Technical Service Bulletin:

Control Board Replacement Procedure

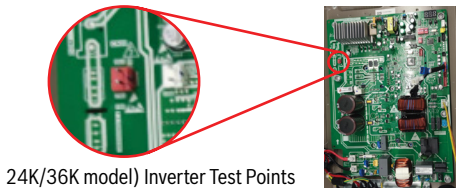
Models: Bosch IDS BOVA15 / IDP Plus Heat Pumps

WARNING: DANGEROUS OPERATION, INJURY OR PROPERTY DAMAGE

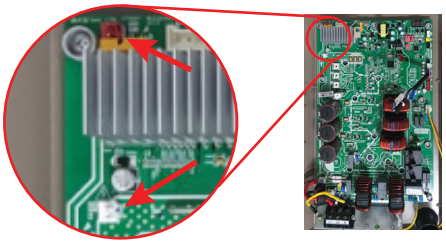
- Improper servicing could result in dangerous operation, injury or property damage. The operations described below must be performed by qualified personnel.

WARNING: HAZARDOUS VOLTAGE - 380 VOLTS DC

- Wait 3 minutes after disconnecting power, then verify DC voltage is less than 43 VDC at inverter test points P-N (See Figure 1). Components may store a dangerous electrical potential of 380 Volts DC. Failure to follow these instructions could result in personal injury or death.



24K/36K model) Inverter Test Points



48K/60K model) Inverter Test Points

Figure 1

NOTICE: IMPROPER OPERATION

- Before starting the replacement, check Dip Switches are set to the correct positions to ensure unit functionality.
- The Control Board is default configured for IDS BOVA15 and Dip Switch SW4-1 is set to OFF position. If replacing an IDP Plus board, ensure Dip Switch SW4-1 is set to ON position. See Table 1.
- SW4-2 dipswitch should always be set to the "OFF" position.
- Check the control board is set to the correct tonnage by setting Dip Switches SW6. See Table 2.

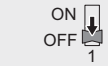
SW4-1 Dip Switch Settings		
BOVA15		1=OFF
IDP Plus		1=ON

Table 1

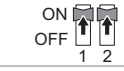
SW6-1 & SW6-2 Dip Switch Settings			
2 Ton		1=OFF	2=OFF
3 Ton		1=OFF	2=ON
4 Ton		1=ON	2=OFF
5 Ton		1=ON	2=ON

Table 2

NOTICE: PRODUCT DAMAGE

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

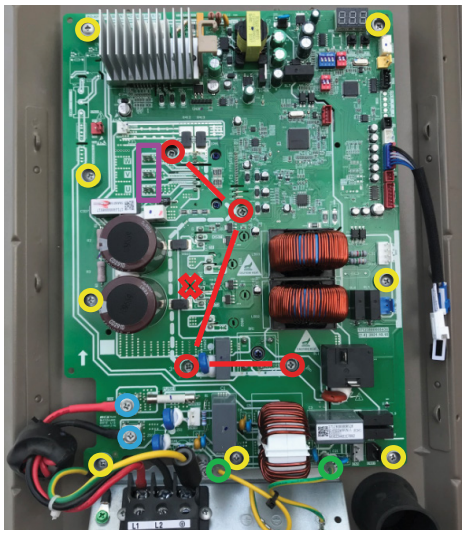
Board Replacement Procedure (For BOVA15 24K/36K or IDP Plus 36K Models)

1. Turn off power to both the indoor and outdoor unit and wait AT LEAST 3 minutes before removing the outdoor unit's control board access panel.

NOTICE: PRODUCT DAMAGE

- 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.
- **There is no need to disconnect the field supplied thermostat wires; directly remove the thermostat wire plug on the control board.**

2. Remove wires and plugs from control board.
3. Remove compressor wire plugs, ground wire plugs, and power wire screws (see Figure 2: items highlighted in purple, green, and blue).



Screw Type				
Color for Location	○	○ ○	✕	○

Figure 2

4. Remove the 8 screws on the board (see Figure 2: items circled in yellow).
5. Remove the 4 screws on the board (see Figure 2: items circled in red).

NOTICE: PRODUCT DAMAGE

- There are 3 different types of screws; they should not be mixed. Different screw types are installed in different locations. Refer to color coding in Figure 2 for appropriate screw type and location.

6. Insert a 1/8" flathead screwdriver in the vertical slot at the location marked with "X" in Figure 3. Twist the screwdriver to remove the circle piece from the board.

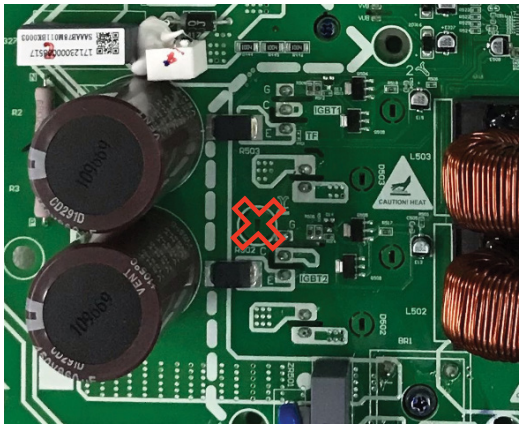


Figure 3

7. Insert screw supplied with the kit into the hole created in step 6 to help separate the control board from the heat sink attached to the unit. Refer to Figure 4, for the supplied screw.

Figure 4

There is a small heat sink that always comes attached to the back of the new board.

8. Apply the thermal paste on the heat sink of the new control board (see Figure 5).

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.

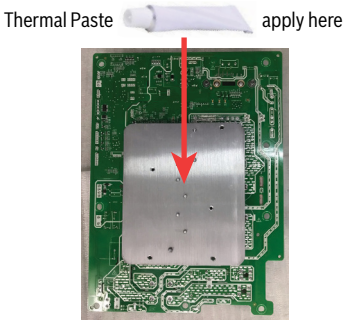


Figure 5

Two tubes of thermal paste are included with each board replacement.

9. Install the new board on the unit.
10. Fasten all screws (see Figure 2 for screw type and location).
11. Reconnect the wires according to the wiring diagram (referencing the picture that was taken prior to removal of old board).

CN11 & CN25 do not have any wire connections.

12. Check SW4/SW5/SW6 dip switch positions. Refer to IOM , Table 1 & 2 or the picture you took.
13. Double check all wire connections and screw positions before powering on.

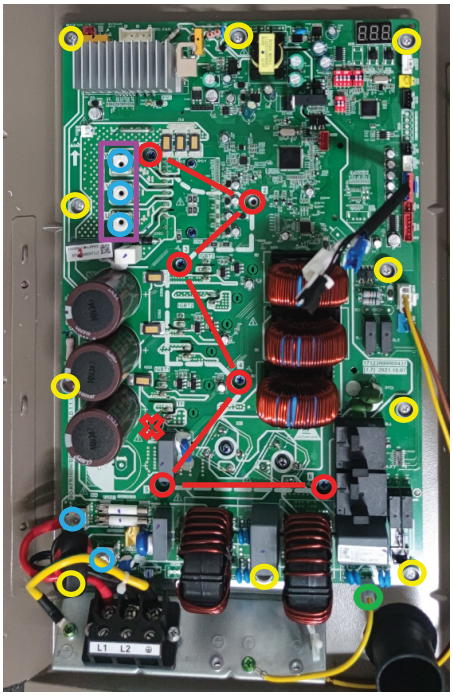
Board Replacement Procedure (For BOVA15 48K/60K or IDP Plus 60K models)

1. Turn off power to both indoor and outdoor unit and wait AT LEAST 3 minutes before removing the outdoor unit's control board access panel.

NOTICE:

- 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.
- **There is no need to disconnect the field supplied thermostat wires; directly remove the thermostat wire plug on the control board.**

2. Remove wires and plugs from control board.
3. Remove compressor wire plugs, ground wire plugs, and power wire screws (see Figure 6: items highlighted in purple, green, and blue).
4. Remove the 10 screws on the board (see Figure 6: items circled in yellow).
5. Remove the 6 screws on the board (see Figure 6: items circled in red).



Screw Type				
Color for Location	○	○ ○	✕	○

Figure 6

NOTICE:

- There are 3 different types of screws; they should not be mixed. Different screw types are installed in different locations. Refer to color coding in Figure 3 and Table 2 for appropriate screw type and location.

6. Insert a small athead screwdriver in the vertical slot at the location marked with "X" in Figure 7. Twist the screwdriver to remove the circle piece from the board.

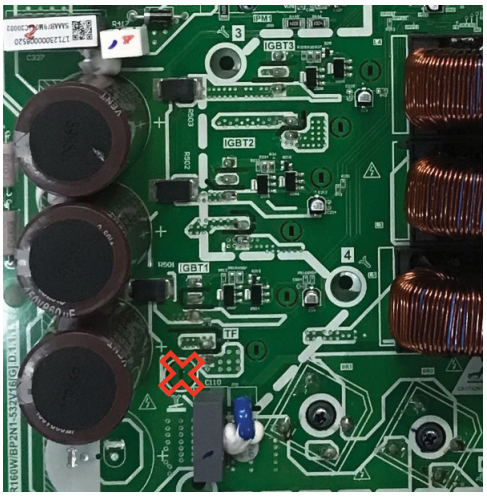


Figure 7

7. Insert screw supplied with the kit into the hole created in step 6 to help separate the control board from the heat sink attached to the unit. Refer to Figure 8, for the supplied screw.

Figure 8

There is a small heat sink that always comes attached to the back of the new board.

8. Apply the thermal paste on the heat sink of the new control board (refer to Figure 9).

NOTICE:

- The full surface area of 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.

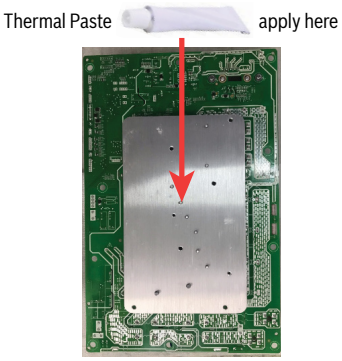


Figure 9

Two tubes of thermal paste are included with each board replacement.

9. Install the new board on the unit.
10. Fasten all screws (See Figure 6 for screw type and location).
11. Reconnect the wires according to the wiring diagram (referencing the picture that was taken prior to removal of old board).

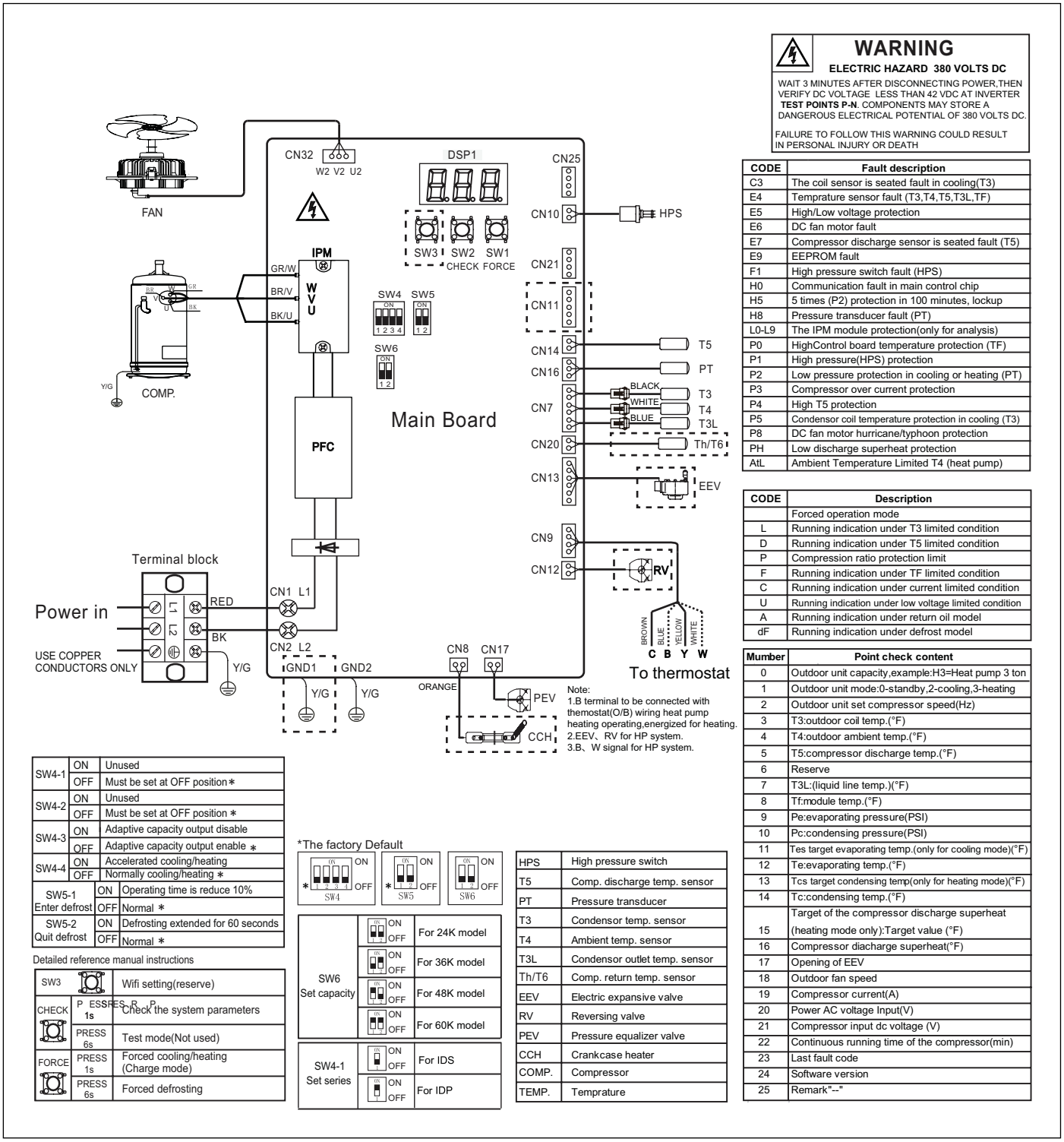
CN11 & CN25 do not have any wire connections.

12. Check SW4/SW5/SW6 dip switch positions. Refer to IOM, Table 1 & 2 or the picture you took.
13. Double check all wire connections and screw positions before powering on.

Outdoor Board LED Code		
☀	ON	Compressor running.
☀	flashing	2s ON then 2s OFF, Compressor is standby.
☀	flashing	Flashing then 3s OFF. Compressor error will show on digital display tube.
☀	flashing	Flashing quickly 400ms/cycle. Compressor chip communication error.

Table 3

IDS BOVA15 Wiring Diagram



CODE	Fault description
C3	The coil sensor is seated fault in cooling(T3)
E4	Temprature sensor fault (T3,T4,T5,T3L,TF)
E5	High/Low voltage protection
E6	DC fan motor fault
E7	Compressor discharge sensor is seated fault (T5)
E9	EEPROM fault
F1	High pressure switch fault (HPS)
H0	Communication fault in main control chip
H5	5 times (P2) protection in 100 minutes, lockup
H8	Pressure transducer fault (PT)
L0-L9	The IPM module protection(only for analysis)
P0	HighControl board temperature protection (TF)
P1	High pressure(HPS) protection
P2	Low pressure protection in cooling or heating (PT)
P3	Compressor over current protection
P4	High T5 protection
P5	Condensor coil temperature protection in cooling (T3)
P8	DC fan motor hurricane/typhoon protection
PH	Low discharge superheat protection
AtL	Ambient Temperature Limited T4 (heat pump)

CODE	Description
	Forced operation mode
L	Running indication under T3 limited condition
D	Running indication under T5 limited condition
P	Compression ratio protection limit
F	Running indication under TF limited condition
C	Running indication under current limited condition
U	Running indication under low voltage limited condition
A	Running indication under return oil model
dF	Running indication under defrost model

Mumber	Point check content
0	Outdoor unit capacity,example:H3=Heat pump 3 ton
1	Outdoor unit mode:0-standby,2-cooling,3-heating
2	Outdoor unit set compressor speed(Hz)
3	T3:outdoor coil temp.(°F)
4	T4:outdoor ambient temp.(°F)
5	T5:compressor discharge temp.(°F)
6	Reserve
7	T3L:(liquid line temp.)(°F)
8	Tf:module temp.(°F)
9	Pe:evaporating pressure(PSI)
10	Pc:condensing pressure(PSI)
11	Tes target evaporating temp.(only for cooling mode)(°F)
12	Te:evaporating temp.(°F)
13	Tcs target condensing temp(only for heating mode)(°F)
14	Tc:condensing temp.(°F)
15	Target of the compressor discharge superheat (heating mode only):Target value (°F)
16	Compressor diacharge superheat(°F)
17	Opening of EEV
18	Outdoor fan speed
19	Compressor current(A)
20	Power AC voltage Input(V)
21	Compressor input dc voltage (V)
22	Continuous running time of the compressor(min)
23	Last fault code
24	Software version
25	Remark"--"

SW4-1	ON	Unused
	OFF	Must be set at OFF position*
SW4-2	ON	Unused
	OFF	Must be set at OFF position *
SW4-3	ON	Adaptive capacity output disable
	OFF	Adaptive capacity output enable *
SW4-4	ON	Accelerated cooling/heating
	OFF	Normally cooling/heating *
SW5-1 Enter defrost	ON	Operating time is reduce 10%
	OFF	Normal *
SW5-2 Quit defrost	ON	Defrosting extended for 60 seconds
	OFF	Normal *

*The factory Default

SW4 SW5 SW6

SW6 Set capacity		For 24K model
		For 36K model
		For 48K model
		For 60K model
SW4-1 Set series		For IDS
		For IDP

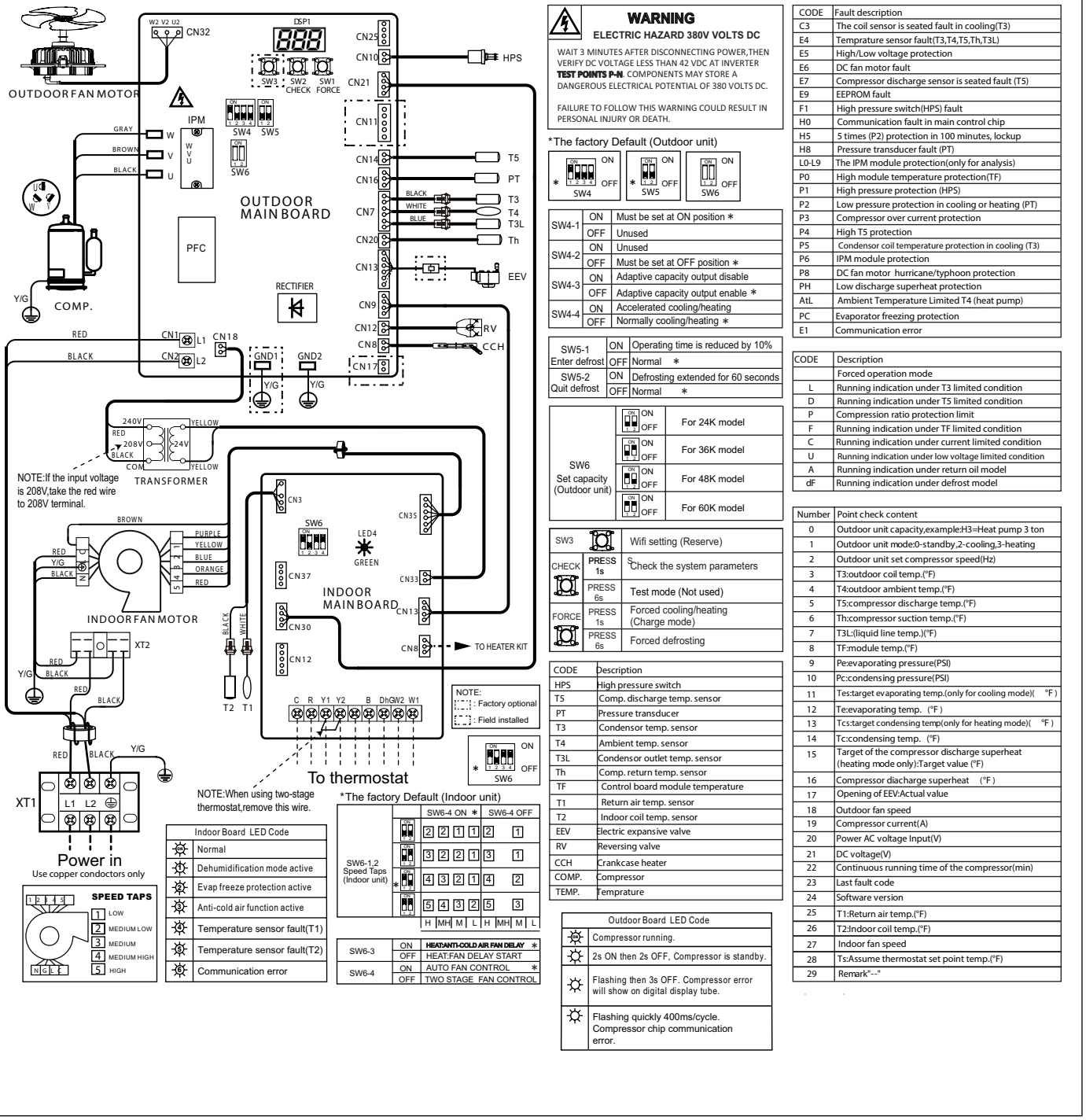
Detailed reference manual instructions

SW3		Wifi setting(reserve)
CHECK	P ESSRES R P 1s	Check the system parameters
	PRESS 6s	Test mode(Not used)
FORCE	PRESS 1s	Forced cooling/heating (Charge mode)
	PRESS 6s	Forced defrosting

HPS	High pressure switch
T5	Comp. discharge temp. sensor
PT	Pressure transducer
T3	Condensor temp. sensor
T4	Ambient temp. sensor
T3L	Condensor outlet temp. sensor
Th/T6	Comp. return temp. sensor
EEV	Electric expansive valve
RV	Reversing valve
PEV	Pressure equalizer valve
CCH	Crankcase heater
COMP.	Compressor
TEMP.	Temprature

Figure 10

IDP Plus Wiring Diagram



WARNING
ELECTRIC HAZARD 380V VOLTS DC

WAIT 3 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.

*The factory Default (Outdoor unit)

SW4-1	ON	Must be set at ON position *
	OFF	Unused
SW4-2	ON	Unused
	OFF	Must be set at OFF position *
SW4-3	ON	Adaptive capacity output disable
	OFF	Adaptive capacity output enable *
SW4-4	ON	Accelerated cooling/heating
	OFF	Normally cooling/heating *

SW5-1 Enter defrost	ON	Operating time is reduced by 10%
	OFF	Normal *
SW5-2 Quit defrost	ON	Defrosting extended for 60 seconds
	OFF	Normal *

SW6 Set capacity (Outdoor unit)	ON 1 2 OFF	For 24K model
	ON 1 2 OFF	For 36K model
	ON 1 2 OFF	For 48K model
	ON 1 2 OFF	For 60K model

SW3		Wifi setting (Reserve)
CHECK	PRESS 1s	Check the system parameters
	PRESS 6s	Test mode (Not used)
FORCE	PRESS 1s	Forced cooling/heating (Charge mode)
	PRESS 6s	Forced defrosting

CODE	Description
HPS	High pressure switch
T5	Comp. discharge temp. sensor
PT	Pressure transducer
T3	Condensor temp. sensor
T4	Ambient temp. sensor
T3L	Condensor outlet temp. sensor
Th	Comp. return temp. sensor
TF	Control board module temperature
T1	Return air temp. sensor
T2	Indoor coil temp. sensor
EEV	Electric expansive valve
RV	Reversing valve
CCH	Crankcase heater
COMP.	Compressor
TEMP.	Temprature

Indoor Board LED Code	
☼	Normal
☼	Dehumidification mode active
☼	Evap freeze protection active
☼	Anti-cold air function active
☼	Temperature sensor fault(T1)
☼	Temperature sensor fault(T2)
☼	Communication error

*The factory Default (Indoor unit)

SW6-1,2 Speed Taps (Indoor unit)

	SW6-4 ON *	SW6-4 OFF
	2 2 1 1 2	1
	3 2 2 1 3	1
*	4 3 2 1 4	2
	5 4 3 2 5	3
	H MH M L H	MH M L

SW6-3	ON	HEAT:ANTI-COLD AIR FAN DELAY *
	OFF	HEAT:FAN DELAY START
SW6-4	ON	AUTO FAN CONTROL *
	OFF	TWO STAGE FAN CONTROL

Outdoor Board LED Code	
☼	Compressor running.
☼	2s ON then 2s OFF, Compressor is standby.
☼	Flashing then 3s OFF. Compressor error will show on digital display tube.
☼	Flashing quickly 400ms/cycle. Compressor chip communication error.

CODE	Fault description
C3	The coil sensor is seated fault in cooling(T3)
E4	Temprature sensor fault(T3,T4,T5,Th,T3L)
E5	High/Low voltage protection
E6	DC fan motor fault
E7	Compressor discharge sensor is seated fault (T5)
E9	EEPROM fault
F1	High pressure switch(HPS) fault
H0	Communication fault in main control chip
H5	5 times (P2) protection in 100 minutes, lockup
H8	Pressure transducer fault (PT)
L0-L9	The IPM module protection(only for analysis)
P0	High module temperature protection(TF)
P1	High pressure protection (HPS)
P2	Low pressure protection in cooling or heating (PT)
P3	Compressor over current protection
P4	High T5 protection
P5	Condensor coil temperature protection in cooling (T3)
P6	IPM module protection
P8	DC fan motor hurricane/typhoon protection
PH	Low discharge superheat protection
AtL	Ambient Temperature Limited T4 (heat pump)
PC	Evaporator freezing protection
E1	Communication error

CODE	Description
	Forced operation mode
L	Running indication under T3 limited condition
D	Running indication under T5 limited condition
P	Compression ratio protection limit
F	Running indication under TF limited condition
C	Running indication under current limited condition
U	Running indication under low voltage limited condition
A	Running indication under return oil model
dF	Running indication under defrost model

Number	Point check content
0	Outdoor unit capacity,example:H3=Heat pump 3 ton
1	Outdoor unit mode:0-standby,2-cooling,3-heating
2	Outdoor unit set compressor speed(Hz)
3	T3:outdoor coil temp.(°F)
4	T4:outdoor ambient temp.(°F)
5	T5:compressor discharge temp.(°F)
6	Th:compressor suction temp.(°F)
7	T3L:(liquid line temp.)(°F)
8	TF:module temp.(°F)
9	Pe:evaporating pressure(PSI)
10	Pc:condensing pressure(PSI)
11	Tes:target evaporating temp.(only for cooling mode)(°F)
12	Te:evaporating temp. (°F)
13	Tcs:target condensing temp(only for heating mode)(°F)
14	Tc:condensing temp. (°F)
15	Target of the compressor discharge superheat (heating mode only):Target value (°F)
16	Compressor diacharge superheat (°F)
17	Opening of EEV:Actual value
18	Outdoor fan speed
19	Compressor current(A)
20	Power AC voltage Input(V)
21	DC voltage(V)
22	Continuous running time of the compressor(min)
23	Last fault code
24	Software version
25	T1:Return air temp.(°F)
26	T2:Indoor coil temp.(°F)
27	Indoor fan speed
28	Ts:Assume thermostat set point temp.(°F)
29	Remark"--"

Figure 11

BOSCH
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