

RS-9100 Electronic Room Sensors and Transducers

Introduction

The RS-9100 series of electronic room temperature sensors and transducers provides a passive or active signal, that corresponds with the room temperature in heating, ventilating and air conditioning applications.

They provide either a 0/10V signal directly proportional to the sensed temperature, or a passive resistive signal using NTC or Pt 100 sensors.

The RS-9100 series is primarily designed to be used as an input to a digital controller of the system 9100 family (except for Pt 100), but can be used with other electronic devices.

**RS-914x****RS-915x****RS-919x****RS-916x**

Features and Benefits

- | | |
|--|--|
| <input type="checkbox"/> Modern and discreet cover which snaps onto a plug-in mounting base | Blends in with room decor.
Easy installation. |
| <input type="checkbox"/> Terminals located on mounting base. | Easy wiring and commissioning. |
| <input type="checkbox"/> Active or Passive output. | Covers a large number of applications. |
| <input type="checkbox"/> Standard range of mounting kits. | Mounting flexibility. |
| <input type="checkbox"/> Service module connection. | Easy commissioning and maintenance of the control system from a remote location. |

Application overview

The RS 9100 series of electronic room temperature sensors and transducers provides, depending on the selected model:

- a 0/10 V signal directly proportional to the sensed temperature.
- an NTC „K2“ resistance signal (see table on page 7).
- a Pt 100 resistance signal (DIN 43760 platinum sensing element).

The different RS 9100 versions with different output signal can be connected to the controllers of the system 9100 series (see table below), but can also be used with other electronic devices.

The 0/10 V dc room temperature transducers receive an +15 V dc supply voltage, available from the system 9100 controllers.

The models with a stand-by push button selector, LED and Service Module can only be used with system 9100 TC-9100 "Universal Controller" and DR 910x controller. Pressing the button will change the mode of operation of the controller from the „comfort“ set point to the „stand-by“ or „off“ set point. Please refer to the appropriate table in the controllers technical bulletins for a detailed description of mode selection.

The models with a set point dial marked 12 to 28°C or -3 to 3K can be used with the TC 9100 "Universal", the SC 9100 "Easy DDC" or the DR/DC/DX 9100 controllers. The 12 to 28°C range will determine the set point of the controller, while the -3 to +3K unit gives a deviation to the room temperature set point programmed into the controller.

Ordering data

Ordering code	Features					Applications				
	Sensing element	Setpoint dial 0...10 V	LED + Push Button	Service module	Sensor location	TC9102	DR910x TC9100	SC9100	DC9100, DX9100 or other electronic devices with 0/10V inputs	Controllers or electronic devices with Pt100 inputs
RS-9140-0000-W	0/10V	-	-	-	enclosed	-	yes	yes	yes	-
RS-9150-0010-W	0/10V	-	yes	yes	enclosed	-	yes	-	-	-
RS-9160-0000-W	0/10V	12/28°C	yes	-	enclosed	-	yes	-	-	-
RS-9160-0005-W	0/10V	-3/+3K	yes	-	enclosed	-	yes	-	-	-
RS-9160-0010-W	0/10V	12/28°C	yes	yes	enclosed	-	yes	-	-	-
RS-9160-0015-W	0/10V	-3/+3K	yes	yes	enclosed	-	yes	-	-	-
RS-9190-0000-W	0/10V	12/28°C	-	-	enclosed	-	yes	yes	yes	-
RS-9190-0005-W	0/10V	-3/+3K	-	-	enclosed	-	yes	yes	yes	-
RS-9190-0006-W	0/10V	-/+	-	-	enclosed	-	yes	yes	yes	-
RS-9191-0005-W	0/10V	-3/+3K	-	-	remote (cable 2m)	-	yes	yes	yes	-
RS-9143-0000-W	NTC-K2	-	-	-	enclosed	yes	-	yes	-	-
RS-9193-0000-W	NTC-K2	12/28°C	-	-	enclosed	-	-	yes	-	-
RS-9193-0005-W	NTC-K2	-3/+3K	-	-	enclosed	-	-	yes	-	-
RS-9145-0000-W	Pt 100	-	-	-	enclosed	-	-	-	-	yes

Ordering data (continued)

Accessories (order separately)

Order code	Description
TM-9100-8900	Opening tool for sensor case
TM-9100-8931-W	Plastic surface mounting kit
TM-9100-8941-W	Wall box mounting kit
TM-9100-8951-W	Panel mounting kit
DR-9100-8914	Service module cable (1.5 m)

Mounting and wiring instructions

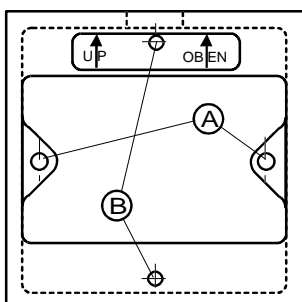
The RS-9100 room sensors are suitable for direct wall-mounting using two of the four screw holes on the base (See Basic Models figure on page 6). They may also be mounted by using one of the three mounting kits shown. The wiring must be entered from the back.

For mounting follow the instructions below:

- Choose an appropriate place to achieve good control of the ambient temperature. The room temperature element only senses the temperature at the place where it is mounted.
- The sensor should not be mounted near windows or doors to avoid draught. On the other hand, sufficient air circulation must be ensured in order to sense the actual temperature of the room.
- Put insulation material in the wiring conduit to prevent introduction of air from outside the room.
- The sensor should not be exposed to direct radiation (lamps, radiators, etc.) or to the sun, since it would lead to incorrect measurement.

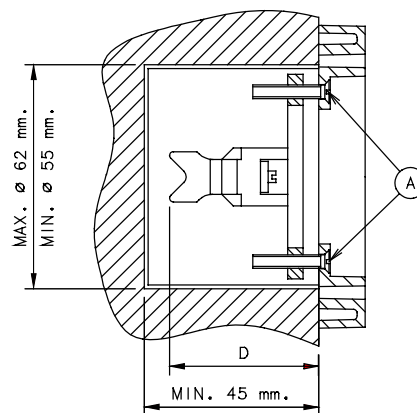
The TM-9100-8931-W surface mounting kit

Screw the kit directly on the wall using holes "A" and mount the base of the module on the kit, using the two screws included and inserting them in the two opposite holes "B", as indicated below:

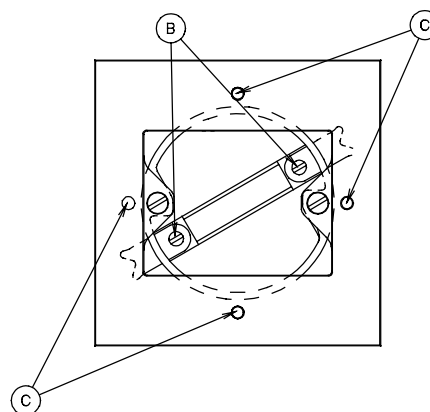


The TM-9100-8941-W wall box mounting kit

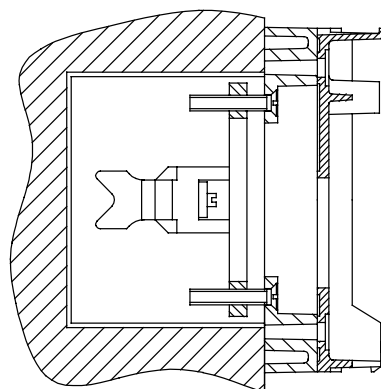
- Adjust height "D" turning screws "A" to match the depth of the wall box



- Insert kit into the wall box respecting the position shown below.

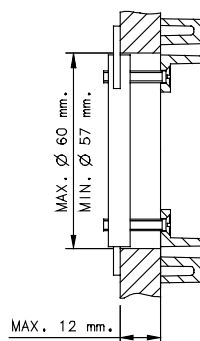


- Tighten screws "B" until the prongs clamp properly on the box.
- Mount the base of the module on the kit as shown below, using the two screws included and inserting them in two opposite holes of the four "C"

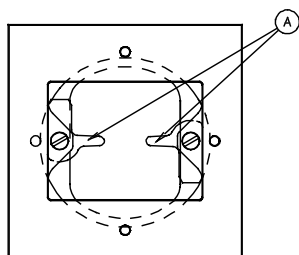


The TM-9100-8951-W Panel mounting kit

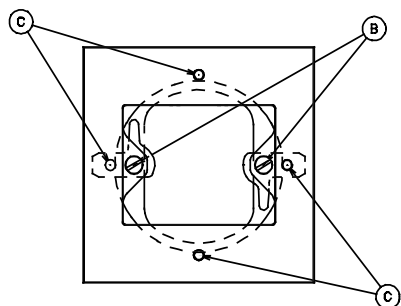
- Drill hole in panel, respecting the dimension shown below:



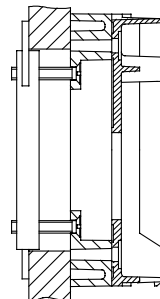
- Turn prongs "A" as shown below. Insert kit into the panel, respecting the position as shown.



- Turn prongs "A" as shown below. Turn screws "B" until kit is fixed on panel.



- Mount the base of the module on the kit as shown below, using the two screws included and inserting them in two opposite holes of the four "C"



Wiring instructions

For wiring follow the instructions below:

- All wiring must be in accordance with local regulations and national rules.
- Do not attempt field repairs. If the transmitter is not operating properly, even though it is wired correctly, it should be replaced

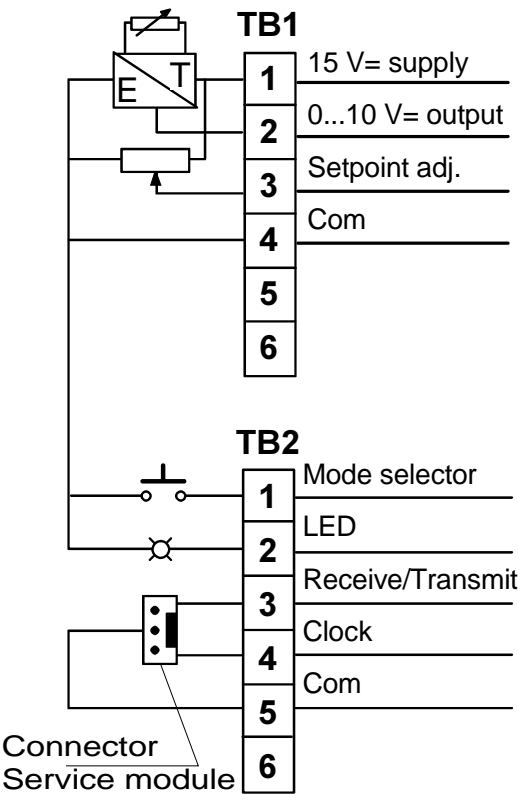


WARNING

When wiring or servicing make sure that:

- the electric voltage to the sensor is switched off to avoid possible damage to the equipment, personal injury or shock.
- you do not touch or attempt to connect or disconnect wires when electric power is on.

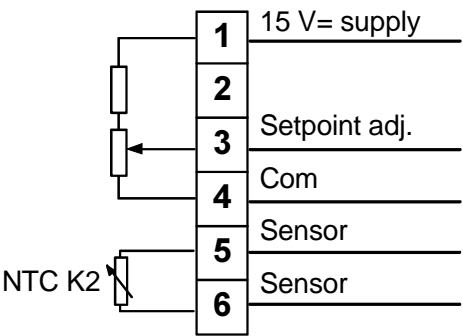
Wiring diagrams 0...10 V models



Used terminals

T-Blocks		TB1						TB2					
Model		1	2	3	4	5	6	1	2	3	4	5	6
RS-9140-0000-W		x	x		x								
RS-9150-0010-W		x	x		x			x	x	x	x	x	
RS-9160-000x-W		x	x	x	x			x	x				
RS-9160-001x-W		x	x	x	x			x	x	x	x	x	
RS-9190-000x-W		x	x	x	x								
RS-9191-0005-W		x	x	x	x								

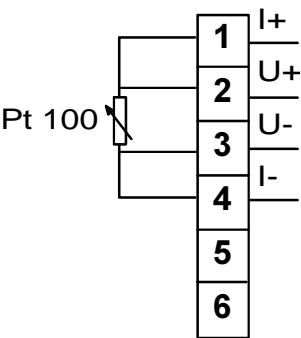
Wiring diagrams NTC K2 models



Used terminals

Model	1	2	3	4	5	6
RS-9143-0000-W					x	x
RS-9193-000x-W	x		x	x	x	x

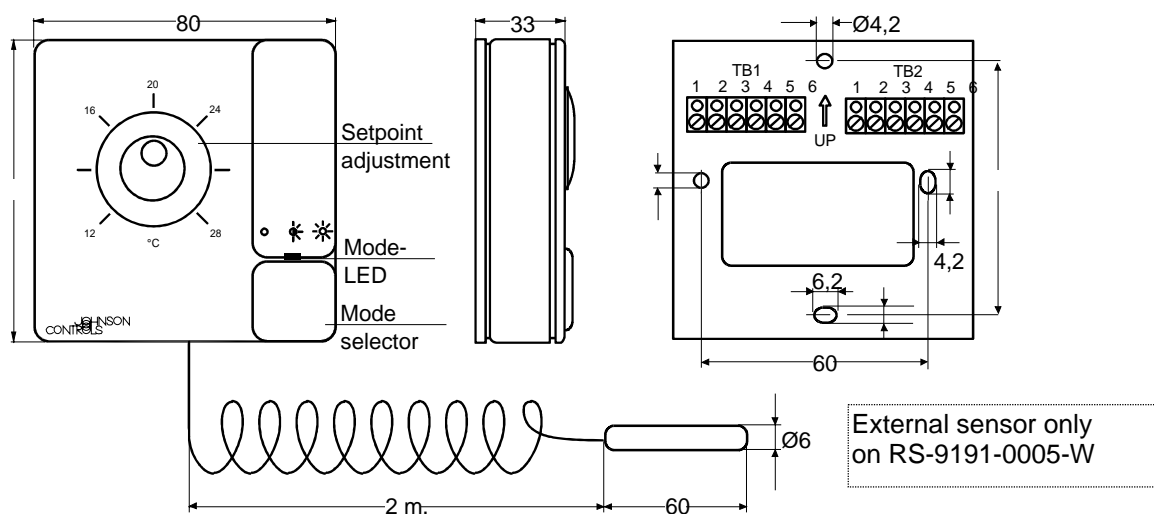
Wiring diagrams Pt-100 model



Used terminals

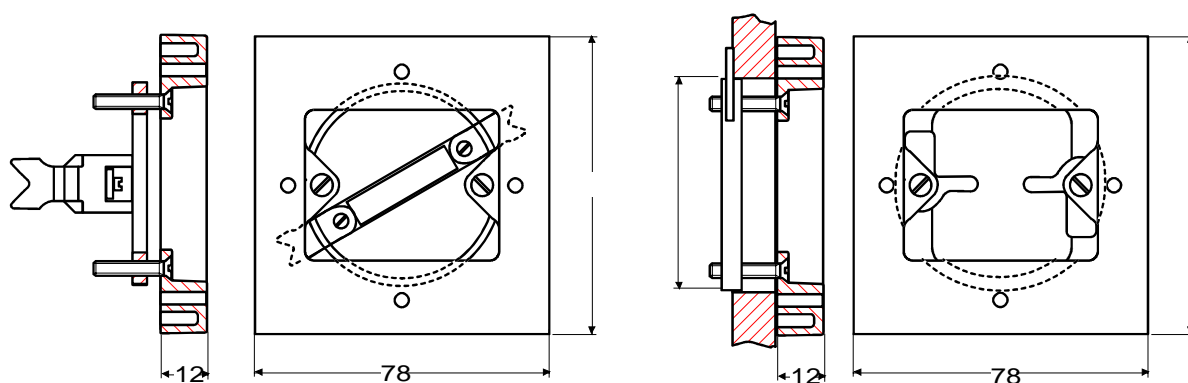
Model	1	2	3	4	5	6
RS-9145-0000-W	x	x	x	x		

Dimensions (in mm.)



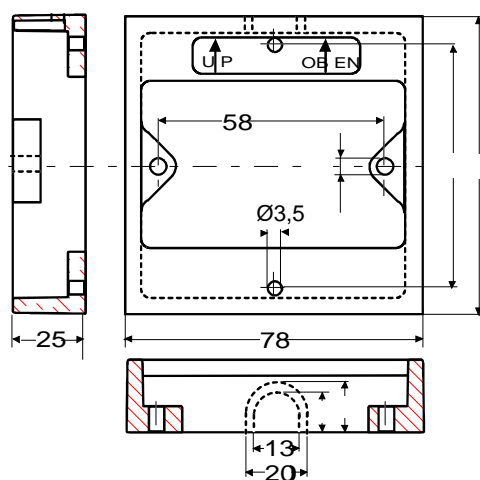
Basic model RS-91xx-00xx-W

Plug-in mounting base on the right



Wall box mounting kit TM-9100-8941-W

Panel mounting kit TM-9100-8951-W



Plastic surface mounting kit TM-9100-8931-W

NTC K2 resistance table

Temperature in °C	Resistance in Ω
0	7352,8
5	5717,8
10	4481,5
15	3537,9
20	2812,8
25	2252,0
30	1814,4
35	1470,6
40	1199,6

Specifications

Sensing Element	0/10 V	NTC „K2“	Pt 100
Supply Voltage	15 Vdc \pm 5 %	15 Vdc \pm 5 % for set point adjustment (RS 9193 models only)	-
Power Consumption	0,1 VA (5mA) no load	0,1 VA (5 mA) no load for set point adjustment (RS 9193 models only)	-
Output signal for temp.	Active 0/10 V linear 0 V \equiv 0°C 10 V \equiv 40°C	Resistive NTC „K2“ 0 to 40°C 2.252 Ω \equiv 25°C	Resistive Pt 100 100 Ω \equiv 0°C (IEC 751, DIN 43 760)
Output load	min. 5 k Ω , max. 2mA	-	-
Accuracy	1,2 % from 10 to 30°C 3,5 % from 0 to 10 & 30 to 40°C	\pm 0,2 K	According to IEC 751, class B.
Set Point Adjustment	limited 0/10 V signal linear (actual range 3 to 7 V)	0/10 V signal linear	-
Mode Selector	momentary contact switch (5 V at 1 mA)	-	-
Mode Indicator	red LED (5 V, 4 mA)	-	-
Ambient Operating Conditions	0 to 50°C, 10 to 90°C RH non condensing		
Storage Conditions	-40 to 70°C, 10 to 90 % RH non condensing		
Terminations	Screw terminal box mounted on base for 1 x 1,5 mm ² / 14 AWG (maximum) cable		
Mounting	Direct surface mounting. See in addition the mounting kits for wall box, panel or plastic surface, page 3, 4 and 6 .		
Housing	Material: ABS + polycarbonate, self extinguishing VO UL 94 Colour: RAL 9010 (pure white)* Protection: IP 30		
Dimension (H x W x D)	80 mm x 80 mm x 33 mm		
Shipping Weight	0,15 kg		
CE Conformity	EMC Directive (89 / 336 EU)		

* Models are also available in "off-white" (GE 80464, plug-in mounting base in iron grey GE 71673), use ordering number without suffix "-W"

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.