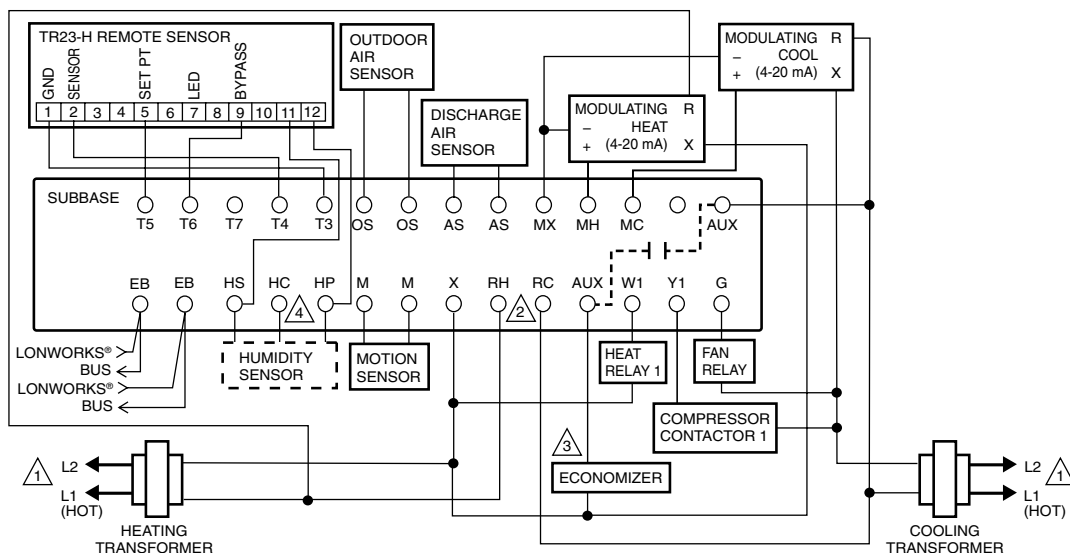
Typical hookup of T7350H1009 in three-stage heat and three-stage cool conventional system with one transformer

THERMOSTATS & CONTROLLERS

T7350 SERIES PROGRAMMABLE COMMERCIAL THERMOSTATS AND W7350 CONTROLLER *T7350, W7350 SERIES*

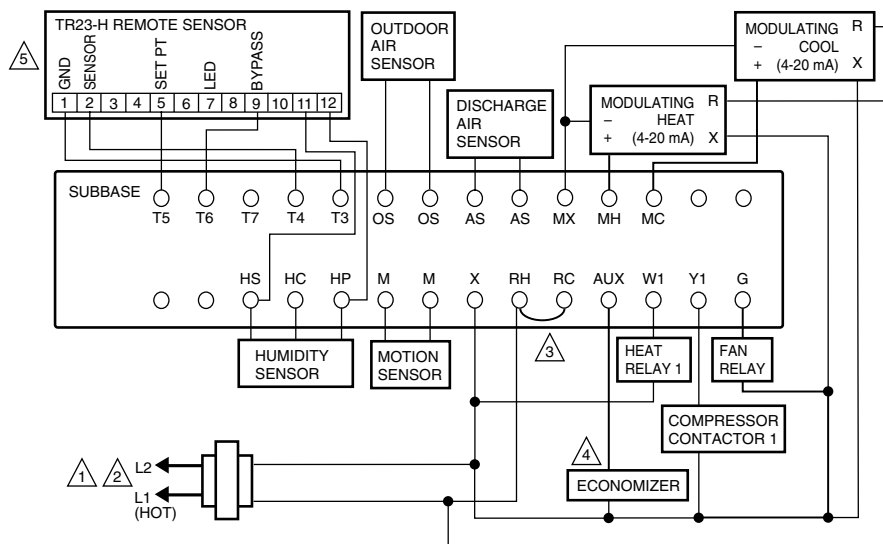


WIRING



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 WHEN INSTALLED ON A SYSTEM WITH TWO TRANSFORMERS, REMOVE THE FACTORY-INSTALLED JUMPER.
- 3 USE ECONOMIZER INSTRUCTIONS FOR INSTALLATION DIRECTIONS.
- 4 WHEN USING THE TR23-H FOR HUMIDITY SENSING THERE IS NO NEED TO WIRE HC TERMINAL BECAUSE THE T3 TERMINAL IS INTERNALLY TIED TO HC, WHICH IS ALSO TIED TO TERMINAL 1 COMMON AT THE SENSOR.

Typical hookup of T7350H1017 for system with two independent heat stages (one modulating), two independent cool stages (one modulating), and two transformers.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 ENSURE TRANSFORMER IS SIZED TO HANDLE THE LOAD.
- 3 HEAT/COOL SYSTEMS WITH ONE TRANSFORMER REQUIRE THE FACTORY-INSTALLED JUMPER.
- 4 USE ECONOMIZER INSTRUCTIONS FOR INSTALLATION DIRECTIONS.
- 5 WHEN USING THE TR23-H FOR HUMIDITY SENSING THERE IS NO NEED TO WIRE HC TERMINAL BECAUSE THE T3 TERMINAL IS INTERNALLY TIED TO HC, WHICH IS ALSO TIED TO TERMINAL 1 COMMON AT THE SENSOR.

Typical hookup of T7350M for system with two independent heat stages (one modulating), two independent cool stages (one modulating), and one transformer.



THERMOSTATS & CONTROLLERS

T7350 SERIES PROGRAMMABLE COMMERCIAL THERMOSTATS AND W7350 CONTROLLER

T7350, W7350 SERIES

ORDERING INFORMATION

MODEL	DESCRIPTION
T7350A1004	Single stage heat pump compatible with auxiliary
T7350M1008	Modulating with 2 stage heat and 2 stage cool
T7350B1002	Multi-stage heat pump compatible with auxiliary
T7350D1008	Multi-stage heat pump compatible with occupancy and humidity feature and auxiliary
T7350H1009	Multi-stage heat pump compatible with occupancy and humidity feature communicating LonWorks®
T7350H1017	Modulating with 2 stage heat and 2 stage cool with occupancy and humidity feature communicating LonWorks®
W7350A1000	Webstat controller for T7350 series thermostats

ACCESSORIES

MODEL	DESCRIPTION
50014064-001	Infra-red thermostat module for T7350 Series
C7041B2005	Duct temperature sensor, 6 inch
C7041B2013	Duct temperature sensor, 12 inch
C7041C2003	Duct temperature sensor, 18 inch
C7041J2007	Duct temperature averaging sensor, 12 foot
C7089R2013	Wireless outdoor sensor

THERMOSTATS & CONTROLLERS

ZONE THERMOSTAT AND FCU THERMOSTAT VT7200, VT7300 SERIES



DESCRIPTION

VT7200 Zone thermostats are digital-display, heating/cooling, with outputs for two-position, floating, and proportional terminal unit control. They are ideal for baseboard heat, unit heaters, radiant panels, reheat, or VAV box (pressure-dependent) control. **VT7300 Series Fan Coil Unit (FCU)** thermostats are digital-display, heating / cooling, with outputs for two-position, floating, or proportional control. In addition, they include multispeed fan relays for high, medium, and low fan speed control. Both thermostats offer remote temperature sensor and remote digital inputs configured for night setback, filter alarm, motion sensor, door/window switch, or service indication.

FEATURES

- **Zone or FCU control models**
- **Two-position, floating, or proportional models**
- **Remote room sensor option**
- **Adjustable deadband**
- **Setpoint range limits (heating and cooling)**
- **Three configurable inputs for any of: night setback, setback override, motion sensor, door or window switch, filter alarm, service advisory, heat/cool changeover**



VT7305C50xx
FCU Thermostat



VT7200C50xx
Zone Thermostat



- **°F/°C (configurable)**
- **Display offset**
- **Adjustable temporary occupied time**
- **Heat, cool, and reheat time base outputs are configurable**
- **Direct or reverse acting (proportional models)**
- **Keypad lockout functions**
- **Dehumidification control models**
- **Three-speed fan control (FCU model)**
- **Selectable system control (FCU model)**

SPECIFICATIONS

Supply Voltage	19-30 VAC, 50/60 Hz	Control Type	Proportional plus integral (PI)
Supply Current	2 VA	Proportional Band	Heating and cooling, 2°F (1.1°C)
Display	Two-line backlit LCD, ±0.2°F (0.1°C)	Floating Time Base	Adjustable, 0.5 to 9 minutes
Control Accuracy	Temperature, ±0.9°F (±0.5°C)	Cycles Per Hour	Adjustable 3 to 8
VT7355C50xx, VT7355F50xx	Dehumidification, ±5% RH from 20 to 80%	Override Timer	0 to 24 hours, 1-hour increments, pushbutton reset
Thermostat Type	Zone (VT7200) or FCU (VT7300)	Sensor Offset	Adjustable ±5°F (±2.5°C), ±15% RH (humidity models)
Cover Controls		Deadband Setpoint	Adjustable 2° to 5°F (1° to 2.5°C)
Zone Models	Up/down/override buttons Heat/Cool "on" LEDs		Adjusted depending on heating or cooling mode, heating and cooling setpoints are changed simultaneously with respect to the deadband
FCU Models	Up/down/°C-or-°F/fan/mode buttons Fan/Heat/Cool "on" LEDs	Cooling Limits	54° to 100°F (12° to 37.7°C)
Control Outputs	See terminal designation table	Heating Limits	40° to 90°F (4.5° to 32°C)
VT7200C50xx	5 triacs (H/C, 2-position or floating)	Keypad Lockout	Selectable system/fan/unoccupied
VT7200F50xx	1 triac, 2 analog outputs (H/C proportional 0 to 10 VDC)	System Setting	O=off, H=heating, C=cooling, A=automatic changeover
VT73(05,55)C50xx	3 relays (fan), 5 triacs (H/C, 2-position or floating control)	FCU Models	O/C, O/H, O/A/H/C, H/O/C
VT73(05, 55)F50xx	3 relays (fan), 1 triac, 2 analog outputs (H/C proportional 0 to 10 VDC)	Fan Setting	L=low, M=medium, H=high, A=auto
Triacs and Relays	30 VAC, 1A, 3A inrush	FCU Models	L/M/H, L/H, L/M/H/A, L/H/A, On/A
Analog Outputs	0-10 VDC, 2K minimum impedance, direct or reverse acting	Enclosure	UL FR1, flame retardant plastic
Auxiliary Inputs	2 digital inputs, 1 universal input, 1 remote sensor	Mounting	Standard vertical, 2" x 4" box
Configurable as	Service/status reminders	Wiring	18 AWG maximum, 22 AWG recommended
	Door/window/motion sensor switch	Color	White
	Filter alarm	Operating Temperature	32° to 122°F (-30° to 50°C)
	Central night setback clock	Operating Humidity	0–95% RH non-condensing
	Remote occupied override switch	Dimensions	4.94"H x 3.38"W x 1.13"D (12.5 x 8.6 x 2.9 cm)
Digital Inputs	Dry contact	Weight	0.75 lb (0.34 kg)
Universal Input	Dry contact or 10K Type 2 Model 24 thermistor	Approvals	UL, cUL, File #E234137, CE
Remote Sensor	Thermistor, 10K Type 2 Model 24	RoHS Statement	Yes
		Warranty	1 year

THERMOSTATS & CONTROLLERS

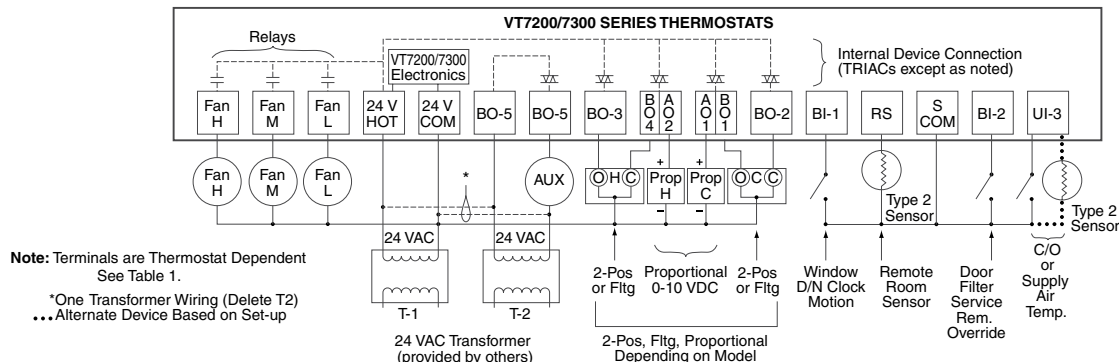
ZONE THERMOSTAT AND FCU THERMOSTAT

VT7200, VT7300 SERIES

WIRING

TABLE 1. TERMINAL DESIGNATIONS BY THERMOSTAT MODEL

ZONE THERMOSTATS		FAN COIL UNIT (FCU) THERMOSTATS				** Terminals and functions are not present on every thermostat	
VT7200C5031 2-Position or Floating	VT7200F5031 Proportional	VT7305C5031 2-Position or Floating	VT7355C5031 2-Position or Floating/RH	VT7305F5031 Proportional	VT7355F5031 Proportional/RH	Terminal**	Thermostat Function**
		X	X	X	X	1	High speed fan
		X	X	X	X	2	Medium speed fan
		X	X	X	X	3	Low speed fan
X	X	X	X	X	X	4	24 VAC power for thermostat, fan and BO-(1, 2, 3, 4), AO-(1, 2)
X	X	X	X	X	X	5	24 VAC common for thermostat, fan and BO-(1, 2, 3, 4), AO-(1, 2)
X	X	X	X	X	X	6	BO-5, auxiliary output, configurable (reheat, occupied, or unoccupied)
X	X	X	X	X	X	7	BO-5, auxiliary output, configurable (reheat, occupied, or unoccupied)
X		X	X			8	BO-3, open heating, (VT7200C5031, VT7355C5031)
X		X	X			9	BO-4, close heating (VT7200C5031, VT7355C5031)
	X			X	X	9	AO-2, heating (VT7305F5031, VT7355F5031)
X		X	X			10	BO-1, open cooling (VT7200C5031)
	X			X	X	10	AO-1, cooling (VT7305F5031, VT7355F5031)
X		X	X			11	BO-2, close cooling, (VT7200C5031, VT7355C5031)
X	X	X	X	X	X	12	BI-1, configurable (night setback clock, motion detector, window switch)
X	X	X	X	X	X	13	RS, remote sensor, 10 kΩ thermistor
X	X	X	X	X	X	14	SCOM, common for remote sensor, BI-(1, 2) and UI-1
X	X	X	X	X	X	15	BI-2, configurable (door, filter, service, remote override)
X	X	X	X	X	X	16	UI-3, configurable (changeover contact or sensor, supply air sensor)



ORDERING INFORMATION

MODEL	THERMOSTAT TYPE
VT7200	Zone Controller
VT7300	Fancoil Controller Commercial (Override Occupancy)
VT7305	Fancoil Controller Hospitality (Hotel/Lodging w/ Temp Scale)
VT7350	Fancoil Controller Commercial (Override Occupancy) w/ Humidity Sensor
VT7355	Fancoil Controller Hospitality (Hotel/Lodging w/Temp Scale) w/ Humidity Sensor

OUTPUTS

C	2 floating + 1 digital (for VT7200), 2 floating + 1 auxiliary (for VT73xx)
F	2 analog + 1 digital (for VT7200), 2 analog + 1 auxiliary (for VT73xx)

COVER

5000	Viconics logo
5031	Blank Cover (no logo)
5500	PIR Cover w/ Viconics logo
5531	PIR Cover Blank (no logo)

Example: VT7305C5031 Hospitality fancoil controller with 2 floating and 1 auxiliary outputs with a blank cover

RELATED PRODUCTS

680-243-6
COV-FCU-L
COV-ZN
KTR24
KTR24-LED-MB
ST-D24
ST-R24SC

Changeover thermostat with conduit fitting
Blank cover for fan coil thermostats
Blank cover for zone thermostats
Remote room thermistor sensor
Remote room sensor with override button and LED
10K Type 2 duct temperature thermistor
Strap-on pipe thermistor

PAGE

1169
1169
1197
1247

THERMOSTATS & CONTROLLERS

BIG BLUE™ AND BLUE™ UNIVERSAL AND SINGLE STAGE PROGRAMMABLE/ NON-PROGRAMMABLE THERMOSTATS 1F95, 1F95EZ AND 1F97 SERIES THERMOSTATS



White
Rodgers™

NEW!

DESCRIPTION

The **White Rodgers 1F95 Series** universal model thermostats are quickly configured for single stage, multi-stage or heat pump and heat pump dual fuel systems. They can also be selected as programmable or non-programmable. The **White Rodgers 1F97 Series** universal model thermostats is for single stage use only, but comes with all of the other features mentioned above. The **White Rodgers 1F97EZ Series** universal model thermostat comes with a large "Easy Reader" display. These thermostats feature the largest display on a keypad operated thermostat, as well as simple and logical installer setup and programming, enhanced by audio confirmation of entries. Variable keypad security prevents tampering and there is also temporary and vacation overrides for added convenience. These thermostats offer power stealing assist for maximum battery life, remote sensing, as well as the exclusive Cool Savings™ feature which adjusts the setpoint after 20 minutes to compensate for humidity loss thus providing the ultimate in comfort control and energy savings.



1F95-1277-ST

FEATURES

- Large 6 inch or 12 inch display
- Quick one button programming
- Configurable as manual heat/cool, auto changeover, heat only or cool only
- Exclusive battery power monitor
- Indoor remote sensing averaging option
- Choice of programming options and time periods
- Intuitive menu-driven set-up, programming and operation, with audio prompt to confirm entries
- Choice of battery powered with optional power stealing assist or hardwired with battery backup

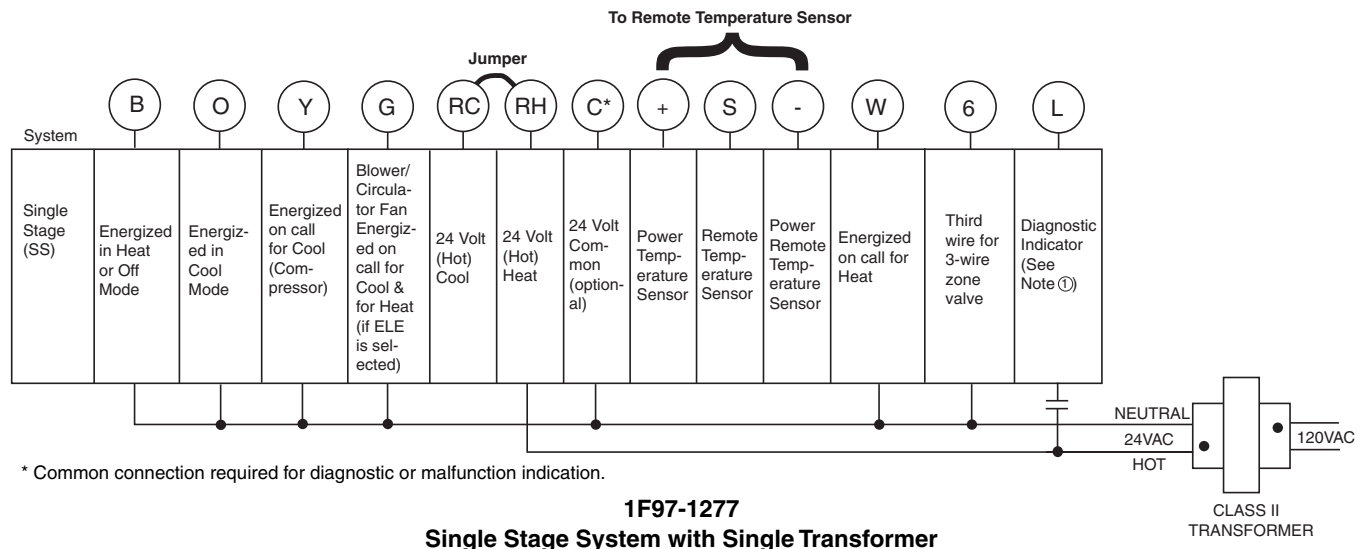
SPECIFICATIONS			
Supply Voltage	24 VAC	Differential	1°
Input Current	1.5A per terminal	Display Type	LCD
Temperature Range	32° to 105°F (0° to 41°C)	Storage Temperature	-40° to 150°F (-40° to 65°C)
Setpoint Range	45° to 99°F (7° to 37°C)	Operating Temperature	32° to 105°F (0° to 41°C)
Schedule Type	4 (Morning, Day, Evening, Night), 2 (Day and Night), 2 (Day and Night)	Dimensions	
Materials Of Construction	ABS plastic	1F95-1277/1F97-1277/1F95-1280/1F95-1291	6-2/7"L x 5-1/8"H x 1-3/4"D (16 x 13 x 4.4 cm)
Mounting	Any except upside down	1F95-0680/1F95-0671/1F95EZ-0671	6-2/5"L x 4-3/5"H x 1-3/4"D (16.26 x 11.7 x 4.4 cm)
Accuracy	±1°	Weight	
Program Options	7 day, 5+1+1	1F95-1277/1F97-1277/1F95-1280/1F95-1291	1.91 lb (0.87 kg)
Bulb and Capillary	No	1F95-0680/1F95-0671/1F95EZ-0671	
Control Type	Low voltage thermostat	Warranty	1.05 lb (0.48 kg) 5 years
Cycles Per Hour Cool	2.5		
Cycles Per Hour Heat	5		
Enclosure	NEMA 1		
Remote Sensor	Select models only		
Sensor Type	Thermistor		
System Type	Universal - SS, MS or HP		
Deadband	1°		

THERMOSTATS & CONTROLLERS

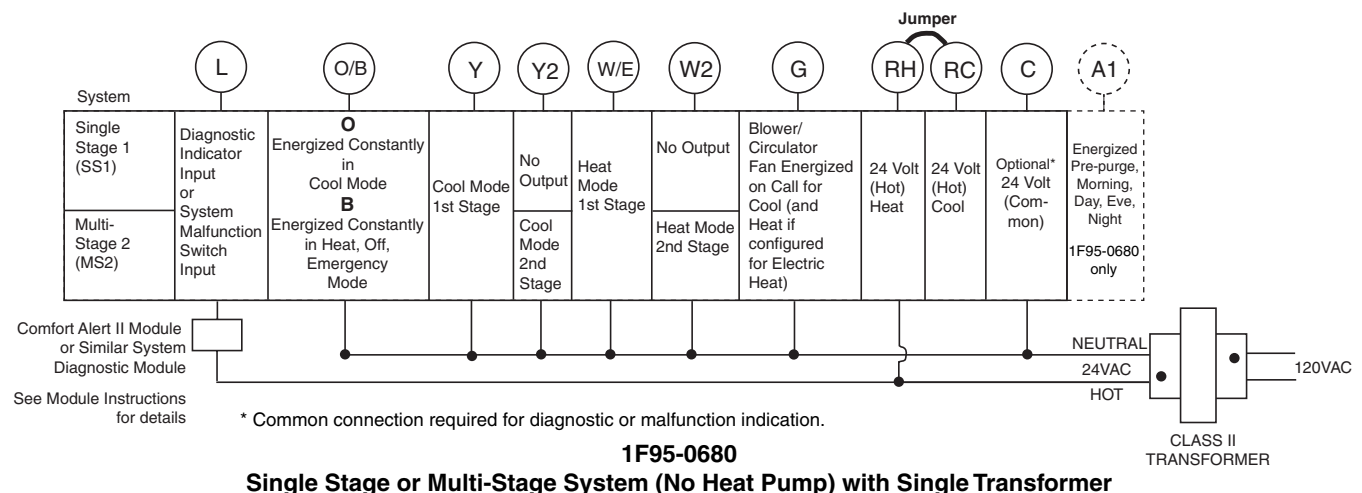
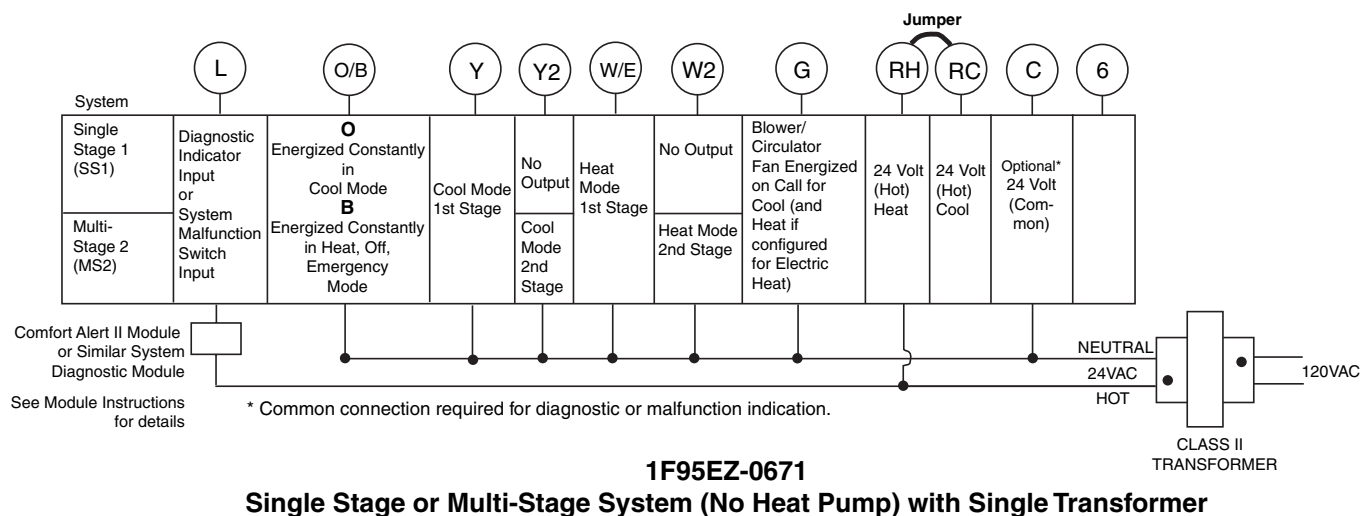
BIG BLUE™ AND BLUE™ UNIVERSAL AND SINGLE STAGE PROGRAMMABLE/ NON-PROGRAMMABLE THERMOSTATS

1F95, 1F95EZ AND 1F97 SERIES THERMOSTATS

WIRING



NOTE: For more wiring and installation information please go to www.kele.com and select the related documents for this family or call your Kele sales representative.

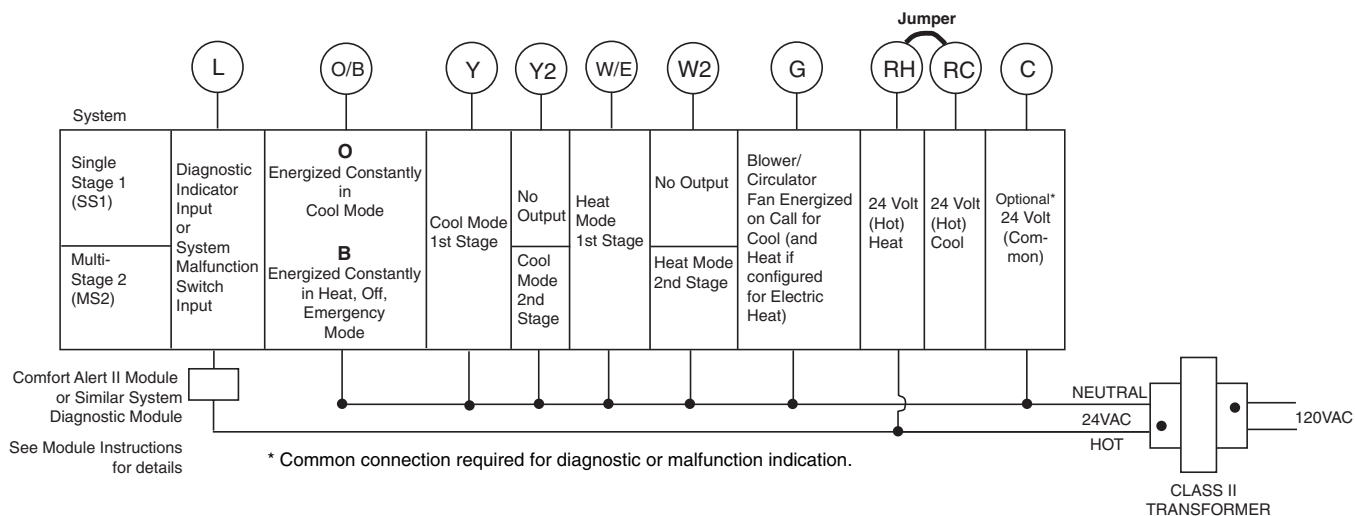


THERMOSTATS & CONTROLLERS



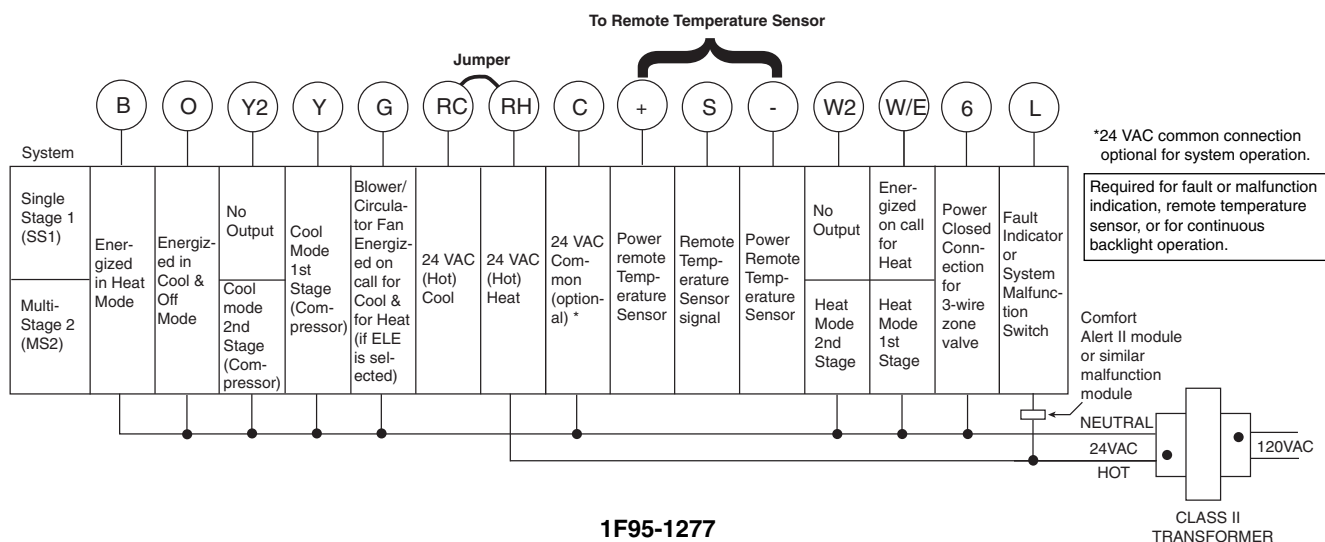
BIG BLUE™ AND BLUE™ UNIVERSAL AND SINGLE STAGE PROGRAMMABLE/ NON-PROGRAMMABLE THERMOSTATS 1F95, 1F95EZ AND 1F97 SERIES THERMOSTATS

WIRING (continued)



1F95-0671

Single Stage or Multi-Stage System (No Heat Pump) with Single Transformer



1F95-1277

Single Stage or Multi-Stage System (No Heat Pump) with Single Transformer

THERMOSTATS & CONTROLLERS

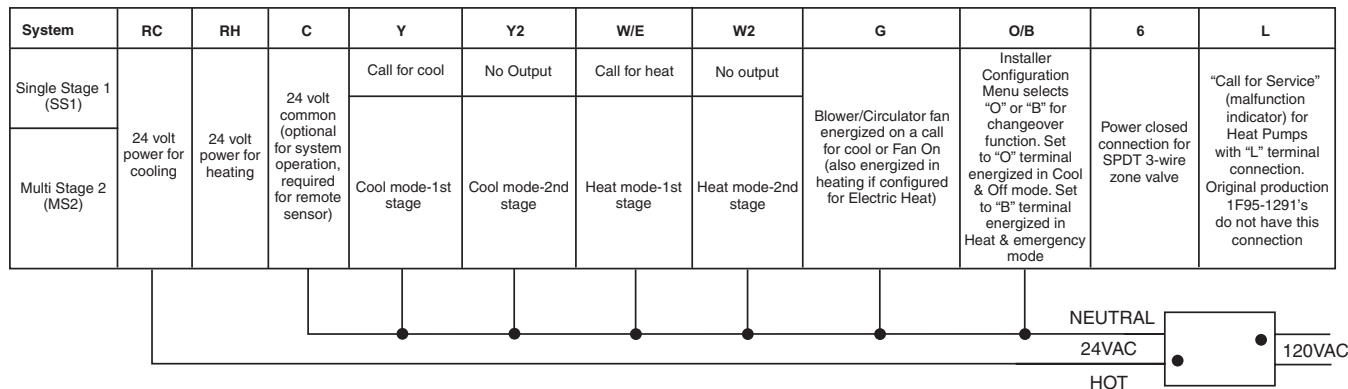
21

THERMOSTATS & CONTROLLERS

BIG BLUE™ AND BLUE™ UNIVERSAL AND SINGLE STAGE PROGRAMMABLE/ NON-PROGRAMMABLE THERMOSTATS

1F95, 1F95EZ AND 1F97 SERIES THERMOSTATS

WIRING



1F95-1280/1F95-1291

Single Stage or Multi-Stage System (No Heat Pump) with Single Transformer

1F95-1280

Remote Sensor Terminals

+	S	-
Supply voltage to remote temperature sensor	Remote temperature sensor signal	Supply voltage to remote temperature sensor

Damper Terminal

A1
Damper or Economizer Operation (see configuration menu item 31)

1F95-1291 Humidification/De-humidification Terminals

HM	DHM
Humidification Terminal, Energizes on call for heat if Humidity setpoint is above room humidity. Can also be used to provide humidification independent of a call for heat and/or in cooling mode if Automatic Humidification is selected in Configuration Menu item #34	De-energizes on call for Dehumidification to lower the fan speed. The DHM terminal is only used on systems with a compatible dehumidification feature that have the required terminal connection on the control module or have a relay installed to lower the fan speed

ORDERING INFORMATION

MODEL

1F95-1277

1F97-1277

1F95-1280

1F95-1291

DESCRIPTION

Single or Multi-stage programmable or non-programmable thermostat with 12 inch touch screen

Heat pump programmable thermostat with 12 inch touch screen

Single or Multi-stage programmable or non-programmable thermostat with 12 inch touch screen

Single or Multi-stage programmable or non-programmable thermostat with humidity control and 12 inch touch screen

1F95-0680

1F95-0671

1F95EZ-0671

Single or Multi-stage heat pump compatible thermostat commercial style with 6 inch display

Single or Multi-stage heat pump compatible thermostat universal style with 6 inch display

Single or Multi-stage heat pump compatible thermostat universal style with EZ read 6 inch display

Note: All models available in a 6-pack.

ACCESSORIES

F145-1328

Indoor remote sensor for 1F95

RELATED PRODUCTS

ATK63

F29-0198

Wire guard for duplex thermostats

Thermostat guard - 8.125"H x 4.375"W x 3.375"D (20.6 x 11.1 x 8.6 cm) inside dim.

PAGE

1392

1392

THERMOSTATS & CONTROLLERS

SINGLE AND MULTISTAGE PROGRAMMABLE AND NON-PROGRAMMABLE THERMOSTAT VT7600 SERIES



VT7600

DESCRIPTION

The **VT7600 Series** is a digital display single or multistage 7-day programmable or non-programmable PI thermostat (°F or °C). It is used with AHU control and heat pump for both heating and cooling applications. The **VT7600** has both system and fan switching with internal or remote sensor capabilities. Five buttons control a simple menu for setup of over 20 configurable parameters. Other control features are listed below.

FEATURES

ALL MODELS

- Fan switching (on/auto/smart)
- System switching (off/auto/cooling/heating)
- Two line 8 digit backlit LCD Display
- Three status LEDs (fan, cooling, heating)
- Five control keys
- Remote and outside air sensor inputs
- Two configurable digital inputs
- Fahrenheit or Celsius operation
- Permanent program retention
- Temporary setpoints
- Proportional plus integral control
- Cycles per hour for heating and cooling

ALL MODELS

- Screen lockout (partial/total)
- Power fail start up delay
- H/C changeover (manual or auto)
- Adjustable deadband
- Individual setpoint range stops H/C
- Extended fan run time
- Extended occupancy time
- Frost low limit protection
- Outside air lockout H/C
- No logo on thermostat
- Room sensor calibration
- Outside air calibration

PROGRAMMABLE MODELS

- Two or four events per day
- Progressive recovery or none
- 12 or 24 hour clock
- Six-hour clock retention
- occupied/unoccupied output contact

ECONOMICAL MODELS

- Mixed-air (0-10V) control output
- Mixed-air sensor input
- Mixed-air setpoint
- Economizer changeover temp
- Outside air damper minimum position (percent)

HEAT PUMP MODELS

- Configurable heat pump O/B control
- OSA lockout for HP emergency/comp heating

SPECIFICATIONS

Supply Voltage	20 to 30 VAC, 50/60 Hz	Control Output	Night setback clock
Supply VA	2 VA		Remote occupied override timer
Display	Two-line backlit LCD	Auxiliary Contact Output	1A relays, 30 VAC, SPST, 3A surge maximum
Controls	Five menu-driven buttons: up, down, menu, no, yes/scroll		1A relay, 30 VAC, SPDT, follows occupied schedule
Thermostat Type	7-day programmable and non-programmable models	Mixed Air Output	Proportional 0-10 VDC, 2K Ω minimum impedance (economizer model only)
Optimal Start	Progressive recovery enable/disable	Control Type	Proportional plus integral
Heat Pump High/Low	Outside air lockout (emergency heating/compressor heating)	Dead Band	Adjustable 2° to 4°F (1° to 2°C)
Stages Available	1H/1C, 2H/2C, (3H/2C heat pump) 2H/2C + proportional mixed air economizer	Outside Air Lockout Limits	
Memory (schedule)	Permanent, EEPROM	Heating	15° to 120°F (26° to 49°C), 5° increments
Clock	Six-hour power-fail retention	Cooling	-40° to 95°F (-40° to 35°C), 5° increments
System Switching	Off/Auto/Cool/Heat	Low Limit Protection	Enable/disable, heating on at 47°F (5.5°C)
Fan Switching	On-continuous Auto-on demand Smart-(on/occupied, off/unoccupied)	Power-up Delay	Adjustable 10 to 120 seconds
Control Accuracy	$\pm 0.9^\circ\text{F}$, ($\pm 0.5^\circ\text{C}$) at 70°F (21°C)	Keypad Lockout	3 levels, (full, none, partial)
Setpoint Range		Cycles Per Hour	Adjustable, heating 3-8; cooling, 3-4
Heating	40° to 90°F (4.5° to 32°C)	Display Offset	Adjustable $\pm 5^\circ\text{F}$, ($\pm 2.5^\circ\text{C}$), 1°F increments
Cooling	54° to 100°F (12° to 37.5°C)	LED Indicators	Three green "on" (fan, cooling, heating)
Setpoint High/Low Limits	Individually-adjustable heating / cooling	Wiring	18 AWG maximum, 22 AWG recommended
Remote Sensor		Mounting	Standard vertical 2" x 4" box
Room Sensor	Room sensor input auto-detected 10K Type 2 thermistors	Enclosure	UL FR1 flame retardant plastic
Outside Air	Outside air input auto-detected 10K Type 2 thermistors	Color	White
Mixed Air	Mixed air input auto-detected (economizer model only) 10K Type 2 thermistors	Operating Temperature	32°F to 122°F (0° to 50°C)
Ancillary Inputs	Two dry-contact digital inputs, applied for: Service/status reminders Filter alarm	Operating Humidity	0 to 95% RH (non-condensing)
		Dimensions	4.94"H x 3.38"W x 1.13"D (12.5 x 8.6 x 2.9 cm)
		Weight	0.75 lb (0.34 kg)
		Approvals	UL Listed File #E234137, cUL, CE
		RoHS Statement	Yes
		Warranty	1 year

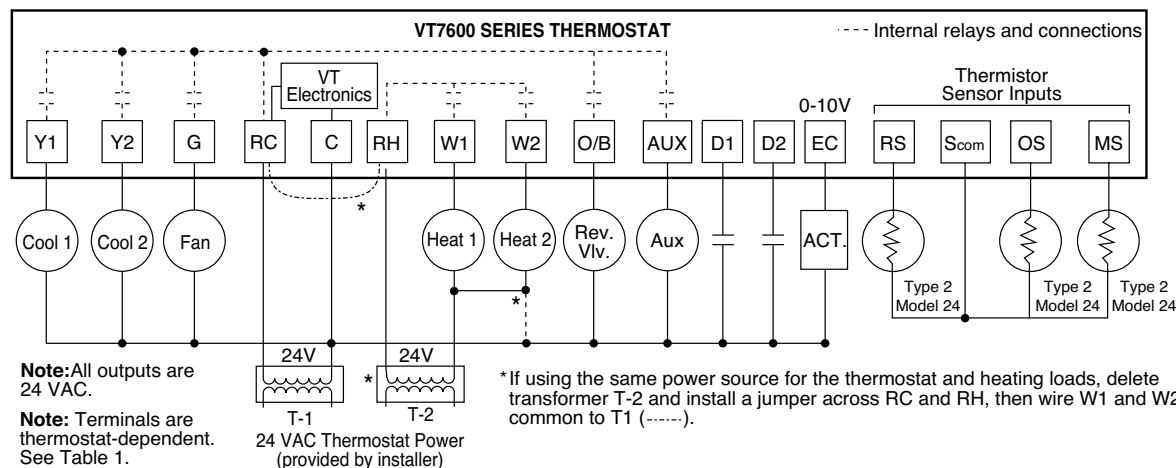
THERMOSTATS & CONTROLLERS

SINGLE AND MULTISTAGE PROGRAMMABLE AND NON-PROGRAMMABLE THERMOSTAT VT7600 SERIES

WIRING

TABLE 1. TERMINAL DESIGNATION BY THERMOSTAT MODEL

THERMOSTAT MODEL VT7600							**Terminals and functions are not present on every thermostat	
VT7600A	VT7600B	VT7600H	VT7652A	VT7652B	VT7656B	VT7652H	Terminal**	Function**
•	•	•	•	•	•	•	Y1	Energizes on a call for first stage cooling (first stage heating HP)
	•	•		•	•	•	Y2	Energizes on a call for second stage cooling (second stage heating HP)
•	•	•	•	•	•	•	G	Energizes fan in accordance with the selected fan mode
•	•	•	•	•	•	•	RC	24 VAC from equipment transformer
•	•	•	•	•	•	•	C	24 VAC (common) from equipment transformer
•	•	•	•	•	•	•	H	24 VAC for heating stages (jumper to RC for single power systems)
•	•	•	•	•	•	•	W1	Energizes on a call for first stage heating (third stage heating HP)
	•			•	•		W2	Energizes on a call for second stage heating
		•				•	O/B	HP reversing valve configurable (O = on or B = on)
			•	•	•	•	AUX	Configurable auxiliary output (follows schedule)
•	•	•	•	•	•	•	D1	Configurable digital input
•	•	•	•	•	•	•	D2	Configurable digital input
					•		EC	0 - 10 VDC economizer actuator output
•	•	•	•	•	•	•	RS	Remote room sensor
•	•	•	•	•	•	•	Scom	Sensor common
•	•	•	•	•	•	•	OS	Outdoor air sensor
					•		MS	Mixed air sensor



THERMOSTATS & CONTROLLERS

SINGLE AND MULTISTAGE PROGRAMMABLE AND NON-PROGRAMMABLE THERMOSTAT
VT7600 SERIES



ORDERING INFORMATION

MODEL	THERMOSTAT TYPE
VT7600	RTU controller, no local schedule
VT7605	RTU + economizer controller, no local schedule
VT7606	RTU + IAQ + economizer controller, no local schedule
VT7607	RTU + humidity controller, no local schedule
VT7652	RTU controller, local schedule
VT7656	RTU + economizer controller, local schedule
VT7657	RTU + humidity controller, local schedule
OUTPUTS	
A	1H/1C (VT7600 and VT7652 only)
B	2H/2C (not available on VT7606)
E	2H/2C + IAQ + economizer controller (VT7606 and VT7656 only)
F	2C + analog heat controller (VT7600 and VT7652 only)
H	3H/3C heatpump controller (VT7600 and VT7652 only)
W	2H/2C + humidity + watersource heatpump controller (VT7600 and VT7652 cover)
COVER	
5000	Viconics logo
5031	Blank cover (no logo)
5500	PIR cover w/ Viconics logo
5531	PIR cover blank (no logo)

VT7605 B 5031 Example: VT7605B5031

RELATED PRODUCTS

		PAGE
KTR24	Remote room thermistor sensor	1169
KTR24-LED-MB	Remote room sensor with override button and LED	1169
ST-D24	10K Type 2 duct temperature thermistor	1197
ST-FZ24-8	Averaging duct thermistor sensor, Type 2, Model 24	1234
ST-O24	OSA thermistor sensor, Type 2, model 24, $\pm 0.36^{\circ}\text{F}$ (0.20°C)	1217

ACCESSORIES

		PAGE
COV-HPUMP	Cover, heat pump, no logo	
COV-MULTI	Cover, conventional, no logo	
COV-SEN-O	Cover, no logo, sensor with override	
TG511A1000	Thermostat guard- clear-medium size	1392

THERMOSTATS & CONTROLLERS

HONEYWELL RESIDENTIAL THERMOSTATS, PROGRAMMABLE AND NON-PROGRAMMABLE T87, TH3000, AND TH4000 SERIES

Honeywell

DESCRIPTION

The **T87 Series** is the latest design of the most recognized thermostat in the world. The **T87** is an analog- or digital-display thermostat made for typical residential use on heating and cooling systems with either conventional heat or heat pump. The **TH3000 Series** is a digital thermostat for typical residential systems with either conventional heat or heat pump. The **TH4000 Series** is a five-day-plus-two programmable digital thermostat. It is also for typical residential systems with either conventional heat or heat pump.

FEATURES

- *Five-year warranty*
- *Traditional look for existing systems*
- *Mercury-free design*
- *Power-stealing design (T87, T8775)*
- *24 VAC power (TH3110, TH4110)*
- *°F or °C selectable (digital types only)*
- *Standard terminal designations*



T87N1000
Non-programmable



T8775C1005
Non-programmable



TH3110D1008
Non-programmable



TH4110D1007
Programmable

SPECIFICATIONS

Supply Voltage	24 VAC power-stealing (T87, T8775) 20 to 30 VAC or 750 mV 50/60 Hz, (TH3110, TH4110)	Control Type	Proportional plus integral (PI)
Battery	2 AA alkaline, (TH3110, TH4110)	Clock	12-hour, ± 1 minute/month, 10-year battery (TH4110)
System Compatibility	Conventional gas/oil and electric (all models) Heat pump, (T8775, TH3110, TH4110)	Compressor Cycle	Adjustable cycles per hour (T8775, TH3110, TH4110)
Digital Display	Adjustable °F or °C, backlit	Minimum Compressor Off Time	Five minutes, fixed (T8775), adjustable (TH3110, TH4110)
T8775	LCD, 0.75 sq in	Wiring	18 to 22 AWG, no shield required
TH3110	LCD, 1.32 sq in	Night Setback Program Times	5+2-day, 4 periods/day (TH4110)
TH4110	LCD, 1.73 sq in	Night Setback Recovery	Adaptive intelligent recovery
Controls	Fan, system, setpoint (programmable on TH4110)	Color	White
T87	Dial and slide switches	Operating Temperature	
TH3110, TH4110	2 to 5 soft keys and slide switches	TH3110, TH4110	32° to 120°F (0° to 49°C)
Accuracy	$\pm 1^\circ\text{F}$ ($\pm 0.5^\circ\text{C}$), (T8775, TH3110, TH4110) $\pm 2^\circ\text{F}$ ($\pm 1^\circ\text{C}$), (T87N)	T8775, T87N	40° to 110°F (4° to 43°C)
Switch Type	1A relay, (T87N, TH3110, TH4110) Electronic, (T8775) 0.02A to 1.5A triac	Operating Humidity	5% to 90% RH (all models)
Stages	1 heat and 1 cool, manually switched	Dimensions	
System Switch	Heat/Off/Cool	TH4110	3.8"H x 5.8"W x 1.25"D (9.6 x 14.7 x 3.2 cm)
Fan Switch	Auto/On	T87	Round 3.69" diameter x 1.75" deep (1.5 x 0.7 cm)
Set Point Range		Weight	0.75 lb, (0.34 kg)
Heat and Cool	40° to 90°F (4.5° to 32°C), (T87N)	Warranty	5 years
Heating Digital	40° to 90°F (4.5° to 32°C), (T8775, TH3110, TH4110)		
Cooling Digital	50° to 99°F (10° to 37°C), (T8775, TH3110, TH4110)		

THERMOSTATS & CONTROLLERS

HONEYWELL RESIDENTIAL THERMOSTATS, PROGRAMMABLE AND NON-PROGRAMMABLE
T87, TH3000, AND TH4000 SERIES



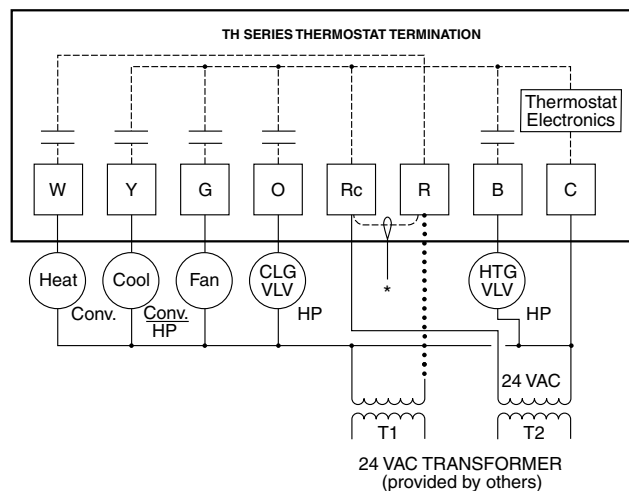
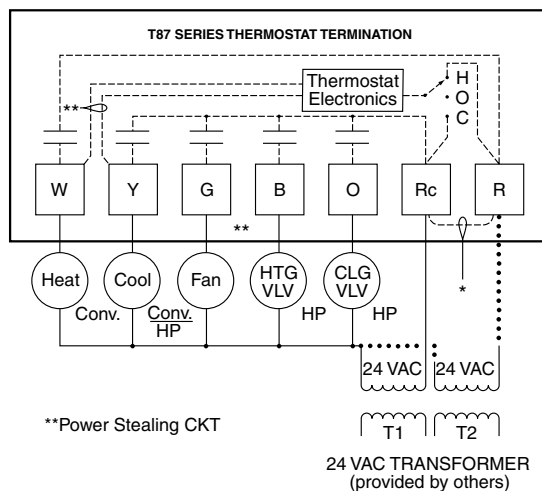
WIRING

TABLE 1. TERMINAL DESIGNATIONS BY THERMOSTAT MODEL

RESIDENTIAL ROUND		RESIDENTIAL DIGITAL DISPLAY		** Terminals and functions are not present on every thermostat	
T87N1000 1H/1C	T8775 1H/1C	TH3110 1H/1C	TH4110 1H/1C, Programmable	Terminal**	Thermostat Function**
		●	●	C	24 VAC common (must come from cooling transformer), (TH3110, TH4110)
O	O	O	O	B	Change-over heating valve, (energized when in heating)
●	●	●	●	R	24 VAC power for heating (typically jumpered with Rc for common powered systems)
●	●	●	●	Rc	24 VAC power for cooling and single transformer systems
O	O	O	O	O	Changeover cooling valve, (energized when in cooling)
●	●	●	●	G	Fan relay
●	●	●	●	Y	Cooling 1st stage conventional and 1st stage heating for heat pump (B terminal energized)
●	●	●	●	W	Heating 1st stage (conventional heat)

O = Heat pump application only

● = Conventional heating application



--- Internal thermostat connections

... Wiring if 2nd transformer needed (T2)

*Install jumper if a single transformer is used (this is most of the time).

Conv. Conventional application
HP Heat pump application

ORDERING INFORMATION

MODEL

T8775C1005

T87N1000

TH3110D1008

TH4110D1007

DESCRIPTION

Round digital thermostat 1H/1C (conventional or heat pump), system (H/O/C), fan auto/on

Round analog thermostat 1H/1C (conventional or heat pump), system (H/O/C), fan auto/on

Digital thermostat 1H/1C (conventional or heat pump), system (H/O/C), fan auto/on

Programmable (5+2 day) thermostat 1H/1C (conventional or heat pump), system (H/O/C), fan auto/on

ACCESSORIES

50000066-001

50002883-001

50010944-001

Round decorative cover plate, 5.5" diameter (T87)

Cover goof plate, 6"H x 8.3"W (TH6000 Series, TH5000 Series)

Range stops for T87 thermostats

PAGE

1391

THERMOSTATS & CONTROLLERS

MULTIPRO™ MULTISPEED AND MULTIPURPOSE THERMOSTAT TB7100A100 MULTIPRO™ SERIES

Honeywell

DESCRIPTION

The TB7100A1000 MultiPRO™ Multispeed and Multipurpose Thermostat is an effortless, seven-day programmable or nonprogrammable thermostat that provides universal system compatibility, precise comfort control and is easy-to-program.

FEATURES

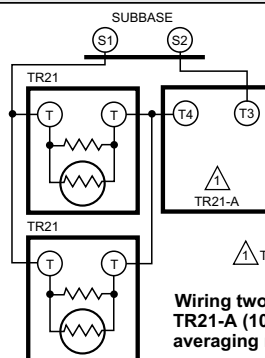
- Large, clear backlit display with backlight
- Menu-driven programming
- Speedy same-schedule programming, no need to copy multiple days
- Programmable or non-programmable modes
- Remote setback input for occupancy sensors or timeclocks
- Real-time clock keeps time during power failures and automatically updates to daylight savings

APPLICATION

- 1H/1C conventional
- Up to 2H/1C heat pump
- 4-pipe fan coil (three fan speeds)
- 2-pipe fan coil (three fan speeds)
- 2-pipe fan coil with Auxiliary Heat (3 fan speeds)
- PTAC (Hi, Lo fan speed)

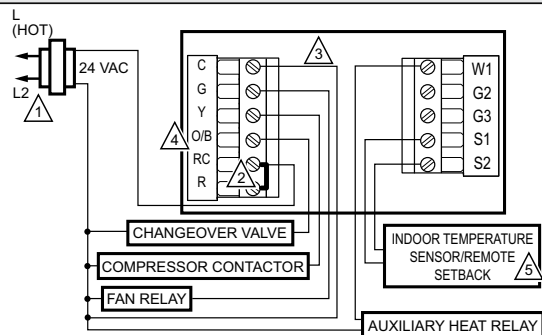

TB7100A100

TR21/TR21-A WIRING



Wiring two TR21 (20K ohm) Sensors and one TR21-A (10K ohm) Sensor to provide a temperature averaging network

WIRING - HEAT PUMP WITH AUXILIARY HEAT



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 FACTORY INSTALLED JUMPER.
- 3 WHEN USING BATTERIES, THE 24V COMMON CONNECTION IS OPTIONAL.
- 4 "O/B" TERMINAL SET TO CONTROL AS EITHER "O" OR "B" IN THE INSTALLER SETUP.
- 5 OPTIONAL INDOOR REMOTE SENSOR OR REMOTE SETBACK. WIRES MUST HAVE A CABLE SEPARATE FROM THE THERMOSTAT CABLE.

Typical hookup of single-stage heat pump with auxiliary heat (2H/1C).

SPECIFICATIONS

Supply Voltage	20-30 VAC, 50/60 Hz
Battery	Optional, 2-AA
Contact Ratings	0.02- 1.0A, 0.60A maximum current for fan terminals
Memory	10 year
Remote Sensor	Indoor/Setback/Changeover
Accuracy	±1°F (0.5°C), system dependent
Output	SPST relays
Control	Proportional plus Integral (PI)
Deadband	Adjustable, 2°/9°F, (1.5°/5°C)
Setpoint/Setback	Adjustable with programmable limits
Heating	40 to 90°F (10 to 32°C)
Cooling	50 to 99°F (10 to 37°C)

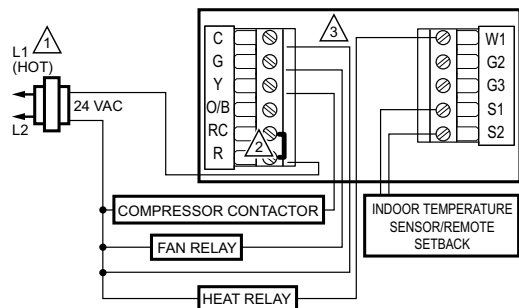
Display	Accuracy ±1°F (±0.5°C)
Changeover	Manual or Auto changeover selectable
System Settings	Heat-Off-Cool-Auto
Fan Setting	Auto-On
Fan Speeds	Low, Medium, High
Dimensions	3.75"H x 6.0"W x 1.375"D (9.5 x 15.2 x 3.5 cm)
Weight	1.0 lb (0.45kg)
Warranty	2 years

THERMOSTATS & CONTROLLERS

MULTIPRO™ MULTISPEED AND MULTIPURPOSE THERMOSTAT TB7100A100 MULTIPRO™ SERIES

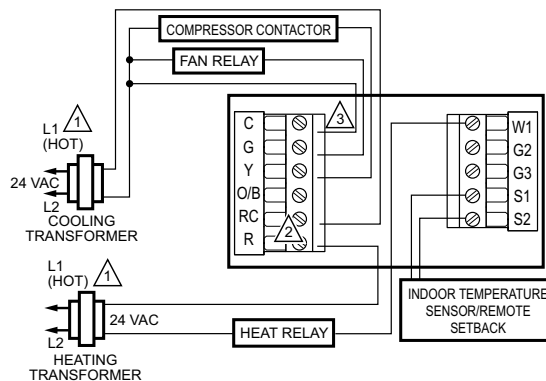


WIRING - CONVENTIONAL



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 FACTORY INSTALLED JUMPER.
- 3 WHEN USING BATTERIES, THE 24V COMMON CONNECTION IS OPTIONAL.

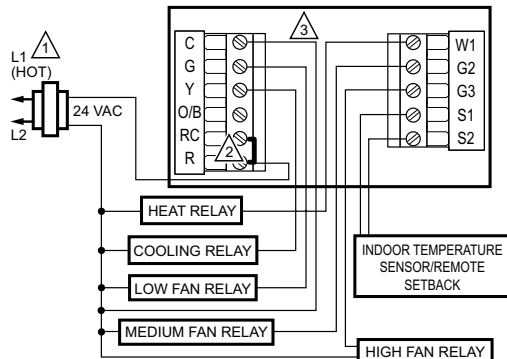
Typical wiring of single transformer 1H/1C system.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 REMOVE FACTORY INSTALLED JUMPER.
- 3 WHEN USING BATTERIES, THE 24V COMMON CONNECTION IS OPTIONAL. WHEN USED, THE COMMON MUST CONNECT TO THE COOLING TRANSFORMER SECONDARY.

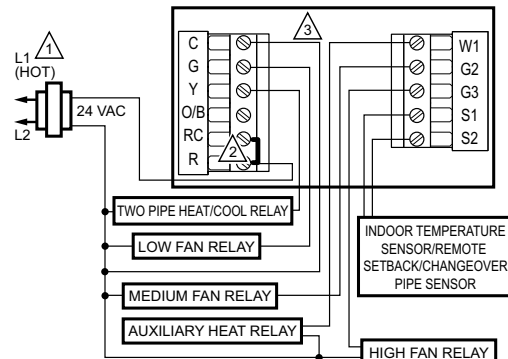
Typical hookup of dual transformer 1H/1C system.

WIRING - FAN COIL



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 FACTORY INSTALLED JUMPER.
- 3 WHEN USING BATTERIES, THE 24V COMMON CONNECTION IS OPTIONAL.

Typical wiring of 4 pipe fan coil.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 FACTORY INSTALLED JUMPER.
- 3 WHEN USING BATTERIES, THE 24V COMMON CONNECTION IS OPTIONAL.

Typical wiring of 2 pipe fan coil with reheat.

ORDERING INFORMATION

MODEL	DESCRIPTION
TB7100A1000	Multispeed and multipurpose thermostat
ACCESSORIES	
C7189U1005	Remote indoor thermistor sensor: 10K ohm NTC (TB7220)
TR21	Wall mount remote indoor sensor: 20K ohm NTC (Type 42)
TR21-A	Wall mount remote indoor sensor: 10K ohm NTC (use for averaging only)

THERMOSTATS & CONTROLLERS

FOCUSPRO™ RESIDENTIAL AND LIGHT COMMERCIAL THERMOSTATS TH5000, TH6000, TB7000 SERIES

DESCRIPTION

The **TH5000 Series** is a single or multi-stage digital thermostat made for typical residential heating and cooling systems with either conventional heat or heat pump. The **TH6000 Series** is a five-day-plus-two programmable thermostat. It is available in single- or multi-stage models for typical residential H/C systems with either conventional heat or heat pump. The **TB7220** is a seven-day programmable thermostat made for light commercial applications. The **TB7220** is multi-stage, for conventional heat or heat pump with additional algorithms to accommodate larger spaces and larger equipment in commercial applications. Algorithms include configurable recovery ramp and pre-occupancy purge cycle. It also has remote sensor capability.

FEATURES

- *Five-year warranty*
- *Large digital backlit display*
- *Auto or manual heat-cool operation*
- *Relay switch type*
- *°F or °C selectable*
- *Standard terminal designations*

Honeywell


TH5220D1029
Non-Programmable



TH6220D1028
Programmable



TB7220U1012
Commercial Programmable



TH5110D1022
Non-Programmable

SPECIFICATIONS

Supply Voltage	20 to 30 VAC or 750 mV, 50/60 Hz	Remote Sensor	10K thermistor, TB7220 only
Battery	Optional, 2-AA	Clock	±1 minute/month, 10-year battery
System Compatibility	Conventional and heat pump	DST Auto Adjust	Yes, TB7220 only
Display	2.98 to 5.09 sq in, model dependent (°F or °C)	Compressor Cycle	Adjustable cycles per hour and minimum off time
Display Offset	-3° to +3°F (-3° to +3°C), TB7220 only	Purge Duration	Adjustable, TB7220 only
Controls	4 to 6 soft keys, model dependent	Heat Pump Lockout	Adjustable, TB7220 only
Keypad Lockout	Configurable, TB7220 only	Remote Sensors	Two, indoor and outdoor, TB7220 only
Sensor Type	Thermistor	Wiring	18 to 22 AWG, no shield required
Accuracy	±1°F (±0.5°C)	Night Setback Program Times	
Switch Type	Y1,Y2,W,E: 1A relay W2,G,O/B,L,A: 0.5A relay	TB7220	7-day, 2 or 4 periods/day
Stages & Control	See terminal designation table	TH6220	5+2- or 5+1+1-day, 4 periods/day
Memory	10 years, then AA batteries required	Color	White
System Switch	Selectable, Heat/Off/Cool/Auto, plus emergency heat on TH5220 and TH6220	Operating Temperature	32° to 120°F (0° to 49°C)
Fan Switch	Auto/On	TB7220	0° to 120°F (-18° to 49°C)
Setpoint Range		Operating Humidity	0 to 90% RH non-condensing
Heating	40° to 90°F (4.5° to 32°C)	Dimensions	
Cooling	50° to 99°F (10° to 37°C)	TH5110	3.42"H x 4.5"W x 1.3"D (8.7 x 11.4 x 3.3 cm)
Setpoint Limits	Full setpoint span (TH5220, TH6220, TB7220 only)	TH6000, TH5220	3.56"H x 5.81"W x 1.5"D (9.0 x 14.7 x 3.8 cm)
Control Type	Proportional plus integral (PI) TB7220 tuned for larger spaces/equipment	TB7220	3.75"H x 6.0"W x 1.4"D (9.5 x 15.2 x 3.6 cm)
Deadband	3°F (1.7°C) fixed (all except TB7220) Adjustable 2° to 9°F (1.1° to 5°C), TB7220 only	Weight	0.75 lb (0.34 kg)
		Warranty	5 years, all except TB7220 (2 years)

THERMOSTATS & CONTROLLERS

FOCUSPRO™ RESIDENTIAL AND LIGHT COMMERCIAL THERMOSTATS

TH5000, TH6000, TB7000 SERIES



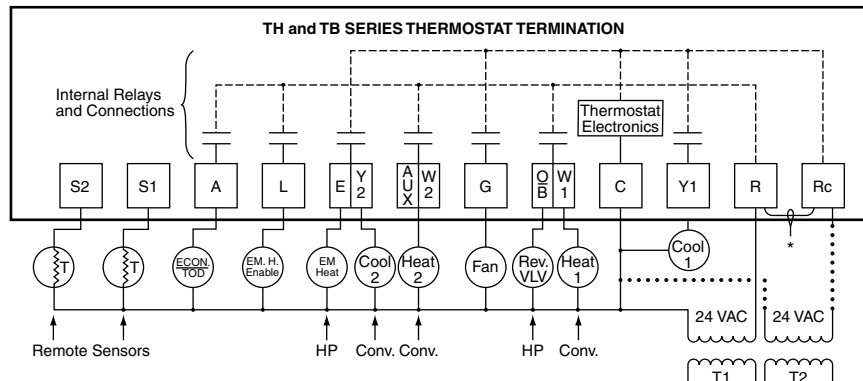
WIRING

TABLE 1. TERMINAL DESIGNATIONS BY THERMOSTAT MODEL

RESIDENTIAL THERMOSTATS		RESIDENTIAL PROGRAMMABLE THERMOSTATS		COMMERCIAL	** Terminals and functions are not present on every thermostat	
TH5110 1H/1C	TH5220 2H/2C	TH6110 1H/1C, programmable	TH6220 2H/2C, programmable	TB7220 3H/2C, programmable	Terminal**	Thermostat Function**
●	●	●	●	●	Rc	24 VAC power for cooling, for a split heating-cooling system
●	●	●	●	●	R	24 VAC power for heating (typically jumpered with Rc for common-powered systems)
●	●	●	●	●	Y1	Cooling 1st stage
●	●	●	●	●	C	24 VAC common (must come from cooling transformer)
●	●	●	●	●	W1	Heating 1st stage
O	O	O	O	O	O/B	Changeover valve (replaces W1 for heat pump)
●	●	●	●	●	G	Fan relay
	●		●	●	W2	Heating 2nd stage (TH5220, TH6220, TB7220)
	O		O		Aux	2nd stage heat for heat pump application (TH5220, TH6220, replaces W2 for HP)
	●		●	●	Y2	Cooling 2nd stage (TH5220, TH6220, TB7220)
	O		O		E	Emergency heat relay (TH5220, TH6220, replaces Y2 for HP)
	●		●		L	Emergency heat enabled annunciate (TH5220, TH6220)
				●	A	Economizer or time-of-day output powered by the R terminal (TB7220)
				●	S1	Remote sensor 1 set for room or OSA (TB7220)
				●	S2	Remote sensor 2 set for room or OSA (TB7220)

O = Heat pump application only

● = Conventional heating application



* Factory Jumper (remove if heating transformer is used).

... Wiring if Separate Heating Transformer is Needed.

--- Internal Thermostat Connections

Conv. Conventional Heating

HP Heat Pump Heating

ECON/TOD Economizer Enable or Time of Day Output

ORDERING INFORMATION

MODEL

TH5110D1022

TH5220D1029

TH6110D1021

TH6220D1028

TB7220U1012

DESCRIPTION

Digital thermostat 1H/1C (HP), system (H/O/C/A), fan auto/on

Digital thermostat 2H/2C (HP), system (H/O/C/A/Em), fan auto/on

Programmable (5-2 day) thermostat 1H/1C (HP), system (H/O/C/A), fan auto/on

Programmable (5-2 day) thermostat 2H/2C (2H/1C HP), system (H/O/C/A/Em), fan auto/on

Programmable (7-day) thermostat 3H/2C (HP), system (H/O/C/A), fan auto/on

RELATED PRODUCTS

32003796-001

50002883-001

C7089U1006

C7189U1005

Cover goof plate, 6"H x 8.3"W (TH7220)

Cover goof plate, 6"H x 8.3"W (TH6000 Series, TH5000 Series)

Outdoor sensor with mounting clip (TB7220)

Remote indoor thermistor sensor: 10K ohm NTC (TB7220)

THERMOSTATS & CONTROLLERS

VISIONPRO™ PROGRAMMABLE THERMOSTAT TH8000 SERIES, MODEL TB8220

Honeywell

DESCRIPTION

The **Vision Pro™ T_8000** is a 7-day programmable thermostat designed for universal system compatibility and is easy to program for precise comfort control. Programming is done using the large clear backlit display by just touching the screen and following the menu. The thermostat is configurable for system type (Conventional/Heat pump), system stages (1H/1C through 3H/2C), Fan control (electric/gas), with some models offering humidity control features. The **T_8000** is powered by 24VAC and/or 3 AAA batteries for time and program retention.

APPLICATION

Designed specifically for low-voltage control requiring time scheduled occupied-unoccupied control. Ideal for roof top units (small business or retail), homes, condos, cottages, and any packaged AHU operation.

FEATURES

- Five-year warranty
- Scheduling or non-scheduling
- Large backlit touch screen display
- Menu touch screen interaction
- Fan switching (touch screen)
- System switching (touch screen)
- Setpoint and configuration (touch screen)
- 1H/1C or 2H/2C or 3H/2C HP
- Heat pump O = on or B = on
- Emergency heat (electric/gas)
- De-humidification control models
- Fahrenheit or Celsius operation
- 24 VAC and/or 3-AAA batteries
- 10-year built-in memory retention
- Base included
- Remote sensor option (room or OSA)
- Seven-day schedule or manual
- 12- or 24-hour clock
- 2 or 4 occupied/unoccupied periods per day
- Adaptive intelligent recovery
- Proportional + Integral control
- Integral adjustment (Fast, Norm, Slow)
- Minimum compressor off timer
- Cycles/hour for cooling and heating
- OSA heat pump compressor lockout
- Screen lockout (partial/total)
- Auto daylight savings time
- Service reminders (TH) (filter, UV lamp, humidity pad)
- 30-day low battery indication
- Clean screen timer
- Change over (manual or auto)
- SP hold permanent or time out (TH)
- Holiday and override (TB)
- Individual setpoint range stops H/C
- Extended fan run time
- Temperature display offset ± 3
- Installer "test function"
- Adjustable H/C deadband
- Economizer/scheduled contact (TB)


TH8110U1003


SPECIFICATIONS

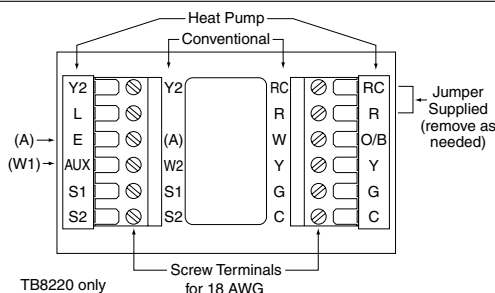
Supply Voltage	20-30 VAC, 50/60 Hz	Touch Screen Controls	
Battery	Optional, 3-AAA	Setpoints	Up/Down
Supply Current	H/C - 1.0A, fan - 0.6A	System	Heat/Off/Cool/Auto
Memory	10 years, then 3-AAA batteries required	Fan control	On/Auto/Circ (TH), On/Auto (TB)
Sensor Type	Built-in 10K thermistor	Schedule	7 day, 2 or 4 periods
Remote Sensor	Room or OSA (accessory required)	Hold (TH)	Permanent or time out
Accuracy	$\pm 1^\circ\text{F}$ (0.5°C), system dependent	Holiday (TB)	Time out by days
Outputs	SPST relays	Clock	12-hour or 24-hour, ± 1 min./month
Control	Proportional plus Integral (PI)	Screen	$^\circ\text{F}/^\circ\text{C}$, backlight
Dead-band	Adjustable, 2°/9°F, (1.5°/5°C)	Override	Occupied time out
Setpoint/Setback	Adjustable with programmable limits	Menu	Service set up, over 40 parameters
Heating	40 to 90°F (10 to 32°C)	Enclosure	White plastic, indoors only
Cooling	50 to 99°F (10 to 37°C)	Color	Premier white
RH	40 to 80%, (TH8321)	Wiring	Terminals for 18 AWG wire
Keypad Lockout	Unlocked, locked completely, or locked except setpoint	Operating Temperature	0° to 120°F (-18° to 49°C)
Display	3.5" x 2.5" backlit touch screen, temperature, humidity (TH8321), system, fan, time, day, setpoint, service reminders (TH), OSA temp if wired	Operating Humidity	0 to 90% RH (non-condensing)
Display Offset	$\pm 3^\circ\text{F}$ (1.5°C), in 1°F (0.5°C) increments	Mounting	Horizontal with base included
		Dimensions	4.56"H x 6.0"W x 1.37"D, (11.6 x 15.24 x 3.5 cm)
		Weight	1.1 lb (0.5 kg)
		Approvals	UL, cUL, California Title 24 (TB), and ADA compliant
		Warranty	5 years

THERMOSTATS & CONTROLLERS

VISIONPRO™ PROGRAMMABLE THERMOSTAT TH8000 SERIES, MODEL TB8220



WIRING



TERMINAL DESIGNATIONS

Designator	Typical connection
AUX	Auxiliary heat relay (heat pump TH)
C	Common connection
E, (A)	Emergency heat, (time-of-day or economizer)
G	Fan relay
L	24 VAC LED light output (externally switched)
O/B	Changeover valve (heat pump)
S1, S2	Indoor or outside air sensor termination
R	24 VAC system or heat transformer
RC	24 VAC cooling transformer
W	First stage heating
W1	Second stage heating (heat pump TB)
W2	Second stage heating
Y	First stage cooling
Y2	Second stage cooling

Note: Not all terminals shown are used on all models. Be sure to use the conventional OR heat pump terminals, NOT both.

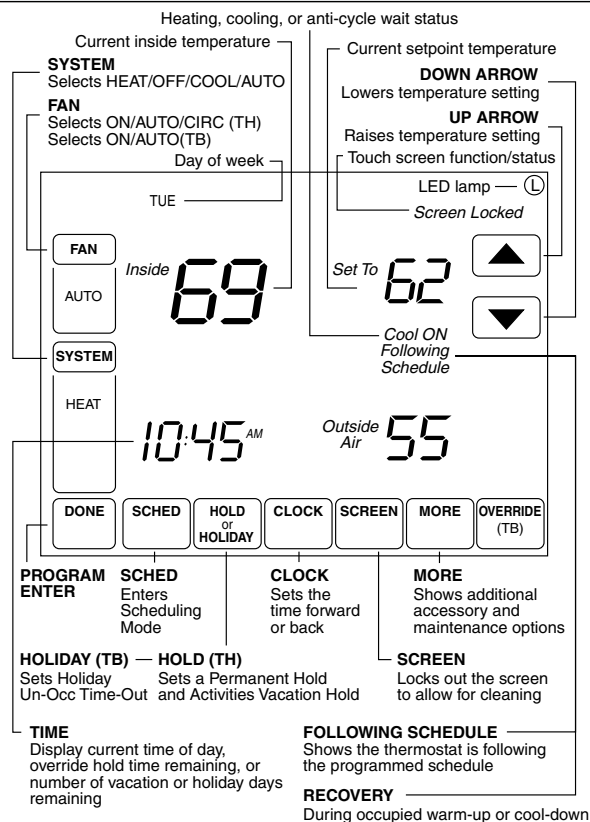
INSTALLATION / MOUNTING

The base plate is mounted directly to the wall or 2" x 4" horizontal or vertical back box. Use 18 AWG wire and terminals shown above. Position thermostat over the base plate and push onto pins. No leveling required.

GENERAL CONTROL SEQUENCE

The occupied status is time programmed to change the occupied and unoccupied setpoints. The thermostat control uses the setpoint as displayed using a PI control of single or multiple stages of heating and cooling equipment. The fan is controlled by demand in the AUTO mode for H/C, with delay fan off as programmed by the installer. In the ON mode the fan is continuous on and in the CIRC mode (TH only) the fan runs by demand plus an additional random circulation amount up to 35% of the scheduled occupied time. System control is selectable for Heat/Off/Cool/Auto. Automatic engages the H/C automatically with an adjustable deadband between the H/C setpoints with control status displayed on the LCD as Heating On or Cooling On, and a wait indicator during anti-cycle control.

THERMOSTAT KEYS AND DISPLAY



ORDERING INFORMATION

MODEL	DESCRIPTION
TB8220U1003	24V commercial, seven-day programmable 2H/2C or 3H/2C HP w/system and fan switch
TH8110U1003	24V residential, 1H/1C or HP seven-day programmable thermostat w/ system and fan switch
TH8320U1008	24V residential, 2H/2C or 3H/2C HP seven-day programmable thermostat with system and fan switch
TH8321U1006	24V residential, 2H/2C or 3H/2C HP seven-day programmable thermostat with system and fan switch and humidity

PRODUCTS	RELATED PRODUCTS
209651A	Wall adaptor plate 7.37" x 5.75"
C7089U1006	Outdoor sensor with mounting clip (TB7220)
C7189U1005	Remote indoor thermistor sensor: 10K Ω NTC (TB7220)



THERMOSTATS & CONTROLLERS

RESIDENTIAL AND LIGHT COMMERCIAL THERMOSTATS

1F80 SERIES

DESCRIPTION

The **1F80 Series** thermostats come with a wide variety of options. These versatile thermostats can be used for residential and light commercial applications with both programmable and non-programmable options. There are also choices of displays including the White Rodgers Blue™ digital display as well as the classic green display. With universal, multi-stage, single stage, and heat pump options the right choice is easy to find in this family of thermostats.

FEATURES

- 2" or 4" Blue™ or classic digital display (classic only available in 2")
- Choice of battery powered, dual power or hardwired models
- Fossil fuel or electric heat compatible
- Permanent Program retention during power loss
- Configuration menu allows keypad selection of options
- Selectable Celsius or Fahrenheit temperature display
- Air filter change indicator option
- Keypad lockout and setpoint temperature limit options

NEW!

White
Rodgers™



1F80-0471



1F86-EZ-0251



1F86-344

SPECIFICATIONS

Supply Voltage	0 to 30 VAC, 50/60 Hz or DC 0.05 to 1.5 Amps (load per terminal) 1.5 Amps maximum load (all terminals combined)
Setpoint Temperature Range	45° to 90°F (7° to 32°C)
Rated Differential	0.4° to 1.7°F
Standard Systems	Gas, oil, electric, heat pump, millivolt systems, 2- or 3-wire hydronic zone valve Thermal Specifications (dependent on model selected)
Operating Ambient Temperature	32° to 105°F (0° to 40°C)
Operating Humidity Range	90% non-condensing maximum

Dimensions	
1F87-361, 1F80-361, 1F86-344, 1F85-277	6.1"W x 3.8"H x 1.1"D (15.5 x 9.7 x 2.8 cm)
1F80-0471, 1F80ST-0471, 1F86-0471, 1F86ST-0471, 1F86EZ-0251	4.4"W x 3.4"H x 1.2"D (11.2 x 8.6 x 3.04 cm)
1F82-0261, 1F80-0261, 1F80-0224, 1F89-0211, 1F86-0244, 1F82-261, 1F89-211, 1F89EZ-0251	4.8"W x 3.8"H x 1.5"D (12.2 x 9.7 x 3.8 cm)
1F85-0422, 1F83-0471, 1F83-0422, 1F85-0477, 1F85ST-0422	5.1"W x 3.9"H x 1.2"D (12.9 x 9.9 x 3.05 cm)
Weight	0.75 lb (0.34 kg) approximate average
Warranty	1 year

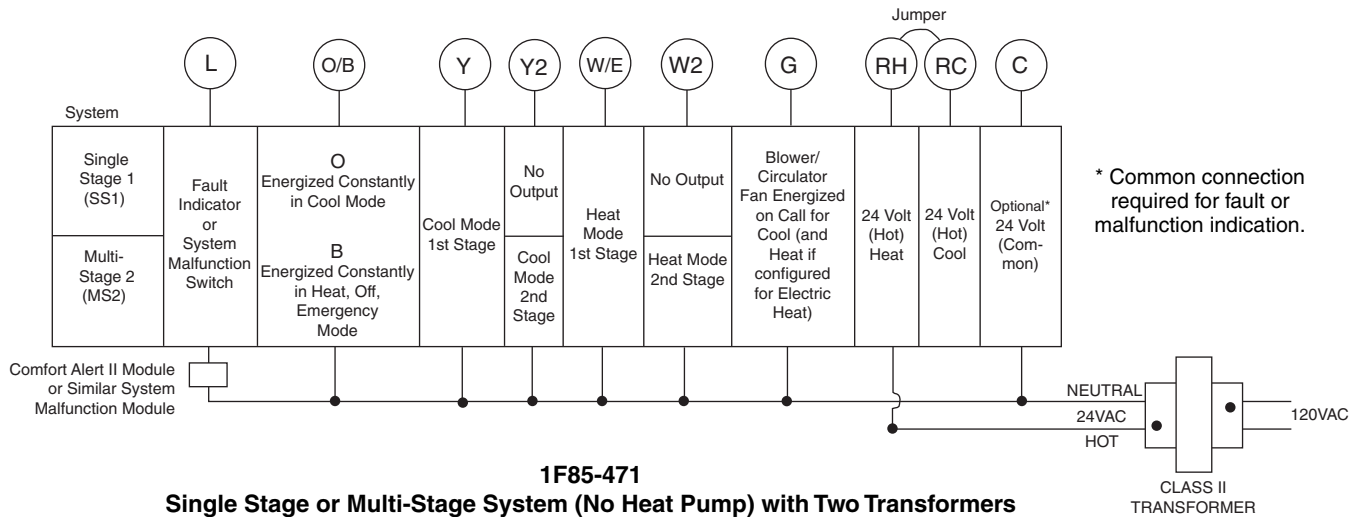
THERMOSTATS & CONTROLLERS

RESIDENTIAL AND LIGHT COMMERCIAL THERMOSTATS

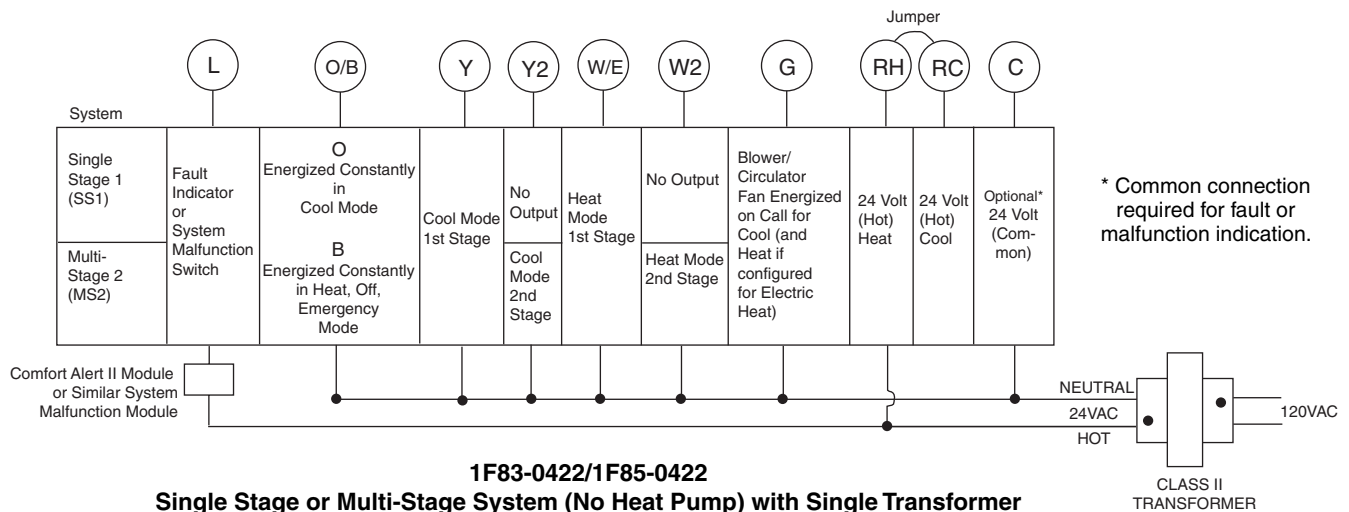
1F80 SERIES



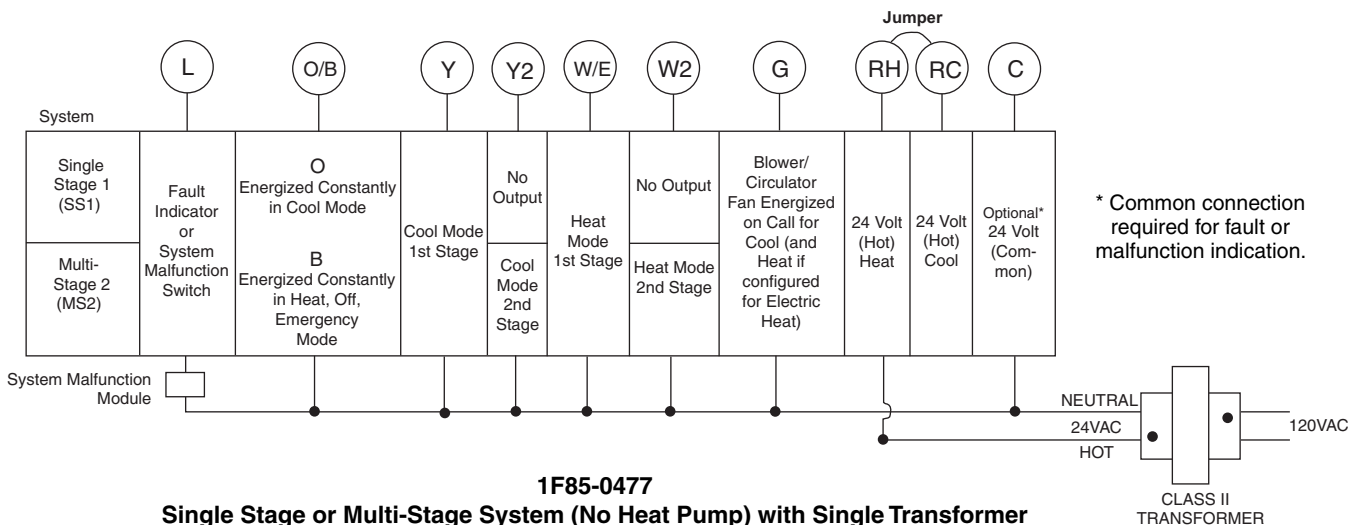
WIRING



1F85-471
Single Stage or Multi-Stage System (No Heat Pump) with Two Transformers



1F83-0422/1F85-0422
Single Stage or Multi-Stage System (No Heat Pump) with Single Transformer



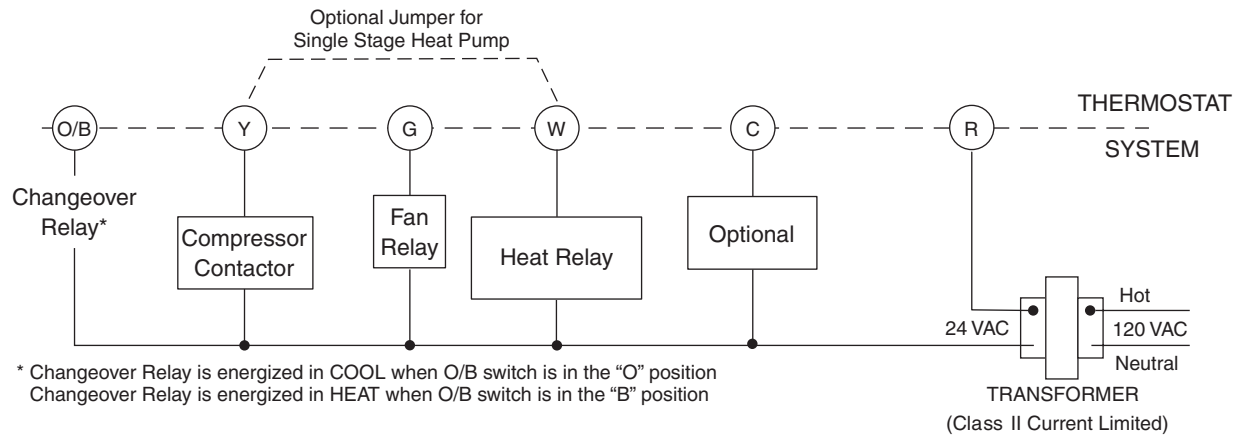
1F85-0477
Single Stage or Multi-Stage System (No Heat Pump) with Single Transformer

THERMOSTATS & CONTROLLERS

RESIDENTIAL AND LIGHT COMMERCIAL THERMOSTATS

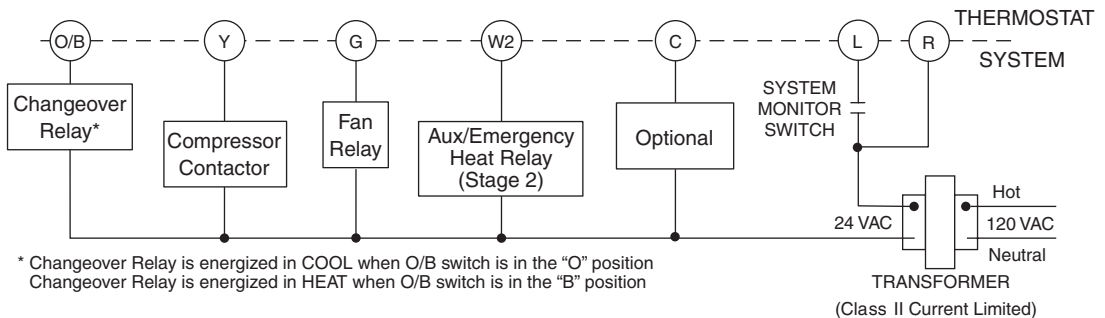
1F80 SERIES

WIRING (continued)



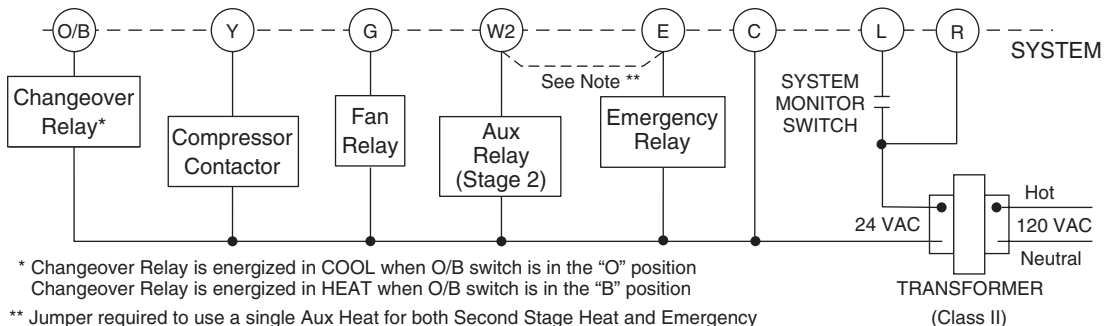
1F80-0224/1F86-0244, 1F80-0261/1F87-0261
Typical Wiring Diagram for Single Transformer Single Stage Systems

NOTE
 If safety circuits are in only one of the systems, remove the transformer of the system with **NO** safety circuits.



1F82-0261/1F89-0211
Typical Wiring Diagram for Single Transformer Systems

NOTE
 If safety circuits are in only one of the systems, remove the transformer of the system with **NO** safety circuits.



1F82-261, 1F89-211
Single Transformer Systems

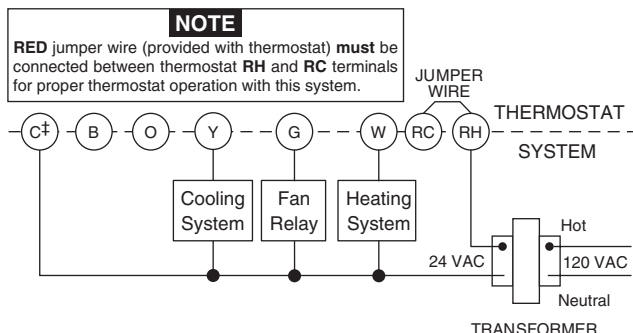
THERMOSTATS & CONTROLLERS

RESIDENTIAL AND LIGHT COMMERCIAL THERMOSTATS

1F80 SERIES



WIRING (continued)



1F80-224, 1F80-361, 1F86-344
Heat/Cool, 4-wire, Single Transformer Systems

ORDERING INFORMATION

MODEL	DESCRIPTION
1F80-0224	Single stage dual power with 24 hour programmable option with 2 inch blue display
1F80-0261	Single stage dual power with 5-1-1 day programmable option with 2 inch blue display
1F80-0471	Single stage dual power with 5-1-1 day programmable option with 4 inch blue display
1F80-361	Single stage dual power non-programmable with classic display
1F80ST-0471	Single stage dual power with 5-1-1 day programmable option with 4 inch blue display (spanish)
1F82-0261	Heat pump programmable dual power with 2 inch blue display
1F82-261	Heat pump programmable dual power with classic display
1F83-0422	Multi stage or single stage with heat pump (2 stage heat)option non-programmable with 4 inch blue display
1F83-0471	Multi stage or single stage with heat pump (3 stage heat)option non-programmable with 4 inch blue display
1F85-0422	Multi-stage or single-stage heat pump (2 stage heat) compatible programmable or non-programmable with 4 inch blue display
1F85-0477	Multi-stage or single-stage heat pump (3 stage heat) compatible programmable or non-programmable with 4 inch blue display
1F85-277	Multi-stage or single-stage heat pump compatible programmable or non-programmable with classic display
1F85ST-0422	Multi-stage or single-stage heat pump (2 stage heat) compatible programmable or non-programmable with 4 inch blue display (spanish)
1F86-0244	Single stage or heat pump non-programmable with 2 inch blue display
1F86-0471	Single stage or heat pump non-programmable with 4 inch blue display
1F86-344	Single stage non-programmable with classic display
1F86EZ-0251	Single stage or heat pump non-programmable with 2 inch blue display with home sleep and away options
1F86ST-0471	Single stage or heat pump non-programmable with 4 inch blue display (spanish)
1F87-361	Single stage or heat pump with 7 day programmable option with classic display
1F89-0211	Heat pump non-programmable with 2 inch blue display
1F89-211	Heat pump non-programmable with classic display
1F89EZ-0251	Heat pump non-programmable with EZ read screen with home, sleep, and away options

Note: All models available in a 6-Pack.

RELATED PRODUCTS		
MODEL	DESCRIPTION	PAGE
ATK63	Thermostat guard (6.9"H x 4.7"W x 1.75"D - inside dim.)	1392
F29-0198	Thermostat guard (8.125"H x 4.375"W x 3.375"D - inside dim.)	1392



THERMOSTATS & CONTROLLERS

DIGITAL DISPLAY PROGRAMMABLE THERMOSTATS

T4000, T8000, AND T12000 SERIES THERMOSTATS

DESCRIPTION

Peco offers a wide range of programmable thermostats to meet your needs. The **T4500 Series** thermostats offer single or multistage heating and cooling. The **T4900 Series** offer up to 3 stages of heating and 2 cooling. Both series come with 24vac power or battery power options. The **T8000 Series** offer multistage heating and cooling with a large digital display. The **T12000 Series** can be used in single stage or multistage heating and cooling applications and it comes with a touchscreen display.

FEATURES

- 7 day, 5/2 day, or non-programmable modes
- Keypad lockout feature
- Occupancy sensor input
- Holiday scheduling
- Remote sensor input
- Outdoor air sensor input for T8000 and T12000
- SD Card programming option on T8000 and T12000
- Blue backlit display
- 24 VAC or battery powered
- Terminal block wiring connections

NEW!



T4000 Series



T8000 Series



T12000 Series

SPECIFICATIONS

Supply Voltage 24 VAC (20-30 VAC) 50/60Hz (±10%)
Output Voltage 20-30 VAC
Output Current 0.02 - 1.0 A per terminal; W1 (B/O), W2 (AUX), G, A, E, Y1, Y2. NOTE: Total current draw must not exceed 2.5A.

Temperature Range 50° to 90° F (10° to 32° C)
Operating Temperature 0° to 120°F (-17° to 48°C)
Operating Humidity 5% to 95% RH, Non-condensing
Additional Specifications

AA Batteries can be used for power (recommended for back-up)

Compatibility SD card: T8000 and T12000 Series

Differential 1°F (0.5°C)
Display Type Digital with blue backlight

Fan Cycling (Auto) or Continuous (On); 1 speed

Fan Switching Off-Heat-Cool-Auto-Emergency (Emergency not available on T4000 models)

Lockout Keypad with 3 digit code capability
Remote Sensor Yes

Switch Type Push button (selectable)
System Type Conventional or Heat Pump
Dimensions 4.3"H x 5.7"W x 1.3"D

(10.92 x 14.48 x 3.3 cm)
1.1 lb (.49 kg)

Weight
Approvals ASHRAE 90.1 AND CA Title 24 Building Code Compliant

Warranty 2 years

THERMOSTATS & CONTROLLERS

DIGITAL DISPLAY PROGRAMMABLE THERMOSTATS T4000, T8000, AND T12000 SERIES THERMOSTATS



TERMINAL DESIGNATIONS AND SYSTEM TYPES, T4000 SERIES			
Conventional Terminal Letters		Heat Pump Terminal Letters	
C	Unswitched side, 24 VAC	C	Unswitched side, 24 VAC
W1	Stage 1 Heat	B/O	Reversing Valve
W2	Stage 2 Heat	AUX	Auxiliary (Stage 3 Heat)
G	Fan	G	Fan
A		A	
E		E	
Y1	Stage 1 Cool	Y1	Compressor Stage 1, Heat /Cool 1
Y2	Stage 2 Cool (or Dehumidify)	Y2	Compressor Stage 2, Heat /Cool 2 (or Dehumidify)
RH	Power for heating, switched side, 24 VAC	RH	Power for heating, switched side, 24 VAC
RC	Power for cooling, switched side, 24 VAC	RC	Power for cooling, switched side, 24 VAC
SC	Sensor Common	SC	Sensor Common
S1	Indoor Remote Sensor	S1	Indoor Remote Sensor

TERMINAL DESIGNATIONS & SYSTEM TYPES, T8000 & T12000 SERIES			
Conventional Terminal Letters		Heat Pump Terminal Letters	
C	Unswitched side, 24 VAC	C	Unswitched side, 24 VAC
W1	Stage 1 Heat	B/O	Reversing Valve
W2	Stage 2 Heat	AUX	Auxiliary (Stage 3 Heat)
G	Fan	G	Fan
A	Economizer/Damper/Humidity	A	Economizer/Damper/Humidity
E	Stage 3 Heat	E	Emergency Heat
Y1	Stage 1 Cool	Y1	Compressor Stage 1, Heat /Cool 1
Y2	Stage 2 Cool (or Dehumidify)	Y2	Compressor Stage 2, Heat /Cool 2 (or Dehumidify)
RH	Power for heating, switched side, 24 VAC	RH	Power for heating, switched side, 24 VAC
RC	Power for cooling, switched side, 24 VAC	RC	Power for cooling, switched side, 24 VAC
SC	Sensor Common	SC	Sensor Common
S1	Indoor Remote Sensor	S1	Indoor Remote Sensor
S2	Occupancy Setback Input*	S2	Occupancy Setback Input*
S3	Outdoor Remote Sensor	S3	Outdoor Remote Sensor"

ORDERING INFORMATION

MODEL	DESCRIPTION
T12511-001	Programmable 3 heat, 2 cool 24 VAC or battery powered large screen
T12532-001	Non-programmable 1 heat, 1 cool 24 VAC or battery powered
T12532-IAQ	Programmable 3 heat, 2 cool 24 VAC or battery powered with scheduling
T4011-001	Non-programmable 1 heat, 1 cool 24 VAC or battery powered
T4522-001	Programmable 1 heat, 1 cool 24 VAC or battery powered
T4932SCH-001	Programmable 3 heat, 2 cool 24 VAC or battery powered large screen with humidity control
T4932SCH-002	Programmable 2 heat, 2 cool 24 VAC or battery powered
T8532-001	Programmable 3 heat, 2 cool 24 VAC or battery powered with humidity control and scheduling
T8532-IAQ	Programmable 1 heat, 1 cool 24 VAC or battery powered

ACCESSORIES

MODEL	DESCRIPTION
SP155-017	Indoor remote sensor
SB200-001	Occupancy sensor

THERMOSTATS & CONTROLLERS

RESIDENTIAL LCD DISPLAY PROGRAMMABLE/ NON-PROGRAMMABLE THERMOSTATS

1F72, 1E78 AND 1F78 SERIES THERMOSTATS

DESCRIPTION

The **1F72 Series** thermostats are configured for heat pump systems and have a 5-2 day programming option. The **1F78 Series** thermostat is available in programmable or non-programmable. The programmable option is a 5-2 day configuration with up to 4 period settings per day. The **1E78** model numbers are vertical versions with the same features as the **1F78** models. This series offers the perfect upgrade from mechanical thermostats at an affordable cost. The large dimensional design of these thermostats covers wall marks left by most mechanical thermostats without the need for a wall plate.

FEATURES

- **Large LCD with backlight**
- **Includes B/O terminals**
- **Fossil fuel or electric heat compatible**
- **Electronic accuracy**
- **Selectable Celsius or Fahrenheit temperature display**

NEW!

White
Rodgers™

1F72-151-ST



1F78-144



1F78-151



1E78-140



1E78-151

SPECIFICATIONS

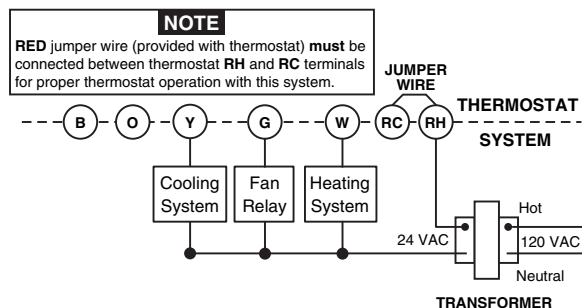
Supply Voltage	24VAC	Reset	Yes
Display	Yes	RoHS Statement	No
Display Type	LCD	Sensing Element	Yes
Accuracy	±1°	Sensor Type	Thermistor
Additional Specifications		Temperature Range	32° to 105°F (0° to 41°C)
1F78-151,1F72-151,1E78-151	Program option 5/2 Day	Operating Temperature	32° to 105°F (0° to 41°C)
1F78-144,1E78-140,1F79-111	Non-programmable	Shipping Temperature	-4° to 150°F (-20° to 65°C)
Control Type	Low Voltage Thermostat	Setpoint Range	45° to 90°F (7° to 32°C)
Deadband	1°	Schedule Type	
Differential	1°	1F78-15,1F72-151, 1E78-151	4 (Morning, Day, Evening, Night),
Rated Differentials - Single Stage Models:		Materials Of Construction	
	Fast Slow		ABS Plastic
Heat (Single Stage)	0.8°F 1.5°F	Mounting	Any except upside down
Cool (Single Stage)	Fixed 1.2°F	Weight	0.58 lb (0.26 kg)
Heat Pump	1.2°F 1.5°F	Warranty	5 years
Aux./Emer. Heat	0.8°F 1.2°F	System Type	
Dimensions		1F78-151,1F78-144,1E78-140,1E78-151	Single Stage
1F78-151,1F78-144,1F72-151,1F79-111	6.25"L x 4.25"H x 1.75"D (15.8 x 10.8 x 4.45 cm)	1F79-111,1F72-151	Heat Pump
1E78-151,1E78-140	4.29"L x 6.2"H x 6.2"D (10.9 x 15.75 x 15.75 cm)	Wiring Terminations	
Enclosure	Nema 1	1F78-151,1F78-144,1E78-151	RC, RH, W, Y, G, O, B
Input Current		1F72-151,1F79-111	R, C, Y, W2, G, O/B, L, E,
1F78-151,1F78-144,1F72-151,1F79-111, 1E78-151	0.05 to 1.0 Amp (load per terminal)	1E78-140	R, C, Y, W/2, G, O/B, L
E78-140	0.05 to 1.5 Amps (load per terminal)		
Fan Switching	Yes		

THERMOSTATS & CONTROLLERS

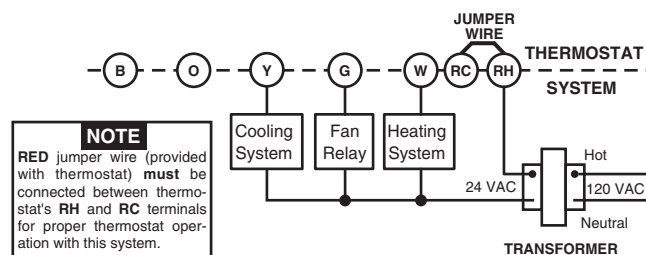


RESIDENTIAL LCD DISPLAY PROGRAMMABLE/ NON-PROGRAMMABLE THERMOSTATS 1F72, 1E78 AND 1F78 SERIES THERMOSTATS

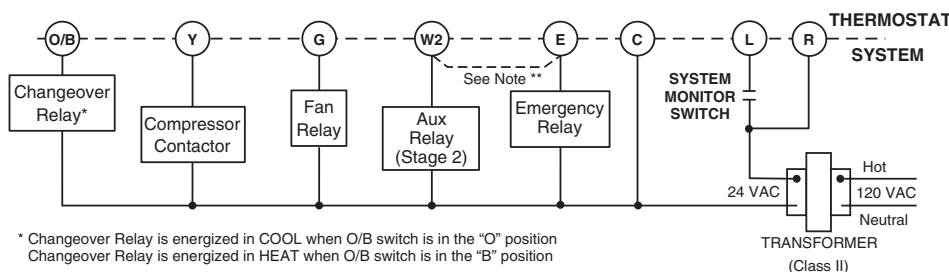
WIRING



1E78-151



1F78-144, 1F78-151



NOTE
If safety circuits are in only one of the systems, remove the transformer of the system with **NO** safety circuits.

Typical wiring diagram for single transformer systems

1F72-151, 1F79-111

ORDERING INFORMATION

MODEL	DESCRIPTION
1F78-151	Thermostat; SS/programmable/classic display
1F78-144	Thermostat; SS/non-programmable/classic display
1F72-151	Thermostat; HP/programmable/classic display
1E78-151	Thermostat; SS/programmable/vertical/classic display
1E78-140	Thermostat; SS/non-programmable/vertical/classic display
1F79-111	Thermostat; HP/non-programmable/classic display

Note: All models available in a 6-pack.

THERMOSTATS & CONTROLLERS

DIGITAL FAN COIL THERMOSTAT TB6575, TB8575 SUITEPRO™ SERIES

DESCRIPTION

The SuitePRO™ is a family of Digital Fan Coil thermostats for residential and commercial applications such as hotels, condominiums, school classrooms, etc. All three models are suitable for multiple applications. Changes in output wiring and external links between wiring terminals allow you to configure the thermostat for the appropriate application. Valves and auxiliary electric heaters can be controlled using a relay or contactor controlled by the system switch.

FEATURES

- Simple, intuitive user interface.
- Pre-installed lead wires for fast installation (TB6575A and TB6575B models only)
- Backlit display permits easy viewing in any light.
- Proportional plus Integral (P+I) control algorithm for precision temperature regulation.
- Adjustable deadband for auto changeover using the Heat and Cool setpoint settings.
- Adjustable maximum heating and minimum cooling setpoint limits using range stops.
- EEPROM permanently retains user settings, including setpoints, during power loss (no batteries required).
- Selectable °C or °F display via Installer Setup.
- Optional remote indoor temperature sensor.
- Freeze protect algorithm turns on heat when needed.

Honeywell

TB6575A100


APPLICATION

TB6575A1000

- 2-pipe or 4-pipe with seasonal/manual/automatic heat/cool changeover

TB6575B1000

- 2-pipe with seasonal or manual heat/cool changeover

TB8575A1000

- 2-pipe or 4-pipe with manual and seasonal heat/cool changeover

SPECIFICATIONS

Supply Voltage

TB6575A1000 and TB6575B1000

120 VAC ±10% at 50/60Hz

240 VAC ±10% at 50/60Hz

TB8575A1000

20 to 30 VAC at 50/60Hz (using

24 VAC Class 2 NEMA rated transformer)

Component Ratings

Fan Relay

24 VAC 1.0A

120 VAC 6.0A

240 VAC 3.0A

Heat/Cool Relay

24 VAC 1.0A

120 VAC 1.0A

240 VAC 1.0A

Onboard Temperature Sensor

Type 10K NTC

Working Range 0° to 120°F (18° to 49°C)

Display Range 32° to 99°F (0° to 37°C)

Accuracy ±2.0°F at 70°F

Remote Temperature Sensor (optional) (Type 42)

Type 20K NTC

Working Range 0° to 120°F (18° to 49°C)

Display Range 32° to 99°F (0° to 37°C)

Accuracy ±2.0°F at 70°F

Remote Pipe Sensor (optional) (Type 42)

Type 20K NTC

Working Range 32° to 199°F (0° to 93°C)

Display Range 32° to 199°F (0° to 93°C)

Accuracy ±5.0°F over the temperature sensing range

Remote Setback Input

TB6575 9 VDC, < 4 mA

TB8575 16 VDC, < 5 mA

TB6575/TB8575 Dry contact, maximum resistance of 100Ω

Operating Temperature 0° to 120°F (18° to 49°C)

Operating Humidity 5% to 90% RH, non-condensing

Weight 1.0 lb (0.45kg)

Approvals CSA Certified C/US for Canada and the U.S.A.

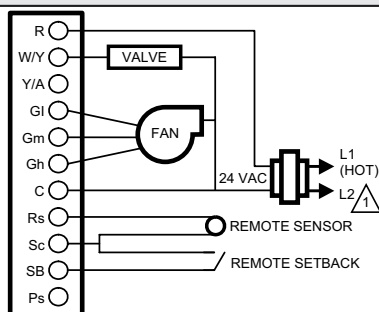
Warranty 2 years

THERMOSTATS & CONTROLLERS



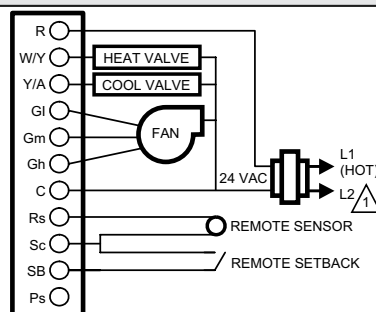
DIGITAL FAN COIL THERMOSTAT TB6575, TB8575 SUITEPRO™ SERIES

WIRING - 24 VAC (TB8575)



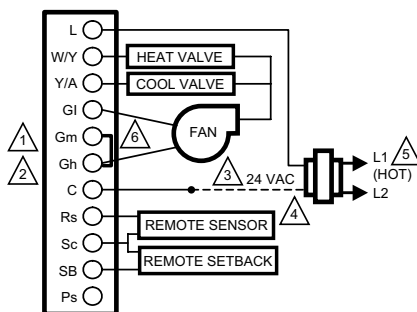
△ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

Two pipes (Heat or Cool) Manual Changeover wiring diagram (24 VAC shown).



△ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

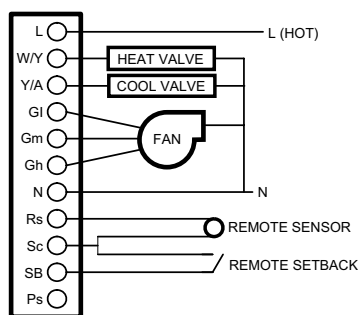
Four pipes (Heat and Cool) Manual/Auto Changeover wiring diagram (24 VAC shown).



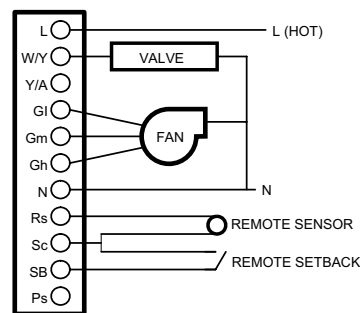
- 1 REMOVE PRE-WIRED WIRE FROM TERMINAL 5 (MID FAN SPEED).
- 2 JUMPER TERMINALS 5 AND 6 (MID AND HIGH FAN SPEEDS). FAN MEDIUM SETTING WILL OPERATE ON HIGH SPEED.
- 3 CONNECT TERMINAL 7 TO THE MID FAN SPEED WIRE FROM PREVIOUS SYSTEM.
- 4 REWIRE THE PREVIOUS MID FAN SPEED WIRE TO THE NEUTRAL CIRCUIT IN THE SYSTEM.
- 5 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 6 CHANGE INSTALLER SETUP IS CODE 9 TO 2 FOR 2 SPEED FAN CONTROL.

Wiring diagram when missing a wire for electromechanical retrofit (24 VAC shown).

WIRING - 120/240/277 VAC (TB6575A/B)



Four pipes (Heat and Cool) Manual/Auto changeover wiring diagram (120/240/277 VAC shown).



Two pipes (Heat or Cool) Manual Changeover wiring diagram (120/240/277 VAC shown).

ORDERING INFORMATION

MODEL
TB6575A1000
TB6575B1000
TB8575A1000

DESCRIPTION
Universal 120/240 VAC line voltage (2 or 4 pipe)
120/240 VAC line voltage (2 pipe only)
Universal 24 VAC low voltage (2 or 4 pipe)

THERMOSTATS & CONTROLLERS

FLOATING AND PROPORTIONAL ZONE THERMOSTAT

TB6980 AND TB7980 SERIES

DESCRIPTION

Model T6980 is a floating-control zone thermostat. **Model T7980** is a proportional-control zone thermostat. Both have PI control algorithms and models with dual outputs are available. The digital display can be °F or °C, and will also display bar graphs and pushbuttons for setpoint and override functions. The microprocessor-based thermostat is dipswitch configurable for application, including night setback value and minimum / maximum setpoint limits.

FEATURES

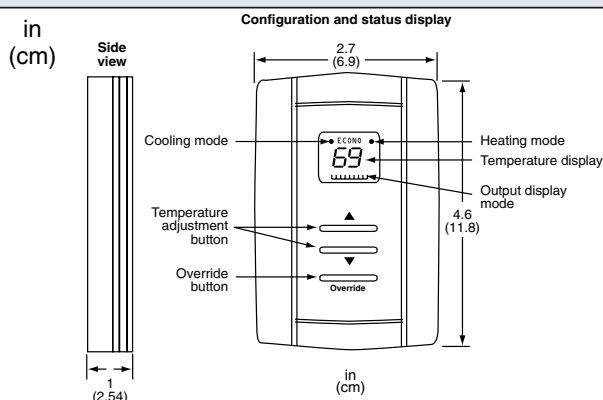
- **Floating control output (T6980)**
- **Proportional control outputs (T7980)**
- **Digital display (°F or °C and output bar graph)**
- **PI control algorithms**
- **Single or dual-output models**
- **Vertical mounting**
- **Night setback override (2-hour)**
- **Remote sensor capable**
- **Room or discharge air control**
- **Minimum and maximum setpoint limits**
- **Minimum damper open %**
- **12-second backlighting**
- **Two-year warranty**



Honeywell

TB6980B1006

DIMENSIONS



SPECIFICATIONS

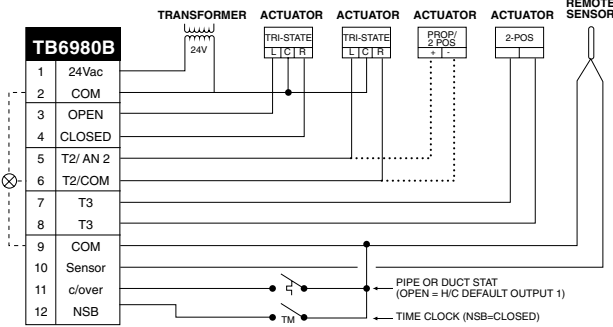
Supply Voltage	24 VAC	Damper Minimum	0-50%
Supply Current	25 mA	Actuator Timing	80-160 seconds (Tx6980 only)
Control	Proportional + integral (PI)	Output 2	Heating, floating control, on/off, or proportional
Display	1" x 1" LCD with 0.5" high temperature digits	Output 3	Minimum on time (1 second, 10 minutes, 15 minutes) or signal percent of output 1
Readout Backlighting	32° to 140°F (0° to 60°C) with 1°F (0.5°C) resolution 12-second dwell, button-activated	Setback Value	2° to 18°F (1° to 9°C), in 2°F (1°C) increments
Outputs	Triac, 24 VAC, 0-10 VDC, or 2-10 VDC	Setpoint Limits	Minimum 50° to 94°F (10° to 34°C) Maximum 51° to 95°F (11° to 35°C)
TB6980A #1	Floating control, heating (reverse acting) or cooling (direct acting)	Internal Switch Settings (Switches 1, 2, and 6 only)	
TB6980B #1	Floating control, heating (reverse acting) or cooling (direct acting)	SW1	°F or °C
#2	0 or 2-10 VDC or on/off, heating (reverse acting)	SW2	Normal or configuration mode
#3	On/off, following output 1	SW6	Output 2 (proportional or triac control)
TB7980A #1	0 or 2-10 VDC heating (reverse acting) or cooling (direct acting)	Memory Protection	Configuration and setpoint
TB7980B #1	0 or 2-10 VDC heating (reverse acting) or cooling (direct acting)	Setpoint Buttons	Range 50° to 90°F (10 to 35°C)
#2	0 or 2-10 VDC or on/off, heating (reverse acting)	Override Button	2-hour night setback override (Pushing twice cancels override)
#3	On/off, following output 1	Operating Temperature	32° to 140°F (0° to 60°C)
Inputs	Night setback, open = occupied	Operating Humidity	0-95% RH, non-condensing
	Changeover, digital input or sensor	Sensor Changeover	Deadband = 9°F (5°C), or contact
	Remote sensor, 500141xx-xxx	Wiring	22 to 18 AWG
Configuration Parameters		Mounting	Direct or to 2" x 4" box Cover secured with set screw
Application	Room, supply air, changeover	Dimensions	4.6"H x 2.7"W x 1.0"D (11.8 x 6.9 x 2.7 cm)
Output 1	Cooling or heating	Weight	0.3 lb (0.14 kg)
		Warranty	2 years

THERMOSTATS & CONTROLLERS

FLOATING AND PROPORTIONAL ZONE THERMOSTAT TB6980 AND TB7980 SERIES



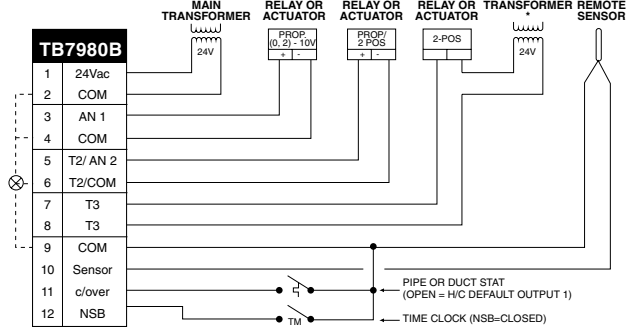
WIRING



--- Internally connected. *T2/COM is internally connected if SW6=analog.

..... Alternative 2 POS/Proportional hookup.

Only terminals 1, 2, 3, 4, 9, 10, 11, 12 are used on **TB6980A** thermostats.



--- Internally connected. *T2/COM is internally connected if SW6=analog.

*Can be a different power source or the same as main transformer.

Only terminals 1, 2, 3, 4, 9, 10, 11, 12 are used on **TB7980A** thermostats.

CONFIGURATION

TB7980B									
⬮⬮⬮⬮⬮⬮⬮	⬮⬮⬮⬮⬮⬮⬮	⬮⬮⬮⬮⬮⬮⬮	⬮⬮⬮⬮⬮⬮⬮	⬮⬮⬮⬮⬮⬮⬮	⬮⬮⬮⬮⬮⬮⬮	⬮⬮⬮⬮⬮⬮⬮	SP HI	SP L0	
Application	Output 1 type	Output 2 type ^a (Htg only)	Output 3 type (follows Output 1)	Output 3 activation	NSB value	Output 1 min. opening	Maximum setpoint	Minimum setpoint	
0 Internal sensor	0 Cool / 0-10V	0 Not used	0 Not used	0 100%	1 1°C (2°F)	0 0%	Can be set between 35°C (95°F) and "minimum setpoint + 1"	Can be set between 10°C (50°F) and "maximum setpoint - 1"	Shading = Factory Setting
1 Room	1 Heat / 0-10 V	1 SSR 24 VAC	1 SSR 24 VAC	1 10%	2 2°C (4°F)	1 10%			
2 Return	2 Cool / 2-10 V	2 N.C. Valve	2 N.C. Valve	2 20%	3 3°C (6°F)	2 20%			
3 Supply	3 Heat / 2-10 V	3 N.O. Valve	3 N.O. Valve	3 30%	4 4°C (8°F)	3 30%			
4 Auto changeover		4 Mech. relay	4 Mech. relay	4 40%	5 5°C (10°F)	4 40%			
5 Limited cooling		5 SSR 3-32 V	5 Contact	5 50%	6 6°C (12°F)	5 50%	Default value is 35°C (95°F)	Default value is 10°C (50°F)	
		6 SCR 0-10 V		6 60%	7 7°C (14°F)				
		7 Act. 0-10 V		7 70%	8 8°C (16°F)				
		8 Act. / 2-10 V		8 80%	9 9°C (18°F)				
				9 90%					

a. If Output 2 type is set to 0-4, set the SW6 switch to Triac. If the output type is set to 5-8, set the switch to Analog.

TB6980B									
Application	Output 1 type	Output 2 type ^a (Htg only)	Output 3 type (follows Output 1)	Output 3 activation	NSB value	Output 1 min. opening	Output 1 opening time	SP HI Maximum setpoint	SP L0 Minimum setpoint
0 Internal sensor	0 Cool	0 Not used	0 Not used	0 100%	1 1°C (2°F)	0 0%	0 80	Can be set between 35°C (95°F) and "minimum setpoint + 1"	Can be set between 10°C (50°F) and "maximum setpoint - 1"
1 Room	1 Heat	1 SSR 24 VAC	1 SSR 24 VAC	1 10%	2 2°C (4°F)	1 10%	1 90		
2 Return		2 N.C. Valve	2 N.C. Valve	2 20%	3 3°C (6°F)	2 20%	2 100		
3 Supply		3 N.O. Valve	3 N.O. Valve	3 30%	4 4°C (8°F)	3 30%	3 110		
4 Auto changeover		4 Mech. relay	4 Mech. relay	4 40%	5 5°C (10°F)	4 40%	4 120		
5 Limited cooling		5 SSR 3-32 V	5 Contact	5 50%	6 6°C (12°F)	5 50%	5 130	Default value is 35°C (95°F)	Default value is 10°C (50°F)
		6 SCR 0-10 V		6 60%	7 7°C (14°F)		6 140		
		7 Act. 0-10 V		7 70%	8 8°C (16°F)		7 150		
		8 Act. / 2-10 V		8 80%	9 9°C (18°F)		8 160		
				9 90%					

a. If Output 2 type is set to 0-4, set the SW6 switch to Triac. If the output type is set to 5-8, set the switch to Analog.

ORDERING INFORMATION

Model	Description	Output 1	Output 2	Output 3
TB6980A1007	Floating (tri-state)	Floating, heating and cooling	None	None
TB6980B1006	Floating (tri-state)	Floating, heating and cooling	Proportional or two-position, heating	Two-position, heating or cooling, as determined by output 1
TB7980A1006	Proportional (0 or 2-10 VDC)	Proportional, heating and cooling	None	None
TB7980B1005	Proportional (0 or 2-10 VDC)	Proportional, heating and cooling	Proportional or two-position, heating	Two-position, heating and cooling, as determined by output 1

RELATED PRODUCTS

50014156-002
50014157-001

Remote room temperature sensor
Remote duct temperature sensor

THERMOSTATS & CONTROLLERS

HONEYWELL SINGLE- OR MULTI-LOOP STANDALONE CONTROLLER T775 SERIES

DESCRIPTION

Model T775 is a standalone multi-point and multi-loop controller designed for a wide range of applications. The I/O point mix is unit-specific with temperature, humidity, and pressure input models available. Relay or analog output models may be selected as well. Single-loop, two-loop, and reset controllers may be selected, all including a seven-day time clock for output disable or night setback. The relay output controllers have adjustable differential control algorithms. Analog output controllers have adjustable throttling range, proportional plus integral (PI), or proportional, integral, and derivative (PID) control. The backlit display is easy to read, and the menu-driven setup is simple. The **T775** is available in NEMA 1 or NEMA 4X enclosures for the most demanding environments.

FEATURES

- **Standalone controller**
- **Multiple power input (24, 120, or 240 VAC)**
- **Single- or dual-loop models**
- **Throttling range, PI and PID tunable modulating models**
- **Adjustable differential two-position models**
- **Humidity, pressure, and universal input models**
- **Two-position 10A relay model**
- **Analog output 0 or 2 to 10 VDC, 4-20 mA, and 135Ω models**



T775M2048
closed door



T775M2078 open door
with wiring



- **Integral seven-day time clock for night setback or shutdown**
- **Remote night setback or shutdown input**
- **°F or °C temperature display**
- **Daylight savings time compensation**

SPECIFICATIONS

Supply Voltage	24, 120, or 240 VAC, 50/60 Hz	Modulating	0 or 2-10 VDC, 2 kΩ minimum impedance
Supply VA	8 VA maximum at 60 Hz, 10 VA maximum at 50 Hz	Temperature Sensor	4-20 mA, 600Ω maximum impedance Series 90, 135Ω
Display	Backlit digital 2.5" x 1.5", configurable °F or °C	Probe	Included in all T775-A,B,L,M,P,R versions
Operation	6-key, menu-driven, with simple programming lock	Range	50021579-001, 8" leads
Memory	Program is non-volatile; time is retained for 24 hours	Accuracy	-60°F to 270°F (-51° to 132°C)
Clock	12 hour (AM/PM) for night setback/ shutdown, daylight savings time enable/disable	Control Type	±1°F at 77°F
Scheduling	7-day, two events per day	Relay on/off	Model-specific (see I/O configuration table)
Setpoint	Model specific (see I/O configuration table)	Modulating	Differential control, adjustable ±1° to ±150°F
Temperature	-40° to 248°F (-40° to 120°C)	Wiring	PI or PID, with adjustable tuning
Humidity (T775U)	0-100%	Enclosure	Throttling range ±1° to ±150°F
Pressure (T775U)	-500 to 500 psi -30 to 30 inches W.C. -3000 to 3000 Pa or kPa	Color	Derivative and integral times 0 to 3600 seconds
Signal Input	Model-specific (see I/O configuration table)	Mounting	Multiple loops depending on model
Temperature RTD	1.1 k at 77°F, PTC, 2.1 °/°F, Platinum	Operating Temperature	Terminal blocks separated by function
Digital input	1 kΩ at 32°F, 385 curve	Operating Humidity	Plenum rated plastic, UL94V NEMA 1, NEMA 4X versions Hinged cover with
Analog (T775U)	0-10 VDC, 4-20 mA	Dimensions	LCD window Five (1/2") knockouts on four sides
Input Calibration	Temperature offset ±10°F Universal offset ±10% of scale	Weight	Two-tone gray
Signal Output	Model-specific (see I/O configuration table)	Approvals	Surface screw tabs or DIN rail
Relays/tri-state	10A at 24 VAC (resistive), 1/2 hp at 120 VAC 125 VA pilot duty	Warranty	-40° to 140°F (-40° to 60°C)

THERMOSTATS & CONTROLLERS

HONEYWELL SINGLE- OR MULTI-LOOP STANDALONE CONTROLLER

T775 SERIES



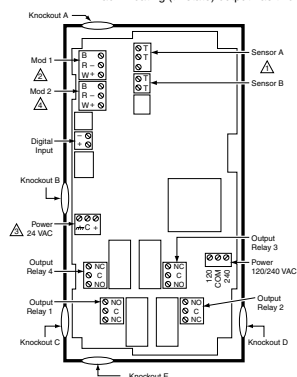
WIRING

TABLE 1. MODEL I/O CONFIGURATION

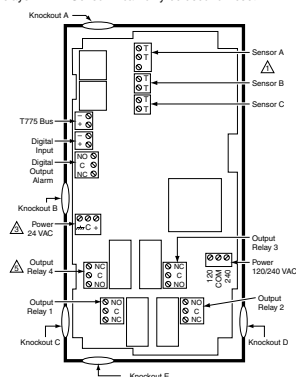
Model	Control Type	Inputs	Outputs	Control Loops	Special Feature	Enclosure	Sensor Included 50021579-001	I/O Legend Description
T775A200	2-Position	1 Temp	1 SPDT	1	Clock NSB	NEMA 1	1	2-Pos Two-position control
T775B20 2	2-Position or Floating*	2 Temp	2 SPDT	2 (1 if Floating)	Clock NSB	NEMA 1	1	Float Floating (tri-state) control
T775B20 0	2-Position or Floating*	2 Temp	4 SPDT	2	Clock NSB	NEMA 1	1	Prop Proportional control
T775B202	2-Position or Floating*	2 Temp	4 SPDT	2	Clock NSB	NEMA 4X	1	Temp Temperature input, RTD
T775M200	Proportional	2 Temp	2 Analog	2	Clock NSB	NEMA 1	1	Univ Universal input
T775M20	Proportional	2 Temp	2 Analog, 2 SPDT	2	Clock NSB	NEMA 1	1	Reset OSA Reset control
T775M2022	Proportional	2 Temp	2 Analog, 2 SPDT	2	Clock NSB	NEMA 4X	1	BLR Boiler special
T775R20 5	2-Position or Floating*	2 Temp	2 SPDT	1 with Reset	Clock with Reset	NEMA 1	2	Seq Sequencer control
T775R20	Proportional, Reset	2 Temp	2 Analog	1 with Reset	Clock with Reset	NEMA 1	2	ALM Alarm relay SPDT
T775R2027	Proportional, 2-Position, Reset	2 Temp	2 Analog, 2 SPDT	1 with Reset	Clock with Reset	NEMA 1	2	Staging Boiler or pump staging
T775R200	2-Position or Floating*	2 Temp	4 SPDT	1 with Reset	Clock with Reset	NEMA 1	2	NSB Night setback function
T775P200	2-Position, Reset, BLR	3 Temp	4 SPDT, 1 ALM	1 with Reset	Staging	NEMA 1	3	
T775L2007	2-Position, Reset, Sequential	2 Temp	4 SPDT	2, 1 with Reset	Multi-stage and Seq	NEMA 1	1	
T775U20	2-Position & Proportional**	1 Temp, 1 Univ	2 Analog, 2 SPDT	2, 1 with Reset	RH, PSI, in W.C.	NEMA 1	None	
T775S200	2-Position	N/A	4 SPDT for sequence expansion on T775(L,P)			NEMA 1	N/A	
T775R20	Proportional, 2-Position, Reset	2 Temp	2 Analog, 4SPDT	1 with Reset	Clock with Reset	NEMA 1	2	

*Each Floating (tri-state) output has two SPDT relays.

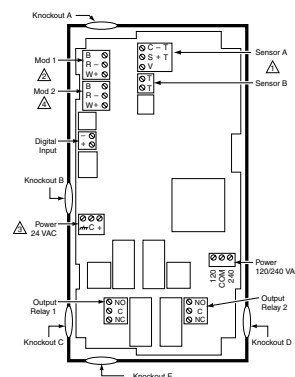
**Sensor B can only be used for reset.



T775A/B/M/R Series 2000 Controller



T775P Series 2000 Controller



T775U Series 2000 Controller

NOTES FOR ALL DIAGRAMS

- △ When used for temperature or 4-20 mA sensing, sensors A and B use the two TT connections and are polarity insensitive.
- △ For Mod 1 and Mod 2 current (mA) or voltage (VDC) output, use signal (+) and common (-). For Mod 1 and Mod 2 Series 90 output, use W, R, and B.
- △ A separate earth ground is required for any power source (24, 120, or 240 VAC).
- △ For Series 90 connections, you must insert a 340Ω resistor across terminals R and W. The resistor is included with the controller.
- △ Relay 4 can be used for pump output. The pump output is always the last relay output.

ORDERING INFORMATION

MODEL

T775A2009	Single loop SPDT controller with one RTD
T775B2016	Single loop floating or twin SPDT controller, NEMA 4
T775B2024	Two-output floating or four SPDT controller, NEMA 4, with one RTD
T775B2032	Single loop floating or two SPDT controller, with one RTD
T775B2040	Two-output floating or four SPDT controller, with one RTD
T775M2006	Two-analog-output proportional controller, with one RTD
T775M2014	Two-output proportional controller with 4 SPDT NEMA 4
T775M2022	Two-output proportional and two-output SPDT controller, NEMA 4, with one RTD
T775M2030	Two-output proportional controller with 4 SPDT
T775M2048	Two-analog-output proportional controller with two SPDT outputs and one RTD
T775R2001	Two-output floating or four-output SPDT reset controller, with two RTDs
T775R2019	Two-output proportional reset controller with four SPDT outputs and two RTDs
T775R2027	Two-output proportional reset controller with two SPDT outputs and two RTDs
T775R2035	One-output floating or two-output SPDT reset controller, with two RTDs
T775R2043	Two-output proportional reset controller, with two RTDs
T775P2003	Four on/off boiler control outputs with reset and three RTDs
T775L2007	Dual loop, Four on/off sequence control outputs (1 loop with reset) and one RTD
T775U2016	Dual loop, Universal input, two proportional outputs, and two SPDT outputs (1 loop with reset)
T775S2008	T775(P,L), four-relay expansion module

RELATED PRODUCTS

50021579-001	Replacement temperature sensor (typically supplied with T775)
C7031D2003	5-inch immersion temperature sensor w/box
C7031J2009	12-foot averaging temperature sensor with wiring box
C7046D1008	8-inch duct temperature sensor w/box
C7130B1009	Room temperature sensor
T775-SENS-WR	Temperature sensor with water-resistant 5-foot leads
T775-SENS-WT	Temperature sensor with water-tight 6-foot leads

THERMOSTATS & CONTROLLERS

MODULAR ELECTRONIC CONTROL SYSTEM SYSTEM 450

DESCRIPTION

The **System 450** from Johnson Controls/PENN is a family of modular digital electronic controllers that is easily assembled and configured to provide reliable temperature, pressure, and humidity control for a wide variety of commercial HVAC and industrial process applications. The **System 450** is designed to replace the System 350 and System 27, and provide many additional features and benefits with a small number of model variations. All of the modules are field configurable out-of-the-box and can monitor and control temperature, pressure and humidity simultaneously.

FEATURES

- **Plug-together connectors and DIN rail or direct wall-mount capability**
- **Multi-purpose, field-configurable, and designed for global use**
- **Backlit LCD and 4-button touch pad user interface**



Johnson
Controls



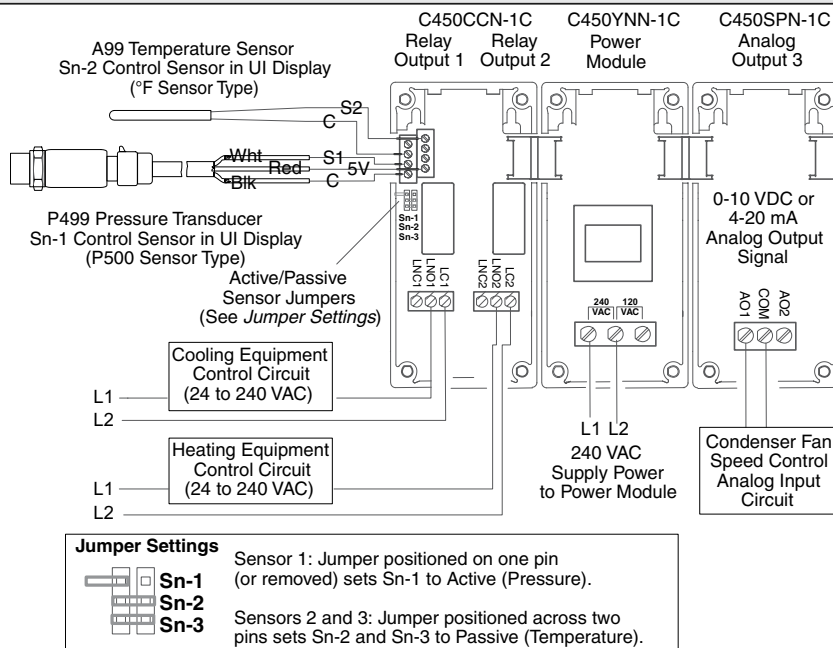
- **Up to 3 inputs and up to 10 outputs allow flexibility in configuring systems from simple to complex**
- **Versatile all-in-one stand-alone control modules provide for scalable digital and/or analog control for temperature, pressure, and humidity**

SPECIFICATIONS

Supply Voltage Power Module	110/120 VAC or 220/240 VAC at 50/60 Hz (100 mA maximum) 24 VAC, 10 VA secondary	Relay Outputs	1/2 HP at 120/240 VAC, SPDT AC Motor Ratings 120 VAC 208/240 VAC AC Full-load Amperes: 9.8A 4.9A AC Locked-Rotor Amperes: 58.8A 29.4A 10A AC Non-inductive at 24/240 VAC Pilot Duty: 125 VA at 24/240 VAC
Control Modules	C450YNN-1 Power Supply Module or 24 (20-30) VAC Safety Extra-Low Voltage (SELV)(Europe) or Class 2 (North America) 50/60 Hz, 10 VA minimum	Mounting	Lexan 950 enclosure suitable for DIN rail mounting or direct surface mount
Supply VA		Operating Temperature	-40° to 150°F (-40° to 66°C) for 0-10 VDC outputs and relay outputs -40 to 104°F (-40° to 40°C) for 4-20 mA outputs
C450CPN-1C	1.3 VA maximum using 0-10V out	Operating Humidity	0 to 95% RH (non-condensing); Maximum Dew Point 29°C (85°F)
C450CQN-1C	1.5 VA maximum using 4-20 mA out	Dimensions	5.0"H x 2.4"W x 2.4"D (12.7 x 6.1 x 6.1 cm)
C450CBN-1C	2.0 VA maximum using 0-10V out	Weight	
C450RBN-1C	2.4 VA maximum using 4-20 mA out	C450CPN-1C	0.43 lb (0.19 kg)
C450CCN-1C	0.9 VA maximum	C450CQN-1C	0.43 lb (0.19 kg)
C450RCN-1C	0.9 VA maximum	C450CBN-1C	0.46 lb (0.21kg)
C450SPN-1C	1.3 VA maximum	C450RBN-1C	0.46 lb (0.21kg)
C450SQN-1C	1.1 VA maximum using 0-10V out	C450CCN-1C	0.49 lb (0.22kg)
C450SBN-1C	1.3 VA maximum using 4-20 mA out	C450RCN-1C	0.49 lb (0.22kg)
C450SCN-1C	1.8 VA maximum using 0-10V out	C450SPN-1C	0.33 lb (0.15 kg)
Input Signal	0.5 VDC for humidity sensors and static pressure transducers; 0.5 to 4.5 VDC for pressure transducers; 1,035Ω at 25°C (77°F) for A99 PTC temperature sensors	C450SQN-1C	0.33 lb (0.15 kg)
Analog Output Voltage Mode (0-10 VDC)	10 VDC maximum output voltage, 10 mA maximum output current requires an external load of 1,000Ω or more. The AO operates in Voltage Mode when connected to devices with impedance greater than 1,000Ω. Devices that fall below 1,000Ω may not operate as intended with Voltage Mode applications.	C450SBN-1C	0.38 lb (0.17 kg)
Current Mode (4-20 mA)	Requires an external load between 0-300Ω. The AO operates in Current Mode when connected to devices with impedance less than 300Ω. Devices that rise above 300Ω may not operate as intended with Current Mode applications.	C450SCN-1C	0.41 lb (0.18 kg)
		C450YNN-1C	0.86 lb (0.39 kg)
		Approvals	
		North America	cULus Listed; UL 60730, File E27734, Vol. 1; FCC Compliant to CFR47, Part 15, Subpart B, Class B Industry Canada (IC) Compliant to Canadian ICES-003, Class B limits
		Europe	CE Compliant; Low Voltage Directive (2006/95/EC); EMC Directive (2004/108/ED); RoHS Directive (2002/95/EC); WEEE Directive (2002/96/EC) Australia C-Tick Compliant (N1813)
		Warranty	3 years



WIRING - EXAMPLE FOR ROOM HEATING AND COOLING WITH CONDENSER FAN SPEED CONTROL (SEE JCI BULLETINS FOR OTHER EXAMPLES)



ORDERING INFORMATION

MODEL

C450CBN-1C
C450CCN-1C
C450CPN-1C
C450CQN-1C
C450RBN-1C
C450RCN-1C
C450SBN-1C
C450SCN-1C
C450SPN-1C
C450SQN-1C
C450YNN-1C

DESCRIPTION

Control module with LCD, 1xSPDT output
Control module with LCD, 2xSPDT outputs
Control module with LCD, 1 analog output
Control module with LCD, 2 analog outputs
Reset control module with LCD, 1xSPDT output
Reset control module with LCD, 2xSPDT outputs
Relay expansion module with 1xSPDT output
Relay expansion module with 2xSPDT outputs
Analog expansion module with 1 analog output
Analog expansion module with 2 analog outputs
Power module, 120 or 240 VAC input

Note: Sensor not included

ACCESSORIES

A99-CLP-1 Mounting clip for A99 temperature sensor
A99BA-200C PTC Sensor with 6.5 ft (2m) shielded cable
A99BB-200C PTC Sensor with 6.5 ft (2m) PVC cable
A99BB-25C PTC Sensor with 9.75 in (0.25m) PVC cable
A99BB-600C PTC Sensor with 19.5 ft (6m) PVC cable
A99BC-1500C PTC Sensor with high temperature 49 ft (15m) silicon cable
A99BC-25C PTC Sensor with high temperature 9.75 in (0.25m) silicon cable
A99BC-300C PTC Sensor with high temperature 9.75 ft (3m) silicon cable
BOX10A-600R PVC enclosure for A99 temperature sensor for outdoors
DPT2650-0R5D-AB Low differential pressure transducer 0 to 0.5 in WC
DPT2650-10D-AB Differential pressure transducer 0 to 10 in WC
HE-67S3-0N00P Duct mount humidity sensor with A99B type temperature sensor
HE-67S3-0N0BT Wall mount humidity sensor with A99B type temperature sensor
P499RCP-101K Electronic pressure transducer 0-100 psi
P499RCP-105K Electronic pressure transducer 0-500 psi
P499RCP-107K Electronic pressure transducer 0-750 psi
SHL10A-603R Sun shield for A99 sensor for outdoor sunny locations
TE-6001-1 Duct temperature element holder with box
WEL11A-601R Immersion well for A99 sensor for fluid temperature liquid sensing

PAGE

1391

ECONOMIZER ZIP ECONOMIZER SERIES

DESCRIPTION

The **ZIP Economizer** saves energy in buildings by using cool outside air as a means of cooling the indoor space. This application can drastically reduce HVAC energy costs while also improving air quality. The **ZIP** has easy plug and play features and by adding the different modules available in the series you can conveniently control many aspects of the space including temperature and humidity as well as remote alarm indication. The **ZIP** base unit offers an extended temperature transfective LCD display, with on board help, providing information throughout the entire set up. The base unit is designed to provide most common economizer functions such as two stages of mechanical cooling, intergrated cooling, four chage over strategies for free cooling and damper position feedback. One of the unique features on the **ZIP Economizer** is the patented **ZIP** code set up function which will automatically find your location once entered to maximize energy savings for your location and also make you compliant with the local energy codes.

FEATURES

- *Plug and play self-configuring*
- *Patented zip code recognition*
- *Easy to read LCD display*
- *Alarm notification*
- *Expandable modules available*
- *Onboard help and troubleshooting*
- *TH module CE 2004/108/EC*

NEW!




ECON-ZIP-BASE



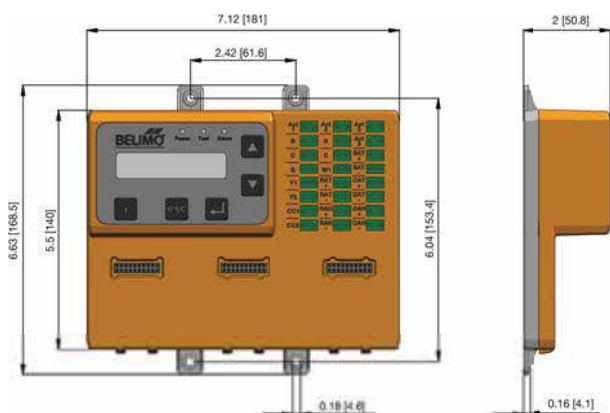
SPECIFICATIONS

Supply Voltage	24 VAC $\pm 20\%$, 50/60Hz, Class 2 power source	Software Class	
Operating Temperature		ECON-ZIP-TH	A
ECON-ZIP-TH Only	-40° to 140°F (-40° to 60°C)	Control Pollution Degree	
All Other Models	-40° to 158°F (-40° to 70°C)	ECON-ZIP-TH	3
Operating Humidity		Temperature Sensor Type	
ECON-ZIP-TH Only	0 to 100% RH	ECON-ZIP-TH	NTC 10kOhm
All Other Models	5 to 95% RH non-condensing	Humidity Sensor Type	
Connectors	1/4" male spade connectors	ECON-ZIP-TH	0-10 VDC (0 to 100% RH) max load 10kOhm, Class 2 limited energy
Power Consumption Rating*		Accuracy	
ECON-ZIP-BASE	Shown on next page with full technical specifications	ECON-ZIP-TH	$\pm 3\%$ 35-65% rH @ 75°F (23.9°C) $\pm 5\%$ 0-34%, 66-100% rH @ 75°F (23.9°C) Response Time: Less than 45 seconds @ 40 FPM, 75°F (23.9°C) Hysteresis: Less than 2.5% rH Long Term Stability: Less than 1% rH/year
ECON-ZIP-COM	2.5 VA (ECON-ZIP-COM), 6.5 VA (ECON-ZIP-BASE + ECON-ZIP-COM)	Approvals	
ECON-ZIP-EM	1.5 VA (ECON-ZIP-EM), 5.5 VA (ECON-ZIP-BASE + ECON-ZIP-EM)	ECON-ZIP-TH Only	UL60730-1, -2-9 and -2-13. UL2043 compliant, CE 2004/108/EC "Electromagnetic compatibility (EMC)", EN60730-1, -2-9 and -2-13 cULus acc. to UL873, CAN/CSA C22.2, No. 24-93
Communication Interface		All Other Models	
ECON-ZIP-COM	RS485 Interface, Optical Isolation max. 1k VDC (for max.1 min), Pin 4: RS485 Com Gnd, Pin 7: RS485 Com A, Pin 8: RS485 Com B	Suitable Actuators	
Supported Remote Alarm		ECON-ZIP-BASE	AFB24-SR, NFB24-SR, LF24-SR, TFB24-SR
ECON-ZIP-COM	Normal Current: 0.5A, Inrush Current: 1A	Housing	NEMA 1
Indoor Fan Speed Selection		Housing Material	UL94-5VA
ECON-ZIP-EM	100,000 cycles @ inrush current of 3A, normal current 1.5A	RoHS	Conformally coated
Exhaust Fan Selection		Weight	
ECON-ZIP-EM	100,000 cycles @ inrush current of 3A, normal current 1.5A	ECON-ZIP-BASE	1 lb (0.45 kg)
Supported CO2 Sensor		All Others	8 oz (0.22 kg)
ECON-ZIP-EM	0-10 VDC, Sensor auto-detection	Warranty	5 years
Auxiliary Input -Purge Contact			
ECON-ZIP-EM	On/Off - 24 VAC, 50/60HZ - Current Load min 10mA		
Auxiliary Input -Remote Potentiometer			
ECON-ZIP-EM	2-10 VDC		
Current Consumption			
ECON-ZIP-TH	Max. 5mA		
Rated Impulse Voltage			
ECON-ZIP-TH	800V		

*The power consumption is for the control only and does not include connected loads such as actuator, compressors, fans, and sensors. For transformer sizing, the power consumption of these attached components must be included.



DIMENSIONS - ECON-ZIP-BASE



ZIP Economizer™ Base Unit

TECHNICAL DATA - ECON-ZIP-BASE

Power Supply	24 VAC ± 20%, 50/60 Hz; Class 2 power source
Power Consumption Rating*	4 VA Base Control (ECON-ZIP-BASE)*
	5.5 VA Base Control with Energy Module (ECON-ZIP-BASE + ECON-ZIP-EM)
	5 VA Base Control with Communication Module (ECON-ZIP-BASE + ECON-ZIP-COM)*
	6.5 VA Base with Energy Module and Communication Module
Rated Impulse Voltage	330V
Connectors	1/4" male spade connectors
Environmental	RoHS, Conformally Coated
Software Class	A
Control Pollution Degree	3
Temperature Input Signal	NTC 10kOhm
Humidity	5 to 95% RH non-condensing
Humidity Input Signal	0-10 VDC; corresponds to 0 to 100%
Housing	NEMA 1
Housing Material	UL94-5VA
Ambient Temperature Range	-40°F to +158°F (-40°C to +70°C)
Storage Temperature Range	-40°F to +176°F (-40°C to +80°C)
Display	2x16 character LCD; LED backlight; transfective
Display Op. Range**	-22°F to +176°F (-30°C to +80°C)
Agency Listing	cULus acc. to UL873, CAN/CSA C22.2, No. 24-93
Energy Code Compliant	ASHRAE 90.1, CA Title 24, NECB

I/O SPECIFICATIONS - ECON-ZIP-BASE

Type	Name	Description	Electrical Specification
Input	R	Supply Hot	24 VAC, ± 20%, 50/60Hz
Input	G	Fan Signal (occupied)	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	C	Supply Common	Common
Input	Y	Cooling requirement Stage 1	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	Y2	Cooling requirement Stage 2	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	W	Heating requirement Stage 1	On/Off, 24 VAC, ± 20%, 50/60Hz
Input	SAT ±	Supply Air Temperature Sensor	Type: 10K NTC (Type II thermistor)
Input	OAT ±	Outdoor Air Temperature	Type: 10K NTC (Type II thermistor)
Input	OAH ±	Outdoor Air Humidity	0-10 VDC Auto Detection: Sensor present if voltage 0.5V-10V
Input	RAT ±	Return Air Temperature	Type: 10K NTC (Type II thermistor)
Input	RAH ±	Return Air Humidity	0-10 VDC Auto Detection: Sensor present if voltage 0.5V-10V
Output	CC1	Compressor 1 RTU Stage 1 Mechanical Cooling Circuitry	100,000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @ 24 V: <600 Ohm @ 60Hz <800 Ohm @ 50Hz
Output	CC2	Compressor 2 RTU Stage 2 Mechanical Cooling Circuitry	100,000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @ 24 V: <600 Ohm @ 60Hz <800 Ohm @ 50Hz
Output	Act 1	Actuator supply common	Common
Output	Act 2	Actuator supply hot	24 VAC, 50/60Hz
Output	Act 3	Actuator control output	2-10 VDC
Input	Act 5	Actuator feedback signal	2-10 VDC

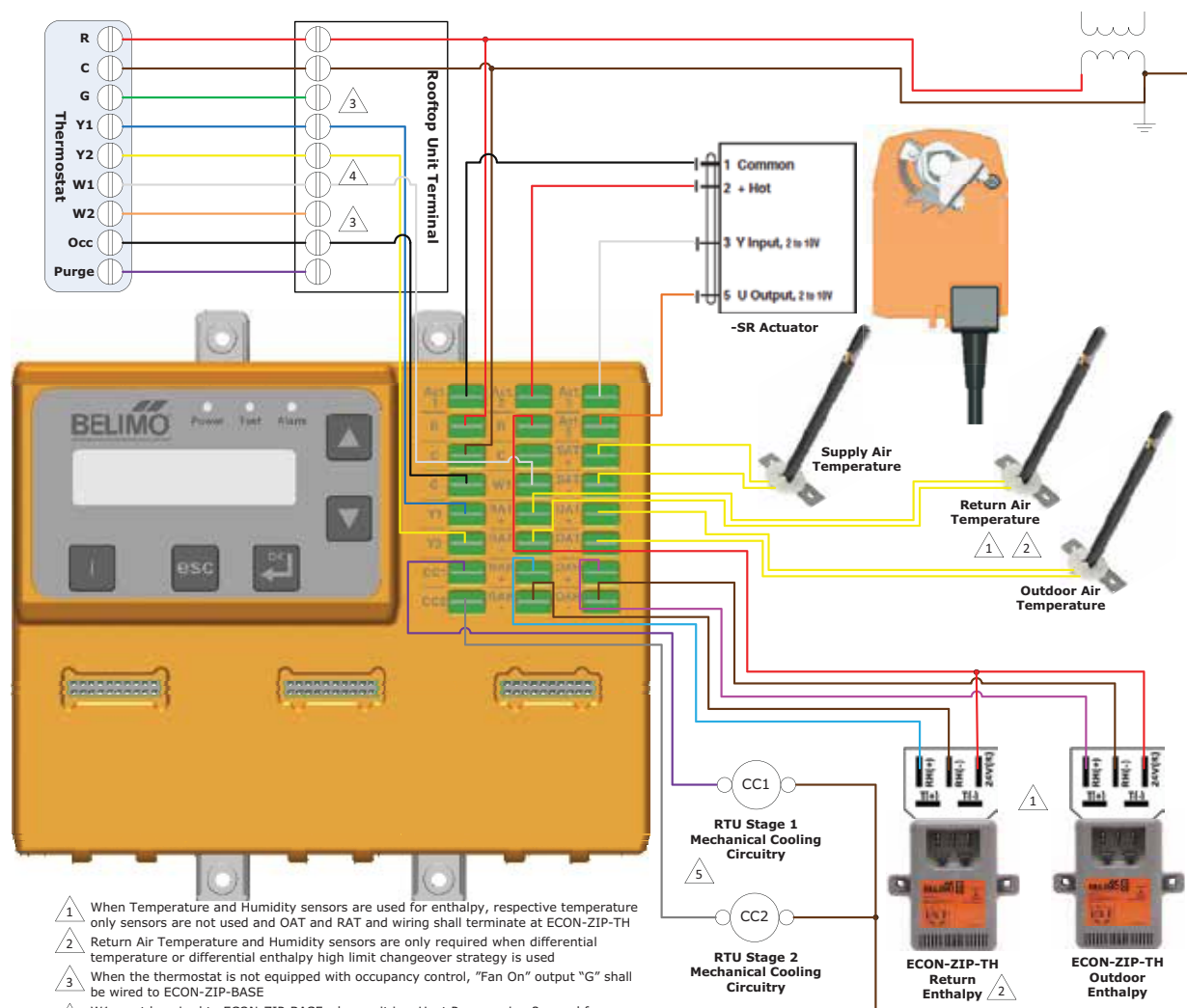
The power consumption is for the control only and does not include connected loads such as actuator, compressors, fans, and sensors. For transformer sizing, the power consumption of these attached components must be included.

*At low temperature, the display has decreased response time, below -22°F (-30°C) it will not function."

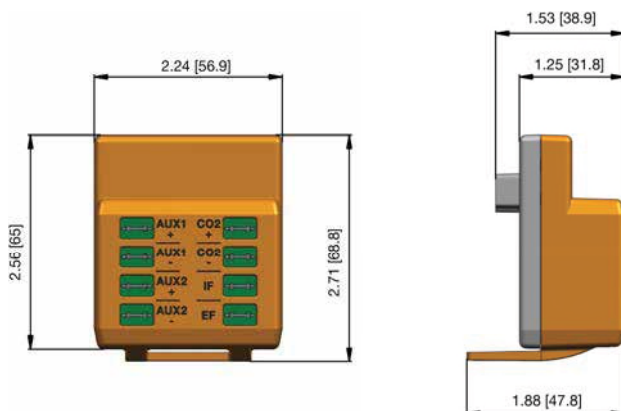
THERMOSTATS & CONTROLLERS

ECONOMIZER ZIP ECONOMIZER SERIES

WIRING - ECON-ZIP-BASE



DIMENSIONS - ECON-ZIP-EM

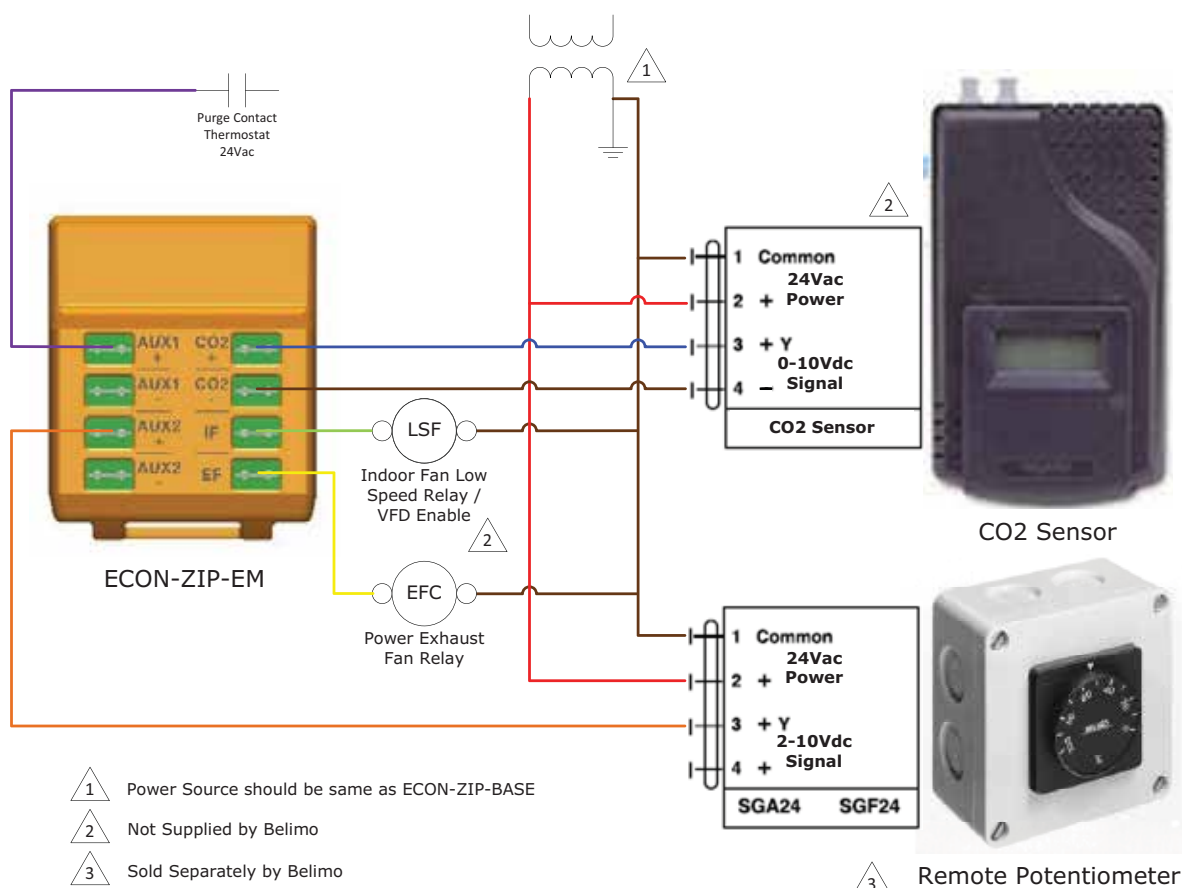


ZIP Economizer™ Communication Module

I/O SPECIFICATIONS - ECON-ZIP-EM

Type	Name	Description	Electrical Specification
Input	CO2 ±	CO2 sensor input	0-10 VDC (0-2000 ppm) Sensor auto-detection
Output	IF	Indoor fan low speed enable	100,000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @24 V: <600 Ohm @ 60Hz <800 Ohm @ 50Hz
Output	EF	Exhaust fan enable	100,000 cycles @ inrush current of 3A, normal current 1.5A Impedance for Auto detection @ 24 V: <600 Ohm @ 60Hz <800 Ohm @ 50Hz
Input	AUX1 ±	Auxiliary input Purge contact input	On/Off, 24 VAC, 50/60 Hz Current load min. 10mA
Input	AUX2 ±	Auxiliary input Remote Potentiometer Input	2-10 VDC

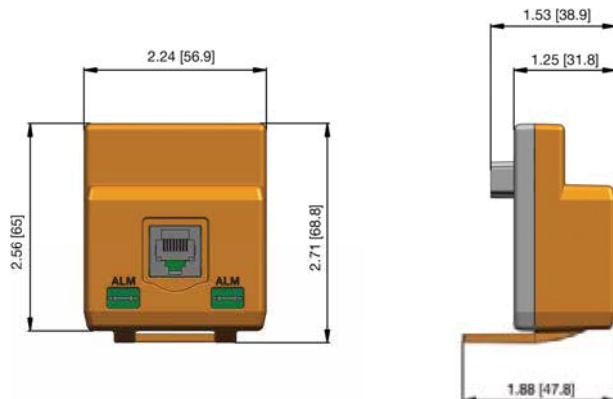
WIRING - ECON-ZIP-EM



THERMOSTATS & CONTROLLERS

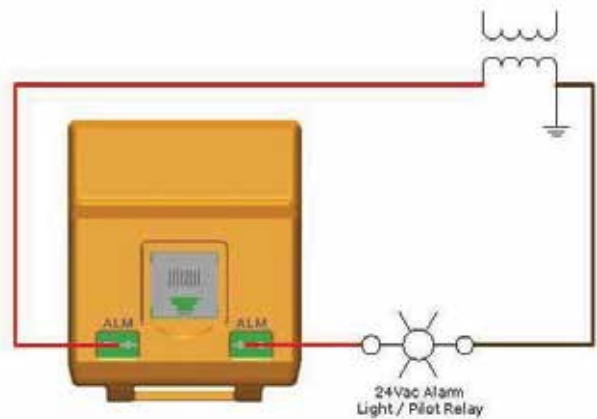
ECONOMIZER ZIP ECONOMIZER SERIES

DIMENSIONS - ECON-ZIP-COM

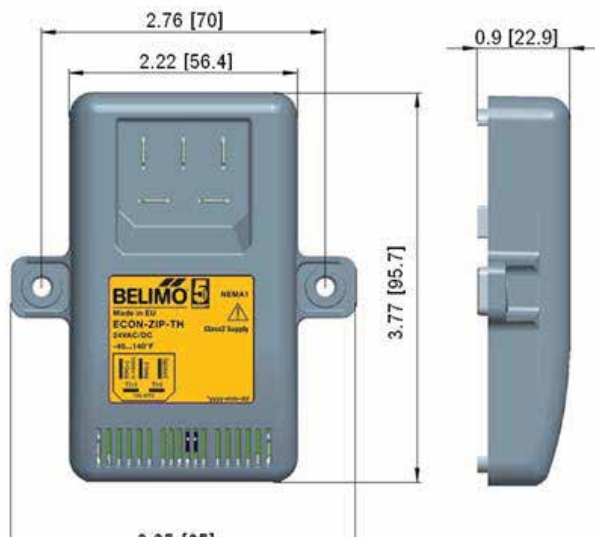


ZIP Economizer™ Communication Module

WIRING - ECON-ZIP-COM

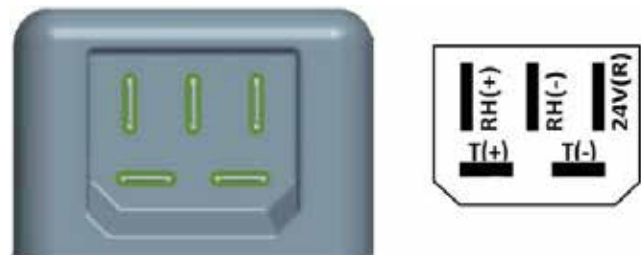


DIMENSIONS - ECON-ZIP-TH



ZIP Economizer™ Temperature & Humidity Sensor

WIRING - ECON-ZIP-TH



ORDERING INFORMATION

MODEL	DESCRIPTION
ECON-ZIP-BASE	Economizer module
ECON-ZIP-COM	Economizer communication module (plug-in)
ECON-ZIP-EM	Economizer energy module (plug-in)
ECON-ZIP-10K	Economizer temperature sensor (plug-in)
ECON-ZIP-TH	Economizer temperature and humidity sensor module (plug-in)



DESCRIPTION

The new **Model PXR4** Set Point Controller is one of the most technically advanced instruments in the industrial and commercial markets today. It is also one of the least expensive controllers of its kind. Through the use of a specially designed Fuji microprocessor, the **Model PXR4** incorporates the latest technology for controlling applications. With simple, finger-tip programming from the front panel, the operator can tailor the operation of the controller quickly and easily. By automatically setting proportional band, integral (reset) time, and derivative (rate) time by means of the autotuning function, control parameter guesswork is eliminated. In addition, this controller employs Fuji's patented fuzzy logic algorithms. The **Model PXR4** can learn processes, using the PID parameters as a starting point. This intelligence allows your process to reach its set point in the shortest time possible while virtually eliminating overshoot.



PXR4



PXR4 Controls



FEATURES

- Any type single-loop control application
- Input 4-20 mA, 1-5 VDC; Output 4-20 mA
- PID control or fuzzy logic control
- Manual or autotuning
- Programmable control action, reverse or direct
- LED indication of the process variable and setpoint
- Output status indication
- Fault indication of input sensor

- Selectable indication resolution
- Digital filtering to suppress electrical noise
- Easily programmed with two-level, menu-driven format
- Nonvolatile memory, no battery required
- 1/16 DIN package
- NEMA 4X faceplate

SPECIFICATIONS

Supply Voltage	100-240 VAC, 50/60 Hz	Noise Reduction	
Supply VA	10 VA at 120 VAC	Normal Mode	(50/60 Hz), 50 dB or more
Input		Common Mode	(50/60 Hz), 140 dB or more
Current	4-20 mA DC, impedance: 250Ω with external resistor	Termination	8-pin socket
Voltage	1-5 VDC, impedance: 450 kΩ minimum	Enclosure	ABS plastic, black, 1/16 DIN NEMA 4X front panel
Input Scaling Range	-1999 to 9999	Mounting	Flush panel or surface mount
Input Sampling Cycle	0.5 seconds	Operating Temperature	14° to 122°F (-10° to 50°C)
Input Filter	0-900.0 seconds in 0.5 second step	Operating Humidity	0 to 90% RH (non-condensing)
Output		Dimensions	
Current	4-20 mA DC, 600Ω maximum	SR2P-056	1.89" x 1.89" x 3.33" (4.8 x 4.8 x 8.47 cm)
Control Type	PID control or fuzzy logic control, manual or autotuning	Weight	0.5 lb (0.23 kg)
Proportional Band	0% to 999.9% in 0.1% steps	Approvals	UL Listed File #E131280, CE certified
Integral Time	0-3200 seconds in 1-second steps	Warranty	1 year
Derivative Time	0-999.9 seconds in 1-second steps		
Action	Direct or reverse, programmable		
Indication Accuracy	±0.5% full scale ±1 digit at 73°F		
Memory	Nonvolatile, no battery required		
Diagnostics	Monitored by watchdog timer		



THERMOSTATS & CONTROLLERS

SETPOINT CONTROLLER

PXR4

APPLICATION

INPUT

Scalable 4-20 mA/1-5 VDC input allows monitoring of the following:

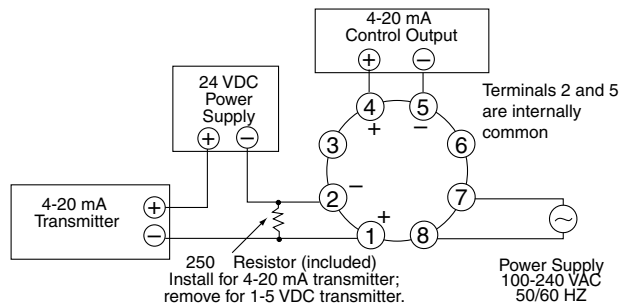
- Temperature
- Humidity
- Pressure
- Air flow
- Water flow
- Any 4-20 mA/1-5 VDC transmitter within a range of -1999 to 9999

OUTPUT

4-20 mA output allows control of the following:

- Valve actuators
- Damper actuators
- Variable speed drives
- Resistance transducers
- I/P transducers
- Step controllers

WIRING



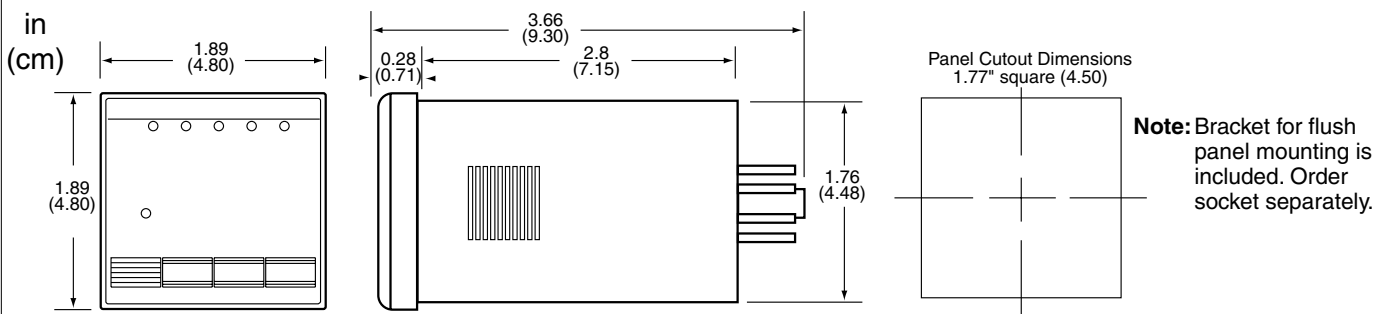
INSTALLATION

The controller should be installed as far away as possible from any device generating high frequency noise. Input signal and power cables connected to the instrument should be wired away from power line and load line to minimize inductive noise. Preferably, the instrument power cable should be twisted to avoid noise.

The following guidelines for location should also be observed:

1. Do not install in a location with corrosive gases (sulfuric gas, ammonia, etc.)
2. Do not install in a location subject to vibration, impact, water, or high temperatures.

DIMENSIONS



ORDERING INFORMATION

MODEL
PXR4
SR2P-06
ATXINS

DESCRIPTION

Setpoint controller, 100 to 240 VAC power
Relay socket, DPDT pin type, DIN/surface mount
Hooded solder-type socket for flush panel mount

THERMOSTATS & CONTROLLERS

SCR POWER CONTROLLER R820 SERIES



DESCRIPTION

The **R820 Series SCR** (Silicon Control Rectifier) controllers provide cost effective modulation of electric loads using industry standard proportional control signals from thermostats or building automation systems. The **R820 Series** incorporates a compact control board mounted to a multi-fin, anodized heat sink with an exceptionally high heat dissipation rate. Models are available in single phase or 3-phase and can control loads up to 600V.

FEATURES

- **Compact, microprocessor-based controller saves space in control panels**
- **Integrated, self-resetting thermostatic protection increases safety**
- **Multi-input control signal maximizes application and system flexibility**
- **Integral heat sink minimizes installation time and wiring costs**
- **Status LED confirms proper operation**



R820



SPECIFICATIONS

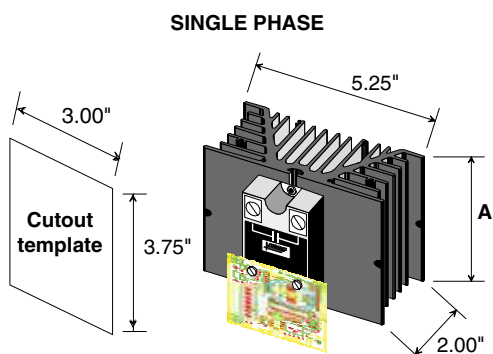
Supply Voltage	24 VAC, +10%/-15%, 50/60 Hz;
Supply VA	2 VA Use Class 1 (properly fused) or Class 2, CSA or UL recognized transformer
Input Signal	0-10 VDC (2-10 VDC control range), 4-20 mA, 0-135 Ω , dip switch selectable low signal = no heat high signal = full heat
Input Impedance	
Voltage	10K Ω
Current	250 Ω
Thermostatic Protection	Cuts off at rise to 180°F (82°C), self-resetting
Operating Temperature	32° to 95°F (0° to 35°C), full rating, amperage de-rated up to 175°F (80°C)
Operating Humidity	0 to 95% RH (non-condensing)
Approvals	CSA; UL, File #E191074
Warranty	1 year

DIMENSIONS

R820 Single Phase	A	Weight (LBS)
R820-211	4.5"	1.80
R820-321	4.5"	1.80
R820-341	6.5"	2.40
R820-421	4.5"	1.80
R820-441	6.5"	2.40
R820-471	10.0"	3.50
R820-621	4.5"	1.80
R820-641	6.5"	2.40
R820-671	10.0"	3.50

R820 Three Phase	A	Weight (LBS)
R820-213	6.5"	2.60
R820-323	10.0"	3.70
R820-343	10.0"	3.70
R820-423	6.5"	2.65
R820-443	10.0"	3.70
R820-623	6.5"	2.65
R820-643	10.0"	3.70

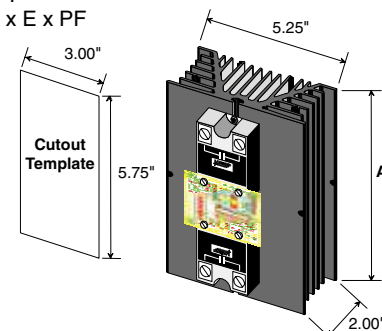
DIMENSIONS



Amp Calculation

Single Phase $kW \times 1000/E \times PF$
 Three Phase $kW \times 1000/1.73 \times E \times PF$

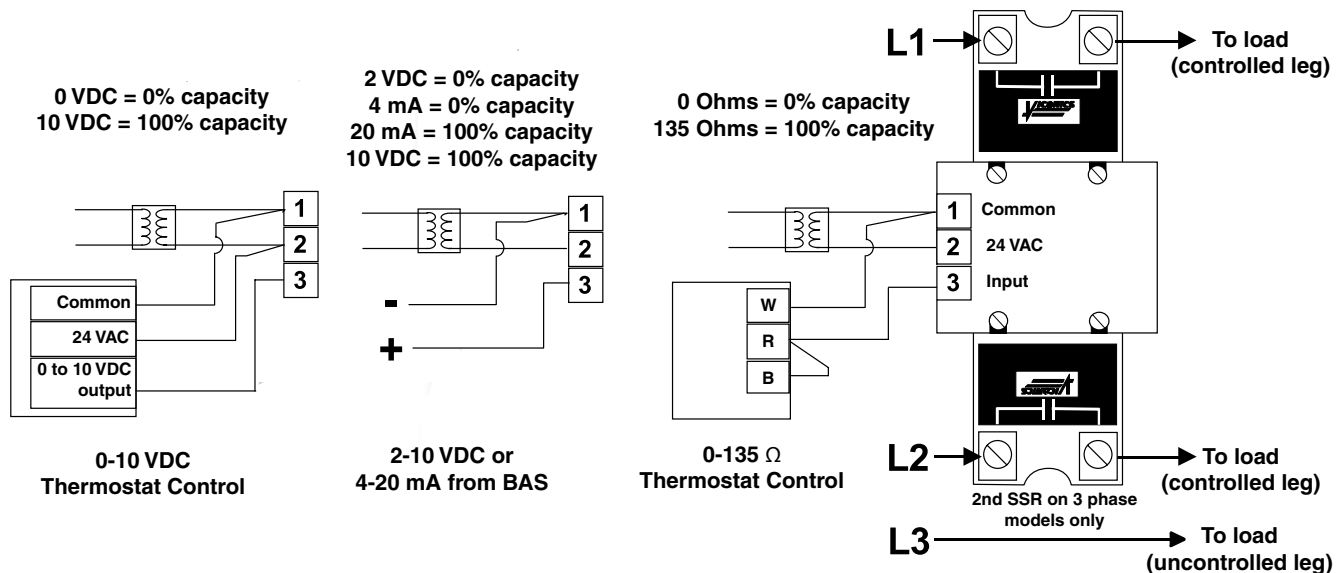
E = Voltage
 PF = Power factor



SCR POWER CONTROLLER R820 SERIES

WIRING

INPUT SIGNAL	SWITCH #1	SWITCH #2	SWITCH #3	SWITCH #4
0 to 10 VDC control signal (2 to 10 VDC control range)	Off	Off	Off	On
4 to 20 mA control signal	Off	Off	On	Off
0 to 135 Ω control signal	On	On	Off	Off



CAUTION: HIGH VOLTAGE WIRING - High voltages are present at the terminals of these devices; follow the installation instructions carefully. All wiring must conform with national and local electrical codes.

ORDERING INFORMATION

MODEL	DESCRIPTION
021-0474	Replacement circuit board
R820-211	SCR power controller 240V, 10A, single phase
R820-213	SCR power controller, 240V, 10A, 3 phase
R820-321	SCR power controller 347V, 25A, single phase
R820-323	SCR power controller 347V, 25A, 3 phase
R820-341	SCR power controller 347V, 45A, single phase
R820-343	SCR power controller 347V, 45A, 3 phase
R820-421	SCR power controller 480V, 25A, single phase
R820-423	SCR power controller 480V, 25A, 3 phase
R820-441	SCR power controller 480V, 45A, single phase
R820-443	SCR power controller 480V, 45A, 3 phase
R820-471	SCR power controller 480V, 75A, single phase
R820-621	SCR power controller 600V, 25A, single phase
R820-623	SCR power controller 600V, 25A, 3 phase
R820-641	SCR power controller 600V, 45A, single phase
R820-643	SCR power controller 600V, 45A, 3 phase
R820-671	SCR power controller 600V, 75A, single phase

ACCESSORIES

021-0474	Replacement circuit board
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DESCRIPTION

The **Model UCM-420A** is a low cost microprocessor-based Proportional plus Integral (PI) controller that may be used for a wide variety of control applications. All setup and programming is done by DIP switches and bottle plug jumpers on the **Model UCM-420A**. Set points may be local and/or remote. The output may be direct- or reverse-acting.

FEATURES

- **PI control**
- **DIP switch/jumper programming**
- **Selectable throttling range**
- **Selectable integral reset rate**
- **Direct or reverse-acting**
- **Setpoint potentiometer on unit**
- **Optional DIN rail mounting**
- **Optional setpoint potentiometer with stainless steel wall plate (UCM-SPA)**

Kele



UCM-420A



UCM-SPA-50-90F



MODES OF OPERATION

Setpoint Controller

The **UCM-420A** input monitors the process being controlled. This input may be a 4-20 mA or 1-5 VDC signal from a pressure sensor, flow transmitter, temperature sensor, etc., or an input from a Precon Type III temperature thermistor. Then, the **UCM-420A** provides a 4-20 mA PI output signal to control a valve, VFD, damper, etc., based on a setpoint as described below.

1. **Local setpoint controller-** The potentiometer mounted on the unit may be used to control the setpoint. The local setpoint may also be a UCM-SPA setpoint potentiometer, the setpoint option of a Precon Model ST-S3EXA temperature sensor, a 4-20 mA signal, or a 1-5 VDC signal.
2. **Remote setpoint controller-** In this mode, the setpoint signal may be a 4-20 mA, 1-5 VDC, or time-based pulse-width signal from a BAS controller.
3. **Remote setpoint controller with local adjustment-** The **UCM-420A** accepts a remote setpoint signal as described above in #2. Then, a local setpoint signal, as described in

#1, may be used to adjust the setpoint. The local setpoint will have authority to adjust the setpoint $\pm 12.5\%$ of the input range. If the local setpoint is from a Precon ST-S3E-XA, it will have authority to adjust the setpoint $\pm 9.4\%$ of the input range.

Sample and Hold

The **UCM-420A** may be used to monitor a 4-20 mA or 1-5V control signal. If the signal being monitored is lost, the **UCM-420A** will hold the last valid value for the signal until the signal returns.

Pulse Width to 4-20 mA Converter

The **UCM-420A** may be used to convert a time-based pulse-width AC or DC signal to a 4-20 mA output.

4-20 mA Signal Generator

If the device to be controlled by the **UCM-420A** needs to be calibrated before the system is started up, the **UCM-420A** may be used to generate a 4-20 mA output in one mA increments.

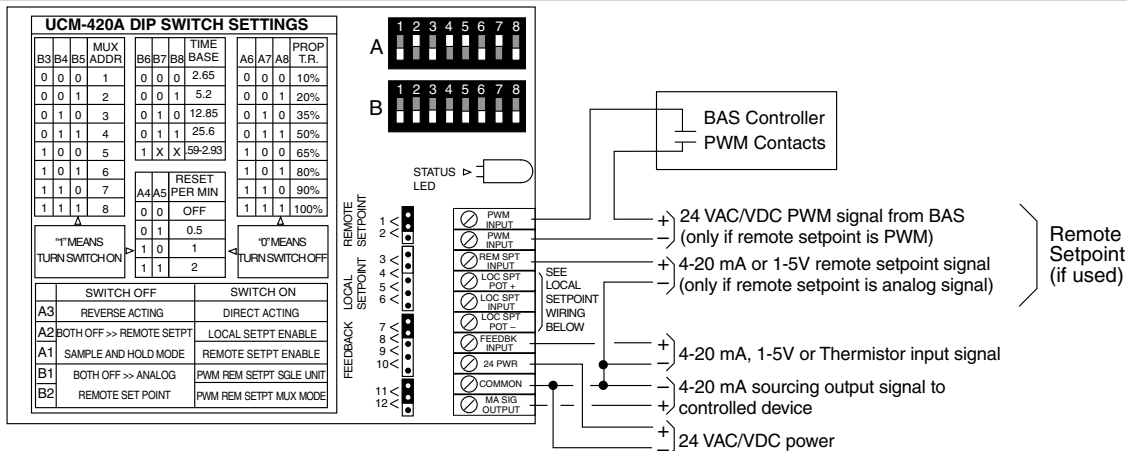
SPECIFICATIONS

Supply Voltage	24 VAC/VDC $\pm 10\%$	LED Status	
Supply Current	130 mA maximum @ 24 VAC, 65 mA maximum @ 24 VDC	Green	Power
Remote Setpoint Input	4-20 mA, 1-5 VDC, PWM	Red	PWM output
Local Setpoint Input	4-20 mA, 1-5 VDC, three-wire potentiometer or PreCon two-wire potentiometer (ST-S3E-XA)	Accuracy	$\pm 1\%$
PWM Time Base	0.1-2.65, 5.2, 12.85, 25.6, or 0.59-2.93 sec	Remote Setpoint Potentiometer	UCM-SPA 0-10k Ω
Analog Output	4-20 mA sourcing	Enclosure	UL94V-0
Output Resolution	255 steps	Operating Temperature	32° to 158°F (0° to 70°C)
Output Burden	650 Ω maximum	Operating Humidity	5 to 95% (non-condensing)
Input	4-20 mA, 1-5 VDC or PreCon Type III thermistor (thermistor range 50° to 90°F)	Weight	
Input Impedance	250 Ω (mA signal), 10 k (voltage signal)	UCM-420A	1.3 lb (0.61 kg)
		UCM-SPA	0.75 lb (0.34 kg)
		RoHS Statement	Yes
		Warranty	18 months

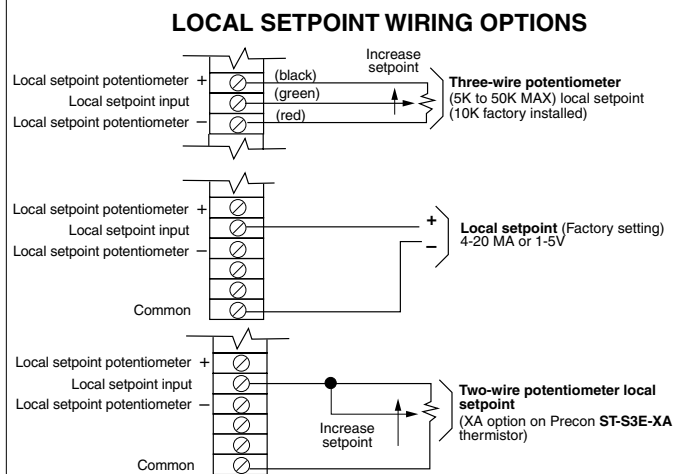
SETPOINT CONTROLLER

UCM-420A

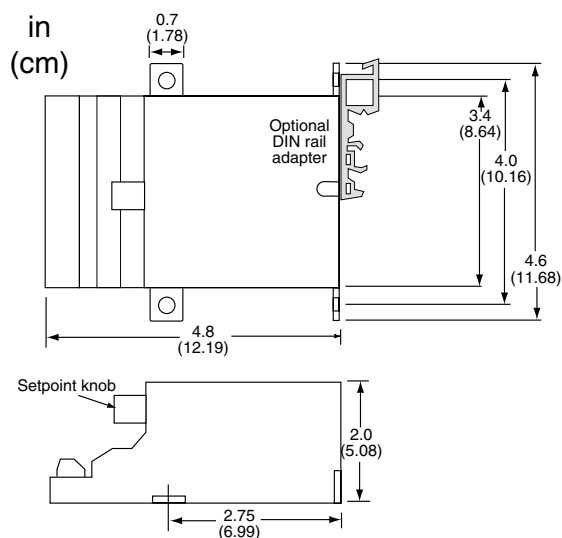
WIRING



LOCAL SET POINT WIRING OPTIONS



DIMENSIONS



ORDERING INFORMATION

MODEL	DESCRIPTION
UCM-420A	Setpoint controller with local setpoint potentiometer
OPTIONS	
47	DIN rail mount (must be factory installed)

UCM-420A - 47 Example: UCM-420A-47 Setpoint controller with DIN rail mounting

RELATED PRODUCTS

UCM-SPA

Setpoint potentiometer, 0-10 kΩ, three-wire potentiometer on stainless steel plate for remote mounting, 0-100% setpoint

UCM-SPA-50-90F

Setpoint potentiometer for 50° to 90°F

UCM-SPA-C

Custom range setpoint potentiometer (specify at time of order, must match range of device wired to feedback input)

DESCRIPTION

The **Model RTC-2P** Room Thermostat Proportional Controller features two proportional outputs (heating and cooling). The proportional plus Integral (PI) control is suitable for pressure dependent VAV box control, as well as fan coil, baseboard, or air handler applications. The occupant controls include a digital display and buttons for setpoint adjustment and night setback/setup override. The **Model RTC-2P** comes with a remote setback input for use with BAS systems and a changeover input for one-pipe system applications. Field setup is through push buttons with adjustments for setback temperatures, deadband, and °F or °C display.



RTC-2P



FEATURES

- *Digital display for °F or °C*
- *Set point adjustment buttons*
- *Night setback manual button or clock input*
- *Remote sensor input*
- *Changeover input*
- *Two proportional outputs heating and cooling*
- *PI control algorithm*
- *0-10V or 2-10V outputs*

APPLICATION

The stand-alone **Model RTC-2P** is ideal for use when a central temperature control system may not be possible. Applications include any pressure-dependent VAV box control. The H/C output can also be used for modulating control of room-based discharge air, fan coil valves, or baseboard heat.

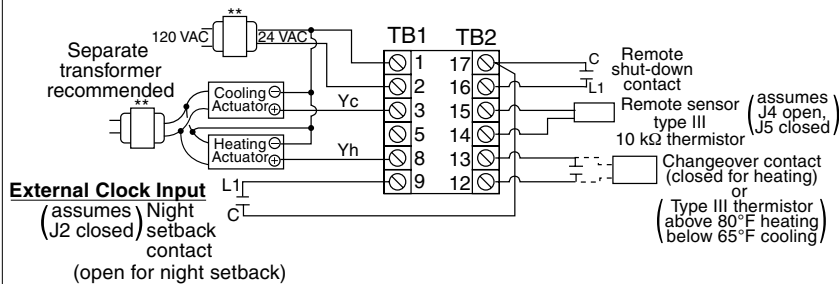
SPECIFICATIONS

Supply Voltage	24 VAC ±20%, 50/60 Hz	Display	0.35" (0.89 cm), two-digit LCD
Supply VA	3 VA	Proportional Band	
Outputs	Proportional, 2-10V standard, 0-10V configurable (install 42K resistor in R14/R15)	Cooling	1.8°F (1.0°C)
Control Inputs	PI algorithm	Heating	2.7°F (1.5°C)
Remote sensor	10K Type III thermistor	Reset Integral Time	15 minutes
Changeover	Contact or thermistor, Type III	Changeover	Contact or 80°F (26.6°C) with a Type III thermistor
Setback	Isolated 24V contact	Deadband	-1.8° to 9.0°F (-1.0° to 5.0°C)
Shutdown	Isolated 24V contact	Dimensions	4.0"H x 4.9"W x 1.2"D (12.45 x 10.16 x 3.05 cm)
Controls	Setpoint buttons up/down, Setback-enable button or 30 minute override	Weight	0.45 lb (0.2 kg)
Range	40° to 90°F (4° to 32°C)	RoHS Statement	Yes
		Warranty	1 year

PROPORTIONAL ROOM THERMOSTAT

RTC-2P

WIRING



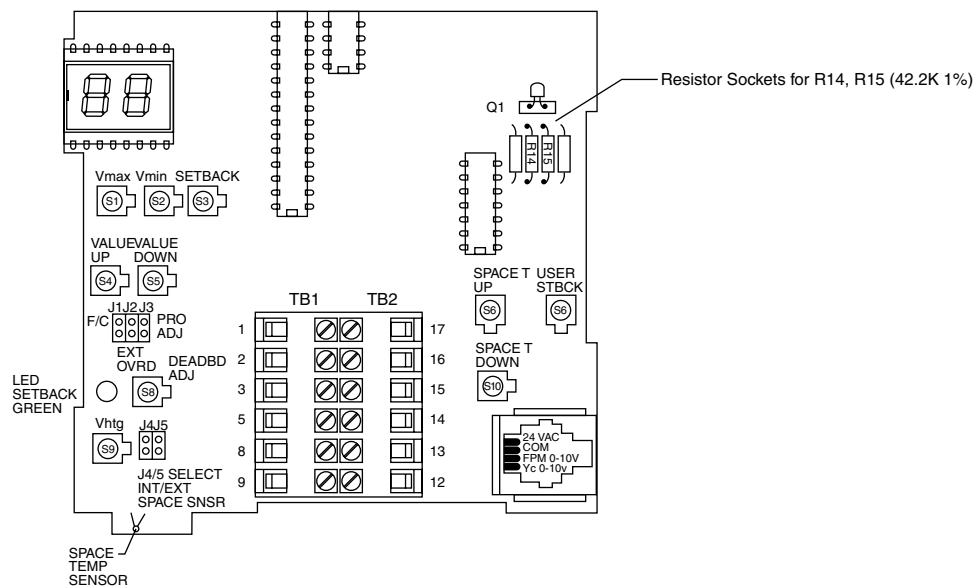
* 0-10 VDC or 2-10 VDC selectable.
Install 42 k Ω resistor across R14/R15 for 0-10 VDC output.
** If one common transformer is used, the actuators must use 1/2 wave rectified power, and polarity must be observed.

TERMINALS

TB1-1 = Common	TB2-17 = Common
TB1-2 = Hot 24 VAC**	TB2-16 = Remote shut off
TB1-3 = Cooling 0-10V*	TB2-15 = Remote space sensor
TB1-5 = N/C	TB2-14 = Remote space sensor
TB1-8 = Heating 0-10V*	TB2-13 = Heat/Cool changeover
TB1-9 = Setback, remote	TB2-12 = Heat/Cool changeover

(TB1-1 and TB2-17 are connected internally)
(42 k Ω Resistor provided)

BOARD LAYOUT



ORDERING INFORMATION

MODEL
RTC-2P

DESCRIPTION

Room temperature controller, two-output H/C proportional thermostat

ST-R3S
ST-S3E
ST-U3

RELATED PRODUCTS

Pipe strap-on sensor 10K Ω Type III thermistor
Room sensor 10K Ω Type III thermistor
Universal duct and immersion sensor 10K Ω Type III thermistor

PAGE
1253
1171
1228

THERMOSTATS & CONTROLLERS

TWO-POSITION ROOM THERMOSTATS

ET SERIES, UT8001



DESCRIPTION

The **ET Series** Two-Position Room Thermostat are designed for on/off control with set points from 50° to 90°F. The **ET5-S-1S Series** is a heating-only thermostat and uses a snap-acting switch for line or low voltage applications. The **ETD5-S-1S Series** is a heating/cooling thermostat and uses a snap-acting switch for line or low voltage application. **Model UT8001** Two-Position Room Thermostat are designed for low voltage on/off control of a manually selected heating or cooling applications. It operates with set points from 50° to 90°F from a bi-metal and magnetic reed switch. Fan switching includes manual On/Auto control.

FEATURES

- Line or low voltage **ET5 heating**
- Line or low voltage **ETD5 heating/cooling**
- Low voltage **UT8001 with fan and system switch has single or dual transformer with adjustable anticipator or mV operation, thermometer, and vertical or horizontal mounting**



ETD5-S-1S

Two position
Line or Low Voltage



UT8001

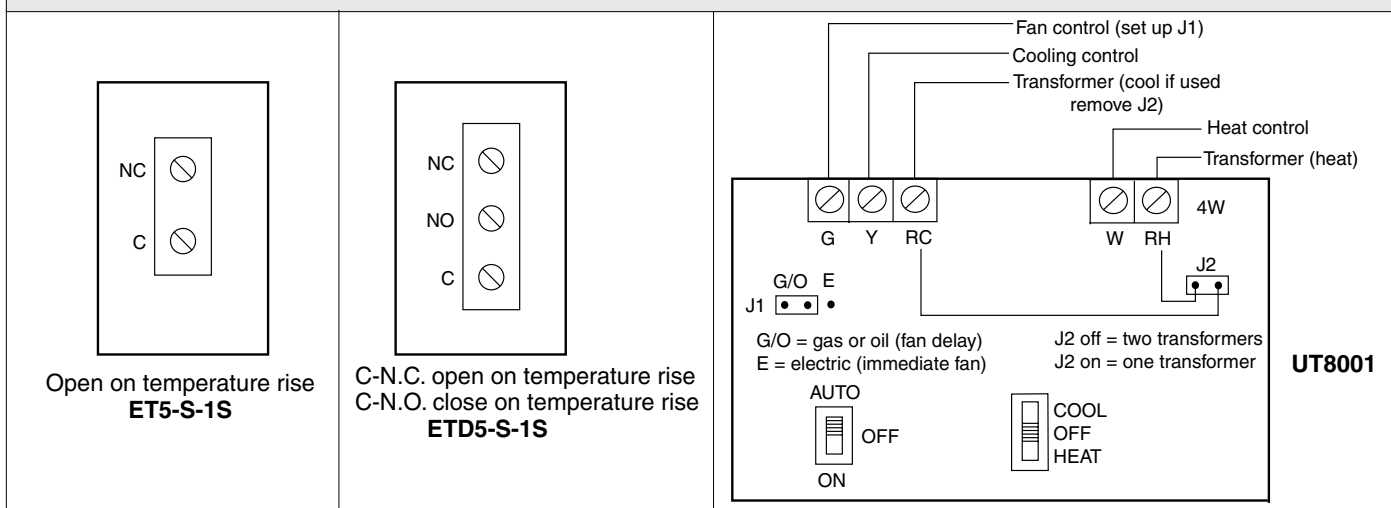
Conventional



SPECIFICATIONS

Model	Supply Voltage	Supply Current	Switch	Contact Type	Differential	Dimensions
ET5-S-1S	24-277 VAC	22A	None	SPST, snap acting	Heating 2°F	4.75"H x 2.75"W x 2.75"D (12.1 x 7.0 x 7.0 cm)
ETD5-S-1S	24-277 VAC	22A	None	SPDT, snap acting	Heating 2°F, Cooling 4°F	4.75"H x 2.75"W x 2.75"D (12.1 x 7.0 x 7.0 cm)
UT8001	24 VAC	1A	Fan and system	Magnetic reed	Heating 3°F, Cooling 3°F	4.75"H x 2.75"W x 1.5"D (12.1 x 7.0 x 3.8 cm)
Setpoint range	50° to 90°F (10° to 32°C)			Weight	0.5 lb (0.23 kg)	
Anticipator	UT8001 only (0.1A to 1A)			Approvals	UL Listed File #E46315; CSA (ET5), cUL (UT8001)	
Control type	Two-position, on/off			Warranty	2 years	
Mounting	2" x 4" (5.1 x 10.2 cm) vertical switch box					

WIRING



ORDERING INFORMATION

MODEL
ET5-S-1S
ETD5-S-1S
UT8001

DESCRIPTION

Line or low-voltage heating thermostat
Line or low-voltage heating or cooling thermostat
Low-voltage thermostat with fan and system switch



THERMOSTATS & CONTROLLERS

LINE-VOLTAGE THERMOSTAT

T22, T25, T26, T46

DESCRIPTION

These thermostats are designed for line-voltage control of residential, commercial, or industrial heating or year-round air conditioning. A liquid-charged temperature sensing element, highly efficient diaphragm, and lever provide precise temperature control. Anticipators are not required.

Model T26 is a line-voltage thermostat for heating or cooling and includes horizontal mounting faceplate kit.

Model T25 is a line-voltage two-stage thermostat. Applications include two stages of heating or cooling or auto changeover control of heating and cooling.

Model T22 is a line-voltage thermostat with a system selector switch for off/auto or heat/off/cool operation.

Model T46 is a line-voltage, heating, cooling or heating/cooling thermostat with integral system and fan switching. It is designed to control line-voltage fan coils or zone valves.



T46



T26



T25



T22



FEATURES

- **Knob or concealed set point adjustment**
- **Line- or low-voltage control**
- **UL listing**
- **Mounts on standard single- or double-gang box**
- **Bimetal thermometer**
- **Ideal for fan coil applications**

SPECIFICATIONS

Thermostat Range	40° to 90°F (5° to 30°C)	Approvals	UL Listed File #E6688/XAPX
Mounting	Separate mounting plate	Weight	1.30 lb (0.59 kg)
Sensing Element	Liquid filled for positive trouble-free operation (anticipator not required)	Warranty	1 year
Thermometer	50° to 90°F (10° to 30°C), bimetal type may be field calibrated		

ELECTRICAL RATINGS

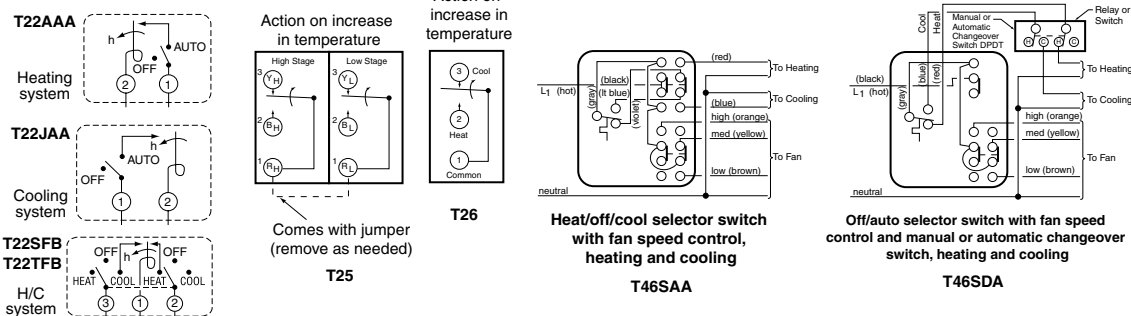
T22, T25, T26, T46 Thermostats, (T26T-3, T22T) Heavy Duty Thermostat

Pilot Duty and Motor Ratings	120V	208V	240V	277V
AC full load amp	6 (8)	3.4 (8)	3 (8)	T25-125 VA pilot duty
AC locked rotor amp	36 (48)	21 (48)	18 (48)	-
AC non-inductive amp	6.5 (10)	6.5 (10)	6.5 (10)	6.5 (10) not T46 or T25

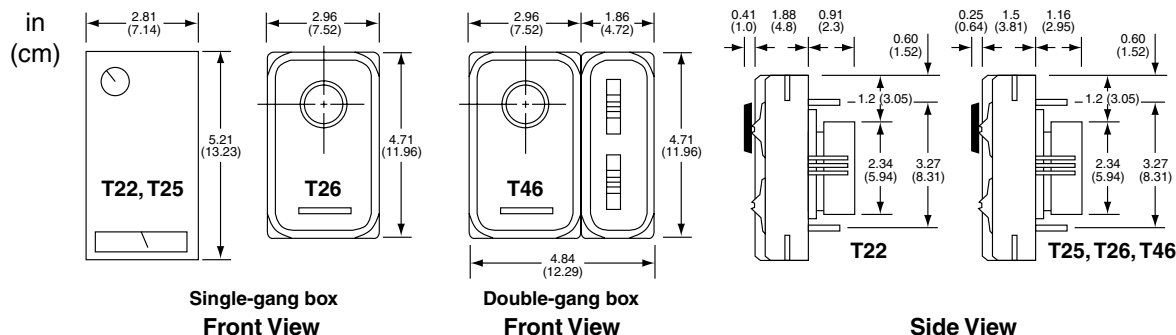
T46 System and Fan Switch Rating Only

Switch Rating	120V	208V	240V	277V
AC full load amp	12	6.9	6	5.2
AC locked rotor amp	34.8	19.1	17.4	14.4

WIRING



DIMENSIONS



ORDERING INFORMATION

MODEL	ADJUSTMENT TYPE	APPLICATION	SELECTOR SWITCH	DIFFERENTIAL °F (°C)		WEIGHT lb (kg)
				HEATING	COOLING	
T46SDA-1	Knob	Heating or cooling SPDT	Off/Auto Low/Med/High	0.7 (0.4)	0.7 (0.4)	1.3 (0.59)
T46SAA-1	Knob	Heating and cooling SPDT	Heat/Off/Cool Low/Med/High	0.7 (0.4)	0.7 (0.4)	1.3 (0.59)
T26S-18*	Knob	Heating or cooling SPDT	None	1.75 (1.0)	2.25 (1.3)	1.0 (0.45)
T26T-3*	Knob	Heating or cooling SPDT, heavy-duty	None	3 (1.7)	3 to 4 (1.7 to 2.2)	1.0 (0.45)
T25A-1	Knob	Two-stage 2 SPDT switches, two-stage heating, cooling, or one-stage heating and one-stage cooling	None	1.75 (1.0)	2.25 (1.3)	1.5 (0.68)
T25A-16	Concealed			3 between stages (1.7)		1.5 (0.68)
T22AAA	Knob	Heating Only SPST	Off/Auto	0.7 (1)	N/A	1.3 (0.59)
T22JAA	Knob	Cooling Only SPST	Off/Auto	N/A	2.25 (1.3)	1.3 (0.59)
T22SFB	Knob	Heating and cooling SPDT	Heat/Off/Cool	1.75 (1)	2.25 (1.3)	1.3 (0.59)
T22TFB	Knob	Heating and cooling SPDT	Heat/Off/Cool	3 (1.7)	3 to 4 (1.7 to 2.2)	1.3 (0.59)

*Includes faceplate for horizontal mounting. The plate is for on-the-job installation over a vertical plate. Field convert to other configurations.

PLT333-12R
PLT333-3R
PLT333-9R

ACCESSORIES

T26 and **T46** vertical plate with no adjust knob and no thermometer
T26 and **T46** vertical plate with thermometer and no adjust knob
T26 and **T46** horizontal plate with no adjust knob and no thermometer

THERMOSTATS & CONTROLLERS

PECO FLOATING AND PROPORTIONAL THERMOSTATS

T158, T168 SERIES

DESCRIPTION

The **T158 Series** is a microprocessor-based floating or two-position low voltage thermostat. The **T168 Series** is a microprocessor-based proportional 4-20 mA or 0-10V thermostat. Both series are designed for fan coil and air handler applications for both two- and four-pipe systems. The processor provides control algorithms for precise stable control under varying capacity and load conditions without the need for field calibration or tuning. These versatile thermostats have options for a variety of high voltage fan and system switching. Models are also available with an unoccupied setback input. Terminations are provided for remote sensors for both air and water temperature.

FEATURES

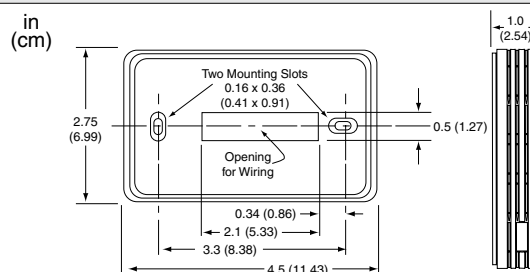
- **Electronic Proportional plus Integral (PI) control**
- **Two-position, floating, and proportional control models**
- **Remote sensor capability**
- **Optional unoccupied control inputs**
- **Fan and system switching models**
- **°F or °C digital display**
- **Built-in start up diagnostics**
- **Seasonal changeover models**
- **Four selection service menu**



TB-158-100



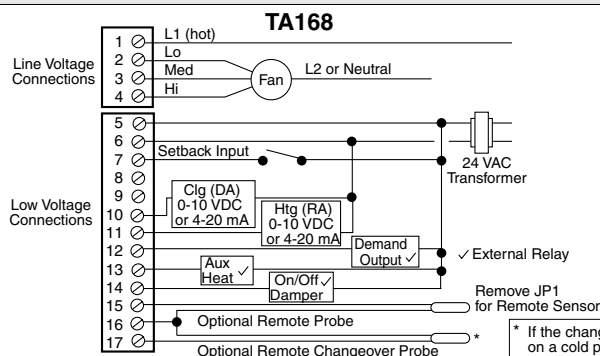
DIMENSIONS



SPECIFICATIONS

	T158	T168
Supply Voltage	20-28 VAC	20-28 VAC
Supply Current	25 mA @ 24 VAC	25 mA @ 24 VAC
Control Type	Two-position or floating	Proportional 4-20 mA, 600Ω load, 0-10 VDC, 1000Ω min
Output Capacity	10 VA @ 24 VAC (Triac)	10 VA @ 24 VAC (Triac), (Heating/Damper/Demand)
Stroke Time	30-300 sec (120 sec default)	30-300 sec (120 sec default)
Temperature Offset	±5°F (0° default)	±5°F (0° default)
Fan Demand Delay	0-10 min. (0 default)	2-10 min. (2 default)
Cooling Minimum Off	30-600 sec (120 sec default)	30-600 sec (120 sec default)
Fan Switching	24 VA @ 24 VAC, 125 VA @ 120 VAC	24 VA @ 24 VAC, 125 VA @ 120 VAC
Setpoint With Setback	50° to 90°F (10° to 32°C)	50° to 90°F (10° to 32°C)
Proportional Band	2°F (1°C)	2°F (1°C)
Heat/Cool Deadband	3°F (1.6°C)	3°F (1.6°C)
Material Of Construction	Flame-retardant PVC, UV stabilized	Flame-retardant PVC, UV stabilized
Color	Cool gray	Cool gray
Display	0.36" (0.9) LCD (°F or °C)	0.36" (0.9) LCD (°F or °C)
Weight	0.28 lb (0.13 kg)	0.28 lb (0.13 kg)
Approvals	UL-recognized component File# E50023, CE	UL-recognized component File# E50023, CE
Warranty	5 year	5 year

T168 WIRING



Typical Wiring for Proportional Control

T168 Program Jumpers and Switch Settings

Dip Switch	Off Switch Open	On Switch Closed
#1: Not used	Not used	Not used
#2: Electric heat (on at setpoint)	Staged heat (on at maximum output plus 1°F)	Staged heat (on at maximum output plus 1°F)
#3: °C display	°F display	°F display
#4: 4-20 mA output	0-10 VDC output	0-10 VDC output
#5: Must be "ON"	Normal operation	Normal operation
#6: Setback	Setback	Setback
	Heating 60°F (15°C)	Heating 50°F (10°C)
	Cooling 85°F (29°C)	Cooling 90°F (32°C)

Notes: 1. Units have a three-minute warm up.
2. Cycle power after dip switches are changed.

Jumpers

Jumpers	Jumpered	I.D.	Unjumpered
Local sensor	JP1	Remote sensor	
Two pipe	JP2	Four pipe	
Not used	JP3	Not used	
Cooling 0-10 VDC	JP4	Cooling 4-20 mA	
Heating 0-10 VDC	JP5	Heating 4-20 mA	

Notes: JP 4 and 5 must both be the same.
Two pipe disables terminal 11.

* If the changeover probe is used on a cold pipe, the control is as shown above on the outputs. If the changeover probe is on a hot pipe, it reverses the action of the cooling output above. Heating is disabled.

70°

T158, T168 SERIES

TA158 (1H/1C)

Line-voltage connections: 1 (L1 (hot)), 2 (Lo), 3 (Med), 4 (Hi) connect to a Fan. 5 (L2 or Neutral) connects to the Fan.

Low-voltage connections: 6 (Setback input), 7 (Setback input), 8 (24 VAC transformer), 9 (24 VAC transformer), 10 (24 VAC transformer), 11 (Heat output), 12 (Cool output), 13 (N/C), 14 (N/C), 15 (N/C).

Triac control: 16 (Optional remote probe), 17 (Optional remote changeover probe).

Notes: *JP4 Installed = Two pipe
Uninstalled = Four pipe
Type 24

TH158 (Heat Pump)

*HI fan speed required acc. cover C158FAOH

Triac

1 N/C

2 N/C

3 Fan HI*

4 Auto/ON

Fan

Low voltage

All low voltage connections

5

6

7 Setback input

8

9

10 B-Heating reversing vlv

11 O-Cooling reversing vlv

12

13 W1-2nd heat output

14 N/C

15

16

17 N/C

24 VAC transformer

✓ External relay

Remove JP1 for remote sensor Type 24

Typical Wiring for On/Off Control

Typical Wiring for Three-Wire Floating Control

Line-voltage connections

- 1 (hot)
- 2 Lo
- 3 Med
- 4 Hi

Low-voltage connections

- 5
- 6 Setback input
- 7 Open
- 8 Open
- 9 Close
- 10 Close
- 11 Close
- 12 Close
- 13 Close
- 14 On/Off damper
- 15 On/Off damper
- 16 Optional remote probe
- 17 Optional pipe changeover probe

Triac control

- 24 VAC transformer
- Tri-state actuator
- External relay or spring return actuator
- Remove JP1 for remote sensor Type 24
- *JP4 Installed = Two pipe Uninstalled = Four pipe Type 24

TB158 (Two-Position)

The diagram shows the wiring for the TB158 (Two-Position) unit. It includes a terminal block with 17 terminals. Terminals 1-4 are for line voltage (L1, L2, Med, Hi). Terminals 5-8 are for low-voltage connections (Setback input, 1st heat output, 2nd heat only output, On/Off damper). Terminals 9-17 are for triac control (Cool output, Demand output, External relay or spring return actuator, Remote JP1 for remote sensor, Optional remote probe, Optional remote changeover probe). A 24 VAC transformer is connected to terminals 9-12. A fan is connected to terminals 1-4. A note indicates that JP4 is installed for two pipes and uninstalled for four pipes.

Line-voltage connections

- 1 L1 (hot)
- 2 Lo
- 3 Med
- 4 Hi

Low-voltage connections

- 5 Setback input
- 6
- 7
- 8

Triac control

- 9 Cool output ✓
- 10 1st heat output ✓
- 11 Demand output ✓
- 12 2nd heat only output ✓
- 13 On/Off damper
- 14
- 15
- 16
- 17

24 VAC transformer

Optional remote probe

Optional remote changeover probe

Remove JP1 for remote sensor Type 24

***JP4 Installed = Two pipe Uninstalled = Four pipe Type 24**

TC158 (2H/1C)

*HI fan speed required acc. cover C158FA0H

All low voltage connections

Triac control

Low voltage

24 VAC transformer

External relay or spring return actuator

Remove JP1 for remote sensor Type 24

Typical Wiring for On/Off Control

The diagram shows the wiring for the TC158 (2H/1C) unit. It includes a terminal block with 17 terminals. Terminals 1-4 are for Triac control: 1 (N/C), 2 (Fan HI*), 3 (Fan HI*), and 4 (Auto/ON). Terminals 5-17 are for Triac control: 5 (Setback input), 6 (N/C), 7 (N/C), 8 (1st heat output), 9 (1st cool output), 10 (2nd heat output), 11 (2nd cool output), 12 (Demand output), 13 (N/C), 14 (N/C), 15 (Optional remote probe), 16 (N/C), and 17 (N/C). The wiring connects the Triac control terminals to a 24 VAC transformer and an external relay or spring return actuator. The Triac control terminals are also connected to a low voltage source. The Triac control terminals are also connected to a low voltage source. The Triac control terminals are also connected to a low voltage source.

Dip Switch	Control Function	Off Switch Open	On Switch Closed
	#1: Heating action	DA (N.O.)**	RA (N.C.)** (only used when #4 is off)
	#2: Cooling action	RA (N.O.)**	DA (N.C.)** (only used when #5 is off)
	#3: Temp display	°C	°F
	#4: Heating signal	ON/OFF	Modulating 3-Wire
	#5: Cooling signal	ON/OFF	Modulating 3-Wire
	#6: Unocc setpoints	60/85°F (15/29°C)	50/90°F (10/32°C)

Notes: 1. Units have a three-minute warm up.
2. Cycle power after dip switches are changed.

* If the changeover probe is used on a cold pipe, the control is as shown above on the outputs. If the changeover probe is on a hot pipe, it reverses the action of the cooling output above. Heating is disabled.
** Refers to valve or damper position

PART NUMBER		CONTROL OUTPUTS						USER CONTROL		2 PIPE / 4 PIPE
NEW MODEL	OLD MODEL	PROPORTIONAL 4-20 mA/0-10V	FLOATING TRIAC	ON/OFF TRIAC	HEAT PUMP TRIAC	DAMPER OCC/UNOCC	DEMAND OUTPUT	FAN^ SWITCHING	SYSTEM MODE SWITCHING	CHANGE OVER PROBE INPUT
TA158-100^	--	--	--	1H/1C	--	--	--	O/H/M/L*	Heating/Cooling/Auto/Off	Yes, 2 or 4 pipe
TB158-100^	ALL TB158	--	1H/1C	[2H]/(1C)***	--	1-Triac	(1-Triac)***	O/H/M/L*	Heating/Cooling/Auto/Off	Yes, 2 or 4 pipe
TC158-100^	--	--	--	2H/1C	--	--	1-Triac	Auto/On**	Heating/Cooling/Auto/Off	No, 4 pipe only
TH158-100^	--	--	--	1H/1C	10/1B	--	1-Triac	Auto/On**	Heating/Cooling/Auto/Off	No, 4 pipe only
TA168-100^	ALL TA168	1H/1C	--	2nd Heating	--	1-Triac	1-Triac	O/H/M/L*	Heating/Cooling/Auto/Off	Yes, 2 or 4 pipe

[^] Changing the cover on **T158** and **T168** thermostats may change or eliminate the fan switching (See accessories C158-__). (New models only)

* O/H/M/L = Off/High/Medium/Low, 24-277V fan contacts, Off shuts down the thermostat with no display.

** Auto/On = Fan is automatically on during equipment demand or On always, 24 VAC low-voltage control. No O/H/M/L operation.

*** Alternate outputs based on DIP switch [4 heating] and (5 cooling). Switches 4 and 5 are independent. See TB158 wiring diagrams above depending on switch settings.

Note: All Triac outputs are 24 VAC with 24 VAC potential on disconnected terminals (open circuit condition).

65345	Thermostat base plate, 4.75" x 4.75"
CA158	Thermostat cover for TA158-100 without fan switch
CA158-FFN	Thermostat cover for TA158-100 with fan off/on switch
CA168	Thermostat cover for TB168-100 with fan switch
CA168-FFN	Thermostat cover for TB168-100 with fan off/on switch
CB158	Thermostat cover for TB158-100 without fan switch
CB158-FFN	Thermostat cover for TB158-100 with fan off/on switch
CC158	Thermostat cover for TC158-100 with fan switch
CC158-FAOH	Thermostat cover for TC158-100 with fan auto/on/high switch
CH158	Thermostat cover for TH158-100 without fan switch
CH158-FAO	Thermostat cover for TH158-100 with fan auto/on switch
CH158-FH1A	Thermostat cover for TH158-100 with fan high/low/auto switch

THERMOSTATS & CONTROLLERS

FAN COIL THERMOSTAT WITH ADA-COMPLIANT DIGITAL DISPLAY

T170

DESCRIPTION

The **T170** is specifically designed for 1H, 1C, on/off vent damper and multi speed fan control applications. The large ADA compliant backlit display shows temperature °F or °C with a simple push of a button and indicates fan and system status. The **T170** is powered from 24-277 volts with direct-wired manual fan or auto-staging fan models. Remote temperature sensor, pipe change over sensor, setback input and occupancy sensor inputs are all standard.

APPLICATION

Designed specifically for direct line-voltage or low voltage wiring of fan coils used for heating and cooling, with fan and damper controls. Ideal for hotels, dormitories, retirement centers, resorts, condos, cottages, schools, vestibule entrances, and so on.

FEATURES

- 1H/1C and On-Off vent damper
- H/C/A/O system switching
- Fan switch Auto/On/Off
- L/M/H manual fan speed or fan auto staging models
- 24-277 VAC power
- Large backlit ADA compliant display/buttons
- Occupancy motion detector inputs
- Door switch or setback input
- Remote sensor and service alert input
- Change over sensor input

- Keypad lockout
- 2-pipe auto purge cycle
- 2-pipe or 4-pipe operation
- Setback from occupancy or clock
- Temperature or continuous set point display
- Temperature offset display
- Setpoint limits, H and C
- Fan off delay
- H/C setback selection
- Easy occupant switched °F or °C display



T170-001



SE200-001



SA200-001



SB200-001



SPECIFICATIONS

Supply Voltage	24-277 VAC, ±10%, 50/60 Hz
Supply Current	45 mA
Sensor Type	Built-in 10K thermistor Type II
Remote Sensor	10K thermistor Type II, acc. required
Output Control	6-SPST relays H/C/Damper, Fan-L/M/H

Output Amps

Voltage	RES	LRA	FLA	HP
120 VAC	6.0	34.8	5.8	1/4
240 VAC	5.0	17.4	2.9	1/4
277 VAC	4.2	14.4	2.4	1/4

Note: Combined load not to exceed 20A

Control	Proportional plus Integral (PI)
Dead-band	3°F (1.6°C)
Setpoint	50° to 90°F (10° to 32°C), adjustable
Setback (H/C)	55° to 90°F (13° to 32°C), adjustable 8°F (4.4°C) minimum separation
Keypad Lockout	All buttons disabled except setpoint

Display	1" x 1.5" backlit digital display room temp., setpoint, system and fan status
Display Offset	±9°F (5°C), in 1°F (0.5°C) increments
Button Controls	
Up, Down	Temperature select
System	Heat/Cool/Auto/Off
Fan Control	On/Off/Auto
Fan Speed	Hi/Medium/Low, hold for °F/°C
Adjustments	Service menu set up, 9 parameters
Enclosure	Vinyl plastic for indoor use only
Switch Cycles	100,000 cycles
Termination	6" flying leads 18-14 AWG
Color	White
Mounting	Horizontal on wall. Screw direct or 4" x 4" back box
Operating Temperature	130°F (54°C) Maximum
Operating Humidity	98% RH non-condensing
Dimensions	4.4"H x 5.8"W x 1.4"D (11.2 x 14.7 x 3.5 cm)
Weight	0.7 lb (0.32 kg)
Approvals	UL, ULC, File# E50023 and ADA compliant
Warranty	5 years

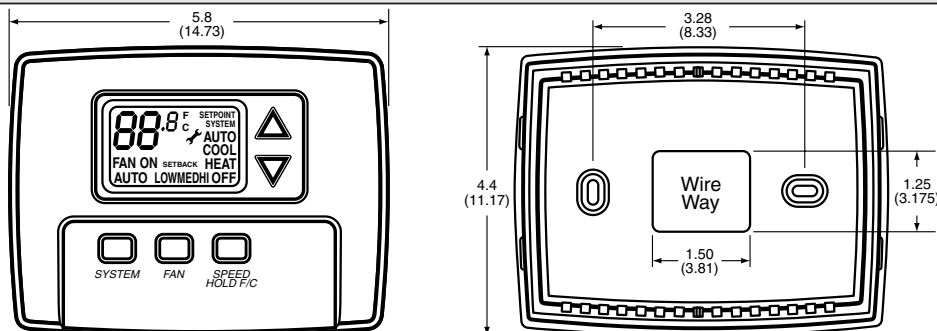
THERMOSTATS & CONTROLLERS

FAN COIL THERMOSTAT WITH ADA-COMPLIANT DIGITAL DISPLAY

T170

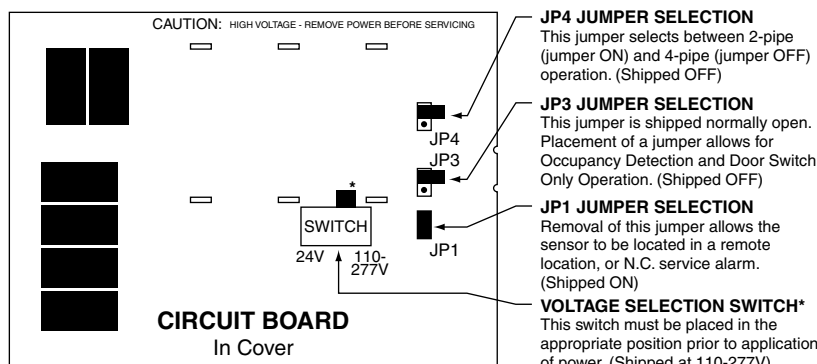


DIMENSIONS / MOUNTING



Note: The cover snaps into place firmly, making occupant tampering difficult. Be sure to install jumpers, select voltage, and wire properly before snapping cover into place.

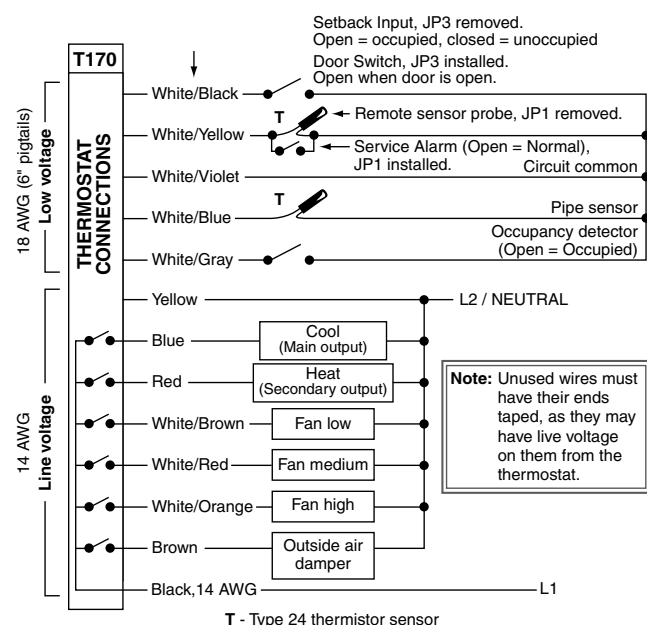
INSTALLATION / JUMPERS



2/4 PIPE SELECTION	WATER TEMP	OUTPUT OPERATION	
		MAIN OUTPUT	SECONDARY OUTPUT
2-PIPE JP4 ON	Cold	Cooling Only - DA The fan will not cycle on with a heat demand.	Disabled
	Hot	Heating Only - RA The fan will not cycle on with a cool demand.	Disabled
4-PIPE JP4 OFF	Cold	Cooling - DA	Heating - RA
	Hot	Heating Only - RA The fan will not cycle on with a cool demand.	Disabled

*Switch selection is as follows:
24V = 24 VAC; 110-277 V = 120, 240, or 277 VAC

WIRING



ORDERING INFORMATION

MODEL	DESCRIPTION
TA170-001	24-277V, H/C/Dpr thermostat with system, fan, and three-speed manual fan switch
TB170-001	24-277V, H/C/Dpr thermostat with system, and fan switch off/auto with three-speed auto staging fan on demand every 2° (2° differential)

RELATED PRODUCTS

	PAGE
680-243-6	Changeover thermostat with conduit fitting
AQS00661	24 VAC/VDC water sensor/switch 572
SA200-001	Ceiling 360-degree occupancy motion sensor, 24 VAC/VDC, form C contacts
SB200-001	Wall occupancy/motion sensor, 110-degree view, 24 VAC/VDC, form C contacts
SE200-001	Plunger style door switch
SE200-002	Magnetic door/window switch, N.C.-SPST
ST-R24S	Changeover temperature sensor 1254
ST-S24E	Remote room temperature sensor 1171

THERMOSTATS & CONTROLLERS

PROGRAMMABLE FAN COIL THERMOSTAT

T180 SERIES

DESCRIPTION

The **T180 Series** is a 7-day, 4-event programmable FCU thermostat. The large ADA compliant backlit display shows temperature °F or °C with a simple push of a button and indicates fan and system status. The **T180** is powered from 24-277 volts with direct-wired manual fan or auto-staging fan models. Remote temperature sensor, pipe changeover sensor, setback input and occupancy sensor inputs are all standard.

APPLICATION

Designed specifically for direct high voltage or low voltage wiring of fan coils used for heating and cooling, with fan and damper controls. Ideal for hotels, dormitories, retirement centers, resorts, condos, cottages, schools, vestibule entrances, and so on.

FEATURES

- 7-day, 4-event schedule
- 1H/1C and On-Off vent damper
- H/C/A/O system switching
- Fan switch Auto/On/Off
- L/M/H manual fan speed or fan staging models
- 24-277 VAC power
- Large backlit ADA compliant display/buttons
- Occupancy motion detector inputs
- Door switch or setback input
- Remote sensor and service alert input
- Change over sensor input



T180-001



SE200-001



SA200-001



SB200-001



- Keypad lockout
- 2-pipe or 4-pipe operation
- Setback from occupancy or clock
- Temperature or continuous set point display
- Temperature offset display
- Setpoint limits, H and C
- Fan off delay
- H/C setback selection
- Easy occupant switched F or C display

SPECIFICATIONS

Supply Voltage	24-277 VAC, ±10%, 50/60 Hz			
Supply Current	45 mA			
Sensor Type	Built-in 10K thermistor Type II			
Remote Sensor	10K thermistor Type II, acc. required			
Output Control	6-SPST relays			
	H/C/Damper, Fan-L/M/H			

Output Loads

Voltage	RES	LRA	FLA	HP
120 VAC	6.0	34.8	5.8	1/4
240 VAC	5.0	17.4	2.9	1/4
277 VAC	4.2	14.4	2.4	1/4

Note: Combined load not to exceed 20A

Control	Proportional plus Integral (PI)
Dead-band	3°F, (1.6°C)
Setpoint	50° to 90°F (10° to 32°C), adjustable
Setback (H/C)	55° to 90°F (13° to 32°C), adjustable 8°F (4.4°C) minimum separation
Keypad Lockout	All buttons disabled except setpoint
Display	1" x 1.5" backlit digital display Room temp., setpoint, system and fan status
Display Offset	±9°F (5°C), in 1°F (0.5°C) increments

Button Controls

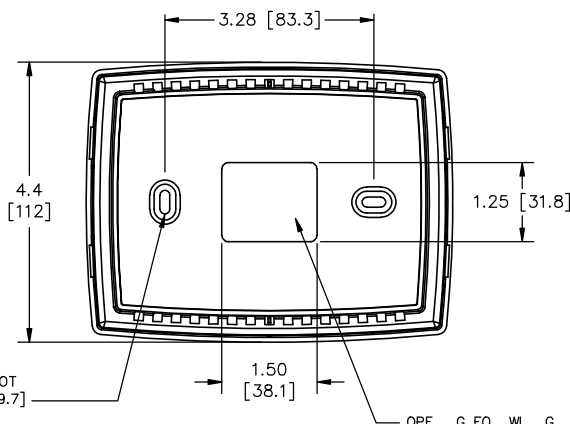
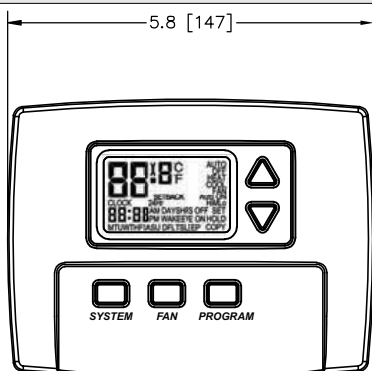
Up, Down	Temperature select
System	Heat/Cool/Auto/Off
Fan Control	On Hi-Med-Lo/Auto Hi-Med-Lo
Program	Clock-°F/°C-Set-Copy-Hold
Adjustments	Service menu set up, 9 parameters
Enclosure	Vinyl plastic for indoor use only
Switch Cycles	100,000 cycles
Termination	6" flying leads 18-14 AWG
Color	White
Mounting	Horizontal on wall. Screw direct or 4" x 4" back box
Operating Temperature	130°F (54°C)
Operating Humidity	98% RH non-condensing
Dimensions	4.4"H x 5.8"W x 1.4"D (11.2 x 14.7 x 3.5 cm)
Approvals	UL Listed File #E50023, ULC, and ADA compliant
Warranty	5 years

THERMOSTATS & CONTROLLERS

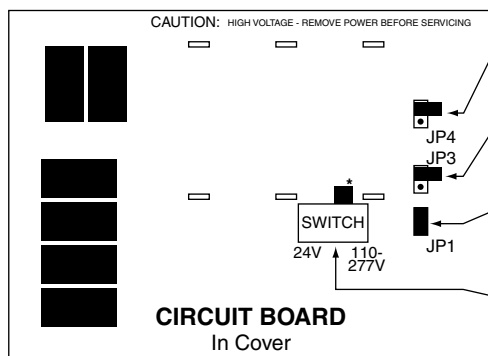
PROGRAMMABLE FAN COIL THERMOSTAT T180 SERIES



DIMENSIONS



INSTALLATION / JUMPERS



JP4 JUMPER SELECTION

This jumper selects between 2-pipe (jumper ON) and 4-pipe (jumper OFF) operation. (Shipped OFF)

JP3 JUMPER SELECTION

This jumper is shipped normally open. Placement of a jumper allows for Occupancy Detection and Door Switch Only Operation. (Shipped OFF)

JP1 JUMPER SELECTION

Removal of this jumper allows the sensor to be located in a remote location, or N.C. service alarm. (Shipped ON)

VOLTAGE SELECTION SWITCH*

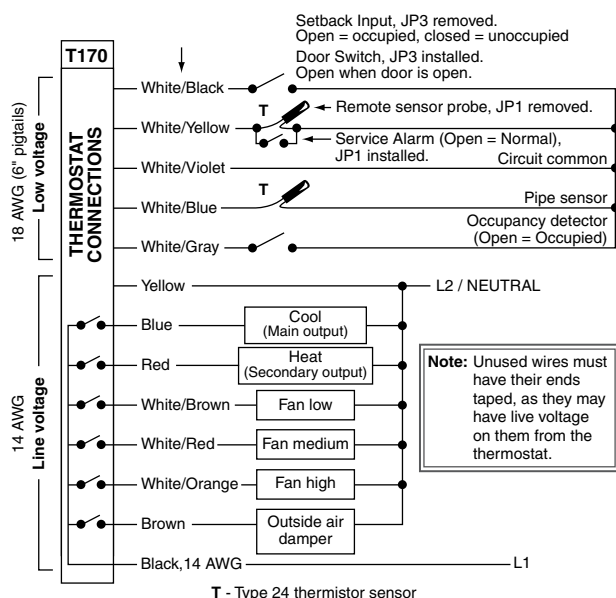
This switch must be placed in the appropriate position prior to application of power. (Shipped at 110-277V)

2/4 PIPE SELECTION	WATER TEMP	OUTPUT OPERATION	
		MAIN OUTPUT	SECONDARY OUTPUT
2-PIPE JP4 ON	Cold	Cooling Only - DA The fan will not cycle on with a heat demand.	Disabled
	Hot	Heating Only - RA The fan will not cycle on with a cool demand.	Disabled
4-PIPE JP4 OFF	Cold	Cooling - DA	Heating - RA
	Hot	Heating Only - RA The fan will not cycle on with a cool demand.	Disabled

*Switch selection is as follows:

24V = 24 VAC; 110-277 V = 120, 240, or 277 VAC

WIRING



ORDERING INFORMATION

MODEL	DESCRIPTION
TA180-001	24-277V, H/C/Dpr thermostat with system, fan, and three-speed manual fan switch
TB180-001	24-277V, H/C/Dpr thermostat with system, and fan switch off/auto with three-speed auto staging fan on demand every 2° (2° differential)

	RELATED PRODUCTS	PAGE
680-243-6	Changeover thermostat with conduit fitting	
SA200-001	Ceiling 360-degree occupancy motion sensor, 24 VAC/VDC, form C contacts	
SB200-001	Wall occupancy/motion sensor, 110-degree view, 24 VAC/VDC, form C contacts	
SE200-001	Plunger style door switch	
SE200-002	Magnetic door/window switch, N.C.-SPST	
ST-R24S	Changeover temperature sensor	1253
ST-S24E	Remote room temperature sensor	1171

THERMOSTATS & CONTROLLERS

PECO LINE AND LOW VOLTAGE TWO-POSITION AND PROPORTIONAL THERMOSTATS T155 AND T167 SERIES

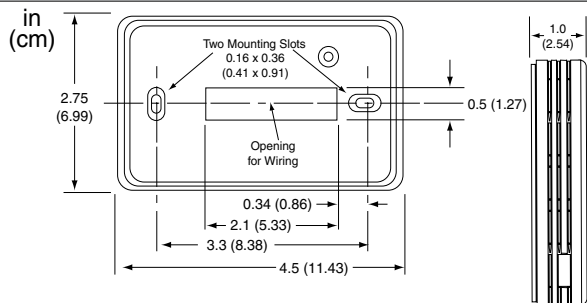
DESCRIPTION

The **T155 Series** is a general-purpose, electronic, two-position line-voltage and low-voltage thermostat. The **T167 Series** is a 0 to 10 VDC proportional heating/cooling low voltage thermostat. Both are designed for a variety of two- and four-pipe, heating, and cooling applications. Both manual and automatic changeover models include a provision for a remote thermistor temperature sensor.

FEATURES

- **Electronic design performance**
- **Two-position and Proportional models**
- **Remote sensor capability**
- **Fan and system switching models**
- **°F scale standard**
- **°C or warmer/cooler dials available**
- **Setpoint stops available**

DIMENSIONS



SPECIFICATIONS

T155

Supply Voltage	24-277 VAC
Supply Current	25 mA @ 24 VAC
Output Capacity	10 VA @ 24 VAC 20 VA @ 120-277 VAC
Control Type	Two position
Differential	1°F (0.5°C)
Deadband	4°F (2.2°C) (TB155 only)

T167

Supply Voltage	24 VAC
Supply Current	25 mA
Control Type	Proportional
Proportional Band	2°F (1°C)
Control Output	0-10 VDC, 1 kΩ min
Deadband	
0-10V actuator	0°F (possible H and C output ON)
2-10V actuator	0.8°F (0.44°C)

General

Fan/System Switch Rating	24 VA @ 24 VAC 125 VA @ 120-277 VAC
Setpoint	50° to 90°F (10° to 32°C)
Operating Temperature	32° to 130°F (0° to 55°C)
Construction	Flame-retardant PVC
Color	Cool gray
Weight	0.28 lb (0.13 kg)
Approvals	UL Listed File #E50023, CE
Warranty	5 years



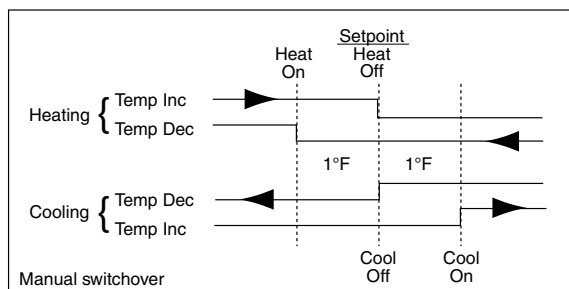
TB155-048
Two-position



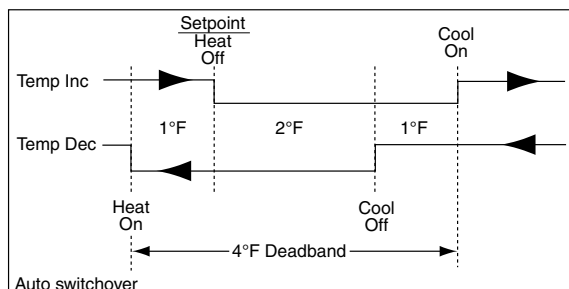
TA167-007
Proportional



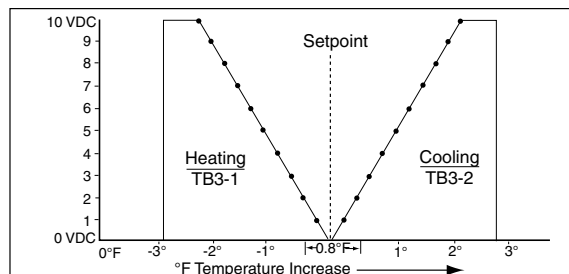
SEQUENCE GRAPHS



TA155-047



TB155-048



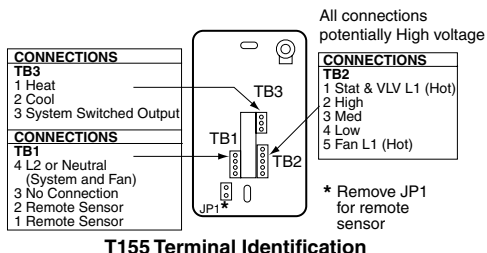
TA167

THERMOSTATS & CONTROLLERS

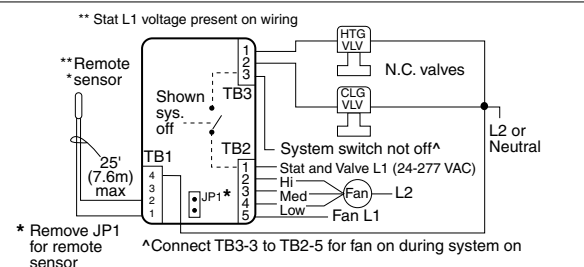
PECO LINE AND LOW VOLTAGE TWO-POSITION AND PROPORTIONAL THERMOSTATS T155 AND T167 SERIES



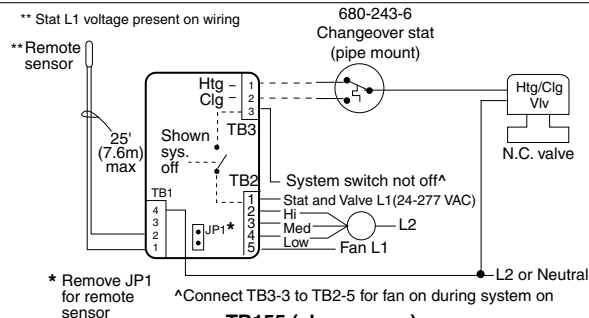
T155 WIRING



T155 Terminal Identification

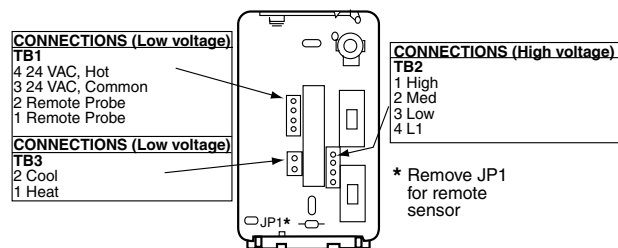


T155

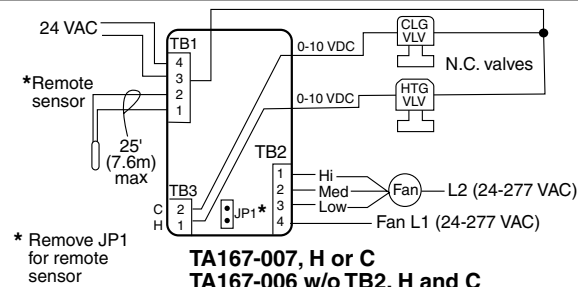


TB155 (changeover)

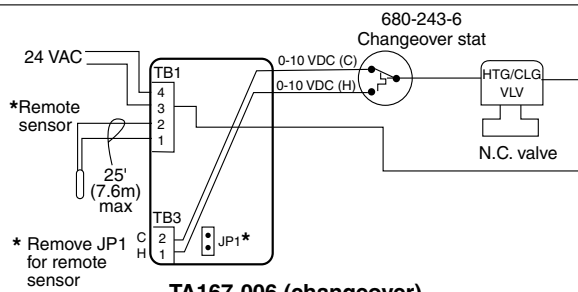
T167 WIRING



T167 Terminal Identification



TA167-007, H or C
TA167-006 w/o TB2, H and C



TA167-006 (changeover)

ORDERING INFORMATION

PART NUMBER		CONTROL OUTPUTS		USER CONTROL		OPTIONAL SENSORS	COVERS
NEW MODEL	OLD KELE MODEL	ON/OFF TRIAC	PROPORTIONAL 0-10 VDC	FAN ^ SWITCHING	SYSTEM MODE ^ SWITCHING	TWO PIPE CHANGEOVER	
TA155-047^	All TA155-043	1H or 1C	--	H/M/L*	Htg/Off/Clg**	None, manual only	horz. & vert.
TB155-048^	All TB155-047	1H and 1C	--	H/M/L*	On/Off**	Yes, requires C/O^ stat	horz. & vert.
TA167-006^	--	--	1H and 1C	None	None	Yes, requires C/O^ stat	vertical
TA167-007^	--	--	1H or 1C	H/M/L*	Htg/Off/Clg**	None, manual only	vertical

^ Changing the cover on T155 and T167 thermostats may eliminate the fan and system switching (See accessories C155-...). (New models only)

^ Must use a changeover thermostat such as the 680-243-6.

* H/M/L = High/Medium/Low, 24-277 VAC fan contacts, Off is wired through the system switch and shuts down the thermostat.

** Fan is off when system switch is Off, 24-277 VAC fan control.

Note: All Triac outputs are 24-277 VAC with voltage potential in an open circuit.

RELATED PRODUCTS

65170	Warmer/cooler setpoint dial
65345	Thermostat base plate, 4.75" x 4.75"
65410	10°-34°C setpoint dial
65860	Setpoint range stop tabs, 2°F increments
680-243-6	Changeover thermostat with conduit fitting
68671	Remote sensor for T155
CA155	Thermostat cover for TA155-047, without fan or system switch, vertical only
CA155-HOC	Thermostat cover for TA155-047, with system H/O/C switch and no fan switch, vertical only
CA167	Thermostat cover for TA167, without fan or system switch
CA167-HOC	Thermostat cover for TA167-007, with system H/O/C switch and no fan switch
CB155	Thermostat cover for TB155-048, without fan or system switch, vertical only
CB155-SNF	Thermostat cover for TB155-048, with system On/Off switch and no fan switch, vertical only
KTR24	Remote room thermistor sensor
ST-U24	10K Ω Universal sensor with box

PAGE

1169
1228

THERMOSTATS & CONTROLLERS

BULB THERMOSTATS

A19, A28, A319, A419 SERIES

DESCRIPTION

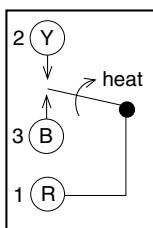
The **A19 Series** is a single stage, heating or cooling, SPDT temperature control that uses a liquid-filled sensing element and capillary. The unit has an exposed or concealed set point dial with adjustable differential, and it will switch line voltages. The **A28 Series** is a two stage, heating or cooling, w/2-SPDT temperature control that uses a liquid-filled sensing element and capillary. The unit has an exposed or concealed set point dial with adjustable differential, and it will switch line voltages. The **A319 Series** is a single stage, heating or cooling, SPDT temperature control that uses a Type 21 thermistor sensor. The unit uses a set point dial and operates on 120 VAC or 240 VAC with a wide adjustable differential. A separate LED indicates relay operation. The **A419 Series** is a single stage, heating or cooling, SPDT temperature control that uses a PTC sensor. This unit features a digital display and buttons to adjust the set point differential, setback temperature, anti-short cycle delay, and failsafe control. The unit operates on 120 or 240 VAC and a 3/8" (0.95 cm) display with H/C, °F /°C and setback indication. A separate LED indicates relay operation.



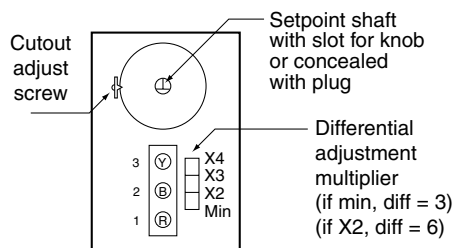
SPECIFICATIONS

	A19/A28	A319	A419
Voltage	None required	120/208/240 VAC 50/60 Hz	
Power	None required	1.8 VA	1.8 VA
Setpoint Adjust	Screwdriver slot or knob (concealed available)	Dial	Buttons and 3/8" display
Sensor	Liquid-filled bulb and capillary	Thermistor	PTC
Ambient Temp	Typical 140°F (60°C), strap-on 290°F (143°C)	-30° to 140°F (-34° to 60°C)	
Differential	x2, x3, x4 multiplier from min differential	1° to 30°F (0.5° to 17°C)	
Dimensions	4.5"H x 2.2"W x 2.0"D (11.43 x 5.59 x 5.08 cm)	5.0"H x 2.4"W x 2.4"D (12.70 x 6.10 x 6.10 cm)	
Approvals	UL Listed File #E6688, CSA	UL Listed File #E27734, CSA	
Weight	1.2 lb (0.55 kg)	1.75 lb (0.75 kg)	
Warranty	1 year	1 year	1 year

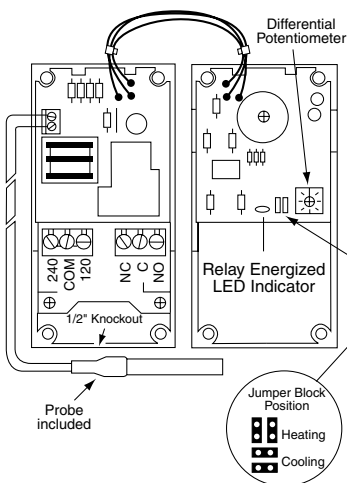
WIRING



Action on increase of temperature



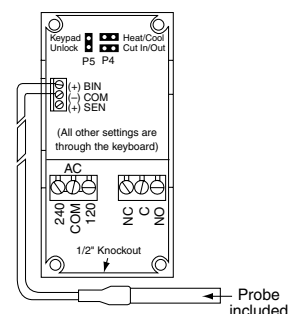
A28 has two sets of contacts



A319

FUNCTION	JUMPER LABEL	SETTING	JUMPER POSITION *
Cooling/Heating	P4-Heat	Cooling* Heating	Removed Installed
Setpoint	P4-Cut-out	Cut-in* Cut-out	Removed Installed
Keypad Lock	P5-Unlock	Locked Unlocked*	Removed Installed

*Factory settings



A419

ORDERING INFORMATION

SINGLE-STAGE SPACE AND REMOTE BULB THERMOSTAT										
Model	Switch Action	Range °F (°C)	Diff °F (°C) Adjustable	Bulb and Capillary	Bulb Well # *	Range Adjuster	Electrical Ranges			
							Motor Ratings VAC	120	208	240
A19BAC-1C	SPDT	30 to 110 (-1 to 43)	3.5 fixed (1.9)	1.4" x 2.25" coil	Space Thermostat	Convertible	AC full load amp	16.0	9.2	8.0
*A19ABA-40	SPST ¹	-30 to 100 (-34 to 38)	3 to 12 (1.7 to 6.7)	3/8" x 4" 6' cap	WEL14A-602R	Screwdriver slot	AC locked rotor amp	96.0	55.2	48.0
A19ABC-4C	SPDT	50 to 130 (10 to 55)	3.5 to 14 (1.9 to 8.0)	3/8" x 5" 8' cap	WEL14A-603R	Knob	Noninductive or resistance load amp (not lamp loads)	22A 120-277 VAC		
A19ABC-24	SPDT	-30 to 100 (-34 to 38)	3 to 12 (1.7 to 6.7)	3/8" x 4" 8' cap	WEL14A-602R	Convertible				
A19ABC-36	SPDT	-30 to 100 (-34 to 38)	3 to 12 (1.7 to 6.7)	3/8" x 4" 20' cap	WEL14A-602R	Convertible				
*A19ABA-40 contacts open on temperature decrease.										
MANUAL RESET - REMOTE LIQUID BULB THERMOSTAT										
Model	Switch Action	Range °F (°C)	Diff °F (°C) Adjustable	Bulb and Capillary	Bulb Well # *	Range Adjuster	Electrical Ranges			
							Motor Ratings VAC	120	208	240
A19ACA-14	SPST Open Low	-30 to 100 (-34 to 38)	Manual reset	3/8" x 4" 6' cap	WEL14A-602R	Screwdriver slot	AC full load amp	16.0	9.2	8.0
							AC locked rotor amp	96.0	55.2	48.0
A19ADB-1C	SPST Open High	100 to 240 (38 to 116)	Manual reset	3/8" x 3.5" 6' cap	WEL14A-602R	Knob	AC full load amp	10.0	—	6.0
							AC locked rotor amp	60.0	—	36.0
CHANGEOVER STRAP-ON LIQUID BULB THERMOSTAT (AQUASTAT)										
Model	Switch Action	Range °F (°C)	Diff °F (°C) Fixed	Mounting to Coil	Range Adjuster	Electrical Ranges				
						Motor Ratings VAC	120	240		
A19DAC-1	SPDT	100 to 240 (38 to 116)	10 (5.6)	Direct clamp-on strap	Knob	AC full load amp	10.0	6.0		
						AC locked rotor amp	60.0	36.0		
Note: A19DAC-1 not for use as a limit control						Pilot duty - 125 VA, 24-600 VAC				
TWO-STAGE SPACE AND REMOTE BULB THERMOSTAT										
Model	Switch Action	Range °F (°C)	Diff °F (°C) Adjustable	Bulb and Capillary	Bulb Well # *	Range Adjuster	Electrical Ranges			
							Motor Ratings VAC	120	208	240
A28AA-4C	2-SPDT	30 to 110 (-1 to 43)	3.5 (1.9) 3 interstage	1.4" x 2.25" 2' coil	Space Thermostat	Convertible	AC full load amp	16.0	9.2	8.0
A28AA-29C	2-SPDT	-30 to 100 (-34 to 38)	5 (2.8) 2 to 7 adj interstage	3/8" x 4" 8' cap	WEL14A-602R	Convertible	AC locked rotor amp	96.0	55.2	48.0
A28MA-2C	2-SPDT	40 to 120 (4 to 49)	5 (2.8) 8 interstage	3/8" x 4" 6' cap	NEMA 3R WEL14A603R	Screwdriver slot	Noninductive or resistance load amp (not lamp loads)	22A 120-277 VAC		
A28AJ18C	2-SPDT	20 to 80 (-7 to 28)	1.5 (0.8) 2 to 7 adj interstage	3/8" x 5" 10' cap	WEL14A-603R	Convertible	Noninductive or resistance load amp (not lamp loads)	10.0	9.2	8.0
SOLID STATE SENSOR THERMOSTAT										
Model	Switch Action	Range °F (°C)	Diff °F (°C) Adjustable	Bulb and Capillary	Range Adjuster	Electrical Ranges				
						Motor Ratings VAC	120	208	240	
A319ABC24-1	SPST	-20 to 100 (-30 to 38)	1 to 30 (0.5 to 17.0)	Type 21 thermistor included 8' (2.4 m) Lead	Knob	AC full load amp	16.0	9.2	8.0	
						AC locked rotor amp	96.0	55.0	48.0	
A319ABC12-1	SPST	100 to 220 (38 to 105)	1 to 30 (0.5 to 17.0)	Type 21 thermistor included 8' (2.4 m) Lead	Knob	Noninductive	15.0	10.0	10.0	
A419ABC-1C	SPDT	-30 to 212 (-34 to 100)	1 to 30 (1.0 to 30.0)	PTC sensor included 6.6' (2m) Lead 0.25 diameter	Buttons with digital display	Horsepower	1.0	1.0	0.5	

* Bulb well not supplied

ACCESSORIES

PAGE

PLT344-1R
SHL10A-603R
TE-6001-1
TE-6001-2
WEL14A-602R
WEL14A-603R

DIN rail end clips
Sun shield for A99 sensor for outdoor sunny locations
Holder for duct sensor
Holder for OSA sensor
4-15/16 COPPER BULB WELL
5-13/16 COPPER BULB WELL

1391
1391



THERMOSTATS & CONTROLLERS

JOHNSON CONTROLS LOW TEMPERATURE LIMIT CONTROL A11 SERIES

DESCRIPTION

The **A11 Series Low-Temperature Limit Controls** incorporate a 20' (6 m), vapor-charged sensing element. The **A11 Series** reacts to the coldest 16" (40.6 cm) section of the control's sensing element. It is suitable for monitoring the trailing face of a coil for freeze protection.

FEATURES

- **Snap-acting contacts**
- **External temperature scale**
- **Easy set point adjustment**
- **Unaffected by ambient temperature at the control and 4' (1.2m) capillary**

APPLICATION

- **Low temperature limit for coils and/or liquid pipes**



A11A-1

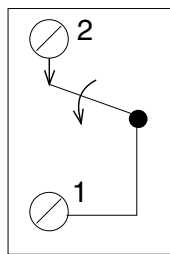


SPECIFICATIONS

Sensing Element	20' (6 m) of 1/8" copper tube	Sensor	R-134A vapor filled
Capillary	4' (1.2 m)	Operating Temperature	0° to 140°F (-18° to 60°C)
Switch	SPST, N.C.	Element	250°F (121°C) maximum
Action	N.C. opens on decrease in temp	Dimensions	3"H x 5.4"W x 2.4"D (7.6 x 13.7 x 6 cm)
Switch Rating	16A @ 120 VAC, 9.2A @ 208 VAC, 8A @ 240 VAC	Weight	1.75 lb (0.79 kg)
Pilot Duty	125 VA @ 24-277 VAC	Approvals	UL listed, File#SA516; CSA certified, File#LR948
Range (Cut Out)	35° to 45°F (2° to 7°C)	Warranty	1 year
Setpoint Adjust	Slot screwdriver		
Differential			
A11A	12°F (6.7°C) manual reset		
A11B	12°F (6.7°C) auto reset		

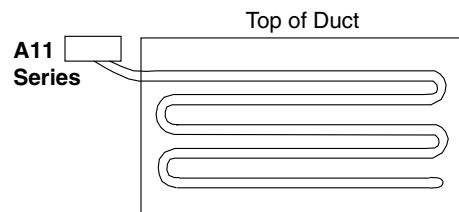
WIRING

SPST - Normally closed
opens on decrease
in temperature



A11 Series

INSTALLATION



Mount sensing element horizontally for proper measurement.
Typically mounted downstream of a coil with capillary
exposed to all areas likely to encounter low temperatures

ORDERING INFORMATION

MODEL	DESCRIPTION
A11A-1	Manual reset low-temperature limit control
A11B-1	Auto reset low-temperature limit control

	RELATED PRODUCTS	PAGE
CC-1G-K	Plastic capillary and sensor holder mounting clip	1391
ES1051	Freeze spray, 8 fl oz	1390
M-648K	Copper-clad capillary mounting clip	1391

THERMOSTATS & CONTROLLERS

LOW & HIGH TEMPERATURE LIMIT CONTROLS

A70 SERIES



DESCRIPTION

The **A70 Series** heavy-duty temperature-limit controls incorporate a vapor charged sensing element. **A70G**, **A70H**, and **A70K** have a four-wire, two-circuit contact block that contains two isolated sets of contacts. The contacts are designed to transfer at set point so that when the main contact opens, the auxiliary contact closes simultaneously. Typical applications include shutdown of a ventilation system and BAS alarm indication upon low or high temperature.



A70HA-1

FEATURES

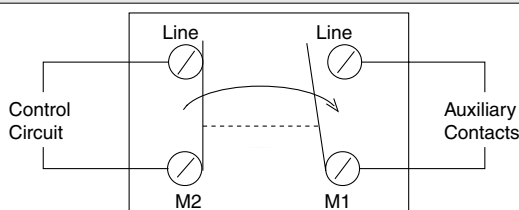
- **Automatic or manual reset models**
- **Long-life, snap-acting contacts**
- **Easy set point adjust**
- **One-year warranty**

SPECIFICATIONS

MODEL	SWITCH ACTION (Main contacts) LINE-M2	TEMP RANGE °F (°C)	RESET °F (°C)	BULB/ CAPILLARY	MAX BULB TEMP °F (°C)	RANGE ADJUSTER	ELECTRICAL RATING								
							MOTOR RATINGS (VAC)	LINE-M2 (Main)				LINE-M1 (Auxiliary)			
								120	208	240	277	120	208	240	277
A70GA-1* Low Limit	Open Low	15 to 55* (-10 to 13)	Auto 5 (2.8)	20' of 1/8" (6m of 0.32 cm) OD tubing	400 (260)	Screwdriver Slot	AC Full Load Amp	16.0	9.2	8.0	–	6.0	3.3	3.0	–
A70HA-1* Low Limit	Open Low	15 to 55* (-10 to 13)	Manual Reset	20' of 1/8" (6m of 0.32 cm) OD tubing	400 (260)	Screwdriver Slot	AC Non-Inductive Amp	16.0	9.2	8.0	7.2	6.0	6.0	6.0	6.0
A70HA-2 Low Limit	Open Low	35 to 80 (1.7 to 27)	Manual Reset	3/8" x 3" (0.95 x 7.6 cm) 6' (1.9m)cap	250 (121)	Screwdriver Slot	Pilot Duty	125 VA, 24-600 VAC 57.5 VA, 120-300 VDC							
A70KA-1 High Limit	Open High	100 to 170 (38 to 77)	Manual Reset	3/8" x 10" (0.95 x 25.4 cm) 6' (1.9m) cap	240 (116)	Screwdriver Slot	Approvals	UL Listed File #SA516							

*The low cut-out stop is set and sealed at 35°F (1.6°C). The control responds to the lowest temperature along any 1' (30.5 cm) section of the 20' (6m) element.

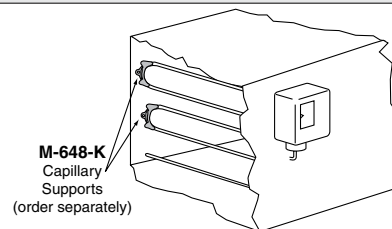
WIRING



A70 Series

Low Limit - Action on temperature decrease
High Limit - Action on temperature increase

INSTALLATION



Mount sensor horizontally for proper measurement. Typically mounted downstream of a coil with capillary exposed to all areas likely to encounter low or high temperatures as required.

ORDERING INFORMATION

MODEL
A70GA-1
A70HA-1
A70HA-2
A70KA-1

DESCRIPTION

Low-limit temperature control, automatic reset, 20' (6m) element
Low-limit temperature control, manual reset, 20' (6m) element
Low-limit temperature control, manual reset, 3" (7.6 cm) element, 6' (1.9m) capillary
High-limit temperature control, manual reset, 10" (25.4 cm) element, 6' (1.9m) capillary

RELATED PRODUCTS

CC-1G-K Plastic capillary and sensor holder mounting clip
ES1051 Freeze spray, 8 fl oz
M-648-K Copper-clad capillary mounting clip

PAGE

1391
1390
1391

THERMOSTATS & CONTROLLERS

LOW LIMIT TEMPERATURE CONTROLLERS

L480 SERIES

DESCRIPTION

The **L480 Series** low limit controllers operate electric dampers, valves and compressor or fan motors to provide temperature or limit control of air conditioning systems and refrigeration units. The **L480B** has an SPDT switch and automatically resets; the **L480G** has an SPST switch that opens on a fall in temperature and requires manual reset. The **L482A** has two SPST switches and manual reset; the main switch opens, and the auxiliary switch closes, on a fall in temperature.

FEATURES

- *Dual temperature scale plate provides both Fahrenheit and Celsius readings*
- *No sensing bulb, the controller operates at the coldest point (1 foot section) of the 20 ft. element for complete coverage*
- *Dustproof and moisture proof enclosed switch for trouble-free operation*
- *Horizontal or vertical mounting for installation flexibility*



L482A1004



L480B1239



APPLICATION

- *Air handling unit coil freeze protection*
- *Freezer cabinets*
- *Display cases*
- *Beverage coolers*
- *Frost alarm for storehouses, orchards*

SPECIFICATIONS

Sensing Element	20' (6m) element, 1/8" dia., no bulb, controller operates at coldest point
Switch action	
L480B	SPDT, automatic reset, makes R-B, breaks R-W on temperature fall
L480G	SPST, manual reset, breaks circuit on temperature fall
L482A	2 SPST, manual reset, main switch (M2) opens, aux. switch (M1) closes on temperature fall
Switch Ratings	See Table 1 and Table 2
Conduit Connection	7/8" (22mm) hole for 1/2" conduit with 1-3/32" (28mm) knockout ring for 3/4" conduit
Setpoint Range	
L480B, G	20° to 60°F (-5° to 15°C)
L482A	15° to 55°F (-9.4° to 13°C), with setpoint stops minimum 34°F
Setpoint Adjustment	Slotted screwdriver
Differential	
L480B, G	Non-adjustable, additive, fixed at 10°F (6°C)
L482A	Non-adjustable, additive, fixed at 5°F (3°C)

Operating Temperature	
L480B, G	-20° to 125°F (-11° to 52°C)
L482A	20° to 140°F (-7° to 60°C)
Maximum Element Temperature	
L480B, G	225°F (107°C)
L482A	250°F (121°C)
Dimensions	
L480B, G	3.3"H x 3.7"W x 2.3"D (8.4 x 9.4 x 5.9 cm)
L482A	4.7"H x 3.9"W x 2.1"D (11.9 x 10.1 x 5.3 cm)
Weight	
L480B	1.5 lb (0.68 kg)
L480G	1.6 lb (0.73 kg)
L482A	2.3 lb (1.04 kg)
Approvals	UL Listed File #E49725, Vol. No. 2, dated 02-09-66; Guide No. SDFY2 CSA Certified Listing G, File No. LR1620; Guide No. 400-E-0
Warranty	1 year

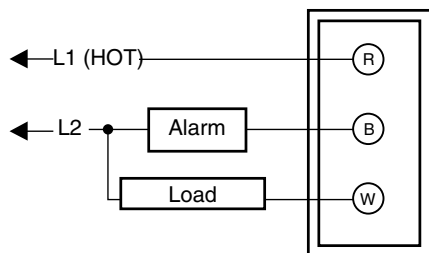
THERMOSTATS & CONTROLLERS

LOW LIMIT TEMPERATURE CONTROLLERS

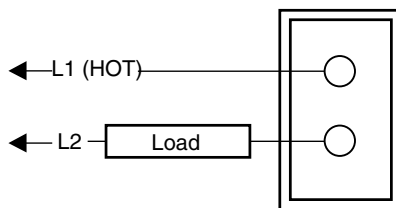
L480 SERIES



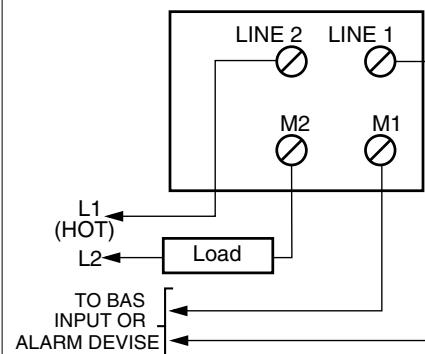
WIRING



L480B



L480G



L482A

TABLE 1: AMPERE RATINGS L480B, G

	120 VAC	240 VAC
Full Load	10.2	6.5
Locked Rotor	61.2	39.0

DC Rating: 0.2A @ 120 VDC, 0.1 A @ 240 VDC
Pilot Duty: 125 VA

TABLE 2: AMPERE RATINGS L482A

	120 VAC	208 VAC	240 VAC	277 VAC
Switch M2 (Main)				
Full Load	16.0	9.2	8.0	-
Locked Rotor	96.0	55.2	48.0	-
Non-inductive	16.0	9.2	8.0	7.2
Switch M1 (Auxillary)				
Full Load	6.0	3.3	3.0	-
Locked Rotor	36.0	19.8	18.0	-
Non-inductive	6.0	6.0	6.0	6.0

Pilot Duty (both poles): 125 VA @ 24 to 600 VAC; 57.5 VA @ 120 to 300 VDC

ORDERING INFORMATION

MODEL	DESCRIPTION
L480B1239	Auto reset, SPDT, 20 ft
L480G1044	Manual reset, SPST, 20 ft
L482A1004	Manual reset, 2 SPST, 20 ft

	RELATED PRODUCTS	PAGE
CC-1G-K	Plastic capillary and sensor holder mounting clip	1391
ES1051	Freeze spray, 8 fl oz	1390
M-648-K	Copper-clad capillary mounting clip	1391

LOW-LIMIT TEMPERATURE CONTROL

TSA, TF142

DESCRIPTION

Models TSA and TF142 provide low-limit temperature control in operating dampers, valves, compressors, or fan motors in HVAC systems. Manual and automatic reset models are available with SPDT or DPDT switching action. **Models TSA and TF142** respond to the lowest temperature sensed along any 1' (0.3m) section of the capillary element.

FEATURES

- **SPDT and DPDT models**
- **Manual and automatic reset models**
- **Easy set point adjustment**
- **Manual test lever**
- **One year warranty**



TSA



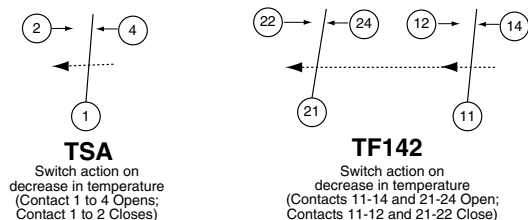
TF142



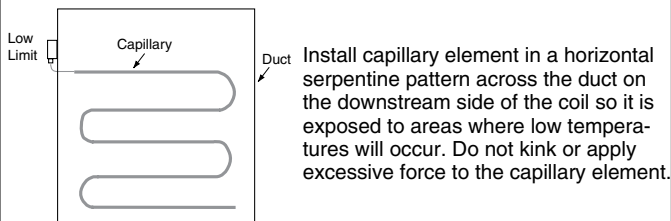
SPECIFICATIONS

Model	TSA-DOP	TSA-COP	TF142-SODP20/SODP06	TF142-SOAP20/SOAP06
Reset	Manual	Automatic	Manual	Automatic
Setpoint Range	35° to 68°F (2° to 20°C)		34° to 70°F (1° to 21°C)	
Differential	4.5°F (2.5°C) fixed		4.5°F (2.5°C) fixed	
Switch Type	SPDT, snap acting		DPDT, snap acting	
Contact Rating	Inductive 24 FLA, 144 LRA @ 120-240 VAC 2 hp @ 120 VAC; 3 hp @ 240 VAC Pilot duty 720 VA max @ 120-600 VAC 144 VA max @ 24 VAC		Inductive 14 FLA, 84 LRA @ 120 VAC; 12 FLA, 72 LRA @ 240 VAC 3/4 hp @ 120 VAC; 2 hp @ 240 VAC Pilot duty 720 VA max @ 120-600 VAC 144 VA max @ 24 VAC	
Sensing Element	Vapor-filled copper capillary, tin-plated 5/64" (0.2 cm) x 20' (609.6 cm), or 6' (182.9 cm) TF Models 3/32" (0.2cm)			
Operating Temperature	-60° to 160°F (-51° to 71°C) Sensing Element 300°F (149°C) max		-60° to 160°F (-51° to 71°C) Sensing Element 300°F (149°C) max	
Dimensions	2.94"H x 3.34"W x 1.56"D (7.47 x 8.48 x 3.56 cm)		3.63"H x 5.5"W x 2.63"D (9.21 x 13.97 x 6.67 cm)	
Weight	1 lb (0.45 kg)		2.8 lb (1.3 kg)	
Approvals	UL and ULC listed, CE, File # E85974, E300881			
Warranty	1 year			
Accessories	M-648-K capillary mounting clip (order separately)		Mounting clips supplied with each control	

WIRING



INSTALLATION



ORDERING INFORMATION

MODEL
TSA-DOP
TSA-COP
TF142-SODP20
TF142-SODP06
TF142-SOAP20
TF142-SOAP06

DESCRIPTION

Low-limit temperature control, SPDT, manual reset
Low-limit temperature control, SPDT, automatic reset
Low-limit temperature control, DPDT, manual reset
Low-limit temperature control, DPDT, manual reset, 6 ft cap
Low-limit temperature control, DPDT, automatic reset
Low-limit temperature control, DPDT, automatic reset, 6 ft cap

RELATED PRODUCTS

CC-1G-K Plastic capillary and sensor holder mounting clip
ES1051 Freeze spray, 8 fl oz
M-648-K Copper-clad capillary mounting clip

PAGE

1391
1390
1391

THERMOSTATS & CONTROLLERS



DUCT HIGH TEMPERATURE LIMIT

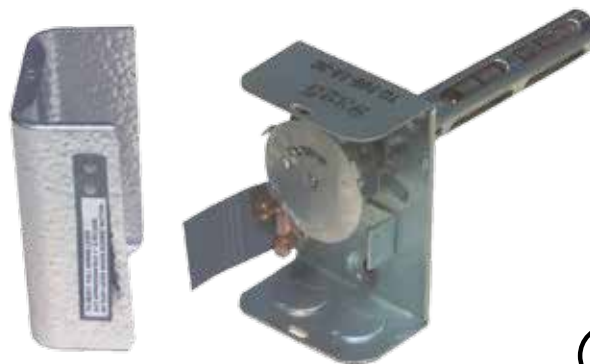
TC-105, TC-100

DESCRIPTION

Models TC-105 and TC-100 feature a helix bimetal element that senses rapid increases in duct temperature, such as in a fire, and operate an SPST switch that opens with a rise in temperature. A manual reset button will reactivate the TC-105 and TC-100 after the high-temperature condition has cleared.

SPECIFICATIONS

Contacts	SPST N.C. mechanical latching
Electrical Capacity	9.8 full load amps @ 115 VAC 4.9 full load amps @ 230 VAC
Element Length	5" (12.7 cm) or 11" (27.9 cm)
Manual Reset Button	External access
Setpoint Range	100° to 250°F (38° to 122°C) field adjustable, factory set @ 125°F (51.6°C)
Differential	25°F (13.8°C) fixed
Weight	
TC100	1 lb (0.48 kg)
TC105	0.75 lb (0.36 kg)
Approvals	UL listed, File #MH7076
Warranty	1 year



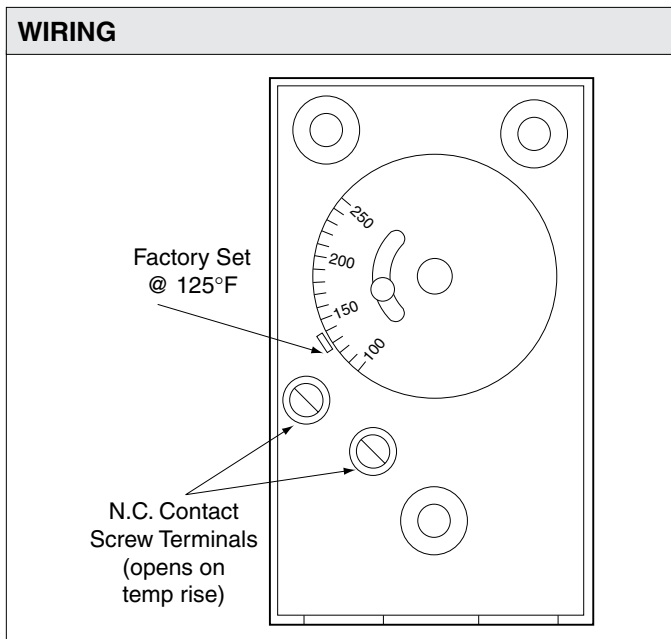
TC-105-1A-3C



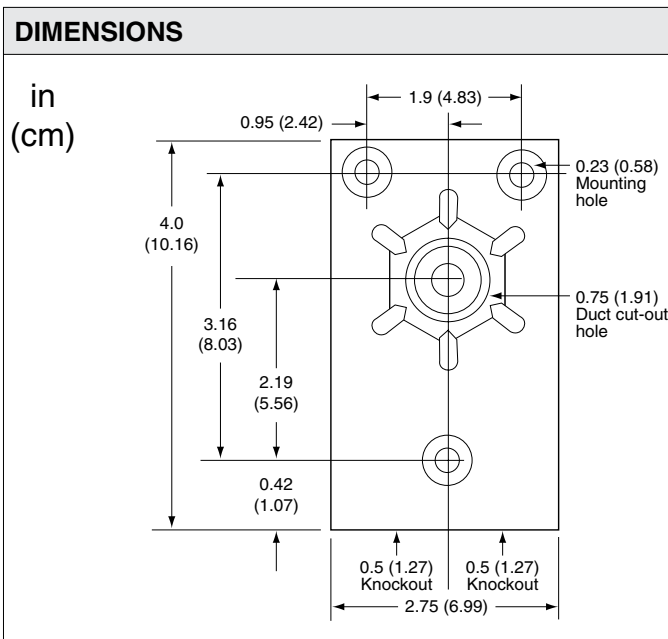
FEATURES

- **Low-cost duct high-temperature limit control**
- **Adjustable set point**
- **Manual reset**
- **UL listed**

WIRING



DIMENSIONS



ORDERING INFORMATION

MODEL
TC-100-1A-3C
TC-105-1A-3C

DESCRIPTION

Duct high-temperature limit with 11" (27.9 cm) element and adjustable setpoint
Duct high-temperature limit with 5" (12.7 cm) element and adjustable setpoint

THERMOSTATS & CONTROLLERS

NEMA 4X INDUSTRIAL CONTROL THERMOSTATS

TF115, TH109, AND TRF115 SERIES

DESCRIPTION

Peco's **TF115-023**, **TH109-009**, **TRF115-005**, and **TRF115-007** industrial control thermostats offer reliable control in industrial, agricultural, and commercial applications. The **TH109-009** has 40-100°F range with a molded plastic enclosure and stainless steel hardware. The **TF115-023** has a low mass, high surface area stainless steel coiled sensor which provides rapid temperature response. Both the **TRF115-005** and **TRF115-007** both have remote bulbs with capillary tubes. All of these thermostats come with SPDT switches and are NEMA 4X, UL listed, and are suitable for use under NEC article 547.

FEATURES

- *Good for both heating and cooling*
- *Rugged, weather resistant NEMA 4X enclosure*
- *Tolerates moist conditions*
- *One SPDT switch on T115 models*
- *Two SPDT switches on TH109 models*

RATINGS

Voltage Rating	FLA	LR	Non-Inductive	Pilot Duty
120 VAC	16.0 VA	80.0 A	25.0 A	125 VA
208 VAC	13.2 VA	66.0 A	25.0 A	125 VA
240 VAC	12.0 VA	60.0 A	25.0 A	125 VA
277 VAC	10.0 VA	50.0 A	22.0 A	125 VA

NEW!



TH109-009

PECO
AUTOMATION AND CONTROLS



TF115



TRF115-005

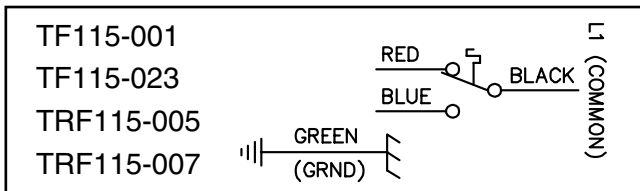


ORDERING INFORMATION AND SPECIFICATIONS

Model Number	Temperature Range	Differential	Switch Action	Bulb	Enclosure Rating	Warranty	Dimensions	Weight, Standard	Approvals
TF115-001	40° to 110°F (4° to 43°C)	Fixed 3°F (-16°C)	Single pole/Double throw (SPDT)	Coiled Air-Stainless Steel	NEMA 4X	2 Years	3.1"W x 6.5"H x 2.5"D (7.9 x 16.5 x 6.4 cm)	2.1 lb (.49 kg)	UL, CSA
TF115-023	-30° to 100°F (-34° to 38°C)	Fixed 6°F (-14°C)	Single pole/Double throw (SPDT)	Coiled Air-Stainless Steel	NEMA 4X	3 Years	3.1"W x 6.5"H x 2.5"D (7.9 x 16.5 x 6.4 cm)	2.1 lb (0.49 kg)	UL, CSA
TRF115-005	0° to 120°F (-17° to 49°C)	Fixed 3°F (-16°C)	Single pole/Double throw (SPDT)	5 foot Stainless Remote	NEMA 4X	4 Years	3.1"W x 6.5"H x 2.5"D (7.9 x 16.5 x 6.4 cm)	2.1 lb (0.49 kg)	UL, CSA
TRF115-007	-30° to 100°F (-34° to 38°C)	Fixed 6°F (-14°C)	Single pole/Double throw (SPDT)	8 foot Copper Remote	NEMA 4X	5 Years	3.1"W x 6.5"H x 2.5"D (7.9 x 16.5 x 6.4 cm)	2.1 lb (0.49 kg)	UL, CSA
TH109-009	40° to 100°F (4° to 38°C)	3°F (-16°C)/ Stage	2-Single pole/Double throw (SPDT)	Coiled Air-Stainless Steel	NEMA 4X	6 Years	3.5"W x 7.3"H x 4.9"D (8.9 x 18.5 x 12.4 cm)	2.1 lb (0.49 kg)	UL, CSA

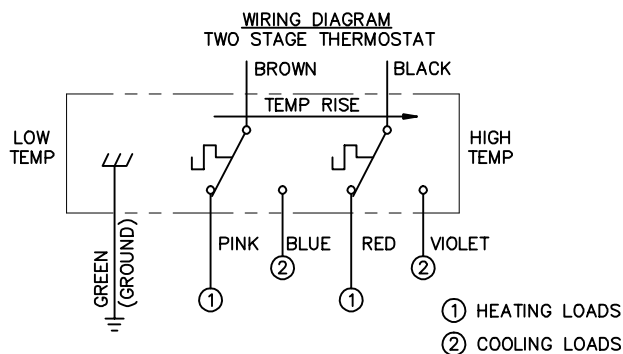
WIRING

Wiring Connections

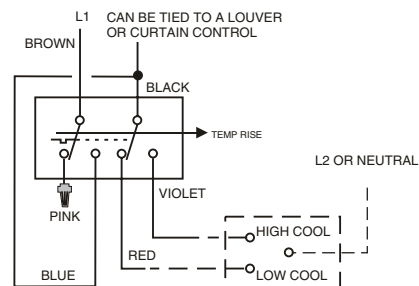


TH109-009

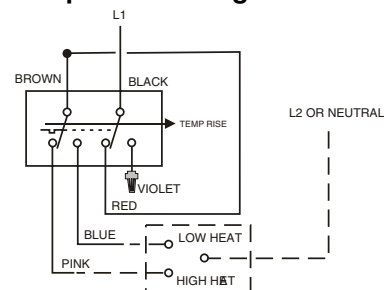
Double pole, double throw contacts operate sequentially with 3°F (1.7°C) nominal separation on temperature rise or fall.



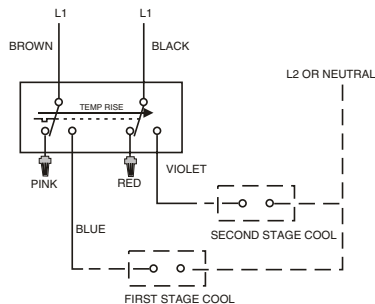
Two Speed Cooling



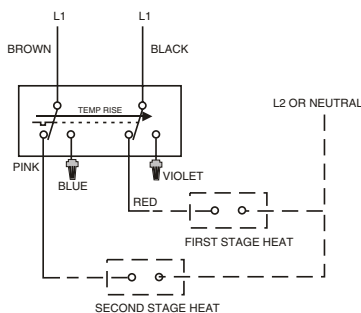
Two Speed Heating



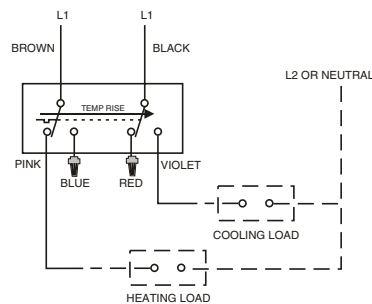
Two Stage Cooling



Two Stage Heating



Auto Changeover Control 1 Heat/1 Cool with 3°F dead band



THERMOSTATS & CONTROLLERS

NEMA 4X RATED THERMOSTATS

T631F/G, TW155/255 SERIES

DESCRIPTION

The **T631F/G Series** and the **TW155/255 Series** thermostats have NEMA 4X enclosure ratings and provide line voltage control of heating, cooling and ventilation systems in areas that are subject to washdown such as barns, poultry and hog houses, pump buildings and crop storage areas.



T631F



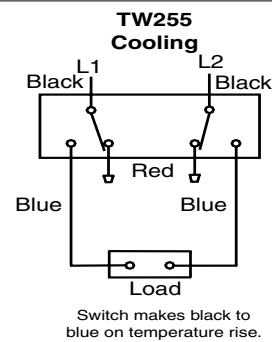
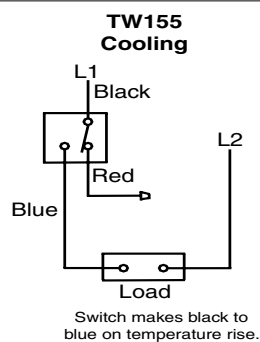
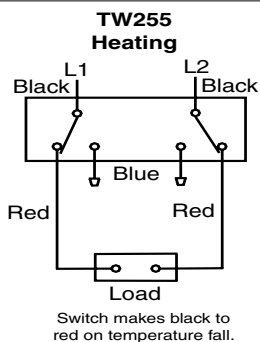
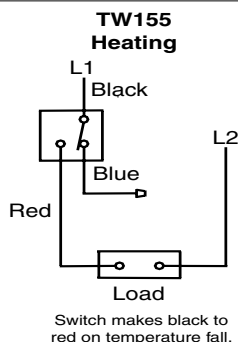
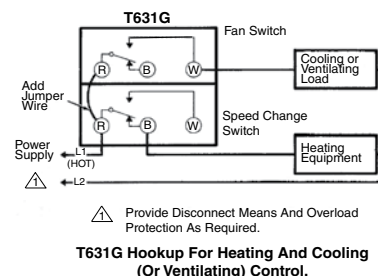
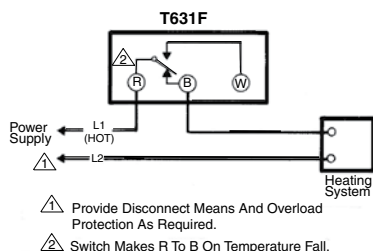
TW155

Honeywell


SPECIFICATIONS

Model	Setpoint	Range °F (°C)	Differential °F (°C)	Output	Contact Rating (A)				Dimensions in (cm)
					24 VAC	120 VAC	240 VAC	277 VAC	
TW155	External	40 to 110 (4 to 43)	FIXED	1 SPDT	-	22 FLA (3/4 HP)	22 FLA (1.5HP)	22 FLA (1.5HP)	TW155/255 6.87"H x 3.125"W x 3.375"D (Not including knob) (17.4 x 7.9 x 8.6 cm) T631F/G 5"H x 6.5"W x 3"D (12.7 x 16.5 x 7.6 cm)
TW255	External	40 to 110 (4 to 43)	FIXED	DPDT	-	22 FLA (3/4 HP)	22 FLA (1.5 HP)	22 FLA (1.5HP)	
T631F1068	Internal	35 to 100 (2 to 38)	FIXED 2 (1.1)	1 SPDT	2 FLA	7.4 FLA 44 LRA	3.7 FLA 22 LRA	3 FLA 18 LRA	Approvals TW155/255 ETL Canada/USA UL listed File No. E4436 Vol. 1 Sec UL Guide XAPX; CSA Certified File No. LR1620 Guide No. 400-E-O; Meets NEC Article 547-4 Maximum Operating Temperature TW155/255 110°F (43°C) T631F/G 145°F (63°C)
T631F1084	External	35 to 100 (2 to 38)	FIXED 2 (1.1)	1 SPDT	2 FLA	7.4 FLA 44 LRA	3.7 FLA 22 LRA	3 FLA 18 LRA	
T631F1092	External	35 to 100 (2 to 38)	FIXED 3.5 (1.9)	1 SPDT (1 HP)	-	16 FLA 96 LRA	8 FLA 48 LRA	-	
T631G1059	External	35 to 100 (2 to 38)	FIXED 2 (1.1) Interstage 0 to 7 (0 to 4)	2 SPDT (1 HP)	-	16 FLA 96 LRA	8 FLA 48 LRA	-	

WIRING



ORDERING INFORMATION

MODEL

TW155
TW255
T631F1068
T631F1084
T631F1092
T631G1059

DESCRIPTION

SPDT, NEMA 4 Thermostat, external setpoint, 120 to 277 VAC rating

DPDT, NEMA 4 Thermostat, external setpoint, 120 to 277 VAC rating

SPDT, NEMA 4 Thermostat, internal setpoint, 24 to 240 VAC rating

SPDT, NEMA 4 Thermostat, external setpoint, 24 to 240 VAC rating

SPDT, NEMA 4 Thermostat, external setpoint, 120 to 240 VAC rating

SPDT (2), NEMA 4 Thermostat, external setpoint, 120 to 240 VAC rating

THERMOSTATS & CONTROLLERS

TWO POSITION ROOM THERMOSTATS

TC-1100 SERIES



DESCRIPTION

The **TC-1100 Series** two-position, single-pole double-throw room thermostat is for single-stage heating or single-stage cooling. The **TC-1100 Series** comes in three setpoint spans to cover most any application: 55° to 85°F, 45° to 75°F, and 75° to 105°F. The **TC-1100 Series** comes standard with thermometer and set point as shown. It is also packaged with cover plates for set point only or for blank cover.

FEATURES

- **High and low voltage**
- **Thumbwheel set point**
- **UL listing**
- **Plates with set point or blank cover**
- **Fits standard single-gang switch box**



TC-1101

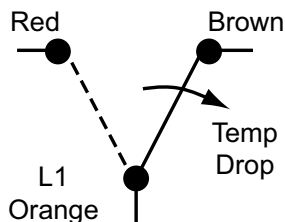


SPECIFICATIONS

Supply Voltage	24-240 VAC	Differential	2°F (1°C)
Contacts		Connections	6.0" (15.24 cm) leads, 14 AWG
Cooling	SPDT 3.0A @ 24/120V, 1.5A @ 240V	Mounting	Vertical, 2" x 4" (5.1 x 10.2 cm) switch box
Heating	SPDT 4.4A @ 24/120V, 2.2A @ 240V	Dimensions	4.38"H x 2.86"W x 1.63"D (11.13 x 7.26 x 4.14 cm)
Pilot Duty	40 VA @ 24V, 210 VA @ 120/240V	Weight	0.8 lb (0.36 kg)
Control Type	Two-position, on/off	Approvals	UL File #XAPX.E9429
Sensor	Bimetal snap acting	Warranty	2 years
Range Limits	Dial stop pins		

WIRING

Orange-Brown makes on temperature drop



TC-1100 Series

ORDERING INFORMATION

MODEL	DESCRIPTION
TC-1101	Two-position SPDT H/C thermostat, setpoint 55° to 85°F
TC-1102	Two-position SPDT H/C thermostat, setpoint 45° to 75°F
TC-1103	Two-position SPDT H/C thermostat, setpoint 75° to 105°F
TC-1101-116	Two-position SPDT H/C thermostat, setpoint 13° to 29°C

THERMOSTATS & CONTROLLERS

THERMOSTAT TOOLS AND CHANGE-OVER THERMOSTAT

ZS002, KT-1, JC5309, ES-1051, 680243-6

DESCRIPTION

Model ZS002 is a handheld thermostat substitution tool and an air conditioning system testing tool for up to two stages of heating and cooling in conventional or heat pump systems.

SPECIFICATIONS

Supply Voltage	24 VAC from the air conditioning system
Connections	Eight 30" leads, 18 AWG, with alligator clips
Red	R - Power
Blue	C - Common
White	W1 - Heat 1
Gray	W2 - Heat 2
Yellow	Y1 - Cool 1
Violet	Y2 - Cool 2
Orange	O/B - Heat pump reversing valve
Green	G - Fan control
Enclosure	5" x 8" plastic with hook (for hanging) and magnetic holding strip
Mode	Three modes, continuity/analyze/activate
LED Indication	19 LEDs, Power/Mode/Control
Switching Capability	Six 2-position controls and one 3-position mode switch



ZS002

ORDERING INFORMATION

MODEL	DESCRIPTION
ZS002	Air conditioning system testing tool

DESCRIPTION

Thermostat Screwdrivers allow removal of sensor and thermostat covers for service.

ORDERING INFORMATION

MODEL	DESCRIPTION
KT1	Mounting screwdriver 1/16" allen key
JC-5309	Flexible 1/16" Allen key pocket screwdriver



KT-1



JC5309

DESCRIPTION

Freeze Spray is for testing sensors and thermostats. Cool down the elements to test thermostat operation or point-to-point wiring verification. This non-corrosive and contaminant-free aerosol has no CFCs and saves checkout time.

Ingredients:	Chemical Name	CAS#	Wt.% Range
	Tetrafluoroethane	811-97-2	94.0-99.0%
	Methanol	67-56-1	0.1-1.5

ORDERING INFORMATION

MODEL	DESCRIPTION
ES1051	Freeze spray, 8 fl oz



ES-1051

DESCRIPTION

Model 680243-6 changeover switch is snap-acting SPDT and made to strap onto water pipes. It is used for heating/cooling changeover inputs to room thermostats. It has a fixed setpoint of 85°F and a 20°F lowside differential (off at 65°F). The maximum fluid temperature is 220°F and maximum ambient is 125°F.

ORDERING INFORMATION

MODEL	DESCRIPTION
680243-6	Pipe-mounted thermostat change-over switch with conduit fitting



680243-6

Circuit Made	Switch Makes
White- Blue	(Cold) Below 60°F
White-Black	(Hot) Above 88°F

THERMOSTATS & CONTROLLERS



THERMOSTAT REMOTE SENSOR ACCESSORIES 356-90K, APB-28, CC-1G, M645K, M-2500, PN-46, TE6001

DESCRIPTION

Models **TE6001**, **CG-1G**, **M645K**, **356-90K**, **M-2500**, **APB-28**, and **PN-46** are all sensor mounting brackets for averaging, duct, and outside air probe applications. They have a 1/4" clip or guide to firmly hold a temperature sensor for the application.

TE6001-1 Duct temperature element holder with box



TE6001-8 Duct temperature element holder without box



M-648K Copper-clad capillary and sensor holder mounting clip



CC-1G-K Plastic capillary and sensor holder mounting clip



APB-28 Adjustable pipe bracket 2"-8" diameter



PN-46 Aluminum sensor holder with adhesive backing



DESCRIPTION

Wall adaptor plates (goof plates) offer concealment of plaster irregularities, and are ideal to cover up old thermostat mounting holes or paint ridges. Foam backing pads offer wall insulation for better temperature readings. Switch plate displays offer readouts for temperature at every light switch.

10-531 White adapter plate 7" x 5.25" (KTR, KHR)
Hole Dimensions: 2" x 1.5"



50002883-001 White wall plate 6" x 8.3" (TH5000, TH6000)
Hole Dimensions: 2.25" x 2"



65345 White wall plate 4" x 4" (PECO)
Hole Diameter: 1.5"



BA/ADP-525-7-WMW Warm white adaptor plate 7" x 5.25"
BA/ADP-525-7-OFW Off white adaptor plate 7" x 5.25"
BA/ADP-525-7-CPW Copla white adaptor plate 7" x 5.25"
BA/FOAMBACK White foam back insulator, 4.4" x 2.6"
BA/FOAMBACK-GREY Grey foam back insulator, 4.4" x 2.6"

Hole Diameter: 1.65"



THERMOSTAT GUARDS ATK, BA, TG, TG500 SERIES

DESCRIPTION

The **TG, ATK** and **BAPI-Guard** Thermostat Guards are used to enclose and protect wall thermostats and sensors against tampering, damage, and unauthorized adjustment of thermostat settings.

FEATURES

TG500 Series Vented Guards

- *Patented, double-wall construction*
- *Available in various sizes*
- *Opaque plastic, clear plastic or painted steel*
- *Includes ring base, cover, lock and two keys*

BAPI-Guard Series Vented Guards

- *Clear low profile design*
- *All mounting and hardware included*
- *Key lock for vertical or horizontal mounting*
- *Two sizes to fit most applications*
- *Hammer tough*

ATK Series

- *Available in wire and cast aluminum*
- *Vertical and horizontal mounting*

TG Series Vented Guards

- *One piece U.V. stabilized high impact molded polycarbonate housing*
- *Ring base is 16 gauge steel with white finish and four mounting holes*
- *Stainless steel fasteners secure housing to base*
- *Ventilation holes allow air to circulate freely*



BAPI-GUARD



TG510A



TG-1



ATK03



ATK04

ORDERING INFORMATION

Model	Size	Cover	Ring Base	Solid Wall Plate	Inside Dimensions			Outside Dimensions		
					Height in (cm)	Width in (cm)	Depth in (cm)	Height in (cm)	Width in (cm)	Depth in (cm)
TG510A1001	Small	Clear	Clear	Opaque	4.38 (11.13)	4.38 (11.13)	2.25 (5.72)	5.88 (14.94)	5.88 (14.94)	2.5 (6.35)
TG510D1005		Painted Steel (off-white)	Opaque		4.38 (11.13)	4.38 (11.13)	2.25 (5.72)	5.88 (14.94)	5.88 (14.94)	2.5 (6.35)
BA/BG2		Clear	Clear	—	4.8 (12.3)	2.9 (7.4)	1.43 (3.65)	6.75 (17)	4.75 (12)	2.1 (5.4)
ATK03		Wire	—		4.25 (10.80)	2.63 (6.66)	1.63 (4.12)	—	—	—
ATK04		Cast Aluminum	—		4.25 (10.80)	2.75 (6.98)	1.63 (4.12)	—	—	—
F229-0225	Medium	Clear	—		3.88 (9.86)	3.5 (8.89)	2.5 (6.35)	—	—	—
TG511A1000		Clear	Clear	Opaque	5.06 (12.85)	6.06 (15.39)	2.63 (6.68)	6.5 (16.51)	7.5 (19.05)	2.94 (7.47)
TG511D1004		Painted Steel (off-white)	Opaque		5.06 (12.85)	6.06 (15.39)	2.63 (6.68)	6.5 (16.51)	7.5 (19.05)	2.94 (7.47)
F29-0227		Clear	—	—	5.25 (13.34)	4.63 (11.76)	3.25 (8.26)	—	—	—
TG-1		Pearlescent	White	—	2.8 (7.1)	5.0 (12.7)	3.1 (7.9)	5.375 (13.7)	7.75 (19.7)	4.25 (10.8)
TG-2	Large	Clear	White	—	2.8 (7.1)	5.0 (12.7)	3.1 (7.9)	5.375 (13.7)	7.75 (19.7)	4.25 (10.8)
TG-37		Prismatic	White	—	3.0 (7.6)	5.5 (14.0)	3.1 (7.9)	5.875 (14.9)	8.5 (21.6)	4.125 (10.5)
TG512A1009		Clear	Clear	Opaque	5.88 (14.94)	8.38 (21.29)	3.0 (7.62)	7.25 (18.42)	9.75 (24.77)	3.38 (8.59)
TG512D1003		Painted Steel (off-white)	Opaque		5.88 (14.94)	8.38 (21.29)	3.0 (7.62)	7.25 (18.42)	9.75 (24.77)	—
BA/BG		Clear	Clear	—	6.9 (17.5)	4.7 (11.8)	1.75 (4.43)	9.45 (24)	9.45 (24)	3.0 (7.6)
ATK63		Wire	—	—	6.50 (16.51)	6.38 (16.21)	3.0 (7.62)	—	—	—
F29-0231		Clear	—	—	7.06 (17.93)	4.13 (10.49)	2.25 (5.72)	—	—	—
F29-0413		—	—	—	6.36 (16.15)	3.5 (8.89)	3.25 (8.26)	—	—	—
F29-0198		—	—	—	8.13 (20.65)	4.63 (11.76)	3.63 (9.22)	—	—	—
F29-0220		Painted Steel (beige)	—	—	7.13 (18.11)	4.63 (11.76)	3.25 (8.26)	—	—	—
F29-0222		Mounted	—	—	6.63 (16.84)	4.50 (11.43)	3.38 (8.58)	—	—	—
F29-0192		Hinged	—	—	6.25 (15.88)	4.75 (12.07)	3.0 (7.62)	—	—	—
F29-0193		Hinged	—	—	6.0 (15.24)	3.82 (9.7)	3.13 (7.95)	—	—	—