

## Technical Service Bulletin:

# Control Board Replacement Procedure

Models: Bosch IDS Ultra Heat Pumps



# BOSCH



### WARNING

#### Dangerous operation, injury or property damage!

Improper servicing could result in dangerous operation, injury or property damage. The operations described below must be performed by qualified personnel.

### NOTICE

#### Product damage!

Do not directly touch the components on the main board to avoid static electricity damage.

### NOTICE

#### Product damage!

The factory default mode is communicating mode and Dip Switch SW5-4 is set to OFF position.

If replacing a unit configured to conventional 20VAC non-communicating mode, ensure Dip Switch SW5-4 is set to ON position. See Table 1.

Check the control board is set to the correct tonnage by setting Dip Switch J2. See Table 2.

#### SW5-4 Dip Switch Settings

Communicating	ON OFF	OFF
Non-Communicating	ON OFF	ON

Table 1

#### J2 Dip Switch Settings

4 Ton	ON OFF	OFF
5 Ton	ON OFF	ON

Table 2

## Board Replacement Procedure (BOVA-60MTB-M19E)

1. Turn off power to both the indoor and outdoor unit and wait AT LEAST 5 minutes before removing the outdoor unit's control board access panel.



### WARNING

#### Electrical hazard 380 volts DC!

Wait 5 minutes after disconnecting power, then verify DC voltage is less than 43 VDC at inverter test points P-N of socket CN22. Components may store a dangerous electrical potential of 380 Volts DC. Failure to follow these instructions could result in personal injury or death.

### NOTICE

#### Improper operation!

Take a picture before removing any screws or wiring to use as reference when installing the new board.

Use a screw driver instead of an electric screw driver/drill or damage to the control board may occur.

Hold the board before removing the last screw, otherwise the main board may fall and cause damage.

#### There is no need to disconnect the field supplied wires; directly remove the wire plugs on the control board.

2. Remove wires and plugs from control board.
3. Remove the 5 compressor wire plugs, power wire screws and ground wirescrews (refer to Figure 1: items circled in blue).

### NOTICE

#### Product Damage!

There are 5 different types of screws; they should not be mixed. Different screw types are installed in different locations. Refer to color coding in Figure 1 for appropriate screw type and location.

4. Remove the 10 screws on the board (refer to Figure 1: items circled in yellow).
5. Remove the 2 ground screws on the board (refer to Figure 1: items circled in green).
6. Remove the 2 screws on the board (refer to Figure 1: items circled in red).
7. Remove the 3 screws on the board (refer to Figure 1: items circled in purple).



Figure 1

Screw Type					
Color for Location	○	○	○	○	○

Table 3

8. Remove the old board after finishing 2 to 7.

**NOTICE**

**Product Damage!**

If the thermal gasket falls off when removing the old board, the new thermal gasket in the accessory bag must be reinstalled. The surface of the thermal gasket must be kept clean. Refer to 9 to 10.

9. Apply a thin and even layer of thermal paste on the heat sink designated location (refer to Figure 2: item framed in yellow).
10. Put the thermal gasket on the heat sink designated location. The side with breakable groove faces out (refer to Figure 2).

**NOTICE**

**Product Damage!**

The full surface area of the replacement board's heat sink must be COMPLETELY covered with thermal paste. Failure to follow these instructions will cause poor heat dissipation and will lead to control board failure.



**WARNING**

**Personal injury or death, product damage!**

The thermal gasket must be installed properly before installing the new board. Failure to install the thermal gasket can result in property damage, personal injury, or death.



One tube of thermal paste is included with each board replacement.

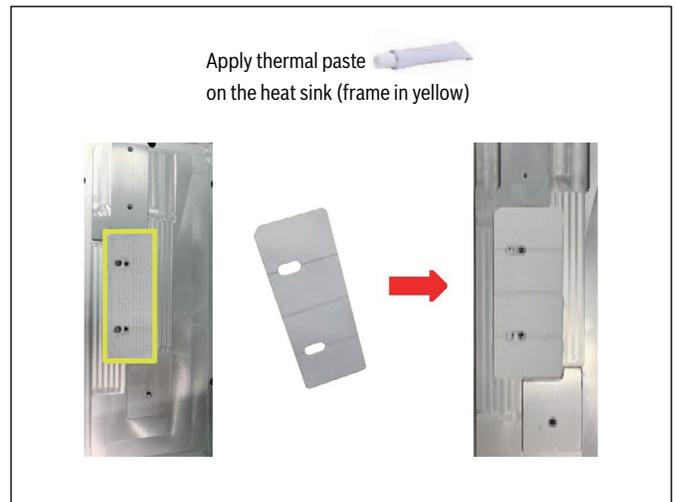


Figure 2

11. Apply the thermal paste on the 6 components of the replacement board (refer to Figure 3).

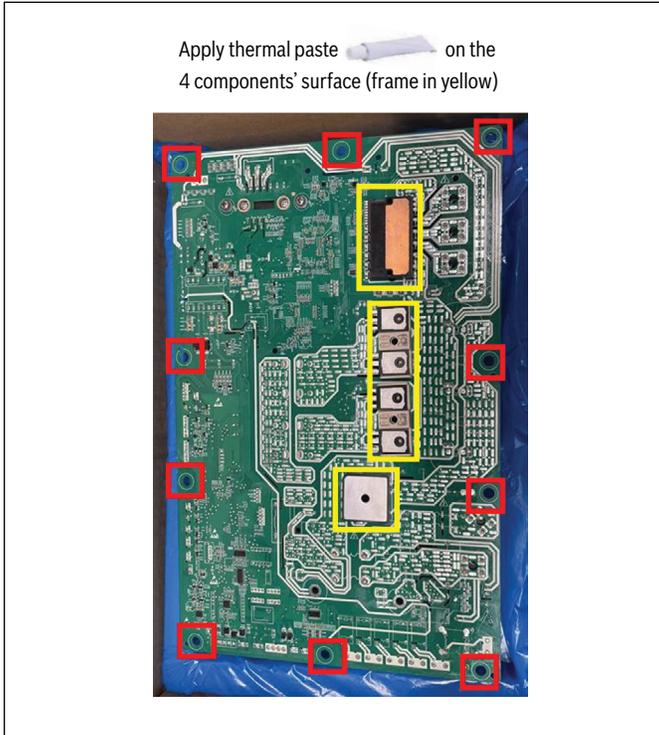


Figure 3

17. Check SW4/SW5/J2 dip switch positions. Refer to the Wiring Diagram on Page 5 and the picture taken before replacement to ensure correct settings.
18. Double check all wire connections and screw positions before powering on.

**NOTICE**

**Product Damage!**

For more information, please refer to the unit wiring diagram located on the inside of the electrical control box panel.

12. Install the 6 plastic standoffs on the new board (refer to Figure 3: items framed in red).
13. Install the new board on the unit.
14. Fasten all screws (refer to Figure 1 for screw type and location).
15. Reconnect the wires according to the wiring diagram located on the inside of the electrical control box panel and the picture that was taken prior to removal of the old board.
16. Fasten the yellow VH socket placed in the accessory bag into CN22 on the control board (refer to Figure 4).

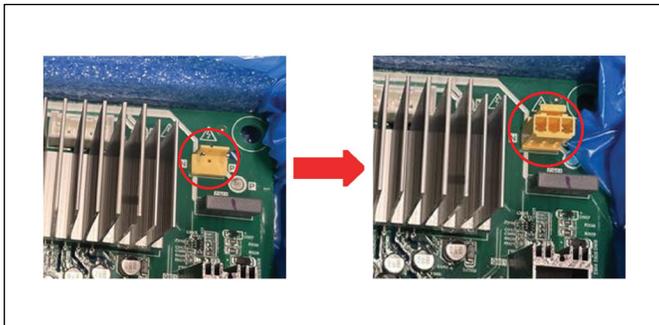
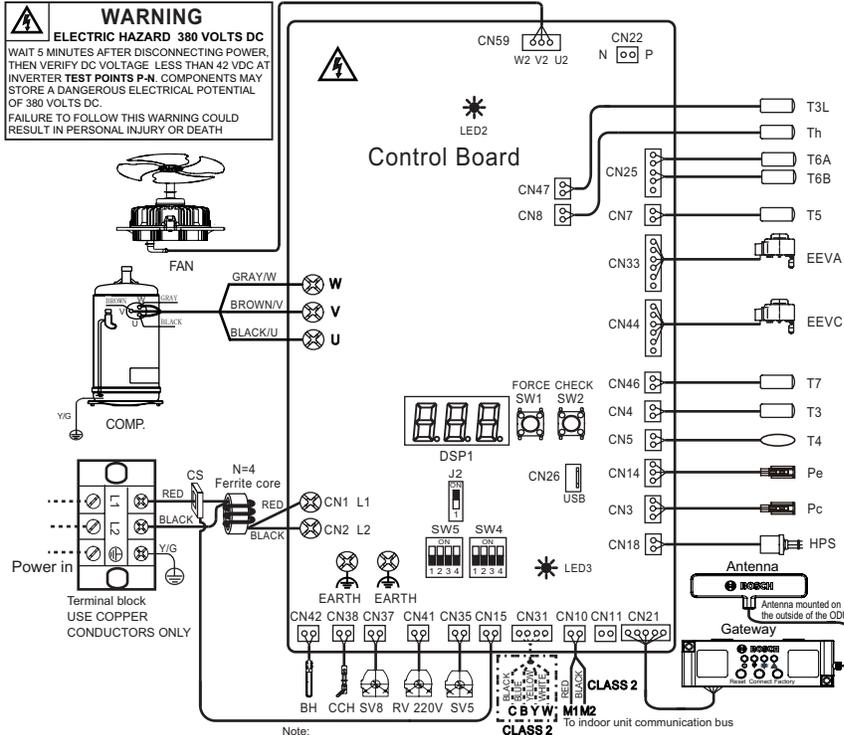


Figure 4

IDS Ultra Wiring Diagram

**WARNING**  
**ELECTRIC HAZARD 380 VOLTS DC**  
 WAIT 5 MINUTES AFTER DISCONNECTING POWER, THEN VERIFY DC VOLTAGE. LESS THAN 42 VDC AT INVERTER TEST POINTS P-N. COMPONENTS MAY STORE A DANGEROUS ELECTRICAL POTENTIAL OF 380 VOLTS DC.  
 FAILURE TO FOLLOW THIS WARNING COULD RESULT IN PERSONAL INJURY OR DEATH



HPS	High pressure switch
Pc	High pressure sensor
Pe	Low pressure sensor
T4	Ambient temp. sensor
T3	Outdoor coil temp. sensor
T3L	Outdoor coil outlet temp. sensor
T6A	C electronic expansion valve
T6B	A electronic expansion valve
T5	Comp. discharge temp. sensor
T6A	Injection inlet of the plate heat exchanger temp. sensor
T6B	Injection outlet of the plate heat exchanger temp. sensor
Th	Comp. suction temp. sensor
T7	Outdoor outlet temp. sensor
SV5	Solenoid valve 5
RV	Reversing valve
SV8	Solenoid valve 8
CCH	Compressor crankcase heating
BH	Baseplate heating
CS	Current sensor
COMP.	Compressor
Temp.	Temperature
ODU	Outdoor unit
IDU	Indoor unit

CODE	Fault description
AL	Ambient temperature limited (T4)
b1	Temperature sensor fault in IDU (T1)
b2	Temperature sensor fault in IDU (T2)
b3	R454B refrigerant sensor fault in IDU
b4	R454B refrigerant sensor communication fault in IDU
b5	Communication fault between IDU and ODU
b6	Power consumption sensor fault in IDU
b7	R454B refrigerant leakage protection in IDU
b8	R454B refrigerant sensor over service life in IDU
C3	The coil sensor is sealed fault in cooling (T3)
E41	Temperature sensor fault (T3)
E42	Temperature sensor fault (T3L)
E43	Temperature sensor fault (T4)
E44	Temperature sensor fault (T5)
E45	Temperature sensor fault (Th)
E46	Temperature sensor fault (T6A)
E47	Temperature sensor fault (T6B)
E48	Temperature sensor fault (T7)
E49	Baseplate heating fault
E51	ODU high/low input voltage protection
E52	ODU high/low DC bus voltage protection
E7	Compressor discharge sensor is seated fault (T5)
E81	EEVA coil fault
E82	EEVC coil fault
EA	Control program does not match drive program in ODU
F1	High pressure switch protection (HPS)
F2	5 times (P21) protection in 100 minutes, system lockout
F41	High pressure sensor fault
F42	Low pressure sensor fault
H01	Drive chip communication fault in ODU
H04	Chip of power consumption sensor communication fault in ODU
H14	Power consumption sensor fault in ODU
J00-JCF	Compressor drive protection
n00-nCF	Fan drive protection
P0	Compressor IPM temperature protection
P1	High pressure switch protection
P11	High pressure protection in cooling/heating (Pc)
P21	Low pressure protection in cooling/heating (Pe)
P31	ODU input over current protection
P32	Compressor over current protection
P4	High compressor discharge temperature protection (T5)
P5	Condenser coil temperature protection in cooling (T3)
Pb1	Hyper-Link(M1M2) over current protection
PH	Low discharge superheat protection

* LED2 RED	Solid ON	Compressor running
	2s ON 2s OFF	Standby
* LED3 RED	0.2s ON 0.2s OFF	Communication fault with control chip
	Blink OFF	Driver fault Power off
* LED3 RED	Solid ON	M1 and M2 short circuit
	OFF	Normal

Note:  
 1. M1 and M2 are connected to indoor unit in communication mode.  
 2. C, B, Y and W are connected to indoor unit in conventional 24VAC non-communicating control mode.  
 3. B terminal is connected in heat pump heating operation, energized for heating in conventional 24VAC non-communicating control mode.  
 4. B and W signals are for heat pump system in conventional 24VAC non-communicating control mode.  
 5. Dash-dotted line means optional.  
 6. Dotted line means field installed.

SW4	ON	Unused
SW4-1	OFF	Reserved *
SW4-2	ON	Accelerated cooling/heating
SW4-3	OFF	Normal *
SW4-4	ON	Accelerated cooling/heating 2
SW4-5	OFF	Normal *
SW4-6	ON	Adaptive capacity output disable
SW4-7	OFF	Normal *
SW5-1	ON	Heating time reduced 10%
SW5-2	OFF	Normal *
SW5-3	ON	Defrosting extended for 60 seconds
SW5-4	OFF	Normal *
SW5-5	ON	Reserved
SW5-6	OFF	Normal *
SW5-7	ON	Non-communicating mode
SW5-8	OFF	Communication mode *

Gateway button descriptions	
Reset	Connect Factory
Reset	Powers gateway off and back on
Connect	Activates bluetooth(hold for at least 4 secs)
Factory	Hold for 3-5 secs to run gateway in diagnostic mode

Diagnostic Check: After holding down the factory button (3-5 secs), press connect button to run full diagnostics. If there are any faults on the gateway, the Fault LED will flash accordingly.

Gateway light indications and descriptions	
Power LED(green)	Solid ON Gateway powered on
Power LED(green)	1 blink/cycle Abnormal voltage to gateway
Power LED(green)	2 blinks/cycle Gateway booting up
Power LED(green)	LED OFF Gateway not powered
Cellular LED(amber)	Solid ON Good signal strength
Cellular LED(amber)	Blinking LED Weak signal strength
Bluetooth LED(blue)	Solid ON Connected to bluetooth
Bluetooth LED(blue)	1 blink/cycle Bluetooth in pairing mode
Bluetooth LED(blue)	2 blinks/cycle Bluetooth in advertising mode
Gateway Fault LED(red)	LED OFF Gateway has no fault
Gateway Fault LED(red)	1 blink/cycle No modbus response from IDS
Gateway Fault LED(red)	2 blinks/cycle Unacceptable signal strength
Gateway Fault LED(red)	3 blinks/cycle Data packet cannot send
Gateway Fault LED(red)	4 blinks/cycle Hardware error
Gateway Fault LED(red)	5 blinks/cycle Cellular communication error

FORCE SW1	PRESS 1s	Forced cooling/heating (Charge mode)
FORCE SW1	PRESS 6s	Forced defrosting
CHECK SW2	PRESS 1s	Check the system parameters

Factory code	Date	Revision
16023000014172	Feb. 27th, 2024	E

Number	Point check content
0	Outdoor unit capacity; HS=Heat pump 5 ton
1	Outdoor unit mode: 0-standby, 2-cooling, 3-heating
2	Outdoor unit set compressor speed (Hz)
3	System last fault code
4	Liquid valve subcooling (°F)
5	Gas valve superheat (°F)
6	T3: outdoor coil temp. (°F)
7	T3L: outdoor coil outlet temp. (°F)
8	T4: outdoor ambient temp. (°F)
9	T5: compressor discharge temp. (°F)
10	T6: compressor suction temp. (°F)
11	T7: outdoor outlet temp. (°F)
12	T6A: injection inlet of the plate heat exchanger temp. (°F)
13	T6B: injection outlet of the plate heat exchanger temp. (°F)
14	Compressor IPM temp. (°F)
15	Pc: evaporating pressure (psig)
16	Pe: condensing pressure (psig)
17	Tas: target evaporating temp. (°F) (only for cooling mode)
18	Tas: evaporating temp. (°F)
19	Tcs: target condensing temp. (°F) (only for heating mode)
20	Tcs: condensing temp. (°F)
21	Target value of the compressor discharge superheat (°F) (only for heating mode)
22	Compressor discharge superheat (°F)
23	Compressor suction superheat (°F)
24	Openings of EEVA (P)
25	Openings of EEVC (P)
26	Fan speed stage
27	ODU fan current (A)
28	Compressor current (A)
29	ODU input current (A)
30	ODU input voltage (V)
31	ODU DC bus voltage (V)
32	ODU power (*0.1kW)
33	Continuous running time of the compressor (min)
34	ODU main control software version
35	IDU motor power (W) (only for communication mode)
36	IDU heat kit staging (only for communication mode)
37	T1: IDU ambient temp. (°F) (only for communication mode)
38	T2: IDU coil temp. (°F) (only for communication mode)
39	IDU software version (only for communication mode)
40	DR function setting
41	Reserved
42	Remark**

Note: \*31~\*36 are only valid in force cooling mode.