

# T775 Series 2000 Electronic Stand-Alone Controllers

## SPECIFICATION DATA



## DESCRIPTION

The T775 electronic stand-alone controllers are the next generation of commercial and agricultural controls capable of remote sensing of temperature and providing switched and/or proportional outputs to various types of loads.

### IMPORTANT

*The T775 is an operating control, not a limit or safety control. If used in applications requiring safety or limit controls, a separate safety or limit control device is required.*

## FEATURES

- **Easy-To-Use Graphical Interface** Operating the new T775 is easy and the intuitive programming will save you time on every job. Each model includes a keypad lockout.
- **NEMA 4X Enclosure Option** Certain models are offered with NEMA 4X enclosures to protect them from water and corrosion for installations like washdown areas, animal confinement areas, swimming pools and other similar locations.
- **Internal Time Clock Scheduler** The Setback and Disable Output options, controlled by the built-in scheduler or digital input, will help save energy during unoccupied times and give you more control of the equipment without needing to purchase an additional time clock. Run times can be displayed for the first 4 relay outputs.
- **Up To Two Independent Modulating Outputs** Each output can be individually configured for 0-10 Vdc, 2-10 Vdc, 4-20 mA or Series 90.
- **Modulating High Or Low Limit Control** To protect your equipment from freezing or overheating, models offering this feature give you the ability to adjust your control temperature at Sensor A to protect equipment at Sensor B. The control adjusts its modulating output to prevent exceeding the user-entered High or Low limit for Sensor B.
- **Optional Configurable Integral And Derivative Times** Standard on every device, this feature delivers pinpoint (PI or PID) control on modulating outputs set up by default to behave just like the previous T775 Series 1000, but now you can adjust reaction times and behavior, giving you more control. Anti-integral wind-up is standard.
- **Reset Models With Simplified Setup** Reset programming is easy. Simply enter the high and low control temperatures and the corresponding high and low outdoor temperatures. As your outside temperature gets colder, the setpoint temperature automatically adjusts to save energy.
- **Configurable Minimum Off Time** If needed, setting a minimum off time can protect equipment and reduce the need for a separate time delay device.
- **Sensor Calibration** Calibrate input sensors up to  $\pm 10^{\circ}\text{F}$  ( $\pm 6^{\circ}\text{C}$ ) for temperature and up to  $\pm 10\%$  of range for other sensors (e.g. pressure, humidity) to compensate for resistance drops in longer sensor wire runs.
- **Special Models** Five T775 models are available for special applications:
  - **Universal Models (T775U2006 and T775U2016)** to control pressure, humidity, or any medium with an analog input
  - **Special Boiler Model (T775P)** for boiler control
  - **Special Staged Sequencing Model (T775L)** for sequence staging of relays with one or two setpoints
  - **Special Expansion Model (T775S)** for staging up to 12 relays with two setpoints

## SPECIFICATIONS

**Power:** 24, 120, or 240 Vac; 50/60 Hz

A separate earth ground is required for any power source.

**Power Consumption:**

- 8 VA maximum at 60 Hz
- 10 VA maximum at 50 Hz

**Operating & Storage Temperature Ambient Rating:**

- -40°F to 125°F (-40°C to 52°C) @ 50 Hz
- -40°F to 140°F (-40°C to 60°C) @ 60 Hz

**Relative Humidity:** 5% to 95% non-condensing

**Dimensions:** refer to Fig. 1 on page 4.

All T775 controllers are field-mountable in any orientation to either a panel or wall.

**Digital Input (DI):** 18 Vdc and 3.5 mA (for choosing external contact)

**Digital Output (DO) Alarm (T775P only):**

- Alternating Current (AC):
  - 30 Vac RMS; 1.5 A steady 3 A inrush P.F. 0.45 NC
  - 20 Vac RMS; 100 mA minimum load on NO and NC contacts
- Direct Current (DC): 1 mA at 100 mV DC minimum load

**NOTE:** In applications requiring a gold contact signal relay, an external signal relay or additional load resistor may be needed for the digital output.

**Relay Contact Output Ratings (N.O. and N.C.):**

- 1/2 hp; 9.8 AFL, 58.8 ALR @ 120 Vac
- 1/2 hp; 4.9 AFL, 29.4 ALR @ 240 Vac
- 125 VA pilot duty @ 120/240 Vac
- 10A @ 24 Vac (resistive)

**Modulating Outputs:**

- 0-10 Vdc; drive a minimum of 2,000 Ohms
- 2-10 Vdc; drive a minimum of 2,000 Ohms
- 4-20 mA; drive a maximum of 600 Ohms
- Electronic Series 90; requires 340 Ohm resistor (included) across terminals R and W
- Floating

**Sensed Temperature Limits (displayed):**

- Minimum -60°F (-51°C)
- Maximum 270°F (132°C)

**High Setpoint Limit:** An irreversible high limit setpoint can be configured to meet local code requirements.

**Sensed Temperature Accuracy:**

- T775: 1°F/C @ ambient room temperature of 77°F (25°C)
- 50021579-001 and T775-SENS-WR: ±0.42°F from -22°F to 248°F (+/- .24°C from -30°C to 120°C)

**Setpoint Range:** -40°F to 248°F (-40°C to 120°C)

**Time Clock:** Two settable time periods per day are standard on all models.

**Volatile Memory:** The date and time settings are retained for 24 hours after a power outage. After a power loss of more than 24 hours, the date and time settings may need to be reentered. All other settings are stored permanently.

**Approvals:** UL 60730-1 for US and Canada, CuL, C-tick

## COMPATIBLE COMPONENTS

### Temperature Sensors<sup>a</sup>

The controller accepts 1,097 Ohms PTC at 77°F (25°C):

- 50021579-001 – Standard sensor (included with all models except NEMA 4X models)
- T775-SENS-STRAP – Strap on sensor with wiring box
- T775-SENS-WR – Water resistant with 5 foot leads (included with NEMA 4X models)
- T775-SENS-WT – Watertight with 6 foot lead
- T775-SENS-OAT – Outdoor air temperature sensor
- C7031D2003 – 5 inch immersion sensor with wiring box (use immersion well; P/N 50001774-001)
- C7031J2009 – 12 foot duct averaging sensor with wiring box
- C7046D1008 – 8 inch duct probe with mounting flange
- C7100D1001 – 12 inch fast response, duct averaging sensor with flange
- C7130B1009 – Room mount sensor

### Humidity Sensors (T775U only)

The controller accepts 0-10 Vdc or 4-20 mA input with a range of 0-100%

H7625, H7635, and H7655 models (available in 2, 3, and 5% RH accuracy) can be used.

### Differential Pressure Sensors (T775U only)

P7640A and PWT pressure transducer models with selectable pressure ranges can be used.

The controller accepts pressure sensors with a signal output of 0-10 Vdc or 4-20 mA for any output range within the following ranges (the minimum and maximum for the sensor output range can be adjusted within the following limits):

- -500 to 500 PSI
- -30.0 to 30.0 inches w.c.
- -3,000 to 3,000 Pa
- -3,000 to 3,000 kPa

### Universal Sensors (T775U only)

The controller accepts 0-5 Vdc, 0-10 Vdc or 4-20 mA input for temperature, pressure, humidity, etc. They may be programmed in units of °F, °C, %, Pa, kPa, PSI, Inches W.C., PPM, or None (no units). CO<sub>2</sub> sensors (C7232 and C7632) are also compatible.

### Actuators

For more information on compatible actuators or other Honeywell products, such as dampers and valves, go to [www.customer.honeywell.com](http://www.customer.honeywell.com). From the home page select **Product Selection Tool** under **Products**.

- Spring return models: ML6425, ML7425, MS4105, MS4110, MS4120, MS7505, MS7510, MS7520, MS8105, MS8110, MS8120
- Non-spring return models: ML6161, ML6174, ML7161, ML7174, MN6105, MN6110, MN7505, MN7510

### Accessories

- 107324A – Bulb Holder, duct insertion
- 107408 – Heat Conductive Compound, 4 ounce
- 50001774-001 – Immersion Well, stainless steel 304, 1/2 in. threading

<sup>a</sup> See form 62-0265 – *Temperature Sensors for the T775 Series 2000 Stand-alone Controller*

Table 1. T775 Controller Configurations.

Controller Model <sup>a</sup>	Description	Replaces	Output Reset	SPDT Relay Outputs	Analog (Mod) Outputs <sup>b</sup>	DO <sup>c</sup>	Floating Outputs <sup>d</sup>	Sensor Inputs	Nbr of Sensors Included	Staged Loop Control	Addable T775S	Enclosure
<b>T775 A/B/M/R Controller Configurations</b>												
T775A2009	Standard	T775A1001	No	1	None	N/A	None	1	1	N/A	N/A	NEMA 1
T775B2016	Standard	N/A	No	2	None	N/A	1	2	1	N/A	N/A	NEMA 4X
T775B2024	Standard	T775C1009 T775D1008	No	4	None	N/A	2	2	1	N/A	N/A	NEMA 4X
T775B2032	Standard	T775A1019 T775B1000	No	2	None	N/A	1	2	1	N/A	N/A	NEMA 1
T775B2040	Standard	T775A1027 T775A1035 T775B1018 T775B1026 T775B1042	No	4	None	N/A	2	2	1	N/A	N/A	NEMA 1
T775M2006	Modulating	N/A	No	None	2	N/A	None	2	1	N/A	N/A	NEMA 1
T775M2014	Modulating	T775G1005 T775G1013 T775G1021 T775G1039	No	4	2	N/A	None	2 <sup>e</sup>	1	N/A	N/A	NEMA 4X
T775M2022	Modulating	N/A	No	2	2	N/A	None	2 <sup>e</sup>	1	N/A	N/A	NEMA 4X
T775M2030	Modulating	T775E1114 T775F1022 T775F1055 T775F1089	No	4	2	N/A	None	2 <sup>e</sup>	1	N/A	N/A	NEMA 1
T775M2048	Modulating	T775E1015 T775E1023 T775E1056 T775E1064 T775E1098	No	2	2	N/A	None	2 <sup>e</sup>	1	N/A	N/A	NEMA 1
T775R2001	Reset Option	N/A	Yes	4	None	N/A	2	2	2	N/A	N/A	NEMA 1
T775R2019	Reset Option	N/A	Yes	4	2	N/A	None	2	2	N/A	N/A	NEMA 1
T775R2027	Reset Option	T775J1043 T775J1050 T775J1068	Yes	2	2	N/A	None	2	2	N/A	N/A	NEMA 1
T775R2035	Reset Option	T775J1001 T775J1076	Yes	2	None	N/A	1	2	2	N/A	N/A	NEMA 1
T775R2043	Reset Option	T775J1019 T775J1027 T775J1035	Yes	None	2	N/A	None	2 <sup>e</sup>	2	N/A	N/A	NEMA 1
<b>T775 L/P/U/S Special Application Controller Configurations</b>												
T775L2007 <sup>f</sup>	Stage Sequencer with Reset	N/A	Yes	4 <sup>g</sup>	None	N/A	None	2	1	Yes	Yes	NEMA 1
T775P2003	Boiler Model with Reset <sup>h</sup>	N/A	Yes	4	None	1	None	3	3	Yes	Yes	NEMA 1
T775U2006	Universal Humidity, Pressure, Temperature, etc.	H775A1006 H775A1022 H775A1048 H775A1063 H775B1005 H775C1004 H775D1003 H775E1002	Yes	2	2	N/A	None	2 <sup>i</sup>	None	N/A	N/A	NEMA 1
T775U2016		N/A	Yes	2	2	N/A	None	2 <sup>j</sup>	None	N/A	N/A	NEMA 1
T775S2008	4-Relay Expansion Module <sup>k</sup>	N/A	N/A	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NEMA 1

<sup>a</sup> All models include a digital input for use with the disable or setback option.

<sup>b</sup> The modulating (analog) outputs are 4-20 mA, 0-10 Vdc, 2-10 Vdc, or Series 90 selectable.

<sup>c</sup> Digital Output alarm (low voltage) available only on the T775P model. The Digital Output alarm can be configured based on minimum, maximum, or differential temperature.

<sup>d</sup> Each floating output eliminates two SPDT relays.

<sup>e</sup> For the models noted above, Sensor B can support a high/low modulating limit for temperature control at Sensor A.

<sup>f</sup> The T775L model can be used to stage multiple relays from two independent heat or cool setpoints. The number of stages for each setpoint can be freely chosen, limited by the number of relays available (up to 12 using two T775S expansion modules). For example, programming could be (3 heat - 4 cool), (5 heat - 1 cool), etc. In addition to the two staged loops, an additional two relays can be available for independent on-off control.

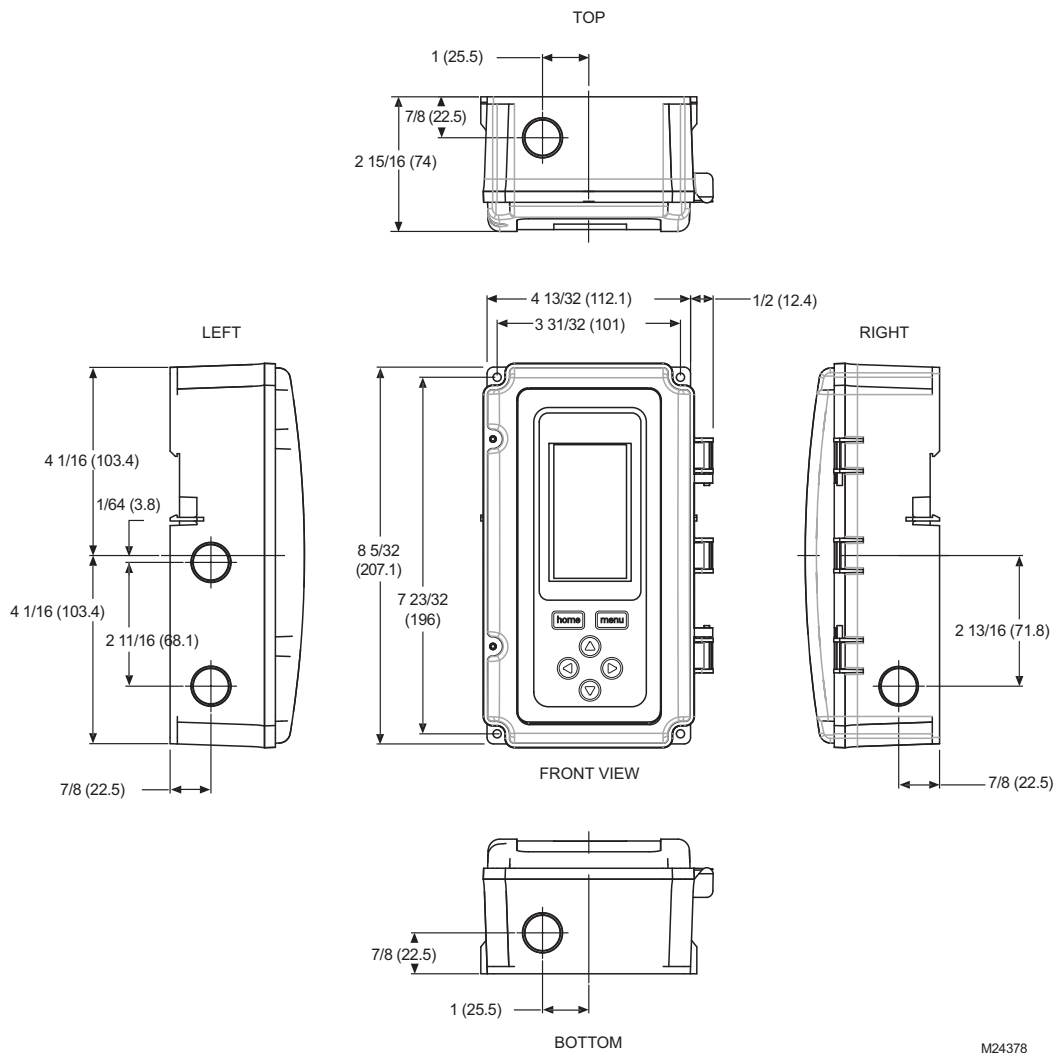
<sup>g</sup> For the T775L model, the maximum number of non-sequenced relays is two (2) with each having its own setpoint and its own throttling range. These relays are available if they are not being used by the staged relay loops.

<sup>h</sup> The T775P model provides an optional Pump Output using the last SPDT relay output (4<sup>th</sup>, 8<sup>th</sup>, or 12<sup>th</sup> depending on configuration). Stages can be configured for either standard, first-on first-off, or equal run time.

<sup>i</sup> For the T775U2006 sensor inputs, Sensor A can be 0-5 Vdc, 0-10 Vdc, 4-20 mA, or a standard temperature input. Sensor B is a standard temperature sensor input only. Sensor B is used only for reset on the T775U2006.

<sup>j</sup> The T775U2016 can control Sensor A (universal) and Sensor B (temperature) independently, like other standard T775 controllers.

<sup>k</sup> Up to two T775S expansion modules can be used with the T775L and T775P models to provide a total of 8 or 12 stages.



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**Fig. 1. T775 Dimensions in inches (mm).**

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## Automation and Control Solutions

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