PRODUCT BULLETIN

T25 Two-Stage Room Thermostat

T25 thermostats are for line- or low-voltage service requiring accurate control of of the following operating functions:

- *control of two stages of heating, such as two-rate unit heaters or duct furnaces, commercial heat pumps, and other units.*
- *control of two stages of cooling, such as two-stage compressors, dual compressor units, and other units.*
- *automatic changeover control of heating and cooling on three- and four-pipe fan coil installations and similar applications; automatic changeover from heating to cooling for unit operation.*

Typical uses are for valves, relays, fan coils, compressor controls, and other applications where low differentials and accurate sensing are required. Two Single-Pole, Double-Throw (SPDT) switches permit independent control circuits.

Each switch may be wired to make or break the control circuit on a rise in temperature. A removable jumper across the "common" terminals is supplied as standard.

Figure 1: T25 Two-Stage Room Thermostat

Features and Benefits	
❑ **Dependable, Field-proven Pennswitches**	Provides accurate measurement and long-term stability
❑ **Sensitive, Liquid-charged Temperature Element with an Efficient Lever Mechanism**	Achieves maximum sensitivity to ambient air temperature changes without using anticipators; no leveling required
❑ **Standard Bimetal Thermometer**	Requires no calibration
❑ **Semi-concealed, Field-settable High-end Temperature Stop**	Deters unauthorized temperature settings above a pre-determined maximum
❑ **Automatic Changeover**	Eliminates the need for manual change between cooling and heating

Product Overview

T25 thermostats are provided with a dependable, easy-reading, bimetal, pointer-type thermometer. The liquid-charged sensing element provides maximum sensitivity to surrounding air temperature changes. Coupled with a highly efficient diaphragm and lever mechanism, the element actuates the enclosed Pennswitches. This provides a low operating differential and dependable switching action without the necessity of either heating or cooling anticipators.

Eliminating anticipators makes every thermostat a stock control. Thermostats may be used at voltages up to 277 VAC, for single-stage or two-stage heating and/or cooling with a wide range of current loads.

T25 Thermostats are available with concealed adjustments. (See Figure 3.) All thermostats have Allen-head cover screws to discourage unauthorized tampering. The concealed high-temperature stop allows adjustments in 2F° (1.1C°) increments from 68 to 80°F (20 to 27°C). This feature deters unauthorized temperature settings above a pre-determined maximum. (See Figure 2.)

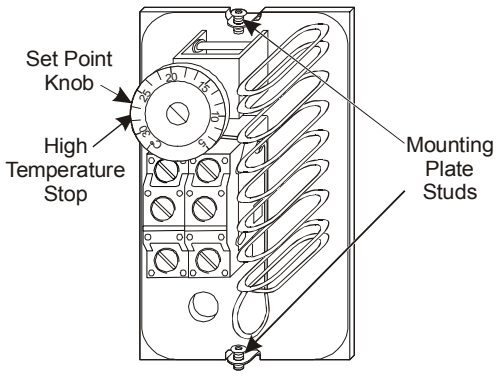

Figure 2: Interior of T25

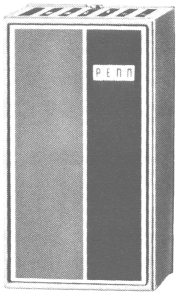

Figure 3: T25 With Concealed Adjustment

IMPORTANT: The T25 Series Thermostats are intended to control equipment under normal operating conditions. Where failure or malfunction of the T25 Thermostats could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn of, or protect against, failure or malfunction of the T25 Thermostats must be incorporated into and maintained as part of the control system.

Operating Temperature Differential

The operating temperature differential of any room thermostat depends on:

- current flow through the thermostat (amperage load)
- air velocity over the thermostat
- rate of temperature change to which the thermostat is subjected
- whether the thermostat is operating heating or cooling equipment

Graphs (Figure 4 and Figure 5) show the operating temperature differentials of these thermostats under various electrical load conditions.

The air velocity was 25 feet per minute, (.1 m/sec) and the rate of temperature change was 6F° (3.3C°) per hour. Higher air velocity and/or a lower rate of temperature change result in a lower operating differential.

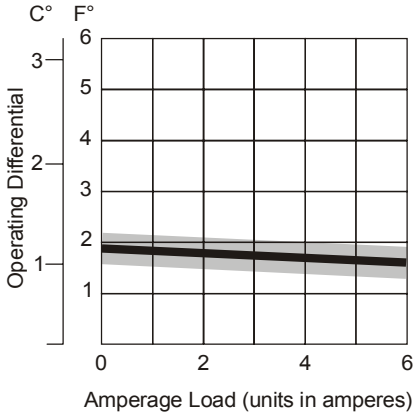

Figure 4: T25 Heating operating differential

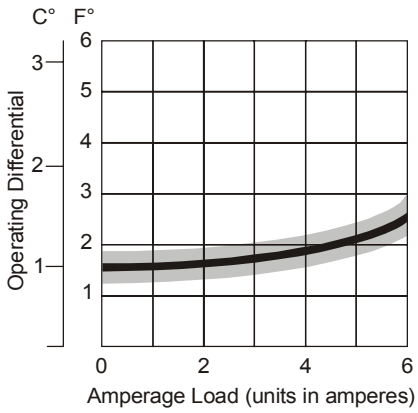

Figure 5: T25 Cooling Operating Differential

Optional Features

Celsius Dial and Thermometer

Celsius Dial and Thermometer are supplied, when specified, at no extra charge. Thermostat range is 40 to 90°F (5 to 30°C). Thermometer scale is 50 to 90°F (10 to 30°C).

Thermostat Guards

Plastic, wire or cast aluminum guards are available at extra cost. See the *GRD Series Universal Thermostat Guards Plastic, Cast Aluminum or Wire Product Bulletin (LIT-125740)*.

Brand Nameplates

Brand nameplates are available on quantity orders. Check with Customer Service.

Ordering Information

Contact the nearest Johnson Controls representative to order a T25 Thermostat, and specify the desired product code number from Table 1.

Repairs and Replacement

Do not attempt field repairs. To replace the thermostat, knob, faceplate, or cover, contact the nearest Johnson Controls representative.

Table 1: Selection Chart

Product Code Number	Description
T25A-1C	Line-voltage Thermostat with Two-Stage and Knob Adjustment
T25A-16C	Line-voltage Thermostat with Two-Stage and Concealed Knob Adjustment
T25A-26C	Line-voltage Thermostat with Two-Stage and 5°C to 30°C scale Concealed Knob Adjustment

Table 2: Electrical Ratings

Motor Ratings	120 V	208 V	240 V	277 V
AC Full Load Amperes	6.0	3.5	3.0	-
AC Locked Rotor Amperes	36.0	21.0	18.0	-
Non-Inductive Amperes	10.0	9.2	8.0	7.2
Pilot Duty—125 VA 24 to 277 VAC				

Note: When used as a two-circuit switch, the total connected load must not exceed 2,000 VA.

Technical Data

Product		T25 Two-stage Room Thermostat
Output		Single-Pole, Double-Throw (SPDT)
Switches		Two Enclosed Pennswitches
Cover		Cold Rolled Steel with “Tawny Silver” Finish
Differential (Mechanical)	**Each Stage**	0.7F° (0.4C°) Approximately
	Between Stages	3F° (1.7C°) Non-Adjustable
Supply Voltage		120 V, 208 V, 240 V, 277 V
Mounting		With Adaptor Plate for Wall or Electrical Box Mounting; Vertical Mounting Only
Range	**Thermostat**	40°F to 90°F (5°C to 30°C)
	Thermometer	50°F to 90°F (10°C to 30°C)
Sensing Element		Liquid Charged, No Leveling Required
Shipping Weight	**Individual Pack**	1.5 lbs (0.7 kg)
	Overpack of 20 Units	32 lbs (14.5 kg)
Terminals		Screw Type. Color Code: Red is Common. Red Closes to Yellow on Temperature Rise. Red Closes to Blue on Temperature Drop.
Thermometer		Bimetal
Agency Listings		UL Listed; File E6688, CCN XAPX (U.S.), CCN XAPX7 (Canada) CSA Certified; File LR948, Class 4813 02

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

JOHNSON CONTROLS

Controls Group
507 E. Michigan Street
P.O. Box 423
Milwaukee, WI 53201

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www.johnsoncontrols.com