

RTS3000 SERIES ROOM SENSORS

These sensors provide precision room temperature sensing for Energy Management Control Systems from the leading manufacturers.

- Three low cost Room Temperatures Sensors to choose from
- high precision thermistor or RTD, accurate to 0.2°C ($\pm .36^{\circ}\text{F}$) over the range of 0°C to 70°C .
- The platinum RTD is accurate to 0.5°C over the same range

The sensors save I/O space on the DDC controller by connecting to a single input. User button activity is captured in the DDC system application programs as high and low going pulses, providing full software control of the button actions.

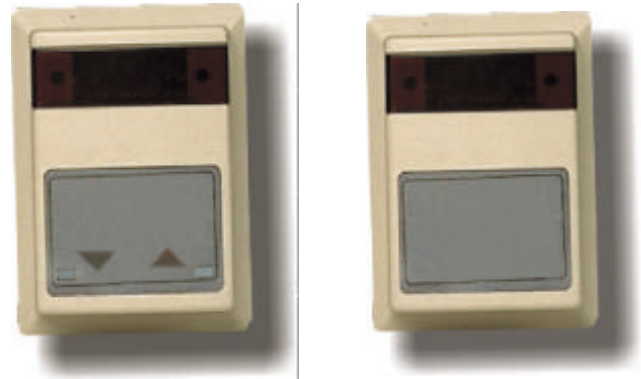
Installation

The unit is located on an interior wall, away from windows, supply ducts and heat sources. The enclosure can be mounted flush on the wall, or on an electrical box. The backplate has holes for North American and European style electrical boxes. The RTS3000 and RTS3002 require two conductors while the RTS3004 requires three. The removable terminal block on the back of the RTS3002 and RTS3004 sensors can accept wires up to 18 gauge, while the RTS3000 requires butt connectors.

Two hidden allen key screws on the bottom of the enclosure backplate are screwed inwards to allow the cover to be removed.

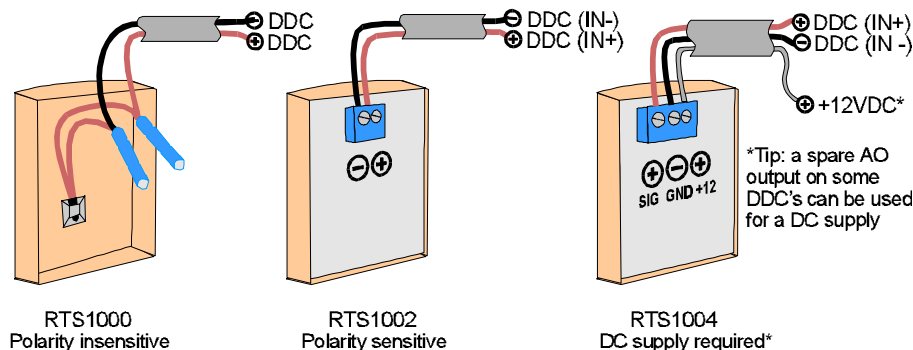


RTS3004 Sensor, four button version



RTS3002 Two buttons sensor and RTS3000 Room sensor

Wiring Diagram



The back view of each sensor showing the cable connection at the sensor and termination at the DDC panel.

The RTS3000 is connected using butt splices or marrettes while the RTS3002 and RTS3004 have removable terminal blocks.

Calibration

The RTS3000 series sensors use precision thermistors, so calibration is optional. The RTS3004 sensor routes the thermistor signal directly to the DDC controller, and also to an on board 8 bit A/D converter for local display of the temperature. This A/D converter and associated circuitry can be calibrated by adjusting a potentiometer on the sensor. The potentiometer affects only the local display, not the thermistor signal at the DDC controller.

Programming of RTS3004

The RTS3004 requires that the DDC be capable of detecting a sudden open and short circuit, and timing the duration of these pulses to within approximately 2 seconds. In the example below, the open and short circuit conditions are detected by watching the sensor go above 100C or below 0C (lines 120 and 130). The TIME-ON statement performs the timing of the pulses (line 170).

In the case of the KMDigital products, the SENSOR-ON and SENSOR-OFF statements are useful. Contact Temco for sample programming for most systems.

The sample programming below detects the following events and adjusts the setpoint & occupied mode accordingly:

SETPOINT UP BUTTON
SETPOINT DOWN BUTTON
OCCUPIED BUTTON
UNOCCUPIED BUTTON

one second open circuit
one second short circuit
five second open circuit
five second short circuit

```
10 REM ***** VARIABLES USED IN THIS PROGRAM *****
20 REM RTS1 IS THE INPUT WHERE THE SENSOR IS WIRED
30 REM SETPOINT1 IS THE VARIABLE USED FOR ROOM1'S SETPOINT
40 REM OCCUPIED1 WHETHER THE ROOM1 IS OCCUPIED OR NOT
50 REM OPENCIRCUIT VARIABLE SET TO TRUE IF AN EXTREME LOW TEMP IS READ
60 REM SHORTCIRCUIT VARIABLE SET TO TRUE IF AN EXTREME HIGH TEMP IS READ
70 REM UPFLAG, DOWNFLAG FLAGS USED TO SHOW IF IT WAS AN OPEN OR SHORT CIRCUIT PULSE
80 REM ANYBUTTON FLAG USED TO SHOW A BUTTON HAS BEEN PRESSED
90 REM BTIMER IS A TIMER FOR ANYBUTTON, LETS US DIFFERENTIAL LONG AND SHORT PULSE
100 REM BUTTONXFLAG 4 FLAGS TO KEEP TRACK OF WHICH BUTTON WAS ACTUALLY PRESSED
110 REM ***** SEE IF A BUTTON IS DOWN *****
120 IF RTS1 > 100 THEN START OPENCIRCUIT ELSE STOP OPENCIRCUIT
130 IF RTS1 < 0 THEN START SHORTCIRCUIT ELSE STOP SHORTCIRCUIT
140 IF OPENCIRCUIT THEN START UPFLAG
150 IF SHORTCIRCUIT THEN START DOWNFLAG
160 IF OPENCIRCUIT OR SHORTCIRCUIT THEN START ANYBUTTON ELSE STOP ANYBUTTON
170 BTIMER = TIME-ON( ANYBUTTON )
180 REM ***** SKIP THE REST TILL THE PULSE IS OVER *****
190 IF ANYBUTTON THEN GOTO 1000
200 REM ***** CHECK WHICH BUTTON WAS HIT *****
210 IF UPFLAG AND BTIMER < 00:00:03 THEN START BUTTON1FLAG
220 IF UPFLAG AND BTIMER < 00:00:03 THEN START BUTTON2FLAG
230 IF DOWNFLAG AND BTIMER > 00:00:03 THEN START BUTTON3FLAG
240 IF DOWNFLAG AND BTIMER > 00:00:03 THEN START BUTTON4FLAG
250 REM ***** PROCESS THE BUTTONS *****
260 IF BUTTON1FLAG THEN SETPOINT1 = SETPOINT1 + 1
270 IF BUTTON3FLAG THEN SETPOINT1 = SETPOINT1 - 1
280 IF BUTTON2FLAG THEN START OCCUPIED1
290 IF BUTTON4FLAG THEN STOP OCCUPIED1
300 REM ***** RESET EVERYTHING *****
310 STOP BUTTON1FLAG
320 STOP BUTTON2FLAG
330 STOP BUTTON3FLAG
340 STOP BUTTON4FLAG
350 STOP UPFLAG
360 STOP DOWNFLAG
1000 REM ***** END OF THE PROGRAM *****
```