



Thermistor and Pressure transducer check process

SandenVendo January 2023

This document explain the process to check the function of the thermistor and pressure transducer of the condensing unit Sanden VENDO CDU-L / CDU-M et CDU-S

References:

Type	Model
CDU-L	R06A2A R06A2B R06A2C
CDU-M	R04A1A R04A1B R04A1C R04A1D
CDU-S	R02A1A R02A1B R02A1D

100% CO2 Condensing units

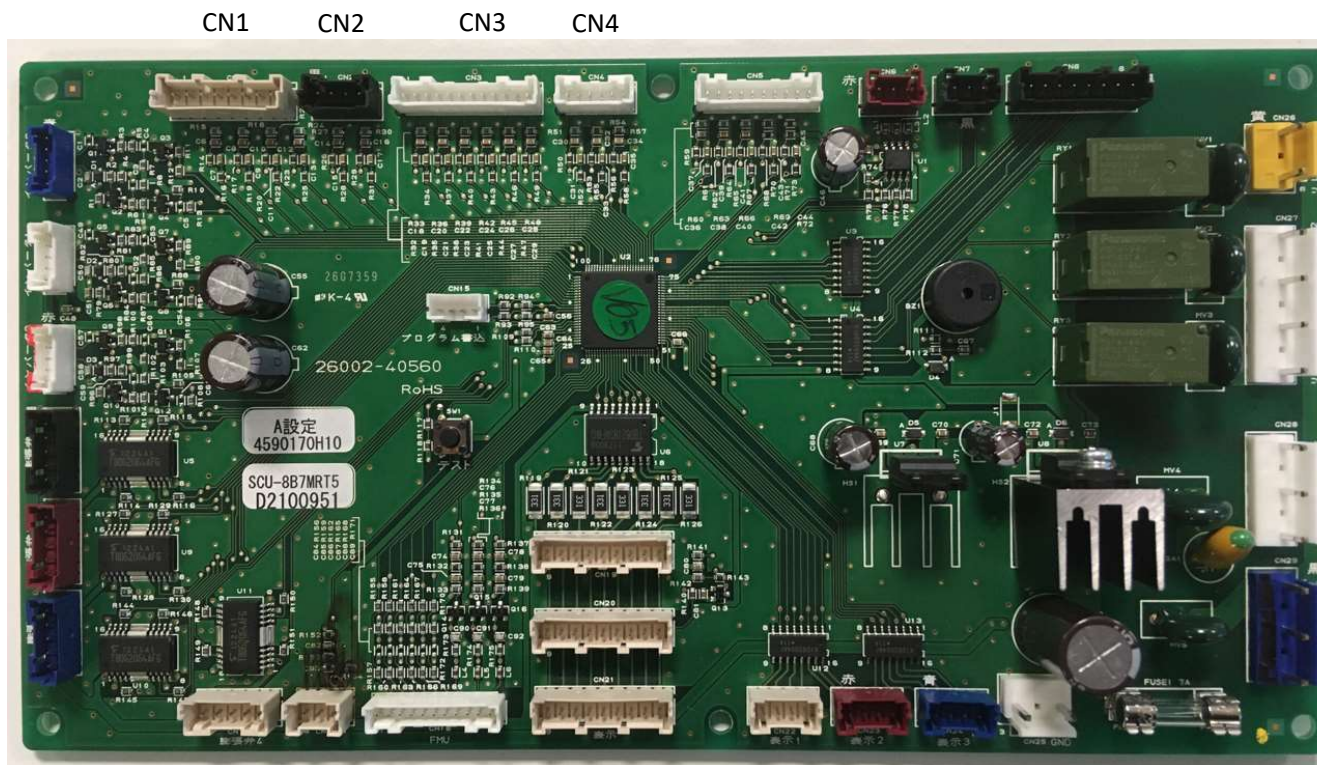
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1. Position of the thermistor and pressure transducer on the PCB controller
2. Ambient temperature thermistor
3. Inlet and outlet heat plate exchanger temperature thermistors
4. Suction temperature thermistor
5. Discharge temperature thermistor
6. Low pressure transducer
7. High pressure transducer
8. Pressure transducer supply voltage check

1. Position of the thermistor and pressure transducer on the control PCB



For more information on the PCB Controller board connectors, see the guide : Maintenance PCB Controller

CN1:

- Ambient temperature thermistor
- Inlet heat plate exchanger temperature thermistor
- Outlet heat plate exchanger temperature thermistor

CN2

- Suction temperature thermistor CLA
- Suction temperature thermistor CLB

CN3

- Discharge temperature thermistor CLB
- High pressure transducer CLB (GND on CN8)
- Low pressure transducer CLB (GND on CN8)
- Discharge temperature thermistor CHC
- High pressure transducer CHC (GND on CN8)
- Low pressure transducer CHC (GND on CN8)

CN4

- Discharge temperature thermistor CLA
- High pressure transducer CLA (GND on CN8, or CN9 when CDU-S)
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- Low pressure transducer CLA (GND on CN8, or CN11 when CDU-S)

2. Ambient temperature thermistor

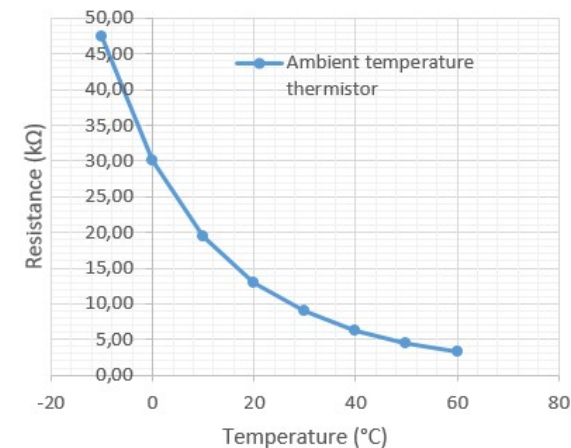
Thermistor reference : 91101-52060

Description : THERMISTOR EOUR ASSY

Thermistor specifications

Temperature[°C]	-10	0	10	20	30	40	50	60
Resistance [kΩ]	47,34	30,00	19,53	13,03	8,90	6,20	4,41	3,19

* In the table above , when temperature is an intermediate value, for example 5°C, make a proportional calculation with the upper and the lower values

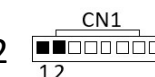


Measure the resistance while the connector is disconnected from the control PCB, and check if the temperature is corresponding to the above table. Contact the tester lead in ohmmeter mode to the 2 thermistor wires.

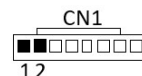
CDU-S : ambient temperature thermistor connected to the port CN1 of the control PCB pin 1&2



CDU-M : ambient temperature thermistor connected to the port CN1 of the control PCB pin 1&2



CDU-L : ambient temperature thermistor connected to the port CN1 of the control PCB pin 1&2



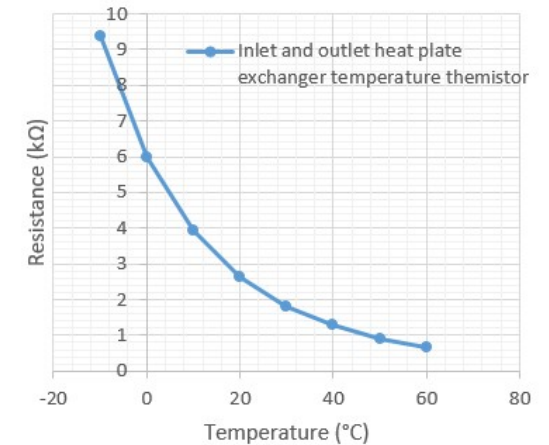
3. Inlet and outlet heat plate exchanger temperature thermistors

Thermistor reference : 91101-52060
 Description : THERMISTOR EOUR ASSY

Thermistor specifications

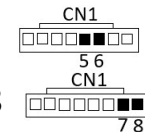
Temperature[°C]	-10	0	10	20	30	40	50	60
Resistance [kΩ]	9,392	6,000	3,935	2,644	1,817	1,274	0,9106	0,6622

* In the table above , when temperature is an intermediate value, for example 5°C, make a proportional calculation with the upper and the lower values



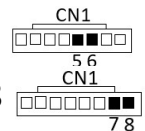
Measure the resistance while the connector is disconnected from the control PCB, and check if the temperature is corresponding to the above table. Contact the tester lead in ohmmeter mode to the 2 thermistor wires.

CDU-S* : inlet heat plate exchanger temperature thermistor connected to the port CN1 of the control PCB pin 5&6
 outlet heat plate exchanger temperature thermistor connected to the port CN1 of the control PCB pin 7&8

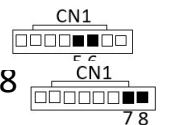


* On the CDU-S this thermistors are installed but not used

CDU-M : inlet heat plate exchanger temperature thermistor connected to the port CN1 of the control PCB pin 5&6
 outlet heat plate exchanger temperature thermistor connected to the port CN1 of the control PCB pin 7&8



CDU-L : inlet heat plate exchanger temperature thermistor connected to the port CN1 of the control PCB pin 5&6
 outlet heat plate exchanger temperature thermistor connected to the port CN1 of the control PCB pin 7&8



4. Suction temperature thermistor

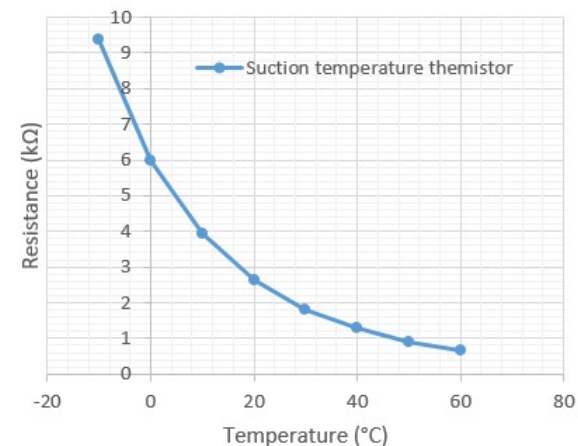
Thermistor reference : 91101-52440

Description : THERMISTOR PB-36-10RD

Thermistor specifications

Temperature[°C]	-10	0	10	20	30	40	50	60
Resistance [kΩ]	9.392	6.000	3.935	2.644	1.817	1.274	0.9106	0.6622

* In the table above , when temperature is an intermediate value, for example 5°C, make a proportional calculation with the upper and the lower values



Measure the resistance while the connector is disconnected from the control PCB, and check if the temperature is corresponding to the above table. Contact the tester lead in ohmmeter mode to the 2 thermistor wires.

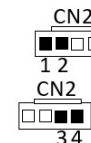
CDU-S : suction temperature thermistor CLA connected to the port CN2 of the control PCB pin 1&2



CDU-M : suction temperature thermistor CLA connected to the port CN2 of the control PCB pin 1&2



CDU-L : suction temperature thermistor CLA connected to the port CN2 of the control PCB pin 1&2
suction temperature thermistor CLB connected to the port CN2 of the control PCB pin 3&4



5. Discharge temperature thermistor

Thermistor reference : 91101-52070

Description : THERMISTOR EOUR

Thermistor specifications

Temperature[°C]	-10	0	10	20	30	40	50	60	70	80	90	100
Resistance [kΩ]	276	162,2	98,32	61,46	39,52	26,06	17,6	12,14	8,541	6,12	4,459	3,3

* In the table above , when temperature is an intermediate value, for example 5°C, make a proportional calculation with the upper and the lower values

Measure the resistance while the connector is disconnected from the control PCB, and check if the temperature is corresponding to the above table. Contact the tester lead in ohmmeter mode to the 2 thermistor wires.

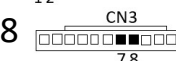
CDU-S : discharge temperature thermistor CLA connected to the port CN4 of the control PCB pin 1&2



CDU-M : discharge temperature thermistor CLA connected to the port CN4 of the control PCB pin 1&2



discharge temperature thermistor CHC connected to the port CN3 of the control PCB pin 7&8



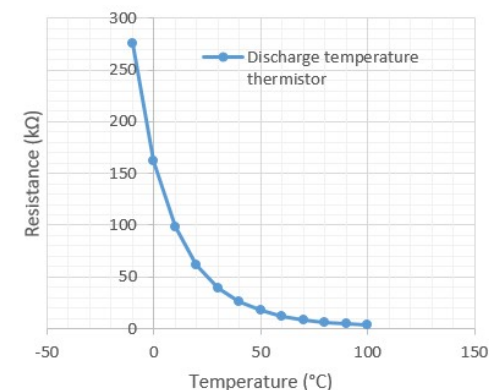
CDU-L : discharge temperature thermistor CLA connected to the port CN4 of the control PCB pin 1&2



discharge temperature thermistor CLB connected to the port CN3 of the control PCB pin 1&2



discharge temperature thermistor CHC connected to the port CN3 of the control PCB pin 7&8



6. Low pressure transducer

Pressure transducer reference: 91406-C2010
 Description :PRESSURE TRANSDUCER HSK

Pressure transducer specifications

Pressure [Mpa]	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Voltage [DC V]	0,50	0,77	1,03	1,30	1,57	1,83	2,10	2,37	2,63	2,90	3,17	3,43	3,70	3,97	4,23	4,50

* In the table above , when temperature is an intermediate value, for example 5°C, make a proportional calculation with the upper and the lower values

Access to the sensor connector being restricted, it is necessary to use a multimeter with thin pins.

**When checking the voltage of a pressure transducer, always use DCV range of the tester.
 Measurement by using resistance range may cause a sensor failure**



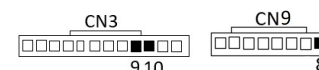
CDU-S/CDU-M/CDU-L : low pressure transducer CLA

Sensor voltage measurement between pin 4 CN4 and pin 8 CN9 (GND) (see graph)
 Supply voltage measurement between pin 3 CN4 and pin 8 CN9 (GND) (5V DC)



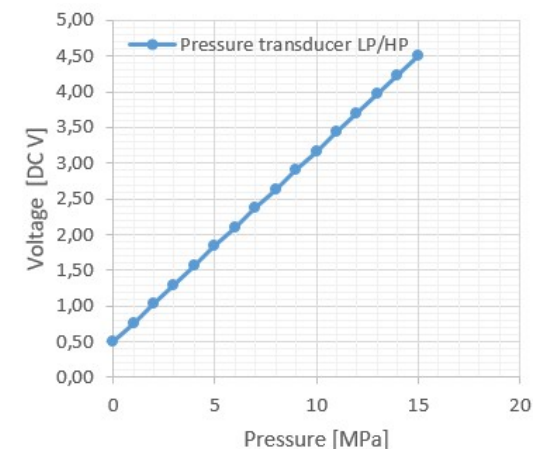
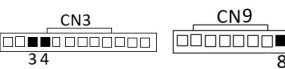
CDU-M/CDU-L : low pressure transducer CHC

Sensor voltage measurement between pin 10 CN3 and pin 8 CN9 (GND) (see graph)
 Supply voltage measurement between pin 9 CN3 and pin 8 CN9 (GND) (5V DC)



CDU-L : low pressure transducer CLB

Sensor voltage measurement between pin 4 CN3 and pin 8 CN9 (GND) (see graph)
 Supply voltage measurement between pin 3 CN3 and pin 8 CN9 (GND) (5V DC)



7. High pressure transducer

Pressure transducer reference: 91406-C2010
 Description :PRESSURE TRANSDUCER HSK

Pressure transducer specifications

Pressure [Mpa]	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Voltage DC V	0,50	0,77	1,03	1,30	1,57	1,83	2,10	2,37	2,63	2,90	3,17	3,43	3,70	3,97	4,23	4,50

* In the table above , when temperature is an intermediate value, for example 5°C, make a proportional calculation with the upper and the lower values

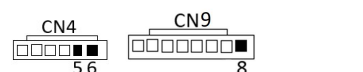
Access to the sensor connector being restricted, it is necessary to use a multimeter with thin pins

**When checking the voltage of a pressure transducer, always use DCV range of the tester.
 Measurement by using resistance range may cause a sensor failure**



CDU-S/CDU-M/CDU-L : low pressure transducer CLA

Sensor voltage measurement between pin 6 CN4 and pin 8 CN9 (GND) (see graph)
 Supply voltage measurement between pin 5 CN4 and pin 8 CN9 (GND) (5V DC)



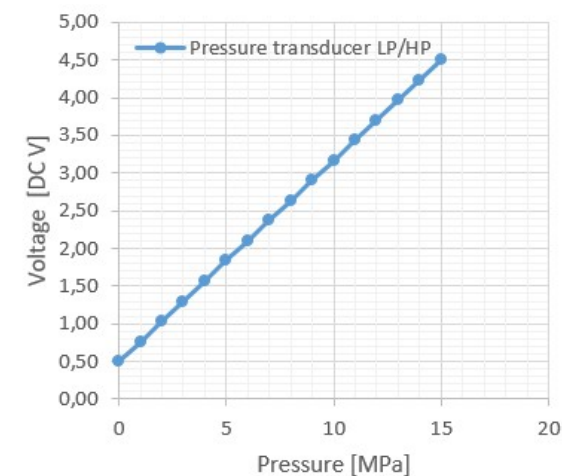
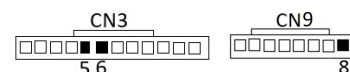
CDU-M/CDU-L : low pressure transducer CHC

Sensor voltage measurement between pin 12 CN3 and pin 8 CN9 (GND) (see graph)
 Supply voltage measurement between pin 11 CN3 and pin 8 CN9 (GND) (5V DC)

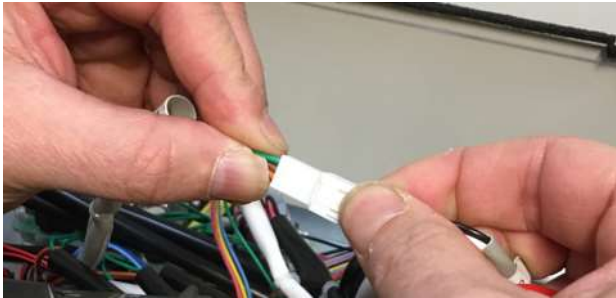


CDU-L : low pressure transducer CLB

Sensor voltage measurement between pin 6 CN3 and pin 8 CN9 (GND) (see graph)
 Supply voltage measurement between pin 5 CN3 and pin 8 CN9 (GND) (5V DC)



8. Pressure transducer supply voltage check



Disconnect the pressure transducer relay harness
Measure the supply voltage between the pin 1 and 3
Check that the voltage value is 5 V DC \pm 5%

