

TB7100A1000 MultiPRO™

Multispeed and Multipurpose Thermostat

FOR CONVENTIONAL, HEAT PUMP, FAN COIL AND PTAC SYSTEMS

GUIDE SPECIFICATION

GENERAL

A. OVERVIEW:

The contractor shall furnish, install, and place in operating condition an HVAC control system described herein. All units shall be located in accordance with the plans.

B. TYPE OF SYSTEM:

System Requirements:

- a. Control up to 1 heating and 1 cooling stage for gas heat, electric heat or conventional rooftops. Up to 2 heat and 1 cool for heat pump, fan coil (2 or 4 pipe), and PTAC.
- b. Up to 3 fan speeds for fan coil and 2 fan speeds for PTAC applications
- c. Remote setback capability for occupancy sensors and timeclocks (optional)
- d. Changeover input for 2 pipe fan coil systems.
- e. Fan ramping and fan reset algorithms for fan coil and PTAC applications.
- f. Provide minimum 2 year clock backup.
- g. Provide two Occupied and two Unoccupied periods per day.
- h. Offer automatic heat/cool changeover with 2°F minimum deadband.
- i. Provide cumulative override capability for a 1 to 12 hour installer-adjustable period.
- j. Include a comfort adjust feature to modify setpoints for the override duration.
- k. Provide Proportional plus Integral (P + I) temperature control.
- l. Display room temperature in °F or °C.
- m. Use multiple remote sensors (optional).
- n. Provide five levels of keypad lockout - none, schedule / system, schedule / system / fan, schedule / system / fan / setpoint, and complete.
- o. Provide Holiday Override, 1-365 days.
- p. Provide separate configurable recovery ramps for heating and cooling.
- q. Provide separate configurable cycle rates for heating and cooling response.
- r. Programmable or non-programmable modes.

System Components:

- a. Seven day programmable thermostat with subbase.
- b. Wall mount temperature sensors (optional).

C. CODES AND STANDARDS:

The system shall comply with applicable provisions of ASHRAE 90-75. Energy Star approved. These specifications are based on equipment from Honeywell to set a standard for design and quality.

D. WIRING:

All wiring shall meet National Electrical Codes and local electrical codes.

E. TESTING GUARANTEE SERVICE:

- Prior to installation, the contractor shall provide copies of submittals.
- The contractor is responsible for assuring that conduit and wire quantity, size, and type are suitable for the equipment supplied.
- Upon completion, the contractor shall conduct a total system test for the owner and engineer.
- All components, parts, and assemblies supplied by the manufacturer shall be guaranteed against defects in materials and workmanship for 2 years.
- Warranty service shall be performed by the contractor.



SEQUENCE OF OPERATIONS

The heating and cooling setpoints shall be individually adjustable for both the Occupied and Unoccupied periods. The thermostat shall have a minimum deadband of 2°F (no mechanical heating or cooling shall operate within this deadband). Space temperature deviation above the cooling setpoint or below the heating setpoint shall generate a demand signal to control the system as follows:

- A. HEATING:** The thermostat shall control the heating output based on the demand signal communicated from the thermostat program, taking into account both space temperature deviation (proportional gain), the duration of that temperature deviation (integral gain). The thermostat shall energize heating equipment when space temperature falls below heating setpoint.
- B. COOLING:** The thermostat shall control the cooling output based on the demand signal communicated from the thermostat program, taking into account both space temperature deviation (proportional gain), the duration of that temperature deviation (integral gain). The thermostat shall energize cooling equipment when space temperature exceeds cooling setpoint.
- C. HEATING SETBACK AND COOLING SETUP:** Initiation of heating setback or cooling setup for each of 7 days shall be provided by a programmed time schedule manually entered into the thermostat. When all or a portion of a manually programmed schedule is unavailable, the thermostat shall control to the default program as shown in Table 1.

Table 1. Default Program.

	Occupied	Unoccupied
Heating Setpoints	70°F (21°C)	55°F (13°C)
Cooling Setpoints	75°F (24°C)	85°F (29°C)

- D. SETPOINT RECOVERY FROM UNOCCUPIED TO OCCUPIED:** The thermostat shall incorporate a ramping feature that gradually changes the space setpoints. During recovery operation, the setpoint changes at a rate in degrees per hour (defined in the Installer Setup Menu).
- E. FAN OPERATION:** For Heat pump or Conventional modes:
- On: Fan operates continuously in Occupied mode, and during a call for heat or cool in the Unoccupied mode. Uses the G fan relay.
 - Auto: Fan is energized with calls for heating and cooling. Uses the G fan relay.
- For PTAC and Fan coil modes:
- Lo, Med, Hi (Fan Coil), Lo, Hi (PTAC): Fan operates continuously in Occupied mode, and during a call for heat or cool in the Unoccupied mode. Uses the G, G2, G3, fan relays.
 - Auto: Fan is energized with calls for heating and cooling. Auto uses the fan ramping algorithm to automatically select the correct fan speed
 - PTAC and Fan Coil modes can be configured for Auto only, constant fan speed only (Lo, Med, Hi), or both.
 - Auto Fan Reset: Set the fan from a constant fan speed (Lo, Med, Hi) to Auto after 2 or 4 hour time period. Saves energy and fan usage. (optional feature)
- F. MINIMUM STAGE OPERATION TIME:**
- Minimum On: Heat - 1 minute; Cool - 3 minutes.
 - Minimum Off: Cool & Heat Pump - 1 minute.
- G. POWER INTERRUPTION:**
- On loss of power, the thermostat shall maintain programmed times and temperatures for 10 years.
 - Clock and day information shall be retained for a minimum of 2 years.
- H. OVERRIDES:**
- The Override button can be used when the thermostat is in Unoccupied mode. It shall switch to the Occupied mode for an installer-configured number of hours.
 - The Holiday Override shall fix the schedule to operate in Unoccupied mode for a number of days (between 1 and 365) without changing programming saved in memory.
 - Pressing "Cancel" or "Run Schedule" shall cancel the overrides and return to the program.
 - Remote Setback input terminals can be used to operate the thermostat in either Occupied or Unoccupied mode (non-programmable mode only).

CONFIGURATION OPTIONS

1. **System Application Configuration**
 - a. 1 Heat/1 Cool Conventional
 - b. 1 Heat without fan
 - c. 1 Heat with fan
 - d. 1 Cool only
 - e. 1 Heat /1 Cool Heat Pump
 - f. 2 Heat / 1 Cool Heat Pump
 - g. 4 pipe fan coil
 - h. 2 pipe fan coil (no reheat, manual changeover only without pipe sensor, automatic changeover with pipe sensor)
 - i. 2 pipe fan coil with reheat (reheat, manual changeover only without pipe sensor, automatic changeover with pipe sensor)
 - j. PTAC 1 Heat/1 Cool – Hi and Lo fan speeds
 - k. PTAC 2 Heat/1 Cool – Hi and Lo fan speeds
2. **Programmable or Non-Programmable Mode**
 - a. Thermostat can be configured as a 7-day programmable thermostat. In the programmable schedule mode, an override button is available for temporary override control. The default override time can be configured through the installer setup.
 - b. Thermostat can be configured as a non-programmable thermostat. Remote setback feature is available in the non-programmable mode.
3. **Preoccupancy Purge**
 - a. This feature is available only when the thermostat is configured as a programmable schedule and when a fan is used. The fan will run 1-3 hours before the occupied schedule starting time to circulate air.
4. **Remote Setback**
 - a. Remote Setback is available in the non-programmable mode. Occupancy sensors, manual time clock inputs, and DDC night setback can be used to provide inputs to setback the thermostat. Unoccupied heating and unoccupied cooling setpoints are available to configure the setback setpoints.
5. **Lockout**
 - a. Lockout configurations are optional and can provide restrictions on access to setpoint, system, schedule, and fan changes.

THERMOSTAT MODELS AND FEATURES

Table 2. TB7100A1000 Thermostat Features.

Model	Applications	Maximum Stages		Features
		Heat	Cool	
TB7100A1000	Conventional or Heat Pump	1 ^a	1	Remote Outdoor or Indoor sensor

^a When configured for heat pump or PTAC operation, an additional stage of heat is available.

OPTIONS

- | | |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| A. TEMPERATURE SENSORS (REMOTE): | TR21, TR21-A, C7189U, C7772, other 20K ohm sensors. |
| B. OTHER ACCESSORIES: | 209651A Vertical Mounting Hardware Wallplate Adapter (Trident white).
TG511, TG512 Universal Versaguard™ Thermostat guards. |

Automation and Control Solutions

Honeywell International Inc.
1985 Douglas Drive North
Golden Valley, MN 55422
customer.honeywell.com

Honeywell Limited-Honeywell Limitée
35 Dynamic Drive
Toronto, Ontario M1V 4Z9

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