AIO™ Ceiling Suspended

Troubleshooting Manual

innova

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Ed.4 | UL 60335-1:20
Ed.2

CONTENTS

1. CEILING SUSPENDED

1.1 General anomalies

1.1.1 Anomaly table

Code	Description	Blocking
G1	The unit does not cool	No
G2	The unit does not heat	No
G3	Water leak	No
G4	Presence of condensation on the unit	No
G5	High noise level	No
G6	Faulty heating element	No
G7	Ice on the internal coil (summer)	No
G8	Ice on the external coil (winter)	No
G9	Ice on the condensate collection tray	No

1.1.2 Troubleshooting procedures

G1

Figure 1. G1 troubleshooting procedure video link

Anomaly: The unit does not cool

Blocking: No

General information

Compressor discharge temperature limits:

- R410a temperature below 100°C
- R32 temperature below 110°C

START

1. **Check that the unit is set to cooling mode with a setpoint lower than the ambient temperature. Is it set correctly?**

   Yes

   - Proceed to the next check

   No

   - Set the unit correctly
2. **Check that the filters are clean. Are they clean?**

   Yes

   - Proceed to the next check

   No

   - Clean filters
3. **Check that the airflow rate is correct. Does it fall within the nominal values?**

   Yes

   - Proceed to the next check

   No

   - Set the P1-P8 setting of the unit to ensure the correct airflow (see paragraph "Airflow adjustment(P1-P8)" ***p. 12***)
4. **Check that cold air is coming out from the internal side and warm air from the external side. Is this the case?**

   Yes

   - Proceed to the next check

   No

   - Check the correct operation of the 4-way
5. **Check the compressor discharge temperature with a thermometer. Does it fall within the compressor discharge temperature limits?**

   Yes

   - Proceed to the next check

   No

   - Have the refrigerant recharged
6. **Despite the checks performed, does the anomaly persist?**

   Yes

   - Connect the supervisor and check the unit parameters (see paragraph "Connection and verification with Supervisor" ***p. 12***)

   No

   - Resolved
7. **Despite the checks performed, does the anomaly persist?**

   Yes

   - Have the unit sizing checked

   No

   - Resolved

END

G2

Figure 2. G2 troublesh

Anomaly: The unit

Blocking: No

General informati

Compressor disch

- R410a temper
- R32 temperat

START

1. **Check that th setpoint high it set correctl**

   Yes

   - Proceed t

   No

   - Set the u
2. **Check that th**

   Yes

   - Proceed t

   No

   - Clean filt
3. **Check that th within the nor**

   Yes

   - Proceed t

   No

   - Set the P1 correct a adjustme
4. **Check that w internal side Is this the cas**

   Yes

   - Proceed t

   No

   - Check th valve
5. **Check the co with a therm compressor**

   Yes

   - Proceed t

   No

   - Have the
6. **Despite the c persist?**

   Yes

   - Connect parame

and verification with Supervisor" ***p. 12***)

No

- Resolved

7. **Despite the checks performed, does the anomaly persist?**

Yes

- Have the unit sizing checked

No

- Resolved

END

G3

Figure 3. G3 troubleshooting procedure video link

Anomaly: Water leak

Blocking: No

START

1. **Check that the system drain slopes from the unit towards the outlet. Does it slope towards the outlet?**

Yes

- Proceed to the next check

No

- Adjust the slope of the drain

2. **Check that the condensate collection trays are securely fixed. Are they securely fixed?**

Yes

- Proceed to the next check

No

- Secure the trays correctly

3. **Check that the connection pipes under the trays are properly secured to the tray fitting. Are they securely fastened?**

Yes

- Proceed to the next check

No

- Secure the pipes properly

4. **Check that the pipe from the internal coil tray flows into the external coil tray. Is it positioned correctly?**

Yes

- Proceed to the next check

No

- Position the pipe correctly

5. **Despite the checks performed, does the anomaly persist?**

Yes

- Check the thermal insulation of the pipes in the compressor area

No

- Resolved

END

G4

Figure 4. G4 troubleshooting procedure video link

Anomaly: Presence of condensation on the unit

Blocking: No

START

1. **Check that the ductwork is properly insulated at the unit connections. Is it compliant?**

Yes

- Proceed to the next check

No

- Properly insulate the ductwork

2. **Check that the filters are clean. Are they clean?**

Yes

- Proceed to the next check

No

- Clean filters

3. **Check that the air duct is clear of obstructions. Is it clear?**

Yes

- Proceed to the next check

No

- Remove the obstructions

4. **Check that the fans are intact. Are they intact?**

Yes

- Proceed to the next check

No

- Replace the faulty fans

5. **Despite the checks performed, does the anomaly persist?**

Yes

- Check the integrity of the unit's insulating parts

No

- Resolved

END

G5

Figure 5. G5 troubleshooting procedure video link

Anomaly: High noise level

Blocking: No

START

1. **Check that th**

Yes

- Proceed t

No

- Remove t

2. **Check that th contact with compliant?**

Yes

- Proceed t

No

- Repositio piping fro

3. **Despite the cl persist?**

Yes

- Set the Pl correct a adjustme

No

- Resolved

END

G6

Figure 6. G6 troublesh

Anomaly: Faulty h

Blocking: No

START

1. **Check on the the electric he correct?**

Yes

- Proceed t

No

- Set the FH

2. **Check that th heating elem deactivated?**

Yes

- Proceed t

No

- Deactivat

3. **Check with a voltage on co correctly?**

Yes

- Proceed t

No

- Replace the main board (see paragraph "Replace the main board" ***p. 12***)

4. **Check with a multimeter that the heating element is powered correctly. Is it powered correctly?**

   Yes
   - Proceed to the next check

   No
   - Check that the heating element wires are connected correctly

5. **Check with a multimeter that there is a 220 V voltage and that the contact is closed on the power relay connectors of the heating element. Is this the case?**

   Yes
   - Proceed to the next check

   No
   - Replace the power relay of the heating element

6. **Despite the checks performed, does the error persist?**

   Yes
   - Replace the heating element

   No
   - Resolved

END

G7

Figure 7. G7 troubleshooting procedure video link

Anomaly: Ice on the internal coil (summer)
Blocking: No
START

1. **Check that the IPT sensor of the internal coil is positioned correctly. Is it positioned correctly?**

   Yes
   - Proceed to the next check

   No
   - Properly position the probe

2. **Check that the filters are clean. Are they clean?**

   Yes
   - Proceed to the next check

   No
   - Clean filters

3. **Check that the airflow rate is correct. Does it fall within the nominal values?**

   Yes
   - Proceed to the next check

   No
   - Set the P1-P8 setting of the unit to ensure the correct airflow (see paragraph "Airflow adjustment (P1-P8)" ***p. 12***)

4. **Check that the 4-way valve is functioning correctly. Is it functioning correctly?**

   Yes
   - Proceed to the next check

   No
   - Replace the 4-way valve

5. **Check with a multimeter that there is no voltage on connector CN2. Is this the case?**

   Yes
   - Proceed to the next check

   No
   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

6. **Despite the checks performed, does the error persist?**

   Yes
   - Check the presence of refrigerant

   No
   - Resolved

END

G8

Figure 8. G8 troubleshooting procedure video link

Anomaly: Ice on th
Blocking: No
START

1. **Check that th**

   Yes
   - Proceed t

   No
   - Clean filt

2. **Check that th maximum flo**

   Yes
   - Proceed t

   No
   - Set the P1 correct a adjustme

3. **Check that th positioned co**

   Yes
   - Proceed t

   No
   - Properly p

4. **Check that th correctly. Is it**

   Yes
   - Proceed t

   No
   - Replace t

5. **Check that th correctly. Is it**

   Yes
   - Proceed t

   No
   - Position t

6. **Check with a voltage on co correctly?**

   Yes
   - Proceed t

   No
   - Replace t "Replace

7. **Despite the ch persist?**

   Yes
   - Check th

   No
   - Resolved

END

G9

Figure 9. G9 troubleshooting procedure video link

Anomaly: Ice on the condensate collection tray

Blocking: No

START

1. **Check that the system drain slopes from the unit towards the outlet. Does it slope towards the outlet?**

   Yes

   - Proceed to the next check

   No

   - Adjust the slope of the drain
2. **Check that the CN1 connector is positioned correctly. Is it positioned correctly?**

   Yes

   - Proceed to the next check

   No

   - Position the CN1 connector correctly
3. **Check with a multimeter that there is a 230 V voltage on connector CN1, provided that the outdoor temperature is below -9°C. Is this the case?**

   Yes

   - Proceed to the next check

   No

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)
4. **Check that the connector of the condensate collection tray heating element is connected correctly. Is it connected correctly?**

   Yes

   - Proceed to the next check

   No

   - Correctly position the connector
5. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the condensate collection tray heating element

   No

   - Resolved

END

1.2 Errors displayed on the screen

1.2.1 Error table

Code	Description	Blocking	Condition
"E1" ***p. 15***	Temperature/Humidity Sensor Error	No	The input does not detect serial communication with the intervention sensor
"E2" ***p. 16***	Internal Coil IPT Sensor Error	No	The input detects a resistance value (ohms) outside the expected range or a short circuit
"E3" ***p. 17***	External Air Temperature Sensor Error (OT)	Yes	The input detects a resistance value (ohms) outside the expected range or a short circuit
"E4" ***p. 18***	External Coil OPT Sensor Error	Yes	The input detects a resistance value (ohms) outside the expected range or a short circuit
"E5" ***p. 19***	Internal fan error	Yes	The internal fan speed is outside the allowable range
"E6" ***p. 20***	External Fan Error	Yes	The external fan speed is outside the allowable range
"E7" ***p. 21***	Communication error with the display	Yes	No communication between the display and the electronic boards
"E8" ***p. 23***	Compressor discharge sensor error	Yes	The input detects an ohm value out of range or a short circuit
"oF" ***p. 24***	Water Level Error	Yes	Activation of the maximum level float in the condensate collection tray
"bL" ***p. 25***	Display locked	No	Keyboard locked
"cP" ***p. 26***	Open contact for presence detection (CP)	Yes	The unit operates only with the CP presence contact closed

1.2.2 Troubleshoot

E1

Figure 10. E1 troublesho

Problem: Temperc

Condition: The inp
communication w

Blocking: No

Electronic board: "

START

1. **Check the po**
   the main boa

   Yes

   - Proceed t

   No

   - Correctly
2. **Check the 5 V**
   CN21. Is it corr

   Yes

   - Proceed t

   No

   - Replace t
     "Replace
3. **Despite the cl**
   persist?

   Yes

   - Replace t

   No

   - Resolved

END

E2

Figure 11. E2 troubleshooting procedure video link

Problem: Internal Coil IPT Sensor Error

Condition: The input detects a resistance value (ohms) outside the expected range or a short circuit

Blocking: No

Electronic board: "Electronic boards" ***p. 13***

Probe resistance values: "Resistance values of the probes" ***p. 13***

START

1. **Check the positioning of the CN7 connector on the main board. Is it positioned correctly?**

   Yes

   - Proceed to the next check

   No

   - Correctly position the connector

2. **Disconnect the probe and check the resistance value of the probe with a multimeter. Is it compliant with the specifications indicated for the probe (see the specific chapter)?**

   Yes

   - Proceed to the next check

   No

   - Replace the probe

3. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

   No

   - Resolved

END

E3

Figure 12. E3 troubleshooting procedure video link

Problem: External Air Temperature Sensor Error (OT)

Condition: The input detects a resistance value (ohms) outside the expected range or a short circuit

Blocking: Yes

Electronic board: "Electronic boards" ***p. 13***

Probe resistance values: "Resistance values of the probes" ***p. 13***

START

1. **Check the positioning of the CN17 connector on the main board. Is it positioned correctly?**

   Yes

   - Proceed to the next check

   No

   - Correctly position the connector

2. **Disconnect the probe and check the resistance value of the probe with a multimeter. Is it compliant with the specifications indicated for the probe (see the specific chapter)?**

   Yes

   - Proceed to the next check

   No

   - Replace the probe

3. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

   No

   - Resolved

END

E4

Figure 13. E4 troublesh

Problem: External

Condition: The inp
(ohms) outside the

Blocking: Yes

Electronic board:

Probe resistance v
probes" ***p. 13***

START

1. **Check the po**
   the main boa

   Yes

   - Proceed t

   No

   - Correctly

2. **Disconnect th**
   value of the p
   compliant wit
   the probe (se

   Yes

   - Proceed t

   No

   - Replace t

3. **Despite the ch**
   persist?

   Yes

   - Replace t
     "Replace

   No

   - Resolved

END

E5

Figure 14. E5 troubleshooting procedure video link

Problem: Internal Fan Error

Condition: The internal fan speed is outside the allowable range

Blocking: Yes

Electronic board: "Electronic boards" ***p. 13***

START

1. **Check the positioning of the CN23 connector on the main board. Is it positioned correctly?**

   Yes

   - Proceed to the next check

   No

   - Correctly position the connector

2. **Check the 115 V AC or 230 V AC power on the power connector. Is it correct?**

   Yes

   - Proceed to the next check

   No

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

3. **Check the VSP 0-10 V DC signal on the CN23 connector. Is it correct?**

   Yes

   - Proceed to the next check

   No

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

4. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the faulty fan

   No

   - Resolved

END

E6

Figure 15. E6 troubleshooting procedure video link

Problem: External Fan Error

Condition: The internal fan speed is outside the allowable range

Blocking: Yes

Electronic board: "Electronic boards" ***p. 13***

START

1. **Check the positioning of the CN9 connector on the main board. Is it positioned correctly?**

   Yes

   - Proceed to the next check

   No

   - Correctly position the connector

2. **Check the 115 V AC or 230 V AC power on the power connector. Is it correct?**

   Yes

   - Proceed to the next check

   No

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

3. **Check the VSP 0-10 V DC signal on the CN9 connector. Is it correct?**

   Yes

   - Proceed to the next check

   No

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

4. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the faulty fan

   No

   - Resolved

END

E7

Figure 16. E7 troublesh

Problem: Commun

Condition: No com
and the electronic

Blocking: Yes

Electronic board: "

START

1. **Check the po**
   the main boa

   Yes

   - Proceed t

   No

   - Correctly

2. **Check that th**
   board to the p
   correctly?

   Yes

   - Proceed t

   No

   - Correctly

3. **Check that th**
   board to the c
   correctly?

   Yes

   - Proceed t

   No

   - Correctly

4. **Check that th**
   are lit. Are the

   Yes

   - Proceed t

   No

   - Replace t
     "Replace

5. **Check that th**
   flashes every
   second?

   Yes

   - Proceed t

   No

   - Replace t
     "Replace

6. **Check that th**
   show no signs
   compliant?

   Yes

   - Proceed t

   No

- Replace the damaged cables

7. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

   No

   - Resolved

END

E8

Figure 17. E8 troubleshooting procedure video link

Problem: Compressor discharge sensor error

Condition: The input detects an ohm value out of range or a short circuit

Blocking: Yes

Electronic board: "Electronic boards" ***p. 13***

START

1. **Check the positioning of the XP209 connector on the driver board. Is it positioned correctly?**

   Yes

   - Proceed to the next check

   No

   - Correctly position the connector

2. **Disconnect the probe and check the resistance value of the probe with a multimeter. Is it compliant with the specifications indicated for the probe (see the specific chapter)?**

   Yes

   - Proceed to the next check

   No

   - Replace the probe

3. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the driver board (see paragraph "Replace the driver board" ***p. 12***)

   No

   - Resolved

END

oF

Figure 18. oF troubleshooting procedure video link

Problem: Water Level Error

Condition: Activation of the maximum level float in the condensate collection tray

Blocking: Yes

Electronic board: "Electronic boards" ***p. 13***

START

1. **Check that the water level in the external condensate collection tray is correct. Is it correct?**

   Yes

   - Proceed to the next check

   No

   - Check the drain tube

2. **Check the positioning of the CN15 connector on the main board. Is it positioned correctly?**

   Yes

   - Proceed to the next check

   No

   - Correctly position the connector

3. **Check the operation of the float using a multimeter. Does the float respond correctly to continuity tests?**

   Yes

   - Proceed to the next check

   No

   - Replace the float

4. **Despite the checks performed, does the error persist?**

   Yes

   - Replace the main board (see paragraph "Replace the main board" ***p. 12***)

   No

   - Resolved

END

bL

Figure 19. bL troubleshooting procedure video link

Problem: Display locked

Condition: Keyboard locked

Blocking: No

Electronic board: "Electronic boards" ***p. 13***

START

1. **Check that the ⏲ button has been pressed for about 10 seconds on the display. Has it been pressed?**

   Yes

   - Proceed to the next check

   No

   - Press and hold the ⏲ button for about 10 seconds

2. **Despite the ch persist?**

   Yes

   - Replace t

   No

   - Resolved

END

cP

Figure 20. cP troublesh

Problem: CP prese

Condition: The uni presence contact

Blocking: Yes

Electronic board: "

START

1. **Check the pos the main boa**

   Yes

   - Proceed t

   No

   - Correctly

2. **Check with a closed. Is it cl**

   Yes

   - Replace t "Replace

   No

   - Proceed t

3. **Check for the terminal conn present?**

   Yes

   - Proceed t

   No

   - Check th to conne

4. **Does the issu performed?**

   Yes

   - Replace t "Replace

   No

   - Resolved

END

1.3 Errors repo (LED)

1.3.1 Error table

Code	Flashing (LED)	Error	QR	Collegamento
1	●○○○○○	Excessive DC voltage		Link to the procedure video
2	○●○○○○	Insufficient DC voltage		Link to the procedure video
3	●●○○○○	Excessive phase current		Link to the procedure video
4	○○●○○○	Loss of synchronization		Link to the procedure video
5	●○●○○○	Phase loss (speed)		Link to the procedure video
6	○●●○○○	Phase loss (current)		Link to the procedure video
7	●●●○○○	IPM_FO - signal error (narrow)		Link to the procedure video
8	○○○●○○	IPM_FO - signal error (wide)		Link to the procedure video
12	○○●●○○	PFC - incorrect current / incorrect power		Link to the procedure video
				Link to the procedure video
				Link to the procedure video
15	●●●●○○	AD error		Link to the procedure video
18	○●○○●○	Temperature sensor failure		Link to the procedure video
19	●●○○●○	Excessive compressor temperature		Link to the procedure video
20	○○●○●○	Abnormal compressor casing temperature		Link to the procedure video
21	●○●○●○	Phase current disturbance		Link to the procedure video
22	○●●○●○	Communication error		Link to the procedure video
				Link to the procedure video
23	●●●○●○	EEprom error		Link to the procedure video
26	○●○●●○	IPM overheating error		Link to the procedure video
27	●●○●●○	Excessive AC current		Link to the procedure video

1.4 Additional procedures

1.4.1 Replace the main board

Link to the procedure video

Figure 21. Main board replacement procedure video link

1.4.2 Replace the power board

Link to the procedure video

Figure 22. Power board replacement procedure video link

1.4.3 Replace the driver board

Link to the procedure video

Figure 23. Driver board replacement procedure video link

1.4.4 Airflow adjus

Link to the procedu

Figure 24. Airflow adju

1.4.5 Firmware and

Link to the procedu

Figure 25. Firmware ar

1.4.6 Connection c

Link to the procedu

Figure 26. Connection video link

1.4.7 Replacement of the previous version of the condensate collection tray

Link to the procedure video

Figure 27. Condensate collection tray previous version replacement procedure video link

1.4.8 Reconfiguration of the CN6 connector

Link to the procedure video

Figure 28. CN6 connection reconfiguration procedure video link

1.5 Maintenance operations

1.5.1 General cleaning of the unit

Link to the procedure video

Figure 29. General cleaning procedure video link

1.5.2 Cleaning or filter replacement

Link to the procedure video

Figure 30. Cleaning or filter replacement procedure video link

1.5.3 Cleaning or replacing batteries

Link to the procedure video

Figure 31. Cleaning or battery replacement procedure video link

1.5.4 Cleaning or replacing the condensate collection tray

Link to the procedure video

Figure 32. Cleaning or condensate collection tray replacement procedure video link

1.5.5 Refrigerant c

Link to the procedu

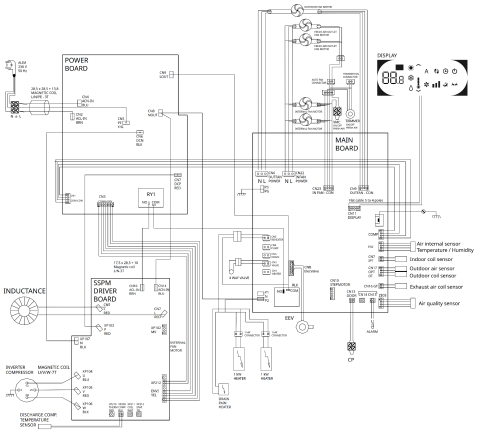
Figure 33. Refrigerant

1.6 Technical

1.6.1 Electronic boa

CN13	Input
CN14	Drain Pu
CN15	Drain Al
ZE	Internal
HU	Internal
CN17 OT	Externa
CN17 OPT	Capaci
CN7 IPT	Evapora
CN16 GT	Exhaust
XP209	Compre
CN1	Heating
CN2	Valve
CN5	Heater
CN4	Pump
CN23	Internal
CN9	Externa
CN19	Step Mo
CN10	Step Mo
CN11	Display

Figure 34.



1.6.2 Resistance values of the probes

Sensor 15 kΩ @ 25ºC

Probe 15 kΩ 3450

T(℃)	Rmin	Rcent	Rmax	DR(%)	DT(℃)
-30,00	63,96	67,94	70,85	4,28	0,95
-29,00	60,58	64,25	66,95	4,20	0,94
-28,00	57,40	60,79	63,29	4,11	0,93
-27,00	54,40	57,53	59,85	4,03	0,91
-26,00	51,59	54,48	56,62	3,93	0,90
-25,00	48,94	51,60	53,59	3,86	0,88
-24,00	46,44	48,90	50,75	3,78	0,87
-23,00	44,09	46,35	48,07	3,71	0,85
-22,00	41,87	43,96	45,55	3,62	0,83
-21,00	39,78	41,70	43,18	3,55	0,82
-20,00	37,80	39,58	40,95	3,46	0,80
-19,00	35,94	37,54	38,85	3,49	0,79
-18,00	34,18	35,69	36,87	3,31	0,78
-17,00	32,52	33,91	35,01	3,24	0,76
-16,00	30,96	32,23	33,25	3,16	0,74
-15,00	29,47	30,65	31,59	3,07	0,73
-14,00	28,07	29,15	30,03	3,02	0,71
-13,00	26,75	27,74	28,55	2,92	0,69
-12,00	25,49	26,40	27,15	2,84	0,67
-11,00	24,30	25,14	25,84	2,78	0,66
-10,00	23,18	23,95	24,59	2,67	0,64
-9,00	22,12	22,82	23,42	2,63	0,62
-8,00	21,11	21,75	22,31	2,57	0,61
-7,00	20,15	20,74	21,26	2,51	0,60
-6,00	19,25	19,79	20,26	2,37	0,57
-5,00	18,39	18,88	19,32	2,33	0,55
-4,00	17,57	18,02	18,43	2,28	0,54
-3,00	16,80	17,20	17,58	2,21	0,52
-2,00	16,06	16,43	16,78	2,13	0,50
-1,00	15,36	15,70	16,02	2,04	0,49
0,00	14,70	15,00	15,30	2,00	0,46
1,00	14,04	14,34	14,64	2,09	0,49
2,00	13,42	13,71	14,02	2,26	0,51
3,00	12,83	13,11	13,42	2,36	0,53
4,00	12,27	12,55	12,86	2,47	0,56
5,00	11,73	12,01	12,32	2,58	0,59
6,00	11,22	11,50	11,81	2,70	0,62
7,00	10,74	11,01	11,32	2,82	0,64
8,00	10,28	10,55	10,86	2,94	0,67
9,00	9,85	10,10	10,41	3,07	0,37
10,00	9,43	9,68	9,99	3,18	0,32
11,00	9,04	9,28	9,59	3,30	0,74
12,00	8,66	8,90	9,21	3,40	0,77
13,00	8,30	8,54	8,84	3,51	0,80
14,00	7,96	8,19	8,49	3,62	0,82
15,00	7,63	7,86	8,16	3,74	0,85
16,00	7,33	7,55	7,84	3,85	0,88
17,00	7,03	7,25	7,54	3,96	0,90
18,00	6,75	6,96	7,25	4,08	0,93
19,00	6,48	6,69	6,97	4,19	0,96
20,00	6,22	6,43	6,70	4,29	0,99
21,00	5,98	6,18	6,45	4,40	1,02
22,00	5,74	5,94	6,21	4,51	1,04
23,00	5,52	5,71	5,97	4,60	1,07
24,00	5,31	5,49	5,75	4,71	1,10
25,00	5,10	5,29	5,54	4,82	1,12
26,00	4,91	5,09	5,34	4,94	1,15
27,00	4,72	4,90	5,14	5,02	1,18
28,00	4,54	4,71	4,96	5,13	1,21
29,00	4,37	4,54	4,78	5,24	1,24
30,00	4,21	4,37	4,61	5,35	1,27
31,00	4,05	4,21	4,44	5,44	1,30
32,00	3,90	4,06	4,28	5,54	1,33
33,00	3,76	3,91	4,13	5,65	1,36
34,00	3,62	3,77	3,99	5,73	1,39
35,00	3,49	3,64	3,85	5,83	1,41
36,00	3,37	3,51	3,72	5,93	1,45
37,00	3,25	3,38	3,59	6,03	1,47
38,00	3,13	3,27	3,46	6,13	1,50
39,00	3,02	3,15	3,35	6,22	1,53
40,00	2,91	3,04	3,23	6,35	1,56
41,00	2,81	2,94	3,13	6,44	1,59
42,00	2,71	2,83	3,02	6,53	1,63
43,00	2,62	2,74	2,92	6,61	1,67
44,00	2,53	2,65	2,82	6,69	1,68
45,00	2,44	2,56	2,73	6,81	1,72
46,00	2,36	2,47	2,64	6,88	1,76
47,00	2,28	2,39	2,56	6,99	1,78
48,00	2,20	2,31	2,47	7,06	1,82
49,00	2,13	2,23	2,39	7,17	1,13
50,00	2,06	2,16	2,32	7,27	0,72
51,00	1,99	2,09	2,24	7,32	1,91
52,00	1,92	2,02	2,17	7,42	1,94
53,00	1,86	1,96	2,10	7,52	1,98
54,00	1,80	1,89	2,04	7,61	1,99
55,00	1,74	1,83	1,97	7,75	2,04
56,00	1,69	1,77	1,91	7,84	2,08
57,00	1,63	1,72	1,85	7,92	2,11
58,00	1,58	1,66	1,80	7,99	2,14

T(℃)	Rmin
59,00	1,53
60,00	1,48
61,00	1,44
62,00	1,39
63,00	1,35
64,00	1,31
65,00	1,27
66,00	1,23
67,00	1,19
68,00	1,15
69,00	1,12
70,00	1,09
71,00	1,05
72,00	1,02
73,00	0,99
74,00	0,96
75,00	0,93
76,00	0,91
77,00	0,88
78,00	0,86
79,00	0,83
80,00	0,81
81,00	0,78
82,00	0,76
83,00	0,74
84,00	0,72
85,00	0,70
86,00	0,68
87,00	0,66
88,00	0,64
89,00	0,63
90,00	0,61
91,00	0,59
92,00	0,58
93,00	0,56
94,00	0,55
95,00	0,53
96,00	0,52
97,00	0,50
98,00	0,49
99,00	0,48
100,00	0,47
101,00	0,45
102,00	0,44
103,00	0,43
104,00	0,42
105,00	0,41
106,00	0,40
107,00	0,39
108,00	0,38
109,00	0,37
110,00	0,36

Probe 187 kΩ @0 ºC

Probe 187 kΩ 3979

T(℃)	Rmin	Rcent	Rmax	DR(%)	DT(℃)
-30,00	891,20	966,10	1047,00	8,37	1,42
-29,00	840,30	910,30	985,40	8,25	1,41
-28,00	792,60	858,00	928,20	8,18	1,41
-27,00	747,80	809,00	874,70	8,12	1,40
-26,00	705,80	763,10	824,50	8,05	1,40
-25,00	666,40	720,00	777,50	7,99	1,40
-24,00	629,40	679,60	733,40	7,92	1,39
-23,00	594,60	641,70	692,10	7,85	1,39
-22,00	562,00	606,10	653,30	7,79	1,39
-21,00	531,30	572,70	616,90	7,72	1,39
-20,00	502,50	541,30	582,70	7,65	1,38
-19,00	475,40	511,70	550,60	7,60	1,38
-18,00	449,90	484,00	520,40	7,52	1,38
-17,00	425,90	457,90	492,00	7,45	1,37
-16,00	403,20	433,30	465,40	7,41	1,37
-15,00	382,00	410,20	440,30	7,34	1,37
-14,00	361,90	388,50	416,70	7,26	1,36
-13,00	343,00	368,00	394,50	7,20	1,36
-12,00	325,20	348,70	373,60	7,14	1,36
-11,00	308,40	330,50	353,90	7,08	1,35
-10,00	292,60	313,40	335,40	7,02	1,35
-9,00	277,60	297,20	317,90	6,97	1,34
-8,00	263,50	281,90	301,40	6,92	1,34
-7,00	250,20	267,50	285,80	6,84	1,34
-6,00	237,60	253,90	271,20	6,81	1,34
-5,00	225,80	241,10	257,40	6,76	1,33
-4,00	214,50	229,00	244,30	6,68	1,33
-3,00	203,90	217,60	232,00	6,62	1,33
-2,00	193,90	206,80	220,40	6,58	1,33
-1,00	184,40	196,60	209,40	6,51	1,32
0,00	175,50	186,90	199,00	6,47	1,31
1,00	167,00	177,80	189,20	6,41	1,32
2,00	159,00	169,20	179,90	6,32	1,31
3,00	151,40	161,00	171,10	6,27	1,30
4,00	144,20	153,30	162,90	6,26	1,31
5,00	137,40	146,00	155,00	6,16	1,29
6,00	130,90	139,00	147,60	6,19	1,30
7,00	124,80	132,50	140,50	6,04	1,30
8,00	119,00	126,30	133,90	6,02	1,29
9,00	113,50	120,40	127,60	5,98	1,29
10,00	108,30	114,80	121,60	5,92	1,28
11,00	103,30	109,50	115,90	5,84	0,61
12,00	98,63	104,40	110,50	5,84	1,27
13,00	94,16	99,66	105,40	5,76	1,27
14,00	89,92	95,13	100,60	5,75	1,27
15,00	85,89	90,82	95,98	5,68	1,26
16,00	82,06	86,74	91,62	5,63	1,26
17,00	78,43	82,85	87,47	5,58	1,25
18,00	74,97	79,16	83,54	5,53	1,25
19,00	71,68	75,65	79,80	5,49	1,25
20,00	68,55	72,32	76,25	5,43	1,24
21,00	65,57	69,15	72,88	5,39	1,24
22,00	62,74	66,13	69,67	5,35	1,24
23,00	60,05	63,27	66,61	5,28	1,23
24,00	57,48	60,54	63,71	5,24	1,23
25,00	55,04	57,94	60,95	5,20	1,22
26,00	52,71	55,46	58,32	5,16	1,22
27,00	50,49	53,11	55,82	5,10	1,22
28,00	48,38	50,86	53,44	5,07	1,21
29,00	46,36	48,72	51,17	5,03	1,21
30,00	44,44	46,68	49,01	4,99	1,21
31,00	42,61	44,74	46,95	4,94	1,20
32,00	40,87	42,89	44,99	4,90	1,20
33,00	39,20	41,13	43,12	4,84	1,19
34,00	37,61	39,44	41,34	4,82	1,19
35,00	36,10	37,84	39,64	4,76	1,18
36,00	34,65	36,30	38,02	4,74	1,18
37,00	33,26	34,84	36,47	4,68	1,18
38,00	31,94	33,44	34,99	4,64	1,17
39,00	30,68	32,11	33,58	4,58	1,17
40,00	29,47	30,83	32,24	4,57	1,16
41,00	28,32	29,61	30,95	4,53	1,16
42,00	27,22	28,45	29,72	4,46	1,16
43,00	26,16	27,34	28,55	4,43	1,15
44,00	25,15	26,27	27,43	4,42	1,15
45,00	24,19	25,25	26,35	4,36	1,14
46,00	23,26	24,28	25,33	4,32	1,14
47,00	22,38	23,35	24,35	4,28	1,14
48,00	21,53	22,46	23,41	4,23	1,13
49,00	20,72	21,60	22,51	4,21	1,13
50,00	19,95	20,79	21,65	4,14	1,12
51,00	19,20	20,01	20,83	4,10	0,57
52,00	18,49	19,26	20,04	4,05	0,54
53,00	17,81	18,54	19,29	4,05	1,10
54,00	17,15	17,85	18,57	4,03	1,10
55,00	16,53	17,19	17,87	3,96	1,09
56,00	15,93	16,56	17,21	3,93	1,09
57,00	15,35	15,96	16,58	3,88	1,09
58,00	14,80	15,38	15,97	3,84	1,08
59,00	14,27	14,82	15,39	3,85	1,08
60,00	13,76	14,29	14,83	3,78	1,08
61,00	13,27	13,78	14,29	3,70	1,06
62,00	12,80	13,28	13,78	3,77	1,06
63,00	12,35	12,81	13,28	3,67	1,06
64,00	11,92	12,36	12,81	3,64	1,06
65,00	11,51	11,93	12,36	3,60	1,05
66,00	11,11	11,51	11,92	3,56	1,04
67,00	10,72	11,11	11,50	3,51	1,05
68,00	10,36	10,73	11,10	3,45	1,04
69,00	10,00	10,36	10,71	3,38	1,02
70,00	9,66	10,00	10,34	3,40	1,02
71,00	9,34	9,66	9,99	3,40	1,02
72,00	9,02	9,33	9,64	3,37	1,02
73,00	8,72	9,02	9,32	3,33	1,01
74,00	8,43	8,71	9,00	3,31	1,01
75,00	8,15	8,42	8,60	2,07	1,01

T(℃)	Rmin
76,00	7,88
77,00	7,62
78,00	7,37
79,00	7,13
80,00	6,90
81,00	6,68
82,00	6,46
83,00	6,25
84,00	6,05
85,00	5,86
86,00	5,68
87,00	5,50
88,00	5,33
89,00	5,16
90,00	5,00
91,00	4,84
92,00	4,70
93,00	4,55
94,00	4,41
95,00	4,28
96,00	4,15
97,00	4,03
98,00	3,90
99,00	3,79
100,00	3,68
101,00	3,56
102,00	3,46
103,00	3,35
104,00	3,26
105,00	3,16
106,00	3,07
107,00	2,98
108,00	2,89
109,00	2,81
110,00	2,72
111,00	2,65
112,00	2,57
113,00	2,50
114,00	2,42
115,00	2,36
116,00	2,29
117,00	2,23
118,00	2,16
119,00	2,10
120,00	2,04
121,00	1,99
122,00	1,93
123,00	1,88
124,00	1,83
125,00	1,78
126,00	1,73
127,00	1,68
128,00	1,64
129,00	1,60

T(℃)	Rmin	Rcent	Rmax	DR(%)	DT(℃)
130,00	1,55	1,60	1,66	3,30	1,29

With over 20 years of experience in the climate comfort sector, we have a clear goal: growth through innovation. Our team is laser-focused on the conception, development, and production of innovative heating, ventilation, and air conditioning solutions. This mission has developed through bringing together technical skills, creativity, technology, design, Italian passion, and a global vision to achieve the best energy efficiency and performance.

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MADE IN ITALY

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