

**METASYS®**

## TM-9100 Series Room Command Module

<b>.ext</b>	<b>Page</b>
<i>English</i>	1
<i>Deutsch</i>	3
<i>Italiano</i>	6
<i>Español</i>	9
<i>Nederlands</i>	12

## TM-9100 Series Room Command Module



### Theory of Operation

The TM-9100 series of Room Command Modules are designed for use with the TC-9102/9 series of DDC terminal unit controllers. The set point dial enables the room occupant to adjust the working set point of the controller within the range of 12 to 28 °C (54 to 82 °F) or -3 to +3 K (+5 to -5 °F), according to the model number. The occupancy button enables the occupant to change the mode of operation of the controller from "COMFORT" to "STANDBY" or to request a temporary "COMFORT" mode during "NIGHT" operation. The current operating mode is shown by an LED indicator.

For Fan Coil Unit controllers, a Room Command Module with a three-speed fan override adjuster is available, and models without a temperature sensor are provided for application where the room temperature sensor is mounted inside the Fan Coil Unit.

### CE Compliance

Directive 89/336/EEC EN 50081-1, EN 50082-1

### Tools Needed

- flat-head screwdrivers (3mm and 5 mm)
- drill, bits, and appropriate 4mm screws and plugs
- pointed tool (available from Johnson Controls, Ordering Code TM-9100-8900)

### Physical Dimensions

Size: 80 mm x 80 mm x 33 mm / 3.2 in. x 3.2 in. x 1.3 in.

Weight: 0.15 kg / 5.3 oz.

### Environmental Data

Ambient Operating Conditions:	0 to +40 °C / +32 to +100 °F 10 to 90% RH noncondensing
Ambient Storage Conditions:	-20 to +70 °C / 0 to +160 °F 10 to 90% RH noncondensing
Housing Material:	ABS + polycarbonate, self-extinguishing VO UL94.
Housing Protection:	IP30 (IEC529)
Supply Voltage:	Power from TC-9102/9 Series Controller
Temperature Sensor:	NTC Thermistor 0 to 40 °C (32 to 100 °F), 2252 ohm at 25 °C (77 °F).
Remote Set Point:	10 Kohm potentiometer marked for 12 to 28 °C or -3 to +3 K

This document is subject to change without notice.

Three-Speed Fan Override:	10 Kohm potentiometer with mechanically guided positions for Auto, Off, 1 (low speed), 2 (medium speed) and 3 (high speed).
Occupancy Button:	Momentary contact (switches 5V at 1 mA).
Mode Indicator:	Red LED (5V, 4 mA)

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## Mounting

### See Figure 1: Room Command Module

The TM-9100 Series Room Command Module is designed for wall mounting in the room to be controlled. It should be located where the occupant can easily read and adjust the set point dial or fan speed override adjust. If the module has an NTC temperature sensor, it should be placed where the temperature is representative of the general room conditions. Cold or warm air draughts, radiant heat and direct sunlight should be avoided.

The installation of electrical wiring must conform to local codes and should be carried out by authorized personnel only. Users should ensure that all Johnson Controls products are used safely and without risk to health or property.

### See Figure 2: Removing Cover from Base

Remove the base of the module from the cover by inserting a pointed tool (a special tool, Ordering Code TM-9100-8900, is available from Johnson Controls) into the small hole at the center top of the cover. While pressing down gently, prise the base away from the cover. As the two parts separate, remove the tool and continue to pull the cover away from the base until the cover is free.

### See Figure 3: Module Base

Mount the base on the wall to cover the electrical output and secure with at least two screws.

For other mounting options, see ordering codes and refer to the corresponding installation sheets.

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## Wiring

### See Figure 4: Wiring to Room Command Module with NTC Sensor

### See Figure 5: Wiring to Room Command Module without NTC Sensor

Before connecting or disconnecting any wires, ensure that all power supplies have been switched off and all wires are potential-free to prevent equipment damage and avoid electrical shock.

Terminations are made on the terminal blocks in the base of the module, which accept up to 1.5 mm<sup>2</sup> (AWG 14) wires. Follow the wiring diagrams shown in figures 4 and 5.

All wiring to the module is at extra low (safe) voltage and must be separated from power line voltage wiring. Do not run wiring close to transformers or high frequency generating equipment. Complete and verify all wiring connections before applying power to the controller to which the module is connected.

# XT-9100, XP-910x

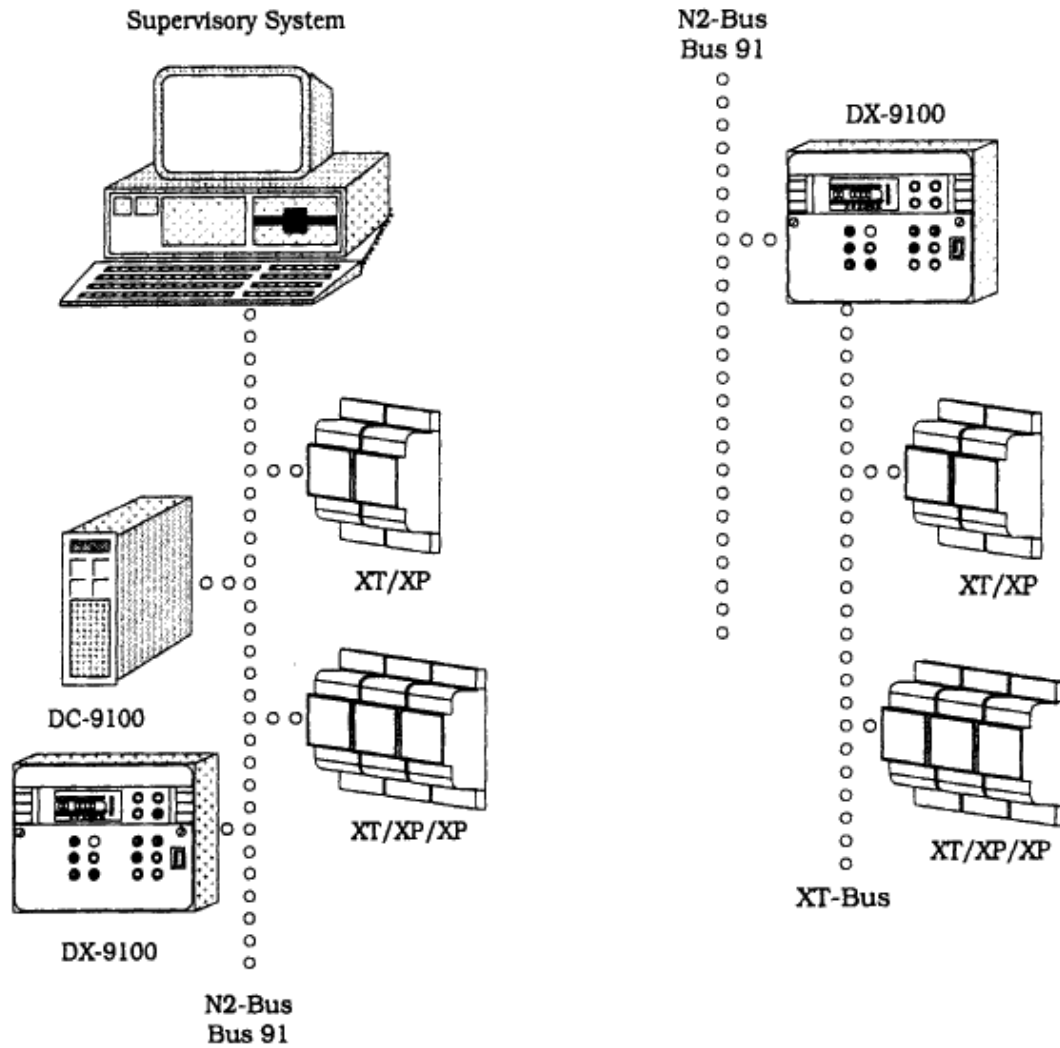


Figure 1: General Application

Figure 2: DX-9100 Application

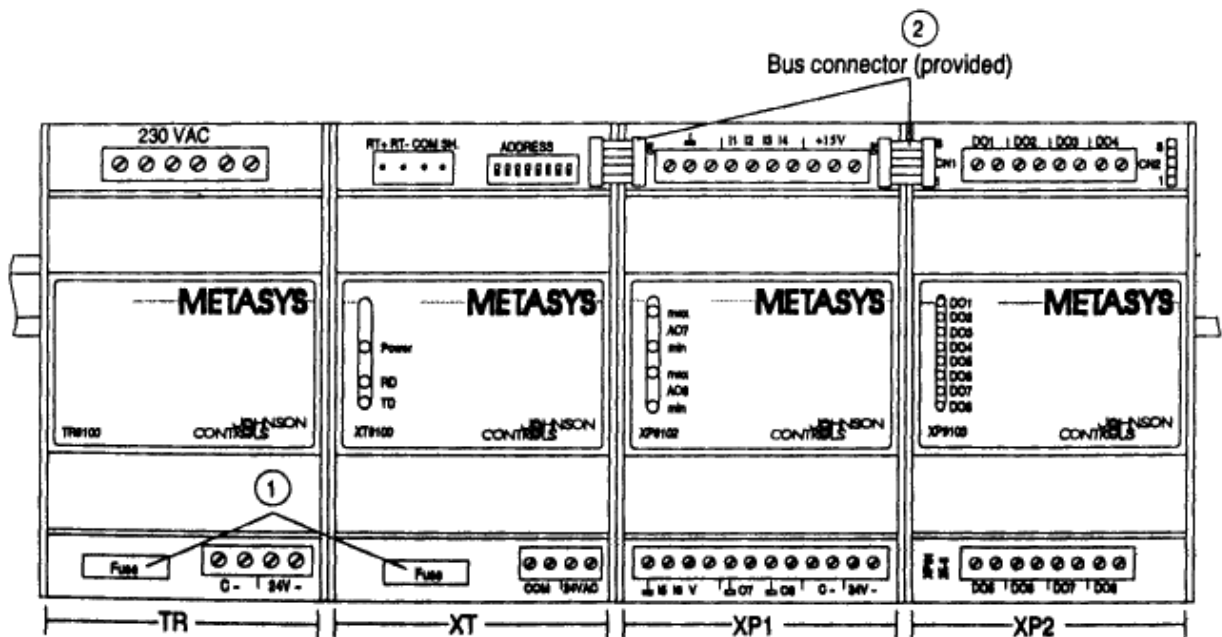


Figure 3: Typical XT-9100 Configuration

XT-9100, XP-910x

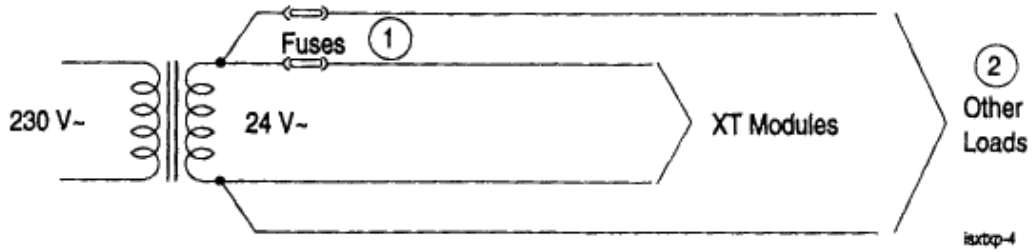


Figure 4: Wiring of Module to a 24 V Transformer

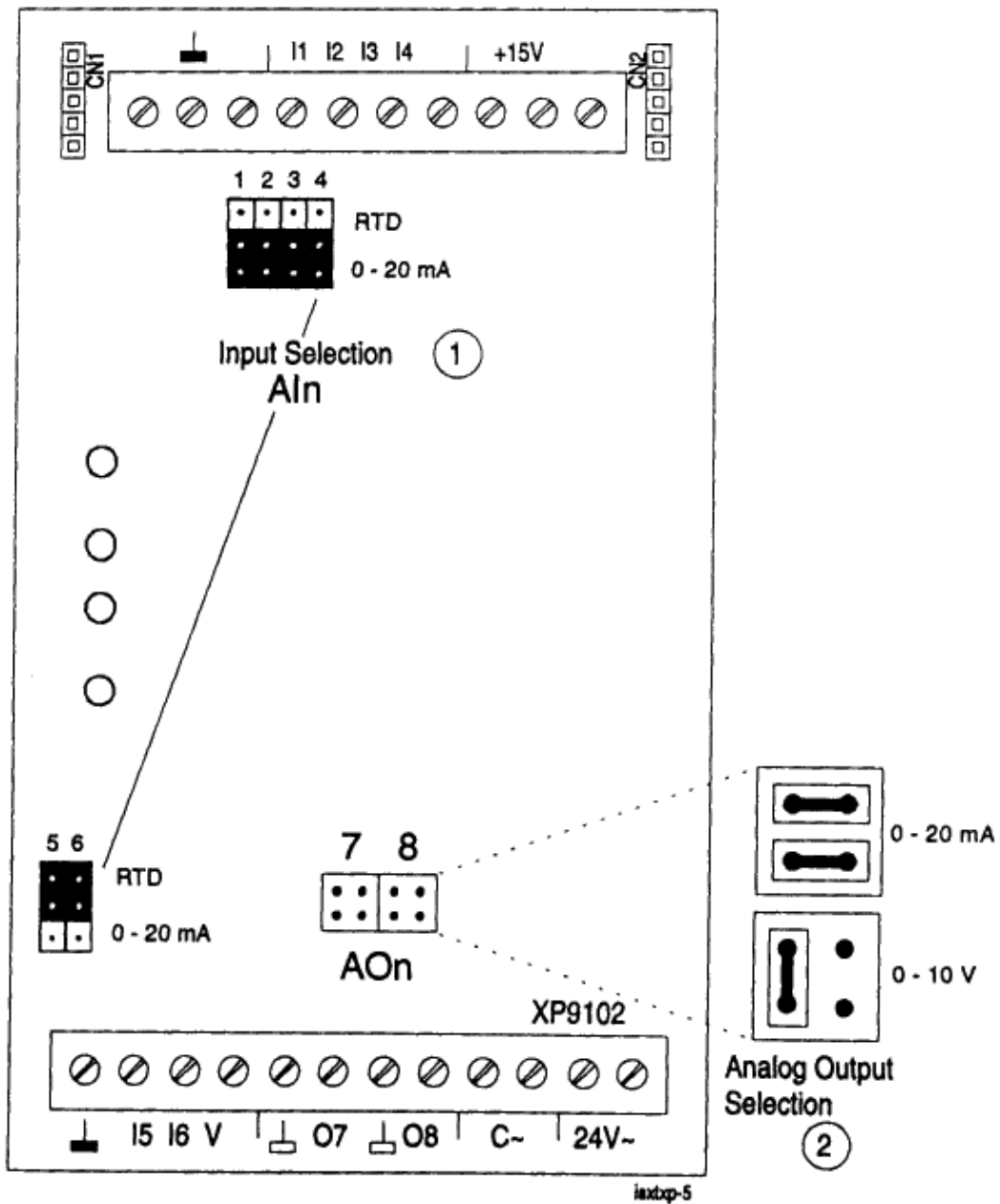


Figure 5: Jumper Details for the XP-9102

## TM-9100 Series Room Command Module

<b>TM-9100 Series Room Command Module</b>	<b>Page</b>	<b>3</b>
• <i>Introduction</i>		3
• <i>Features</i>		4
<b>Installation</b>		<b>5</b>
• <i>Mounting</i>		5
• <i>Wiring</i>		9
<b>Specifications &amp; Technical Data</b>		<b>11</b>
• <i>Ordering Codes</i>		12

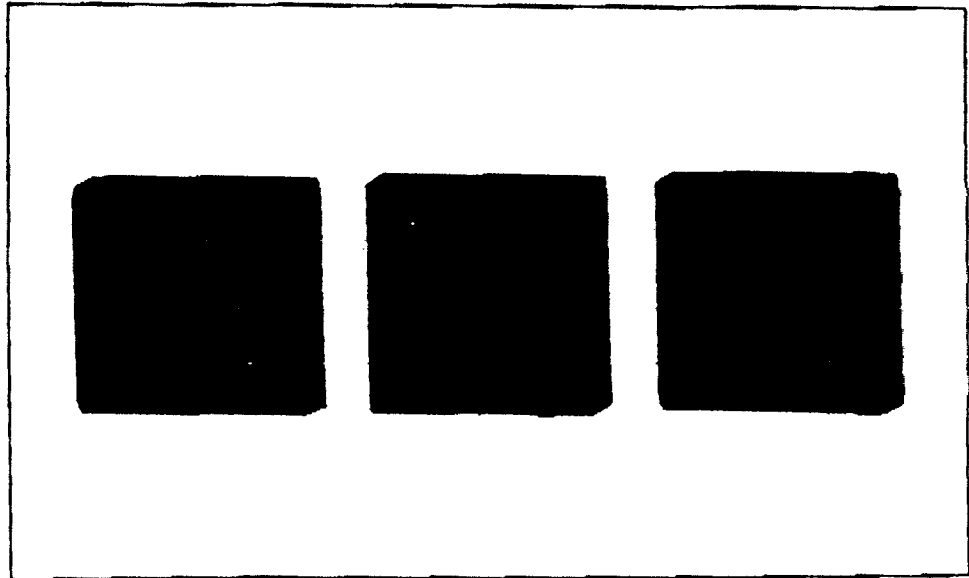
# TM-9100 Series Room Command Module

## **Introduction**

The TM-9100 series of Room Command Modules are designed for use with the TC-9100 series of DDC terminal unit controllers. The set point dial enables the room occupant to adjust the working set point of the controller within the range of 12 to 28°C or -3 to +3°K, according to the model number. The occupancy button enables the occupant to change the mode of operation of the controller from "COMFORT" to "STANDBY" or to request a temporary "COMFORT" mode during "NIGHT" operation. The current operating mode is shown by an LED indicator.

For Fan Coil Unit controllers, a Room Command Module with a three-speed fan override adjuster is available, and models without a temperature sensor are provided for application where the room temperature sensor is mounted inside the Fan Coil Unit.

Refer to ordering codes at the end of this bulletin for details of all models available.



**Figure 1: TM-9100 Series Room Command Modules**

Actual

INSTALLED MODULE.

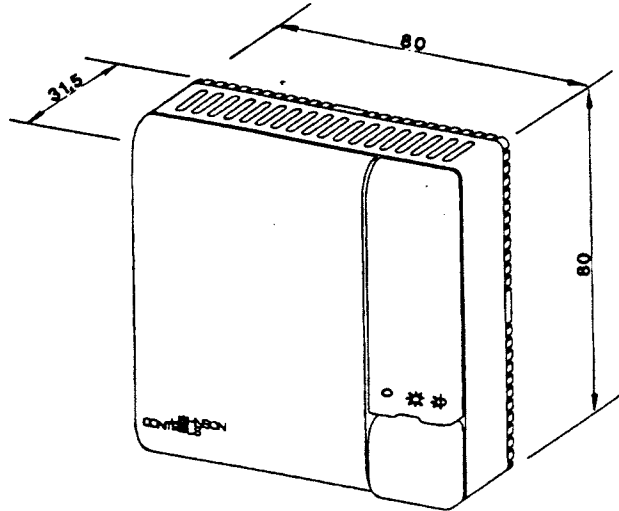
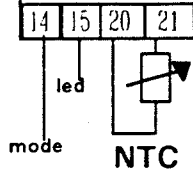
# JOHNSON CONTROLS

## ROOM COMMAND MODULE with NTC sensor

### TM-9150-X000

1 = Separable connectors  
0 = Plug-in connector fixed onto the base

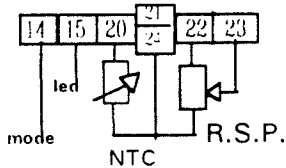
- Built-in NTC temperature sensor
- Wiring connections



- Built-in NTC temperature sensor
- Push button Mode Selector with Led indication:
  - Comfort/Led on
  - Stand-by/Led blinking
  - Night/Led off
- Set point override range: 12-28°C ± 3 K configurable

- On request: concealed pot for set point override

- Wiring connections

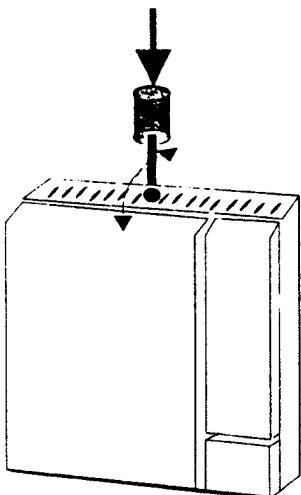
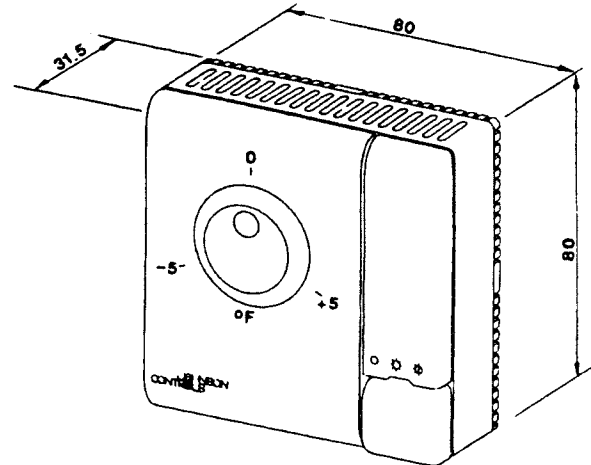


### TM-9160-X000

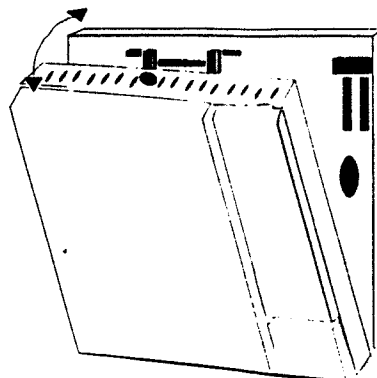
1 = Separable connectors  
0 = Plug-in connector fixed onto the base

-000X

0 = Dial range 12-28°C  
5 = Dial range ± 3 K



1



2

- 1) Press slightly with screwdriver through hole to open
- 2) Pay attention to correct pins connections when closing



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## Features

All modules have an attractive off-white cover which snaps onto a grey mounting base. Terminals are located in the base for ease of wiring.

### Set Point Dial

The Room Command Module is available with a set point dial marked 12 to 28°C or -3 to +3°K. The module must be connected to a TC-9100 series controller with the corresponding remote set point range. The 12 to 28°C range module determines the set point of the controller while the -3 to +3°K range module gives a deviation to the room temperature set point programmed into the controller. Mechanical stops to limit the range of travel of the set point dial are available to order.

### Occupancy Button

When pressed for approximately one second, the occupancy button changes the mode of operation of the controller to the "alternate" mode or back to normal mode. When the controller is in "COMFORT" mode the alternate mode is "STANDBY", and when in "NIGHT" mode the alternate mode is a temporary "COMFORT" mode for a period of one hour. Full details of the alternate modes can be found in the TC-9102 Technical Bulletin (Ordering Code MN-9100-2117) of the System 91 Manual.

### Mode Indicator

The LED indicator directly above the Occupancy Button shows the current operating mode of the controller as follows:

- Steady On: COMFORT Mode (occupied)
- Flashing: STANDBY Mode (unoccupied)
- Off: NIGHT or OFF Mode (Scheduled unoccupied or not in use)

### Three-Speed Fan Override Adjuster

When connected to a TC-9102 Controller which has a three-speed fan control auxiliary output, the three-speed fan override adjuster allows manual control of the speed of the fan. The positions of the adjuster are as follows:

- A Automatic fan speed is set by TC-9102 Controller.
  - OFF Fan OFF (except when controller is in anti-freeze mode).
  - 1 Fan low speed
  - 2 Fan medium speed
  - 3 Fan high speed
- } Except when the controller is in OFF mode.

# Installation

The TM-9100 Series Room Command Module is designed for wall mounting in the room to be controlled. It should be located where the occupant can easily read and adjust the set point dial or fan speed override adjust. If the module has an NTC temperature sensor, it should be placed where the temperature is representative of the general room conditions. Cold or warm air draughts, radiant heat and direct sunlight should be avoided.

The installation of electrical wiring must conform to local codes and should be carried out by authorized personnel only. Users should ensure that all Johnson Controls products are used safely and without risk to health or property.

## Mounting

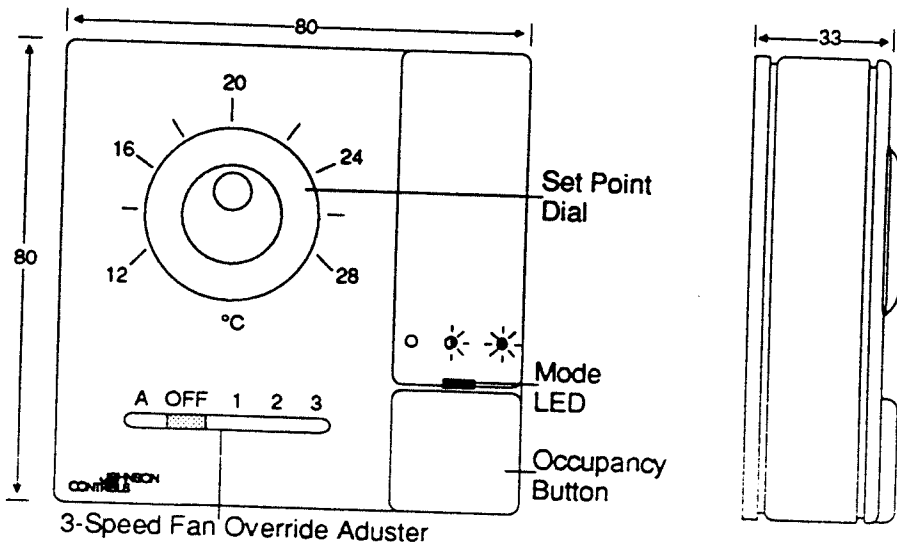


Figure 2: Room Command Module (Dimensions in mm)

Remove the base of the module from the cover by inserting a pointed tool (a special tool, Ordering Code TM-9100-8900, is available from Johnson Controls) into the small hole at the center top of the cover. While pressing down gently, prise the base away from the cover. As the two parts separate, remove the tool and continue to pull the cover away from the base until the cover is in free.

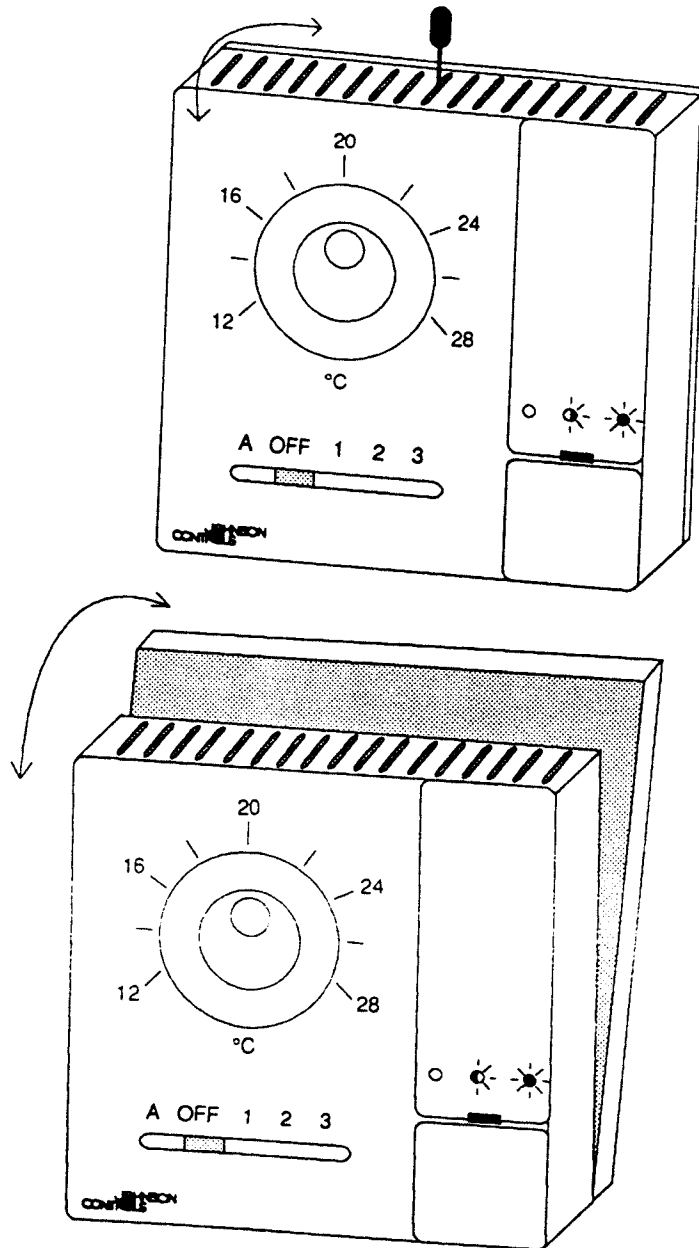
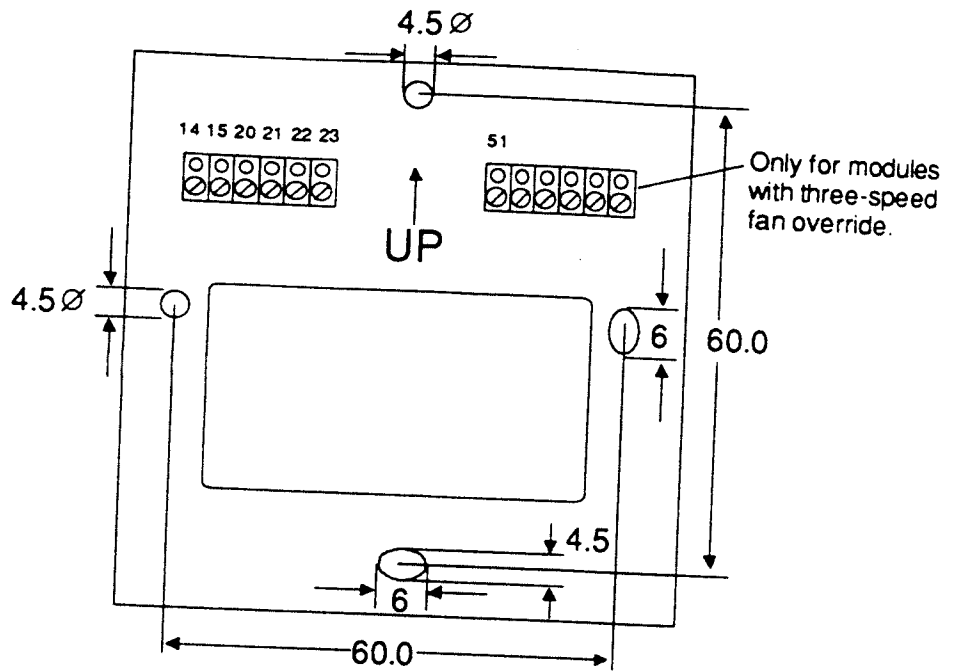


Figure 3: Removing Cover from Base

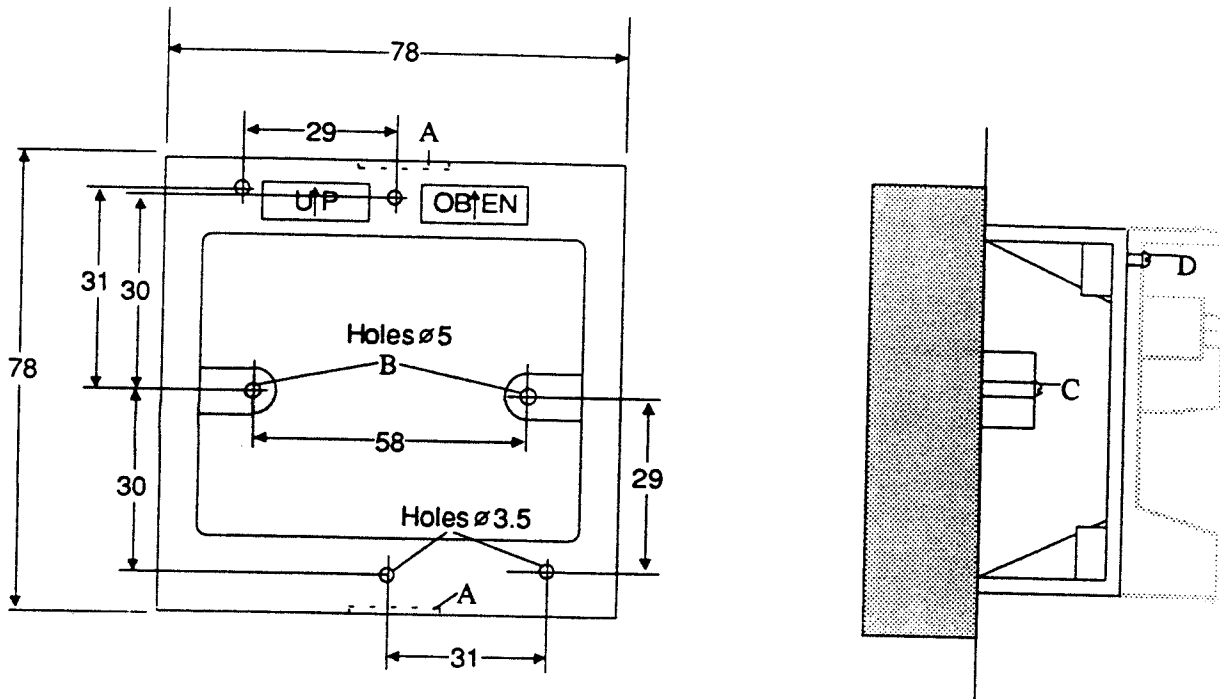


**Figure 4: Module Base (Dimensions in mm)**

Mount the base on the wall to cover the electrical output and secure with at least two screws. For wall-surface wiring, a wall mount conduit box is available (see ordering codes).

To install the wall mount conduit box:

1. Remove one of the notches (A) with a suitable tool.
2. Mark the position of the holes (B) on the wall and drill holes 5 mm in diameter. Insert plastic plugs into holes.
3. Position and fix the mounting box to the wall using the two long screws (C) provided in the kit.
4. Fix the base of the TM-9100 to the mounting box using the two short screws (D) provided in the kit.



**Figure 5: Wall Mount Conduit Box (Dimensions in mm)**

To reassemble the room command module, place the cover over the lower edge of the base and push the upper part of the cover until it "clicks" firmly into place.

## Wiring

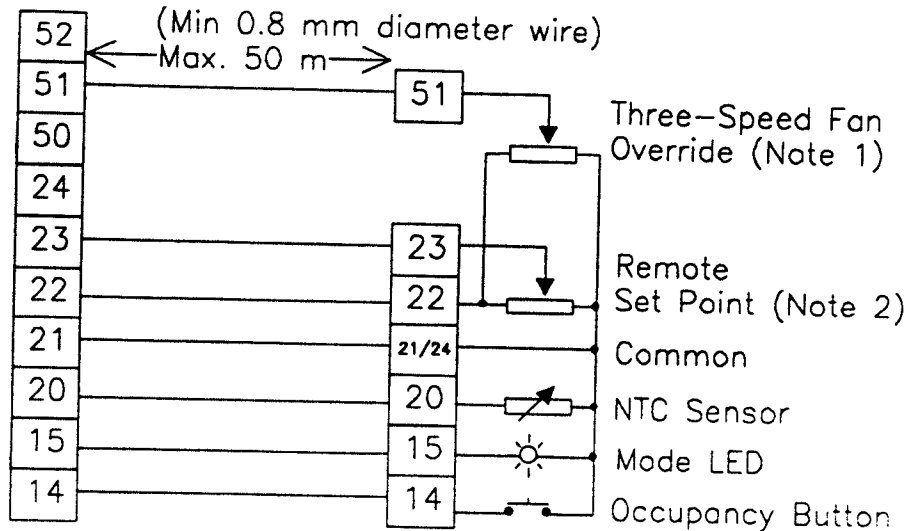
Before connecting or disconnecting any wires, ensure that all power supplies have been switched off and all wires are potential-free to prevent equipment damage and avoid electrical shock.

Terminations are made on the terminal blocks in the base of the module, which accept up to 1.5mm<sup>2</sup> wires. Follow the wiring diagrams shown in figures 6 and 7.

All wiring to the module is at extra low (safe) voltage and must be separated from power line voltage wiring. Do not run wiring close to transformers or high frequency generating equipment. Complete and verify all wiring connections before applying power to the controller to which the module is connected.

TC-9100 Series  
Controller

TM-9150/TM-9160  
Room Command Module



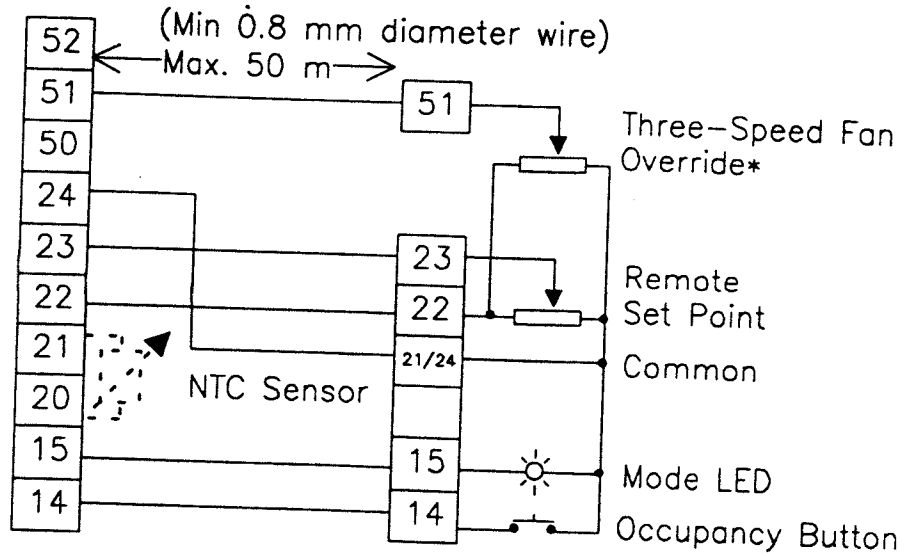
Note 1: Only for modules with three-speed fan override (see ordering codes).

Note 2: Model TM-9160 only.

**Figure 6: Wiring to Room Command Module with NTC Sensor**

TC-9100 Series  
Controller

TM-9170 Room  
Command Module



\*Only for modules with three-speed fan override (see ordering codes).

**Figure 7: Wiring to Room Command Module without NTC Sensor**

# Specifications & Technical Data

<b>Supply Voltage</b>	Power from TC-9100 Series Controller
<b>Ambient Operating Conditions</b>	0 to 50°C 10 to 90% RH noncondensing
<b>Ambient Storage Conditions</b>	-20 to 70°C 10 to 90% RH noncondensing
<b>Terminations</b>	Terminal block in base for 1 x 1.5 mm <sup>2</sup> /14 AWG (maximum) cable.
<b>Temperature Sensor</b>	NTC Thermistor 0 to 40°C, 2252 ohm at 25°C.
<b>Remote Set Point</b>	10 Kohm potentiometer marked for 12 to 28°C or -3 to +3°C Mechanical limitation of travel available (specify on order).
<b>Three-Speed Fan Override</b>	10 Kohm potentiometer with mechanically guided positions for Auto, Off, 1 (low speed), 2 (medium speed) and 3 (high speed).
<b>Occupancy Button</b>	Momentary contact (switches 5V at 1 mA).
<b>Mode Indicator</b>	Red LED (5V, 4 mA)
<b>Mounting</b>	Direct surface mount or on Wall Conduit Box (see ordering codes).
<b>Housing</b>	Material: ABS + polycarbonate, self-extinguishing VO UL94. Protection: IP30 (IEC44)
<b>Dimensions (H x W x D)</b>	80 mm x 80 mm x 33 mm
<b>Shipping Weight</b>	0.15 kg



**Ordering Codes**

**Table 1: Room Command Module Ordering Codes**

Ordering Code	Description			
TM-9150-0000	Occupancy Button	NTC Sensor	w/o S.P. dial	
TM-9160-0000	Occupancy Button	NTC Sensor	12-28°C	
TM-9160-0005	Occupancy Button	NTC Sensor	+/- 3 K	
TM-9160-0002	Occupancy Button	NTC Sensor	12-28°C	3-Speed Fan Override
TM-9160-0007	Occupancy Button	NTC Sensor	+/- 3 K	3-Speed Fan Override
TM-9170-0000	Occupancy Button	w/o Sensor	12-28°C	
TM-9170-0005	Occupancy Button	w/o Sensor	+/- 3 K	
TM-9170-0002	Occupancy Button	w/o Sensor	12-28°C	3-Speed Fan Override
TM-9170-0007	Occupancy Button	w/o Sensor	+/- 3 K	3-Speed Fan Override

**Table 2: Accessories Ordering Codes**

Ordering Code	Description
TM-9100-8930	Wall Mount Conduit Box for Room Command Module - Grey
TM-9100-8931	Wall Mount Conduit Box for Room Command Module - Off-White
TM-9100-8900	Special Tool (to open module)
TE-9100-8501	Unit Mount NTC Temperature Sensor (1.5-m cable)