# CARRIER AND BRYANT VRF:

## Advanced Service Training

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5/20/21

# COURSE OBJECTIVES

- Explore advanced function and operation features
- Identify the different board layouts of the product line
- Review the proper steps for board replacement on multiple systems
- Identify key system components and service functions
- Review key troubleshooting codes and systems
- Complete advanced troubleshooting activities with lab time


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# AGENDA

**Section 1**
FUNCTION AND OPERATION

**Section 2**
PIPING AND COMPONENTS

**Section 3**
MODE OF OPERATION

**Section 4**
STARTUP AND ADDRESSING

**Section 5**
FURTHER TROUBLESHOOTING

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# FUNCTION AND OPERATION

Aux Heat Setup

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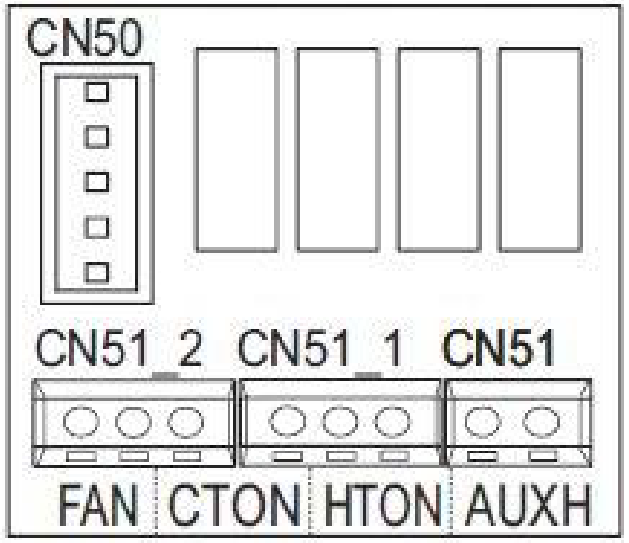
# FUNCTION AND OPERATION

## Aux Heat Setup

### DRY CONTACT BOARD

24V DC Voltage Signal




**40VMM as example**

| | |
|---|---|
| FAN | control port of exhaust fan device etc. |
| CTON | control port of humidifier etc. |
| HTON | control port of economizer etc. |
| AUTH | control port of auxiliary heater etc. |

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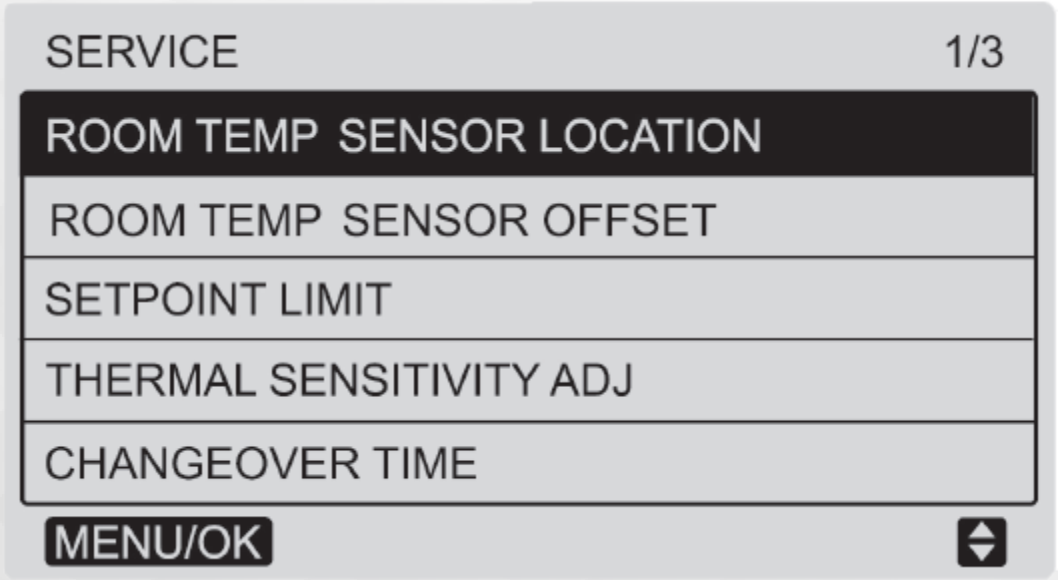
## PROGRAMMABLE CONTROLLER (40VM900003)

Press and hold **BACK** and **FAN** buttons for five seconds at the same time to enter the interface for parameter settings as shown below.

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# FUNCTION AND OPERATION

## Aux Heat Setup

Press the Temp Down arrow to move the curser down and choose Dry Contacts (Next slide)

Then press Menu/ok to enter the setting

| NO. | SERVICE MENU | | DESCRIPTION | SET PARAMETER |
|---|---|---|---|---|
| 1 | ROOM TEMPERATURE SENSOR LOCATION | | Select whether to use the IDU room temperature sensor of the wired controller. | Wired remote control (default) |
| | | | | Indoor unit |
| 2 | ROOM TEMPERATURE SENSOR OFFSET | | The temperature compensation value for wired controller T1. | -5 °F, -4 °F, -3 °F, -2 °F, -1 °F, 0 °F (default), 1 °F, 2 °F, 3 °F, 4 °F, 5 °F<br>or<br>-5 °C, -4 °C, -3 °C, -2 °C, -1 °C, 0 °C (default), 1 °C, 2 °C, 3 °C, 4 °C, 5 °C |
| 3 | SETPOINT LIMIT | MAX HEATING SETPOINT SETTING | Set the upper limit of the temperature range for heating. | 86 F (default) to 62 F<br>30 C (default) to 17 C |
| | | MIN. COOLING SETPOINT SETTING | Set the lower limit of the temperature range for cooling. | 50 F (default) to 86 F<br>10 C (default) to 30 C |
| 4 | THERMAL SENSITIVITY ADJUSTMENT | | Select a capacity interval. | THERMAL ON (1 F) (default), THERMAL ON (2 F)<br>or<br>THERMAL ON (1 C) (default), THERMAL ON (1 C) |
| 5 | CHANGE OVER TIME | | Automatic mode change over time. | 15 min. (default), 30 min., 60 min., 90 min. |
| 6 | ANTI-COLD BLOW | | Set the temperature when the fan is turned off to prevent cold winds | 68 F (default), 50 F, 59 F, 75 F, 82 F<br>or<br>20 C (default), 10 C, 15 C, 24 C, 28 C |
| 7 | TERMINAL FAN CONFIGURATION | | Fan off after a delay of | 4 min. (default), 8 min., 12 min., 16 min. |
| 8 | THERMO-OFF FAN SPEED SETTING | COOLING | Set the fan step for cooling thermo off. | OFF, LOW, MIDDLE, HIGH, MAINTAIN (default) |
| | | HEATING | Set the fan step for heating thermo off. | OFF (default), LOW, MIDDLE, HIGH, MAINTAIN |

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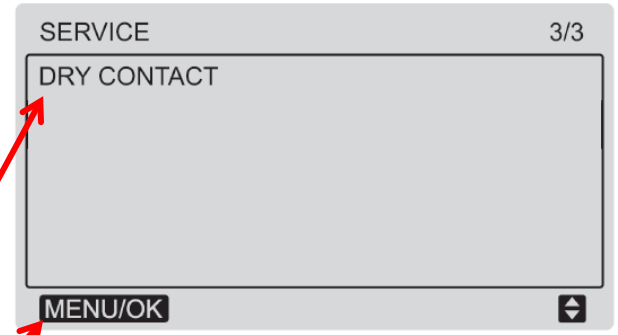
# FUNCTION AND OPERATION

## Aux Heat Setup

| | | | | |
|---|---|---|---|---|
| 9 | STATIC PRESSURE (NOT USED FOR ALL INDOOR UNITS) | | Set the IDU static pressure of the DC fan. | 0: 0 in. wg (default)<br>1: 0.04 in. wg<br>2: 0.08 in. wg<br>3: 0.12 in. wg<br>4: 0.16 in. wg<br>5: 0.20 in. wg<br>6: 0.24 in. wg<br>7. 0.28 in. wg<br>8: 0.32 in. wg<br>9: 0.36 in. wg<br>10: 0.40 in. wg<br>11: 0.44 in. wg<br>12: 0.48 in. wg<br>13: 0.52 in. wg<br>14: 0.56 in. wg<br>15: 0.60 in. wg<br>16: 0.64 in. wg<br>17: 0.68 in. wg<br>18: 0.72 in. wg<br>19: 0.76 in. wg<br>20: 0.80 in. wg<br>21: 0.84 in. wg<br>22: 0.88 in. wg<br>23: 0.92 in. wg<br>24: 0.96 in. wg<br>25: 1.0 in. wg |
| 10 | OCCUPANCY SENSOR | OCCUPANCY ON/OFF | Set occupancy delay function to valid or invalid | OFF (default), ON |
| | | OCCUPANCY DELAY | Set the time for delayed power-off of the unattended IDU (valid only when the IDU is connected to an infrared sensing controller). | 0 min (default-THERMAL OFF), 15 min., 30 min., 60 min. (SETBACK DELAY) |
| | | OCCUPANCY SET TEMP OFFSET | Setback temperature setpoint amount after occupancy delay elapses. | 0 °F, 2 °F, 4 °F (default), 6 °F, 8 °F<br>or<br>0 °C, 1 °C, 2 °C (default), 3 °C, 4 °C |
| 11 | DRY CONTACT | DRY CONTACT STATUS | Whether the IDU is connected to a third-party heat source. | DISABLE (default), ENABLE |
| | | DRY CONTACT CONFIGURATION | Set the start and end condition for the third-party heat source and the delayed end time of dry contact. | Starting condition, when the room temperature is lower than the set temperature:<br>1 °F (default), 2 °F, 3 °F, 4 °F, 5 °F<br>or<br>1 °C (default), 1 °C, 2 °C, 2 °C, 3 °C |
| | | | | Delayed closing time of dry contact:<br>15 min. (default), 30 min., 60 min. |
| | | INDOOR FAN STATUS | Forcibly turn on the fan or not when the third-party heat source starts. | ON (default), OFF |
| 12 | IDU ADDRESSING | | Set the IDU address | 0#-63# |

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# FUNCTION AND OPERATION

## Aux Heat Setup

| | | | | |
|---|---|---|---|---|
| 11 | DRY CONTACT | DRY CONTACT STATUS | Whether the IDU is connected to a third-party heat source. | DISABLE (default), ENABLE |
| | | DRY CONTACT CONFIGURATION | Set the start and end condition for the third-party heat source and the delayed end time of dry contact. | Starting condition, when the room temperature is lower than the set temperature:<br>1 °F (default), 2 °F, 3 °F, 4 °F, 5 °F<br>or<br>1 °C (default), 1 °C, 2 °C, 2 °C, 3 °C |
| | | | | Delayed closing time of dry contact:<br>15 min. (default), 30 min., 60 min. |
| | | INDOOR FAN STATUS | Forcibly turn on the fan or not when the third-party heat source starts. | ON (default), OFF |

- Press the Temp UP and Down arrows to change your dry contact configuration to setup AUX heat.
- Press Menu/Ok to save the settings.
- Pressing the Back button or waiting 30 seconds will exit the service menu.

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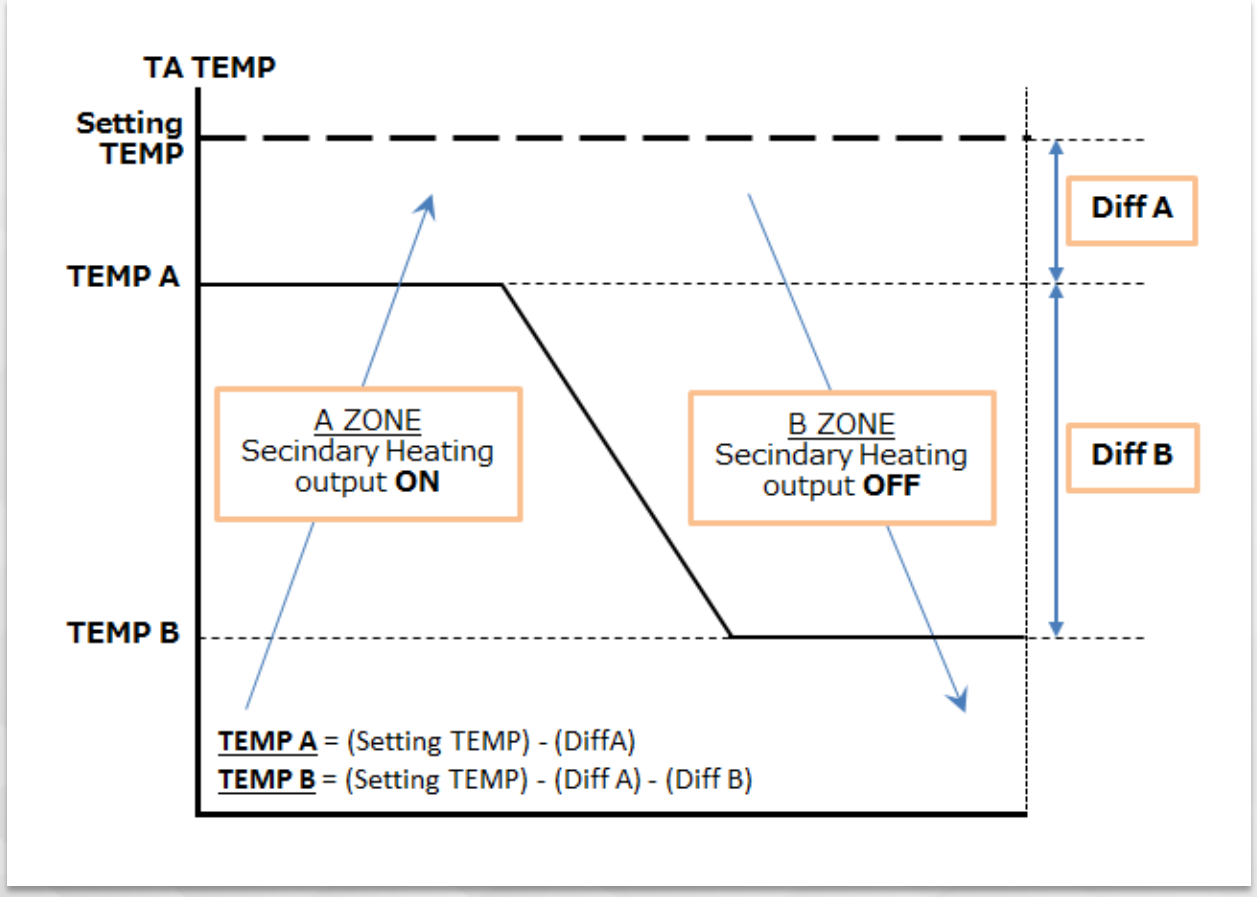
# FUNCTION AND OPERATION

## Aux Heat Setup




**TS-T1**

1F (Factory Default)
2F
3F
4F
5F

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# FUNCTION AND OPERATION

## Thermostat Exercise

1. Change IDU to sense temperature at the wired thermostat
2. Change minimum cooling set point to 68F
3. Change maximum heating set point to 74F

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# FUNCTION AND OPERATION

## Wiring Schematics

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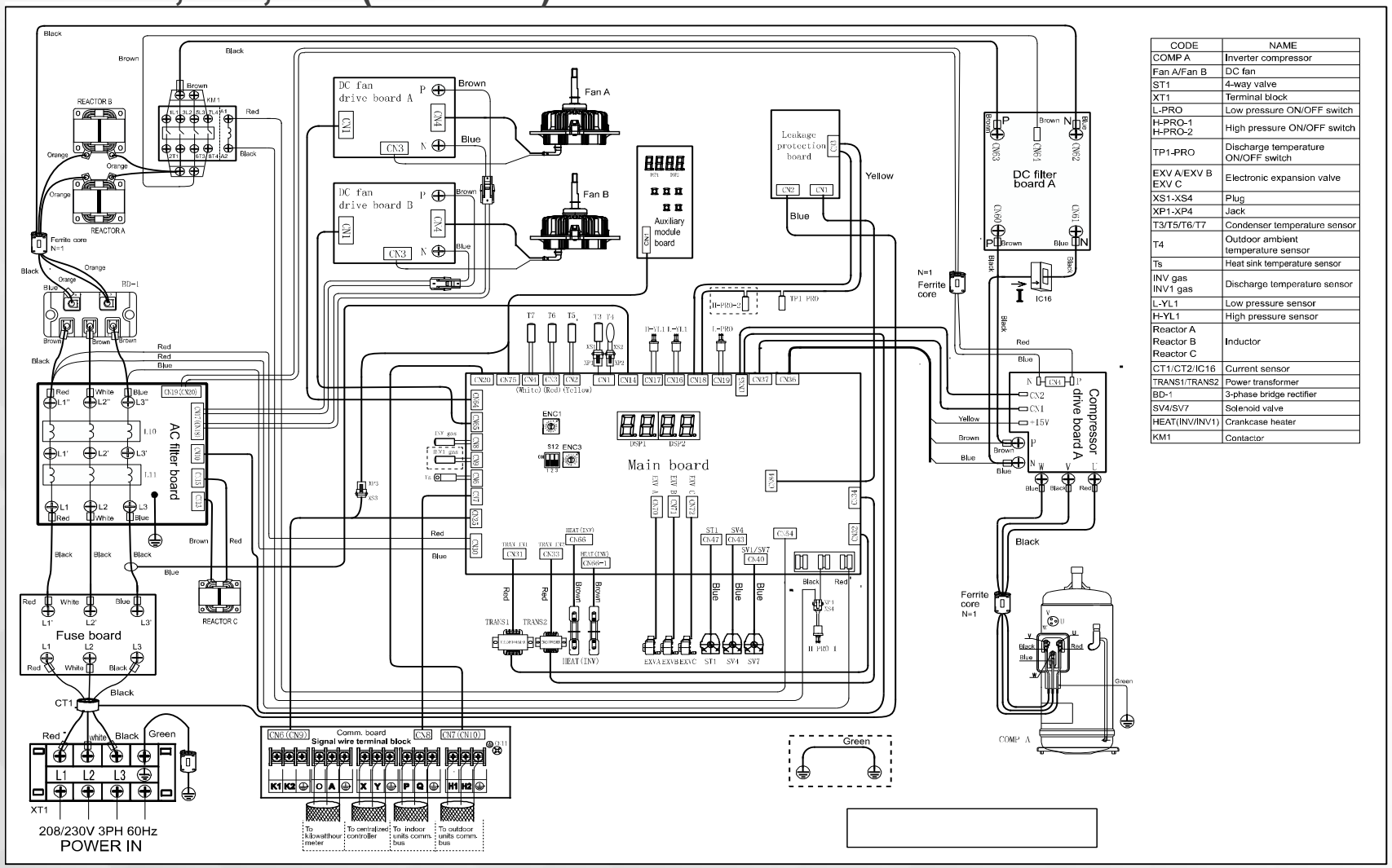
# FUNCTION AND OPERATION

Heat Pump

## 38VMA072, 096, 120 (208/230V)




| CODE | NAME |
|---|---|
| COMP A | Inverter compressor |
| Fan A/Fan B | DC fan |
| ST1 | 4-way valve |
| XT1 | Terminal block |
| L-PRO | Low pressure ON/OFF switch |
| H-PRO-1<br>H-PRO-2 | High pressure ON/OFF switch |
| TP1-PRO | Discharge temperature ON/OFF switch |
| EXV A/EXV B<br>EXV C | Electronic expansion valve |
| XS1-XS4 | Plug |
| XP1-XP4 | Jack |
| T3/T5/T6/T7 | Condenser temperature sensor |
| T4 | Outdoor ambient temperature sensor |
| Ts | Heat sink temperature sensor |
| INV gas<br>INV1 gas | Discharge temperature sensor |
| L-YL1 | Low pressure sensor |
| H-YL1 | High pressure sensor |
| Reactor A<br>Reactor B<br>Reactor C | Inductor |
| CT1/CT2/IC16 | Current sensor |
| TRANS1/TRANS2 | Power transformer |
| BD-1 | 3-phase bridge rectifier |
| SV4/SV7 | Solenoid valve |
| HEAT(INV/INV1) | Crankcase heater |
| KM1 | Contactor |

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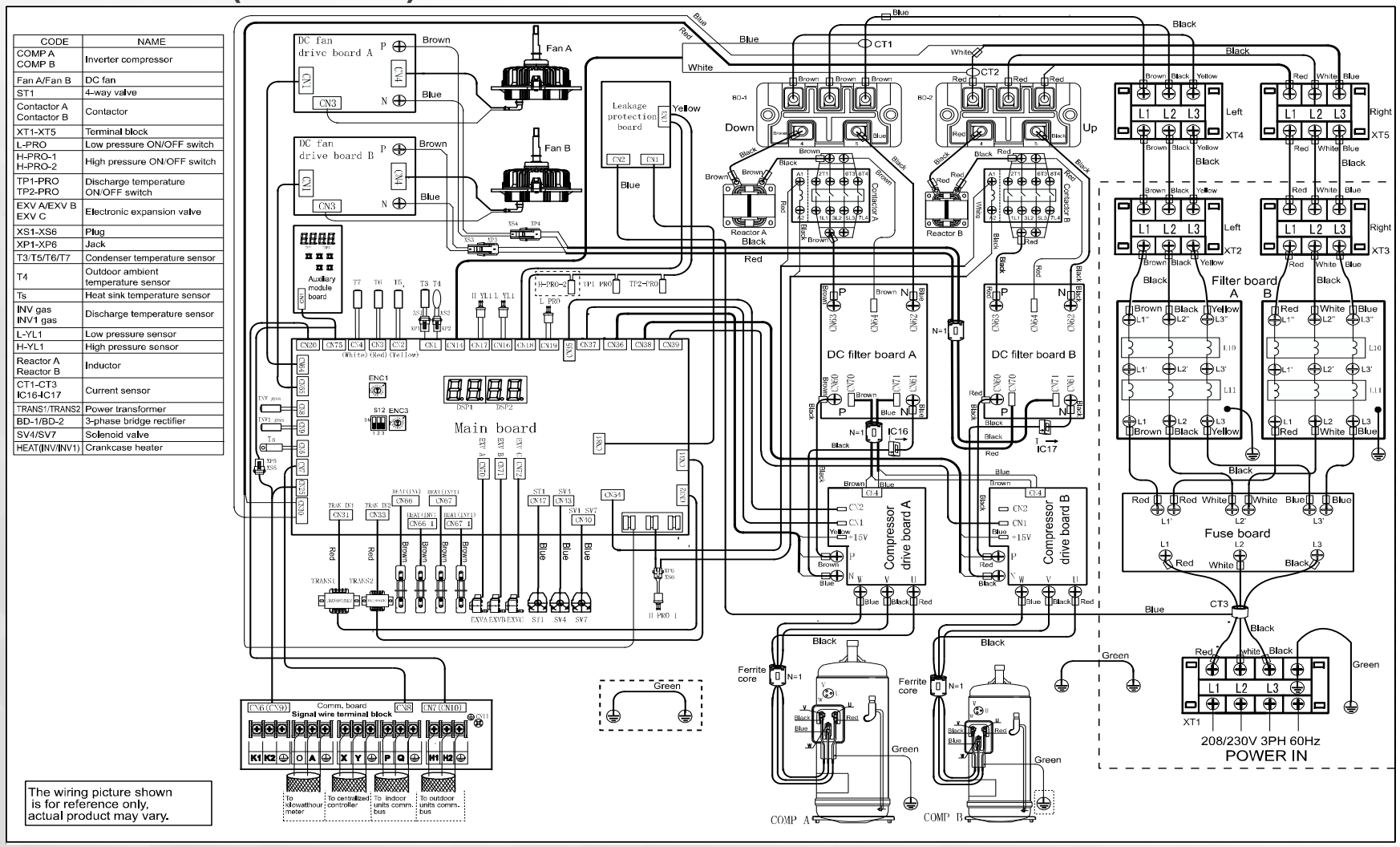
# FUNCTION AND OPERATION

Heat Pump

## 38VMA144 (208/230V)

| CODE | NAME |
|---|---|
| COMP A<br>COMP B | Inverter compressor |
| Fan A/Fan B | DC fan |
| ST1 | 4-way valve |
| Contactor A<br>Contactor B | Contactor |
| XT1-XT5 | Terminal block |
| L-PRO | Low pressure ON/OFF switch |
| H-PRO-1<br>H-PRO-2 | High pressure ON/OFF switch |
| TP1-PRO<br>TP2-PRO | Discharge temperature ON/OFF switch |
| EXV A/EXV B<br>EXV C | Electronic expansion valve |
| XS1-XS6 | Plug |
| XP1-XP6 | Jack |
| T3/T5/T6/T7 | Condenser temperature sensor |
| T4 | Outdoor ambient temperature sensor |
| Ts | Heat sink temperature sensor |
| INV gas<br>INV1 gas | Discharge temperature sensor |
| L-YL1 | Low pressure sensor |
| H-YL1 | High pressure sensor |
| Reactor A<br>Reactor B | Inductor |
| CT1-CT3<br>IC16-IC17 | Current sensor |
| TRANS1/TRANS2 | Power transformer |
| BD-1/BD-2 | 3-phase bridge rectifier |
| SV4/SV7 | Solenoid valve |
| HEAT(INV/INV1) | Crankcase heater |

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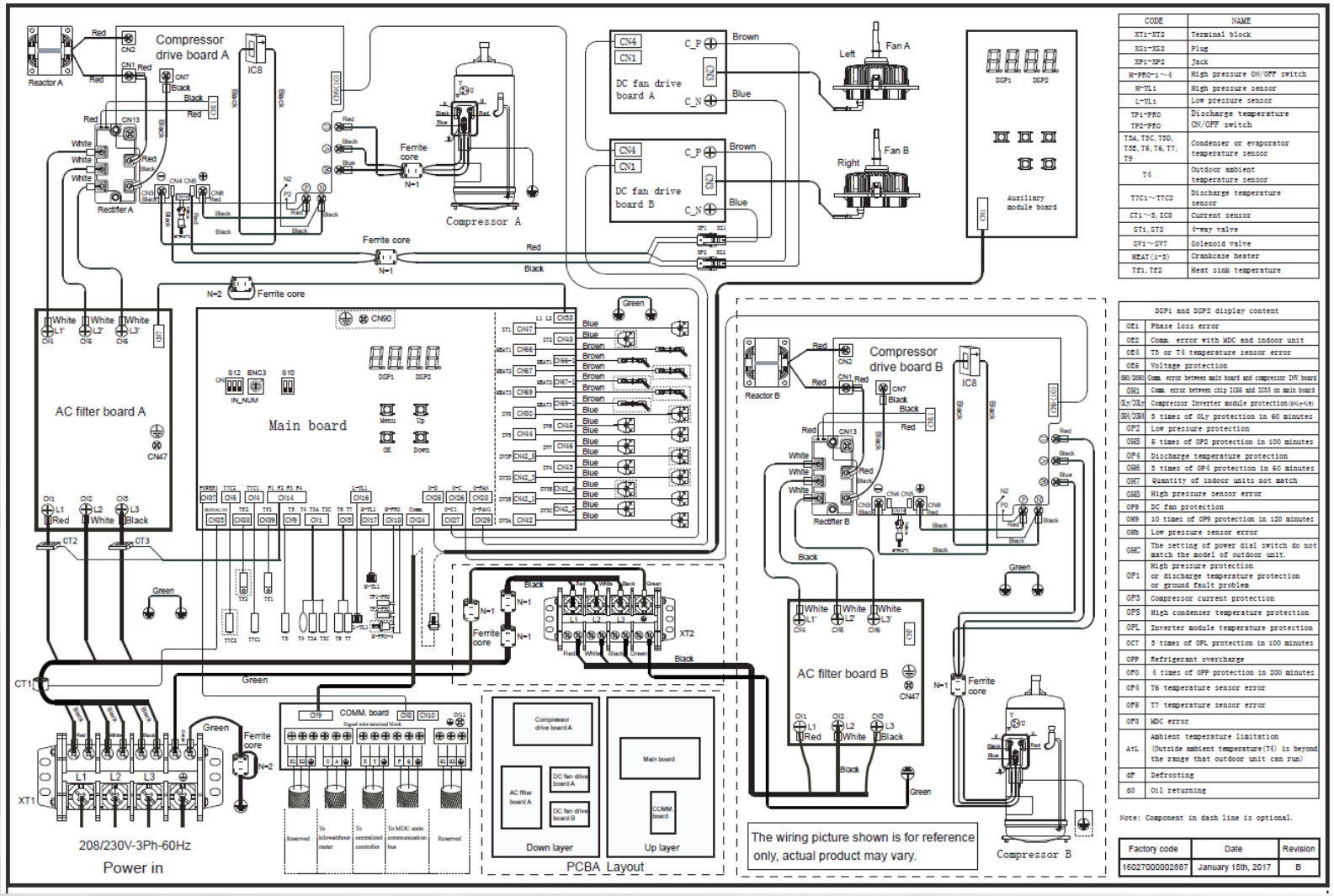
# FUNCTION AND OPERATION

## Heat Recovery

### 38VMA072, 096, 120, 144, 168, 192, 216, 240




| CODE | NAME |
|---|---|
| XT1~XT2 | Terminal block |
| XS1~XS2 | Plug |
| XP1~XP2 | Jack |
| H-PRO-1~4 | High pressure ON/OFF switch |
| H-YL1 | High pressure sensor |
| L-YL1 | Low pressure sensor |
| TP1-PRO TP2-PRO | Discharge temperature ON/OFF switch |
| T5A, T5C, T5D, T5E, T6, T6, T7, T9 | Condenser or evaporator temperature sensor |
| T4 | Outdoor ambient temperature sensor |
| T7C1~T7C2 | Discharge temperature sensor |
| CT1~3, IC8 | Current sensor |
| ST1, ST2 | 4-way valve |
| SV1~SV7 | Solenoid valve |
| HEAT(1-3) | Crankcase heater |
| Tf1, Tf2 | Heat sink temperature |

| DSP1 and DSP2 display content | |
|---|---|
| OE1 | Phase loss error |
| OE2 | Comm. error with MDC and indoor unit |
| OE4 | T5 or T4 temperature sensor error |
| OE5 | Voltage protection |
| E6D/E6E | Comm. error between main board and compressor INV board |
| OH1 | Comm. error between chip IC66 and IC53 on main board |
| OLy/2OLy | Compressor Inverter module protection(Oy=y=3) |
| 3OL/2OL | 3 times of OLy protection in 60 minutes |
| OP2 | Low pressure protection |
| OH5 | 6 times of OP2 protection in 100 minutes |
| OP4 | Discharge temperature protection |
| OH6 | 5 times of OP4 protection in 60 minutes |
| OH7 | Quantity of indoor units not match |
| OHB | High pressure sensor error |
| OP9 | DC fan protection |
| OH9 | 10 times of OP9 protection in 120 minutes |
| OHb | Low pressure sensor error |
| OHC | The setting of power dial switch do not match the model of outdoor unit. |
| OP1 | High pressure protection or discharge temperature protection or ground fault problem |
| OP3 | Compressor current protection |
| OP5 | High condenser temperature protection |
| OPL | Inverter module temperature protection |
| OC7 | 5 times of OPL protection in 100 minutes |
| OPF | Refrigerant overcharge |
| OF0 | 4 times of OPF protection in 200 minutes |
| OF4 | T6 temperature sensor error |
| OF5 | T7 temperature sensor error |
| OF9 | MDC error |
| AtL | Ambient temperature limitation (Outside ambient temperature(T4) is beyond the range that outdoor unit can run) |
| dF | Defrosting |
| dO | Oil returning |

Note: Component in dash line is optional.

| Factory code | Date | Revision |
|---|---|---|
| 16027000002887 | January 15th, 2017 | B |

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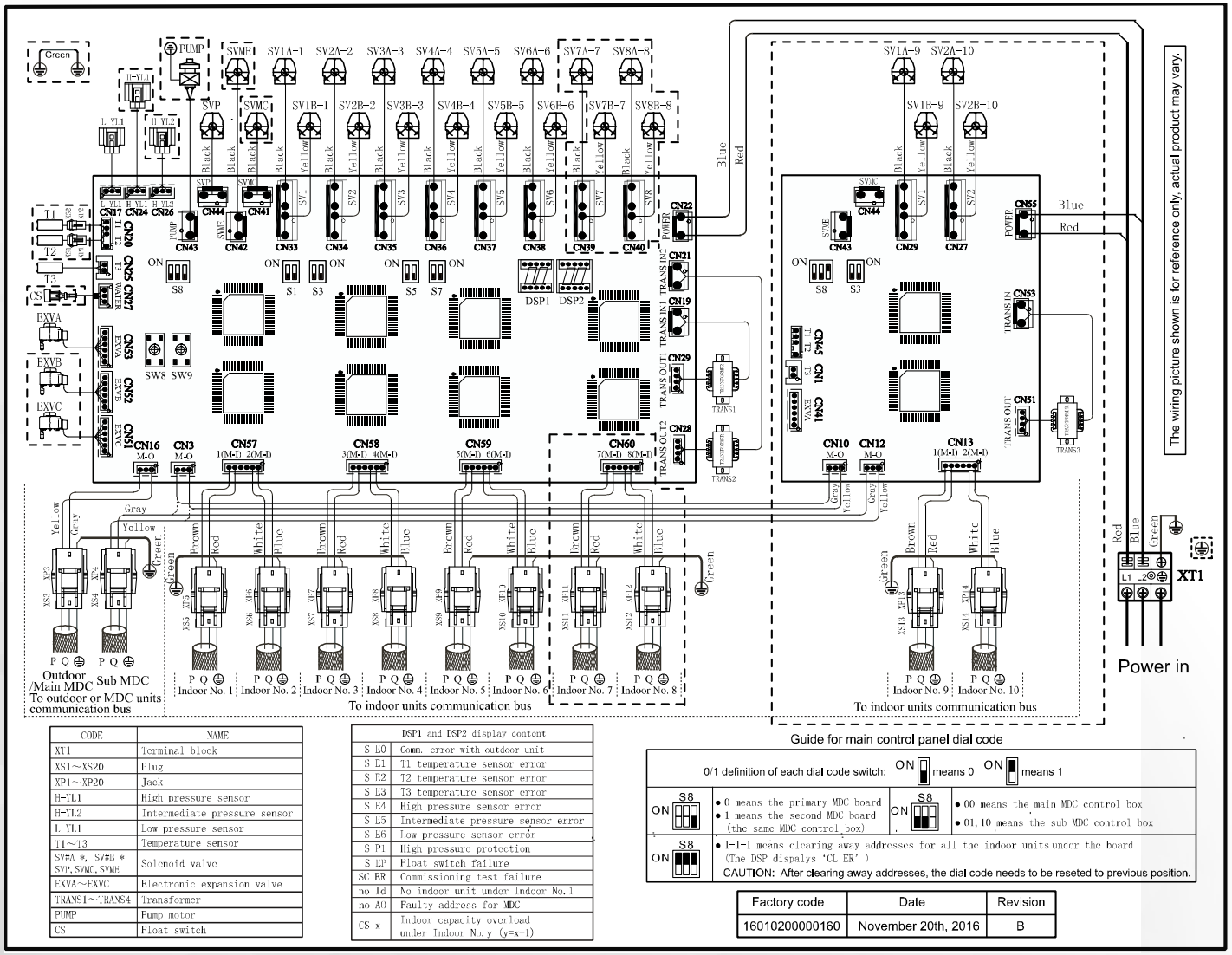
# FUNCTION AND OPERATION

## MDC

### 40VMD006, 008, 010




| CODE | NAME |
|---|---|
| XT1 | Terminal block |
| XS1～XS20 | Plug |
| XP1～XP20 | Jack |
| H-YL1 | High pressure sensor |
| H-YL2 | Intermediate pressure sensor |
| L YL1 | Low pressure sensor |
| T1～T3 | Temperature sensor |
| SVEA *, SVEB * SVP, SVMC, SVME | Solenoid valve |
| EXVA～EXVC | Electronic expansion valve |
| TRANS1～TRANS4 | Transformer |
| PUMP | Pump motor |
| CS | Float switch |

| DSP1 and DSP2 display content | |
|---|---|
| S E0 | Comm. error with outdoor unit |
| S E1 | T1 temperature sensor error |
| S E2 | T2 temperature sensor error |
| S E3 | T3 temperature sensor error |
| S E4 | High pressure sensor error |
| S E5 | Intermediate pressure sensor error |
| S E6 | Low pressure sensor error |
| S P1 | High pressure protection |
| S EP | Float switch failure |
| SC ER | Commissioning test failure |
| no Id | No indoor unit under Indoor No.1 |
| no AO | Faulty address for MDC |
| CS x | Indoor capacity overload under Indoor No.y (y=x+1) |

Guide for main control panel dial code

0/1 definition of each dial code switch: ON means 0 ON means 1

S8 ON
- 0 means the primary MDC board
- 1 means the second MDC board (the same MDC control box)

S8 ON
- 00 means the main MDC control box
- 01, 10 means the sub MDC control box

S8 ON
- 1-1-1 means clearing away addresses for all the indoor units under the board (The DSP dispalys 'CL ER')

CAUTION: After clearing away addresses, the dial code needs to be reseted to previous position.

| Factory code | Date | Revision |
|---|---|---|
| 16010200000160 | November 20th, 2016 | B |

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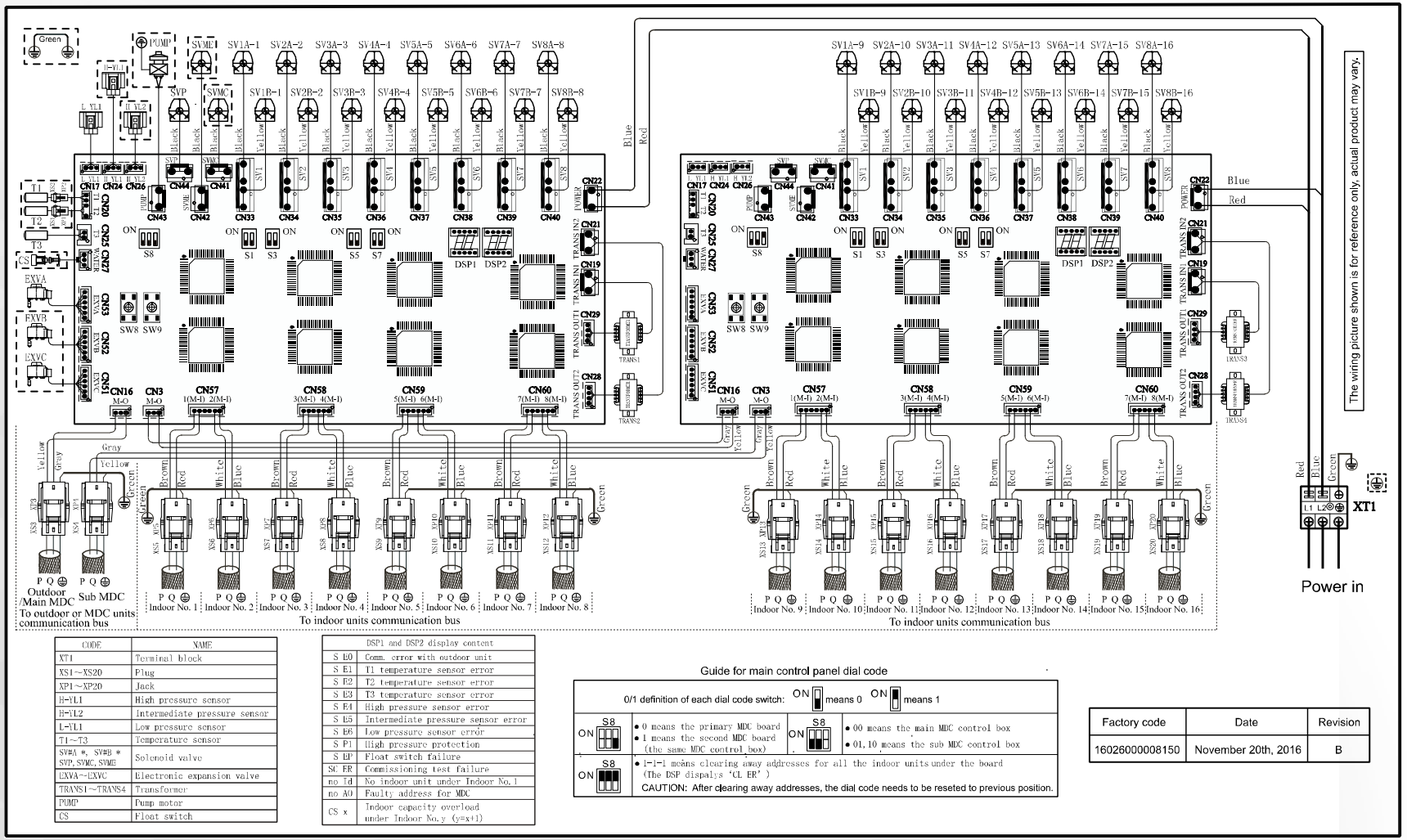
# FUNCTION AND OPERATION

MDC

## 40VMD016




| CODE | NAME |
|---|---|
| XT1 | Terminal block |
| XS1~XS20 | Plug |
| XP1~XP20 | Jack |
| H-YL1 | High pressure sensor |
| H-YL2 | Intermediate pressure sensor |
| L-YL1 | Low pressure sensor |
| T1~T3 | Temperature sensor |
| SV#A *, SV#B * SVP, SVMC, SVME | Solenoid valve |
| EXVA~EXVC | Electronic expansion valve |
| TRANS1~TRANS4 | Transformer |
| PUMP | Pump motor |
| CS | Float switch |

| DSP1 and DSP2 display content | |
|---|---|
| S E0 | Comm. error with outdoor unit |
| S E1 | T1 temperature sensor error |
| S E2 | T2 temperature sensor error |
| S E3 | T3 temperature sensor error |
| S E4 | High pressure sensor error |
| S E5 | Intermediate pressure sensor error |
| S E6 | Low pressure sensor error |
| S P1 | High pressure protection |
| S EP | Float switch failure |
| SC ER | Commissioning test failure |
| no Id | No indoor unit under Indoor No. 1 |
| no AO | Faulty address for MDC |
| CS x | Indoor capacity overload under Indoor No. y (y=x+1) |

Guide for main control panel dial code

0/1 definition of each dial code switch: ON means 0 ON means 1

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S8 ON
- 00 means the main MDC control box
- 01, 10 means the sub MDC control box

S8 ON
- 1-1-1 means clearing away addresses for all the indoor units under the board (The DSP dispalys 'CL ER')

CAUTION: After clearing away addresses, the dial code needs to be reseted to previous position.

| Factory code | Date | Revision |
|---|---|---|
| 16026000008150 | November 20th, 2016 | B |

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# FUNCTION AND OPERATION

## High Wall

| Code | Title |
|---|---|
| XT1 | Terminal |
| FM | Indoor fan motor |
| GM | Swing motor |
| EEV | Electronic expansion valve |
| T1 | Room temp. sensor |
| T2A | Inlet pipe temp. sensor |
| T2B | Outlet pipe temp. sensor |
| CS | Water level switch |
| ALARM | Warning lamp |
| PUMP | Pump motor |
| XP1-6/XS1-4 | Connectors |

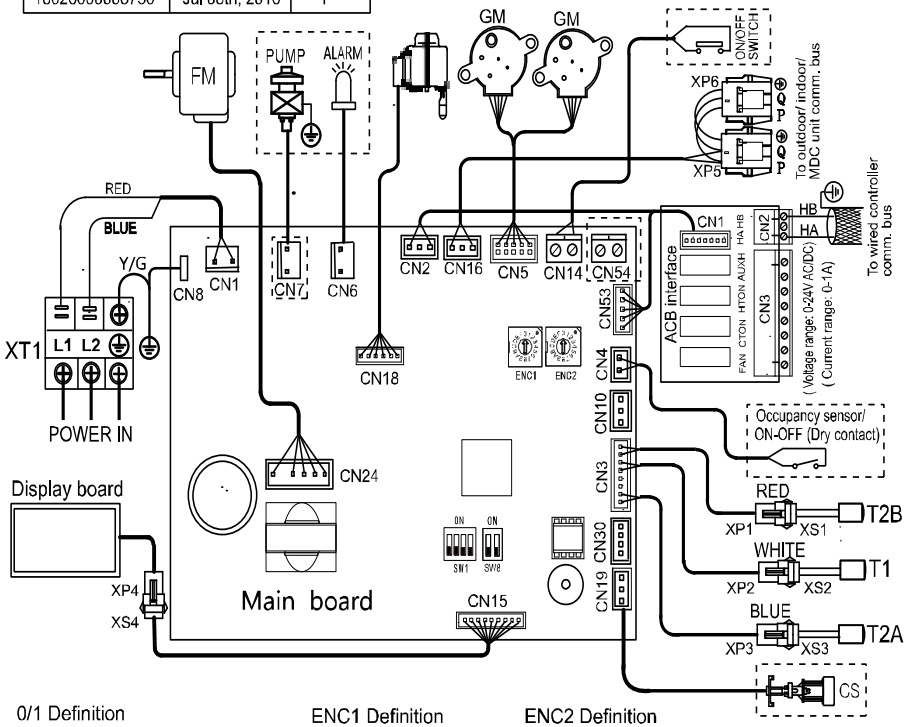
SW8 Definition

| | |
|---|---|
| SW8 ON 12 | ● (Reserved) |
| SW5 ON 12 | ● (Reserved) |

R101 Definition

| | |
|---|---|
| R101 | ● Without Resistor "R101" for auto restart function |
| R101 | ● With Resistor "R101" for manual restart function |

| Factory code | Date | Revision |
|---|---|---|
| 16026000008730 | Jul 08th, 2016 | F |




0/1 Definition

| | |
|---|---|
| ON Means 0 | ON Means 1 |

ENC1 Definition

| | |
|---|---|
| ENC1 | ● (Reserved) |

ENC2 Definition

| | |
|---|---|
| ENC2 | ● (Reserved) |

| Error Code | Error Content |
|---|---|
| dd | ● Mode conflict |
| E1 | ● Comm. error with outdoor unit |
| E2 | ● Temp. sensor (T1) error |
| E4 | ● Temp. sensor (T2B) error |
| E5 | ● Temp. sensor (T2A) error |
| E6 | ● DC fan error |
| E7 | ● EEPROM error |
| E9 | ● Comm. error with wired controller |
| Eb | ● EEV error |
| EC | ● Indoor fan error in auto system-check mode |
| Ed | ● Outdoor unit error |
| EE | ● Water level alarm |
| FE | ● No address when first time power on |
| UU | ● MDC error in auto system-check mode |

SW1 Definition

| | |
|---|---|
| SW1 ON 1234 | ● 0 means auto addressing mode (Default) |
| | ● 1 means factory test mode |
| SW1 ON 1234 | ● 0 means normal mode(Default) |
| | ● 1 means factory self-checking mode |
| SW1 ON 1234 | ● (Reserved) |
| SW1 ON 1234 | ● 0 means standard indoor unit(Default) |
| | ● 1 means main indoor unit (Must be addressed #63) |

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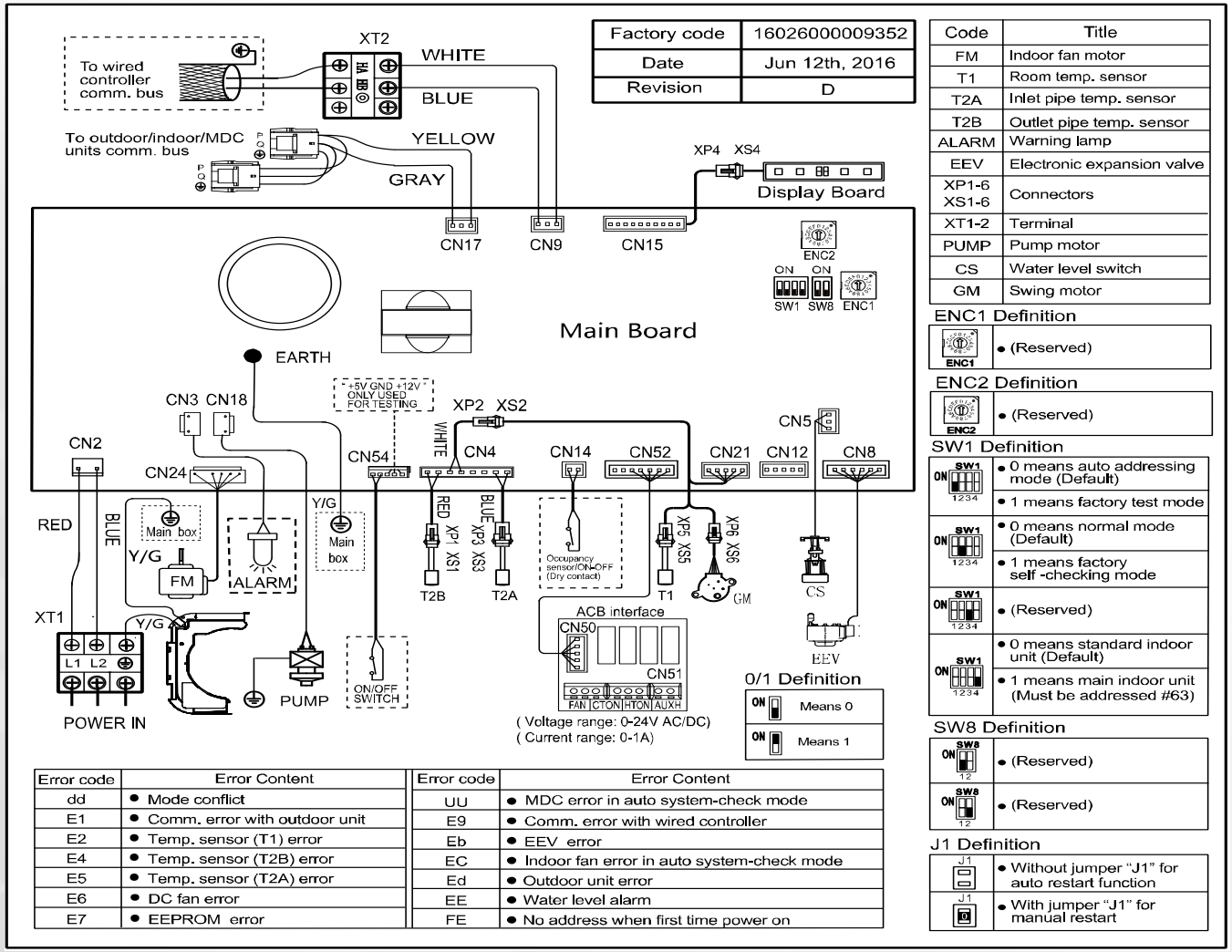
# FUNCTION AND OPERATION

## 4-Way Compact




| Factory code | 16026000009352 |
|---|---|
| Date | Jun 12th, 2016 |
| Revision | D |

| Code | Title |
|---|---|
| FM | Indoor fan motor |
| T1 | Room temp. sensor |
| T2A | Inlet pipe temp. sensor |
| T2B | Outlet pipe temp. sensor |
| ALARM | Warning lamp |
| EEV | Electronic expansion valve |
| XP1-6 XS1-6 | Connectors |
| XT1-2 | Terminal |
| PUMP | Pump motor |
| CS | Water level switch |
| GM | Swing motor |

**ENC1 Definition**

| | |
|---|---|
| ENC1 | • (Reserved) |

**ENC2 Definition**

| | |
|---|---|
| ENC2 | • (Reserved) |

**SW1 Definition**

| | |
|---|---|
| ON SW1 1234 | • 0 means auto addressing mode (Default)<br>• 1 means factory test mode |
| ON SW1 1234 | • 0 means normal mode (Default)<br>• 1 means factory self -checking mode |
| ON SW1 1234 | • (Reserved) |
| ON SW1 1234 | • 0 means standard indoor unit (Default)<br>• 1 means main indoor unit (Must be addressed #63) |

**SW8 Definition**

| | |
|---|---|
| ON SW8 12 | • (Reserved) |
| ON SW8 12 | • (Reserved) |

**J1 Definition**

| | |
|---|---|
| J1 | • Without jumper "J1" for auto restart function |
| J1 | • With jumper "J1" for manual restart |

| Error code | Error Content |
|---|---|
| dd | • Mode conflict |
| E1 | • Comm. error with outdoor unit |
| E2 | • Temp. sensor (T1) error |
| E4 | • Temp. sensor (T2B) error |
| E5 | • Temp. sensor (T2A) error |
| E6 | • DC fan error |
| E7 | • EEPROM error |

| Error code | Error Content |
|---|---|
| UU | • MDC error in auto system-check mode |
| E9 | • Comm. error with wired controller |
| Eb | • EEV error |
| EC | • Indoor fan error in auto system-check mode |
| Ed | • Outdoor unit error |
| EE | • Water level alarm |
| FE | • No address when first time power on |

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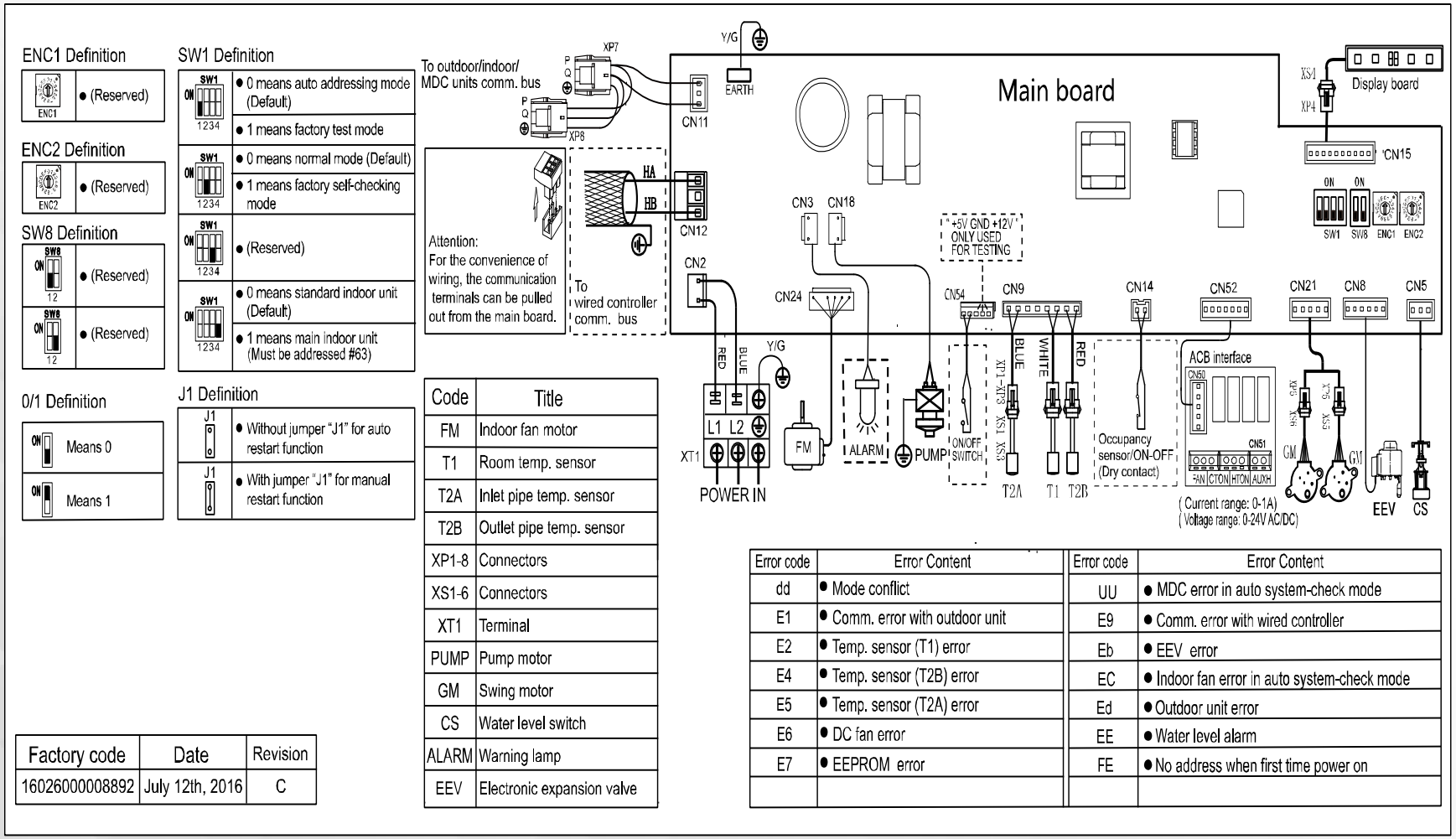
# FUNCTION AND OPERATION

## 4-Way




| Code | Title |
|---|---|
| FM | Indoor fan motor |
| T1 | Room temp. sensor |
| T2A | Inlet pipe temp. sensor |
| T2B | Outlet pipe temp. sensor |
| XP1-8 | Connectors |
| XS1-6 | Connectors |
| XT1 | Terminal |
| PUMP | Pump motor |
| GM | Swing motor |
| CS | Water level switch |
| ALARM | Warning lamp |
| EEV | Electronic expansion valve |

| Error code | Error Content | Error code | Error Content |
|---|---|---|---|
| dd | ● Mode conflict | UU | ● MDC error in auto system-check mode |
| E1 | ● Comm. error with outdoor unit | E9 | ● Comm. error with wired controller |
| E2 | ● Temp. sensor (T1) error | Eb | ● EEV error |
| E4 | ● Temp. sensor (T2B) error | EC | ● Indoor fan error in auto system-check mode |
| E5 | ● Temp. sensor (T2A) error | Ed | ● Outdoor unit error |
| E6 | ● DC fan error | EE | ● Water level alarm |
| E7 | ● EEPROM error | FE | ● No address when first time power on |
| | | | |

| Factory code | Date | Revision |
|---|---|---|
| 16026000008892 | July 12th, 2016 | C |

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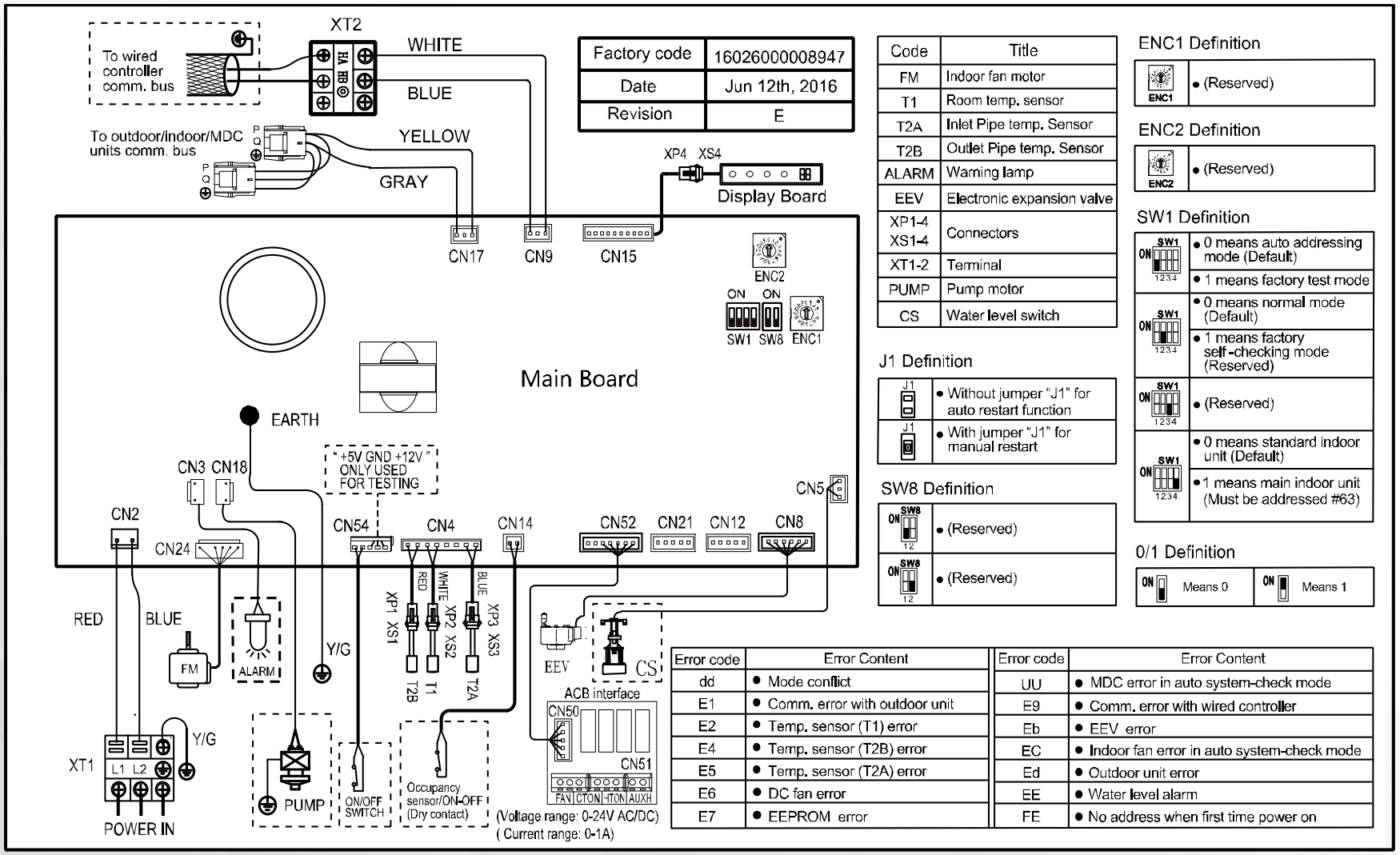
# FUNCTION AND OPERATION

## Low Static Ducted




| Factory code | 16026000008947 |
|---|---|
| Date | Jun 12th, 2016 |
| Revision | E |

| Code | Title |
|---|---|
| FM | Indoor fan motor |
| T1 | Room temp. sensor |
| T2A | Inlet Pipe temp. Sensor |
| T2B | Outlet Pipe temp. Sensor |
| ALARM | Warning lamp |
| EEV | Electronic expansion valve |
| XP1-4 XS1-4 | Connectors |
| XT1-2 | Terminal |
| PUMP | Pump motor |
| CS | Water level switch |

**J1 Definition**

| | |
|---|---|
| J1 | • Without jumper "J1" for auto restart function |
| J1 | • With jumper "J1" for manual restart |

**SW8 Definition**

| | |
|---|---|
| SW8 ON 12 | • (Reserved) |
| SW8 ON 12 | • (Reserved) |

**ENC1 Definition**

| | |
|---|---|
| ENC1 | • (Reserved) |

**ENC2 Definition**

| | |
|---|---|
| ENC2 | • (Reserved) |

**SW1 Definition**

| | |
|---|---|
| SW1 ON 1234 | • 0 means auto addressing mode (Default) |
| | • 1 means factory test mode |
| SW1 ON 1234 | • 0 means normal mode (Default) |
| | • 1 means factory self-checking mode (Reserved) |
| SW1 ON 1234 | • (Reserved) |
| SW1 ON 1234 | • 0 means standard indoor unit (Default) |
| | • 1 means main indoor unit (Must be addressed #63) |

**0/1 Definition**

| | |
|---|---|
| ON | Means 0 |
| ON | Means 1 |

| Error code | Error Content | Error code | Error Content |
|---|---|---|---|
| dd | • Mode conflict | UU | • MDC error in auto system-check mode |
| E1 | • Comm. error with outdoor unit | E9 | • Comm. error with wired controller |
| E2 | • Temp. sensor (T1) error | Eb | • EEV error |
| E4 | • Temp. sensor (T2B) error | EC | • Indoor fan error in auto system-check mode |
| E5 | • Temp. sensor (T2A) error | Ed | • Outdoor unit error |
| E6 | • DC fan error | EE | • Water level alarm |
| E7 | • EEPROM error | FE | • No address when first time power on |

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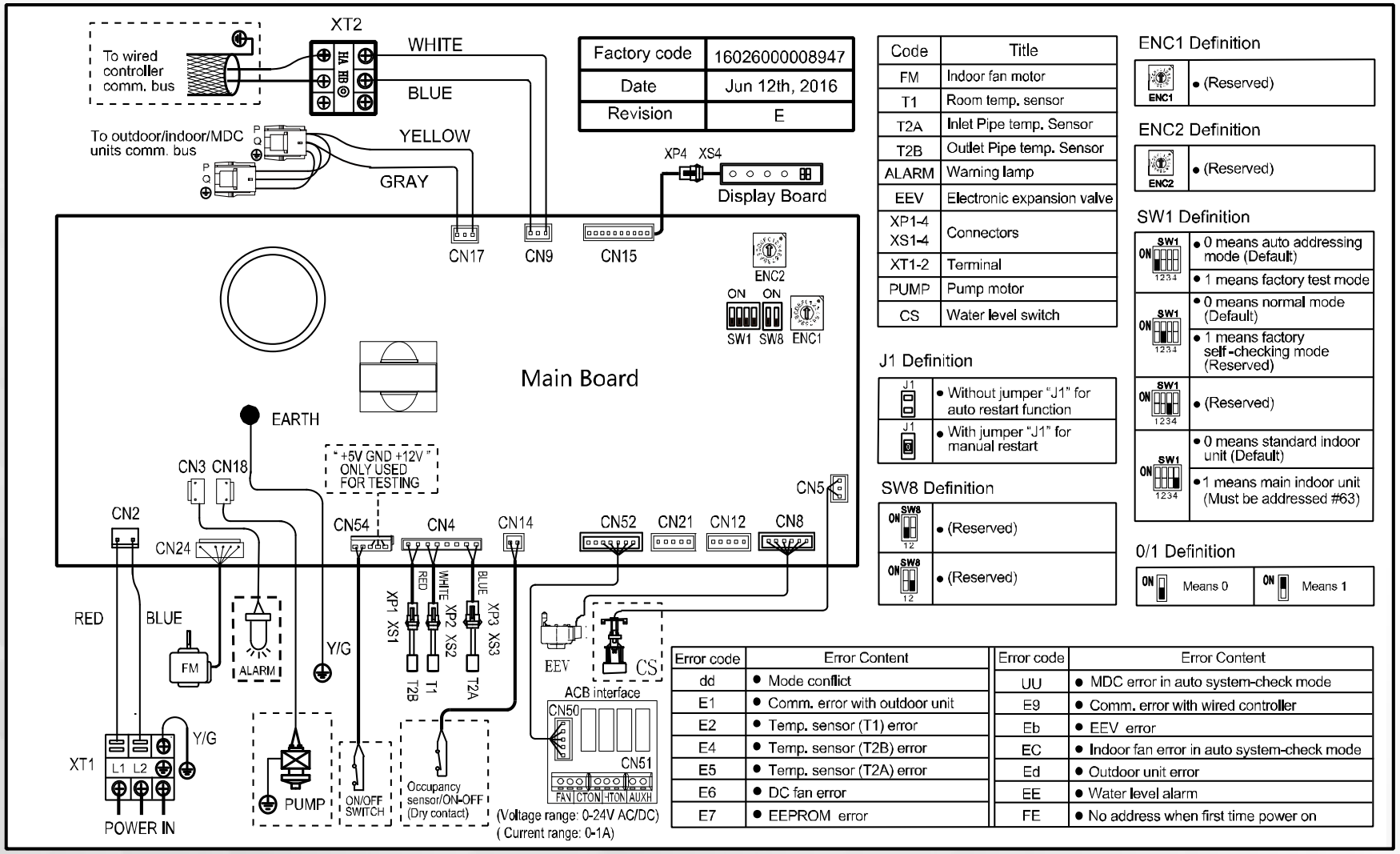
# FUNCTION AND OPERATION

## Medium Static Ducted (40VMM007 (009---3))




| | |
|---|---|
| Factory code | 16026000008947 |
| Date | Jun 12th, 2016 |
| Revision | E |

| Code | Title |
|---|---|
| FM | Indoor fan motor |
| T1 | Room temp. sensor |
| T2A | Inlet Pipe temp. Sensor |
| T2B | Outlet Pipe temp. Sensor |
| ALARM | Warning lamp |
| EEV | Electronic expansion valve |
| XP1-4 XS1-4 | Connectors |
| XT1-2 | Terminal |
| PUMP | Pump motor |
| CS | Water level switch |

**J1 Definition**

| | |
|---|---|
| J1 | • Without jumper "J1" for auto restart function |
| J1 | • With jumper "J1" for manual restart |

**SW8 Definition**

| | |
|---|---|
| SW8 ON 12 | • (Reserved) |
| SW8 ON 12 | • (Reserved) |

**ENC1 Definition**

| | |
|---|---|
| ENC1 | • (Reserved) |

**ENC2 Definition**

| | |
|---|---|
| ENC2 | • (Reserved) |

**SW1 Definition**

| | |
|---|---|
| SW1 ON 1234 | • 0 means auto addressing mode (Default) |
| | • 1 means factory test mode |
| SW1 ON 1234 | • 0 means normal mode (Default) |
| | • 1 means factory self-checking mode (Reserved) |
| SW1 ON 1234 | • (Reserved) |
| SW1 ON 1234 | • 0 means standard indoor unit (Default) |
| | • 1 means main indoor unit (Must be addressed #63) |

**0/1 Definition**

| | |
|---|---|
| ON | Means 0 |
| ON | Means 1 |

| Error code | Error Content | Error code | Error Content |
|---|---|---|---|
| dd | • Mode conflict | UU | • MDC error in auto system-check mode |
| E1 | • Comm. error with outdoor unit | E9 | • Comm. error with wired controller |
| E2 | • Temp. sensor (T1) error | Eb | • EEV error |
| E4 | • Temp. sensor (T2B) error | EC | • Indoor fan error in auto system-check mode |
| E5 | • Temp. sensor (T2A) error | Ed | • Outdoor unit error |
| E6 | • DC fan error | EE | • Water level alarm |
| E7 | • EEPROM error | FE | • No address when first time power on |

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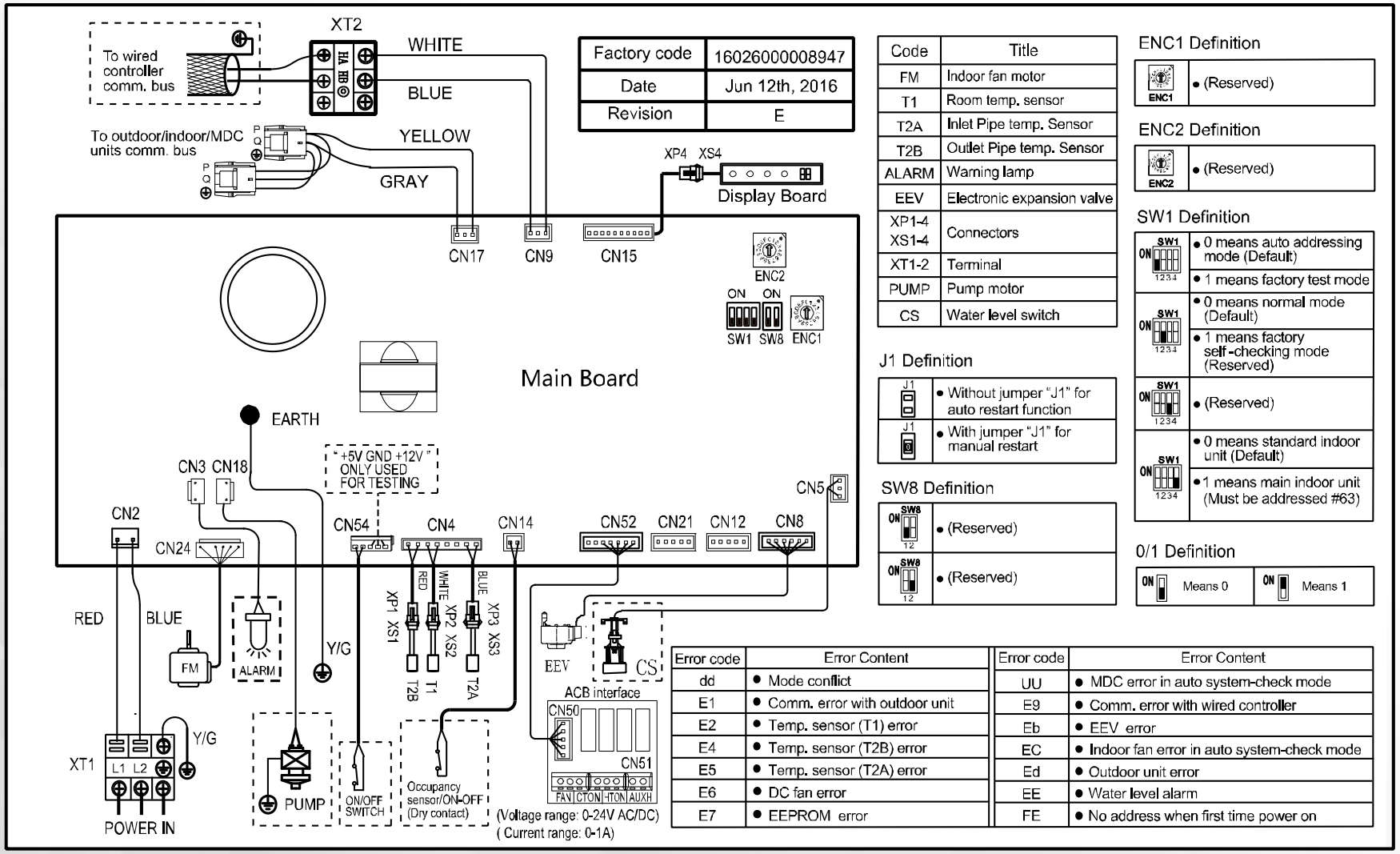
# FUNCTION AND OPERATION

## Floor Recessed




| Factory code | 16026000008947 |
|---|---|
| Date | Jun 12th, 2016 |
| Revision | E |

| Code | Title |
|---|---|
| FM | Indoor fan motor |
| T1 | Room temp. sensor |
| T2A | Inlet Pipe temp. Sensor |
| T2B | Outlet Pipe temp. Sensor |
| ALARM | Warning lamp |
| EEV | Electronic expansion valve |
| XP1-4 XS1-4 | Connectors |
| XT1-2 | Terminal |
| PUMP | Pump motor |
| CS | Water level switch |

**J1 Definition**

| | |
|---|---|
| J1 | • Without jumper "J1" for auto restart function |
| J1 | • With jumper "J1" for manual restart |

**SW8 Definition**

| | |
|---|---|
| SW8 ON 12 | • (Reserved) |
| SW8 ON 12 | • (Reserved) |

**ENC1 Definition**

| | |
|---|---|
| ENC1 | • (Reserved) |

**ENC2 Definition**

| | |
|---|---|
| ENC2 | • (Reserved) |

**SW1 Definition**

| | |
|---|---|
| SW1 ON 1234 | • 0 means auto addressing mode (Default) |
| | • 1 means factory test mode |
| SW1 ON 1234 | • 0 means normal mode (Default) |
| | • 1 means factory self-checking mode (Reserved) |
| SW1 ON 1234 | • (Reserved) |
| SW1 ON 1234 | • 0 means standard indoor unit (Default) |
| | • 1 means main indoor unit (Must be addressed #63) |

**0/1 Definition**

| | |
|---|---|
| ON | Means 0 |
| ON | Means 1 |

| Error code | Error Content | Error code | Error Content |
|---|---|---|---|
| dd | • Mode conflict | UU | • MDC error in auto system-check mode |
| E1 | • Comm. error with outdoor unit | E9 | • Comm. error with wired controller |
| E2 | • Temp. sensor (T1) error | Eb | • EEV error |
| E4 | • Temp. sensor (T2B) error | EC | • Indoor fan error in auto system-check mode |
| E5 | • Temp. sensor (T2A) error | Ed | • Outdoor unit error |
| E6 | • DC fan error | EE | • Water level alarm |
| E7 | • EEPROM error | FE | • No address when first time power on |

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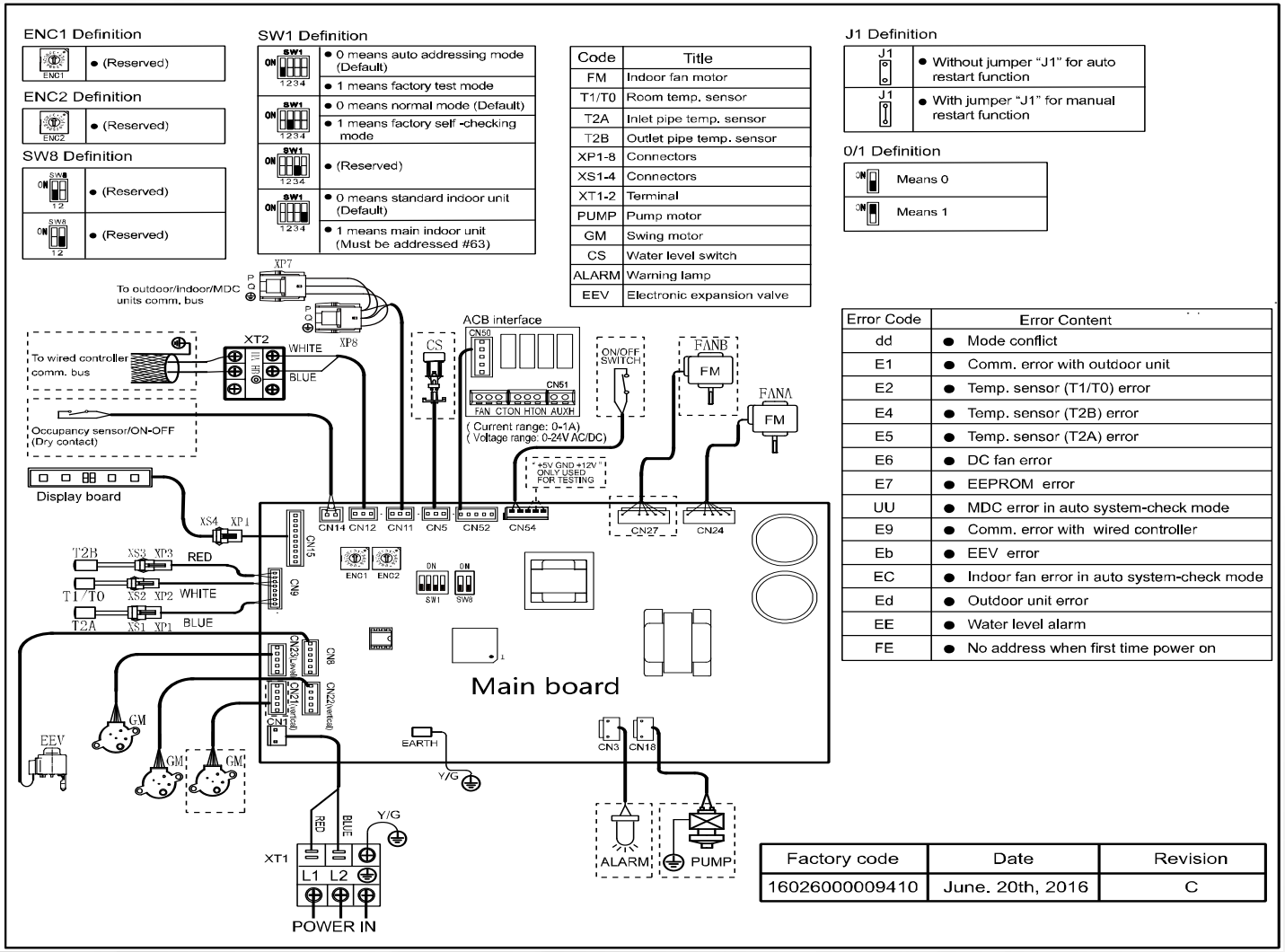
# FUNCTION AND OPERATION

## Convertible Floor Ceiling

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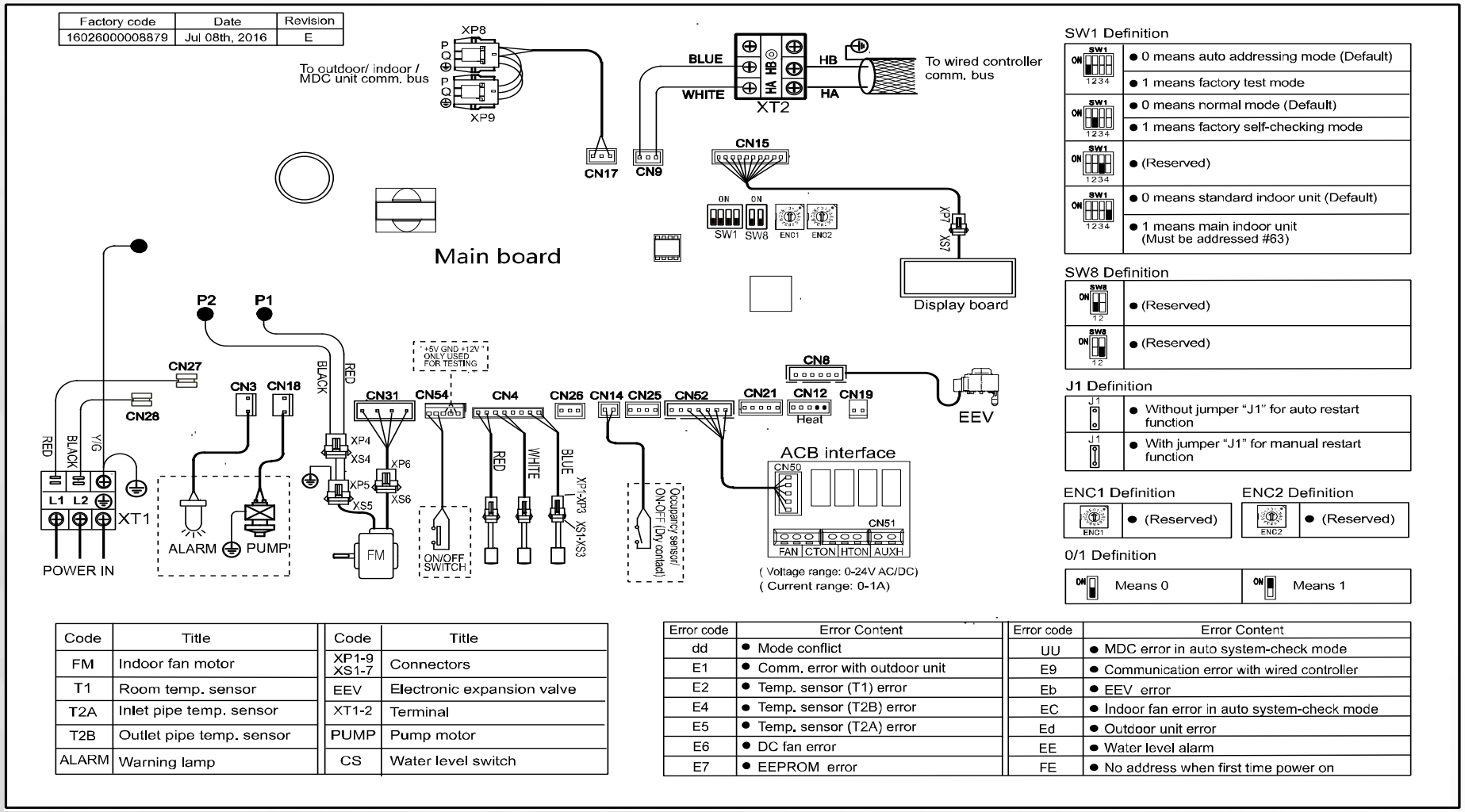
# FUNCTION AND OPERATION

## Vertical Air Handler

| Factory code | Date | Revision |
|---|---|---|
| 16026000008879 | Jul 08th, 2016 | E |




### SW1 Definition

| | |
|---|---|
| SW1 ON 1234 | ● 0 means auto addressing mode (Default) |
| | ● 1 means factory test mode |
| SW1 ON 1234 | ● 0 means normal mode (Default) |
| | ● 1 means factory self-checking mode |
| SW1 ON 1234 | ● (Reserved) |
| SW1 ON 1234 | ● 0 means standard indoor unit (Default) |
| | ● 1 means main indoor unit (Must be addressed #63) |

### SW8 Definition

| | |
|---|---|
| SW8 ON 12 | ● (Reserved) |
| SW8 ON 12 | ● (Reserved) |

### J1 Definition

| | |
|---|---|
| J1 | ● Without jumper "J1" for auto restart function |
| J1 | ● With jumper "J1" for manual restart function |

### ENC1 Definition

| | |
|---|---|
| ENC1 | ● (Reserved) |

### ENC2 Definition

| | |
|---|---|
| ENC2 | ● (Reserved) |

### 0/1 Definition

| | |
|---|---|
| ON | Means 0 |
| ON | Means 1 |

| Code | Title | Code | Title |
|---|---|---|---|
| FM | Indoor fan motor | XP1-9 XS1-7 | Connectors |
| T1 | Room temp. sensor | EEV | Electronic expansion valve |
| T2A | Inlet pipe temp. sensor | XT1-2 | Terminal |
| T2B | Outlet pipe temp. sensor | PUMP | Pump motor |
| ALARM | Warning lamp | CS | Water level switch |

| Error code | Error Content | Error code | Error Content |
|---|---|---|---|
| dd | ● Mode conflict | UU | ● MDC error in auto system-check mode |
| E1 | ● Comm. error with outdoor unit | E9 | ● Communication error with wired controller |
| E2 | ● Temp. sensor (T1) error | Eb | ● EEV error |
| E4 | ● Temp. sensor (T2B) error | EC | ● Indoor fan error in auto system-check mode |
| E5 | ● Temp. sensor (T2A) error | Ed | ● Outdoor unit error |
| E6 | ● DC fan error | EE | ● Water level alarm |
| E7 | ● EEPROM error | FE | ● No address when first time power on |

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2

# PIPING AND COMPONENTS

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# PIPING AND COMPONENTS

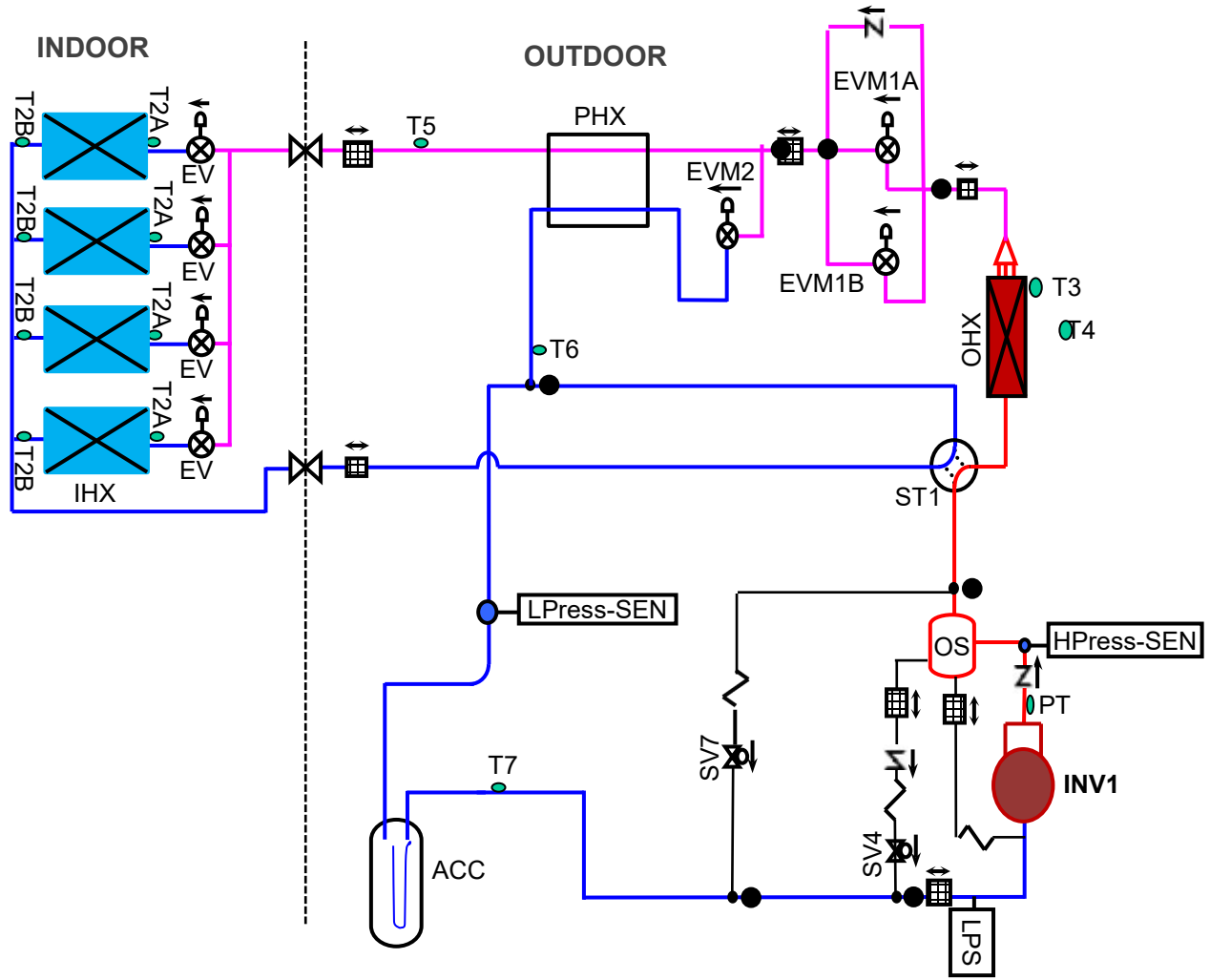
## Heat Pump System

### Heat Pump

#### Abbreviations Definition

**T1:** Room temperature
**T2A:** Temperature of evaporator inlet
**T2B:** Temperature of evaporator outlet
**T2 average:** Mean value of T2B or T2A
**T3:** Temperature of condenser outlet
**T4:** Ambient temperature
**T5:** Liquid Temperature
**T6:** Temperature of PHX outlet
**T7:** Return temperature
**PT:** Discharge temperature
**PC:** Discharge pressure
**ST1:** 4-way valve
**EVM1-A/B:** Electric expansion valve
**EVM2:** Electric expansion valve
**SV4:** Solenoid valve
**SV7:** Solenoid valve

: Cut off valve
: Filter
: One way valve
: Throttle pipe

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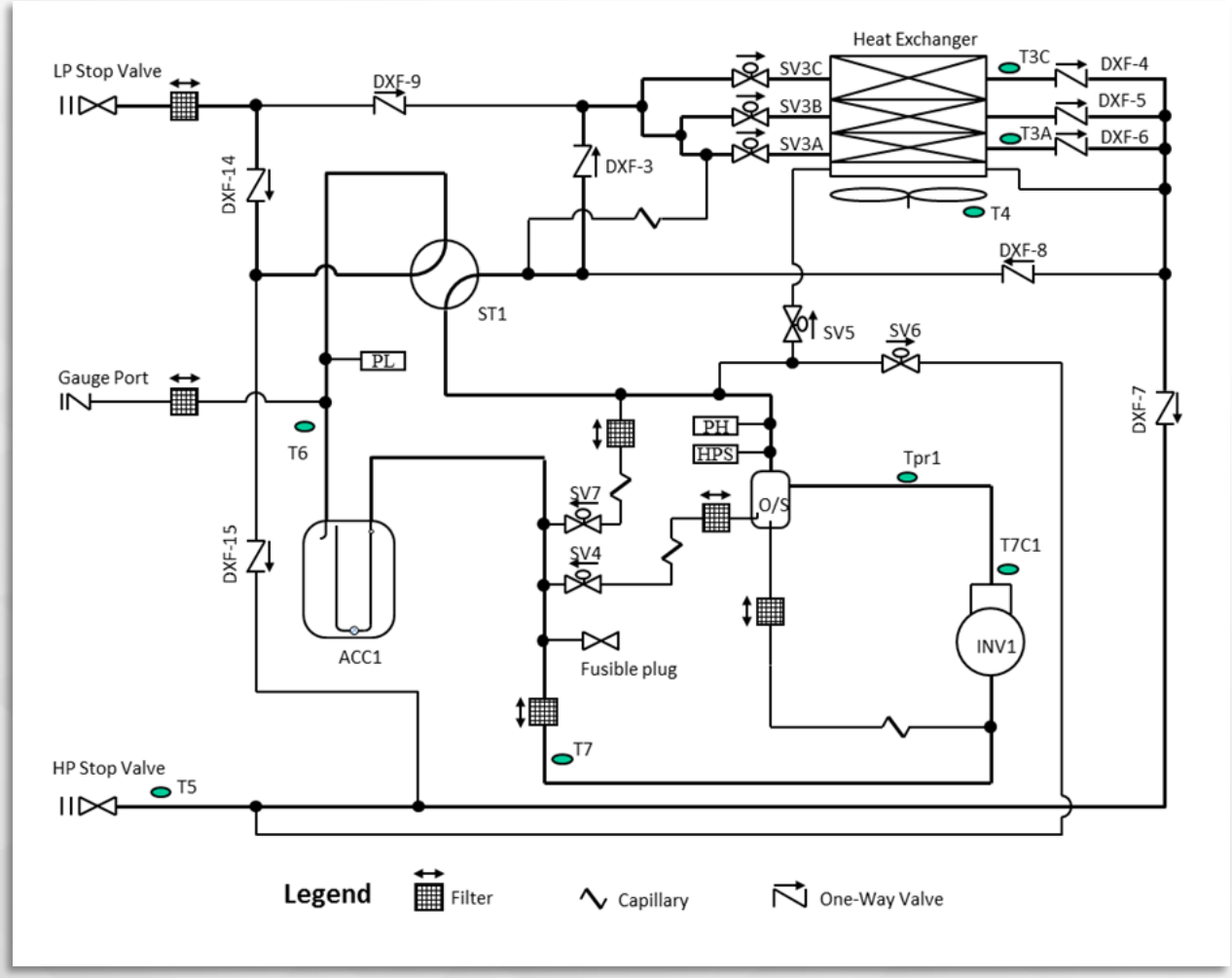
# PIPING AND COMPONENTS

38VMR072, 096, 120

## Heat Recovery

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# PIPING AND COMPONENTS

38VMR072, 096, 120

## Heat Recovery

| Name | Symbol | Major Function |
|---|---|---|
| Inverter compressor | INV1 | Varies the refrigerant flow rate by adjusting the frequency based on objective pressure |
| Inverter fan | FANA | Regulate the heat exchanger capacity by adjusting rotating speeds based on the operating pressure. |
| | FANB | |
| 4-way valve | ST1 | Switch the operation mode between heating and cooling |
| Solenoid valve | SV3A | Used to control heat exchanger areas |
| | SV3B | |
| | SV3C | |
| | SV4 | Used for control the amount of oil from the oil separator to the compressor |
| | SV5 | 1) High-pressure-rise prevention<br>2) To prevent the bottom of heat exchangers being frozen in heating mode |
| | SV6 | 1) To supply hot gas for heating indoor units in cooling main mode<br>2) Bypass hot gas from compressor discharge in heating operation |
| | SV7 | 1) Bypass pressure at start-up stage and control capacity at low load condition<br>2) High-pressure-rise prevention<br>3) Discharge superheat protection |
| Thermistor | T3A | Used to control defrosting during heating operation |
| | T3C | |
| | T4 | Used to detect outdoor air temperature and control fan speed |
| | T5 | Used to control SV6 based on the refrigerant status in cooling main mode |
| | T6 | Used for MDC to control EVXA and SVP |
| | T7 | |
| | T7C1 | Used to detect discharge temperature and calculate discharge superheat |
| | Tf1 | 1) Detects heat sink temperature of Inverter module in electric control box<br>2) Used to control fans based on this value to protect electric components |
| | Tpr1 | Provides high-temperature protection |
| High pressure sensor | PH | Used to detects high pressure |
| Low pressure sensor | PL | Used to detects low pressure |
| High pressure switch | HPS | This is to prevent abnormal increase of high pressure, to which will activate at 4.0MPa and shut down compressors. |

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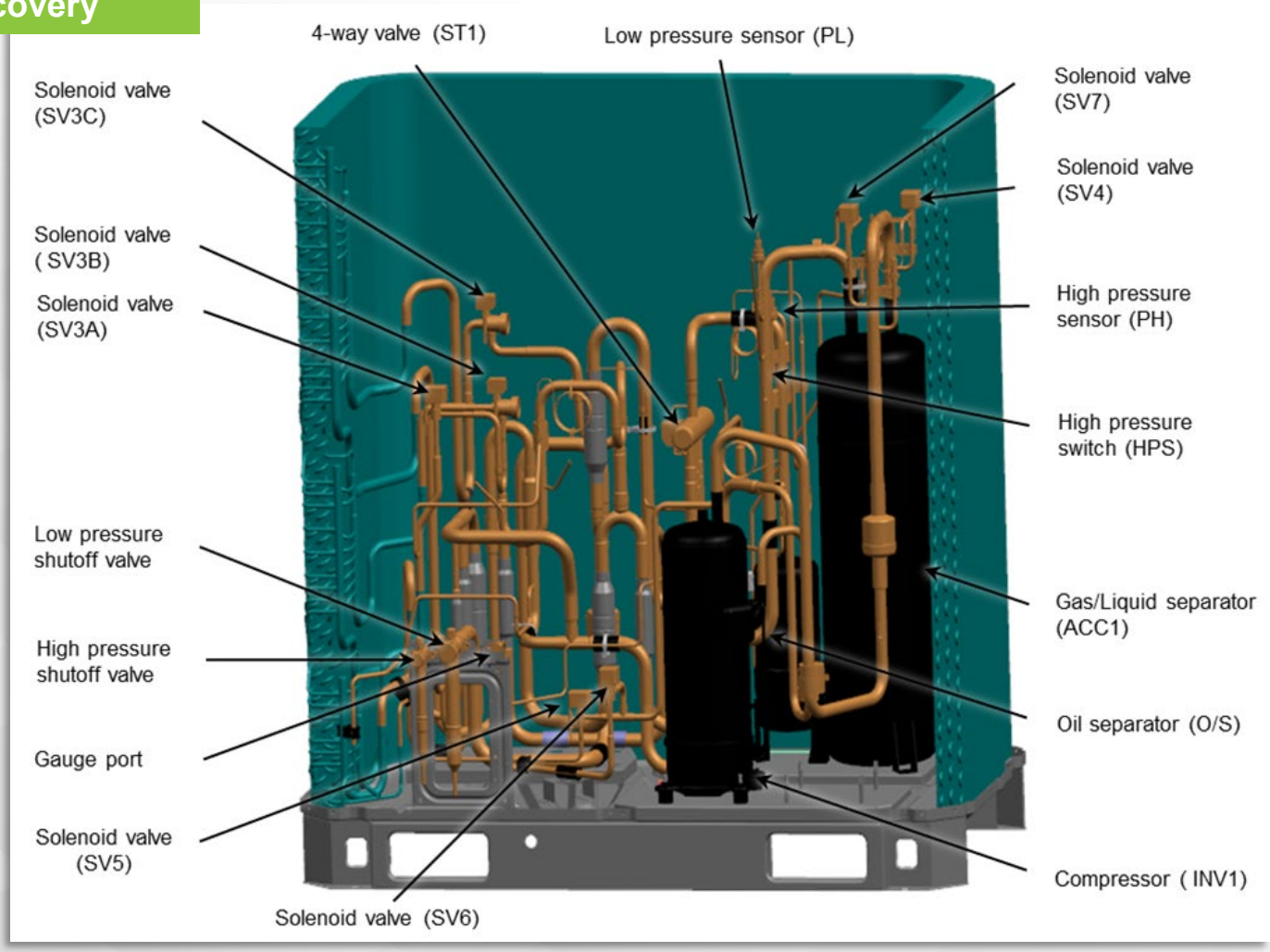
# PIPING AND COMPONENTS

38VMR072, 096, 120

## Heat Recovery

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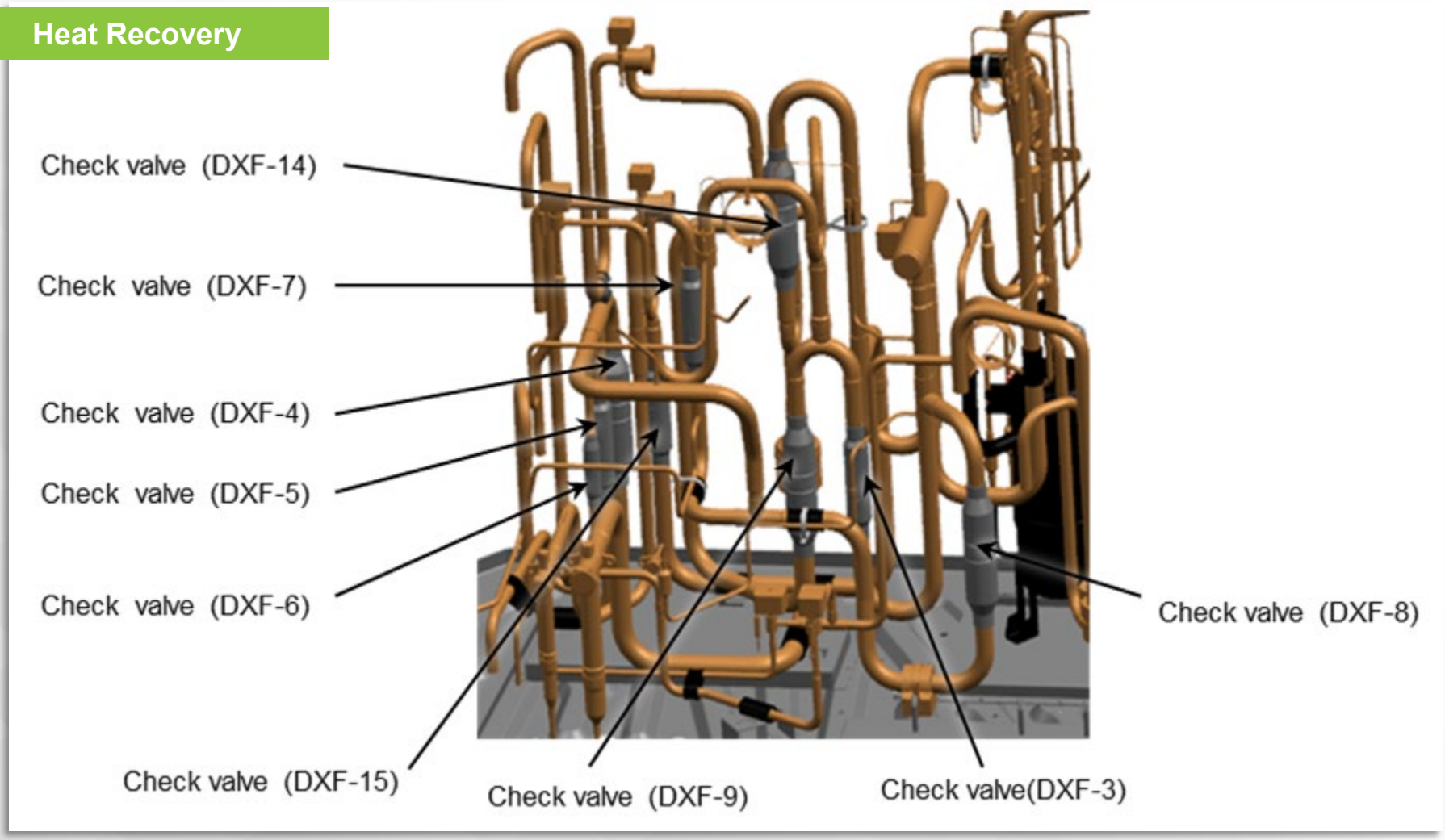
# PIPING AND COMPONENTS

38VMR072, 096, 120

**Heat Recovery**

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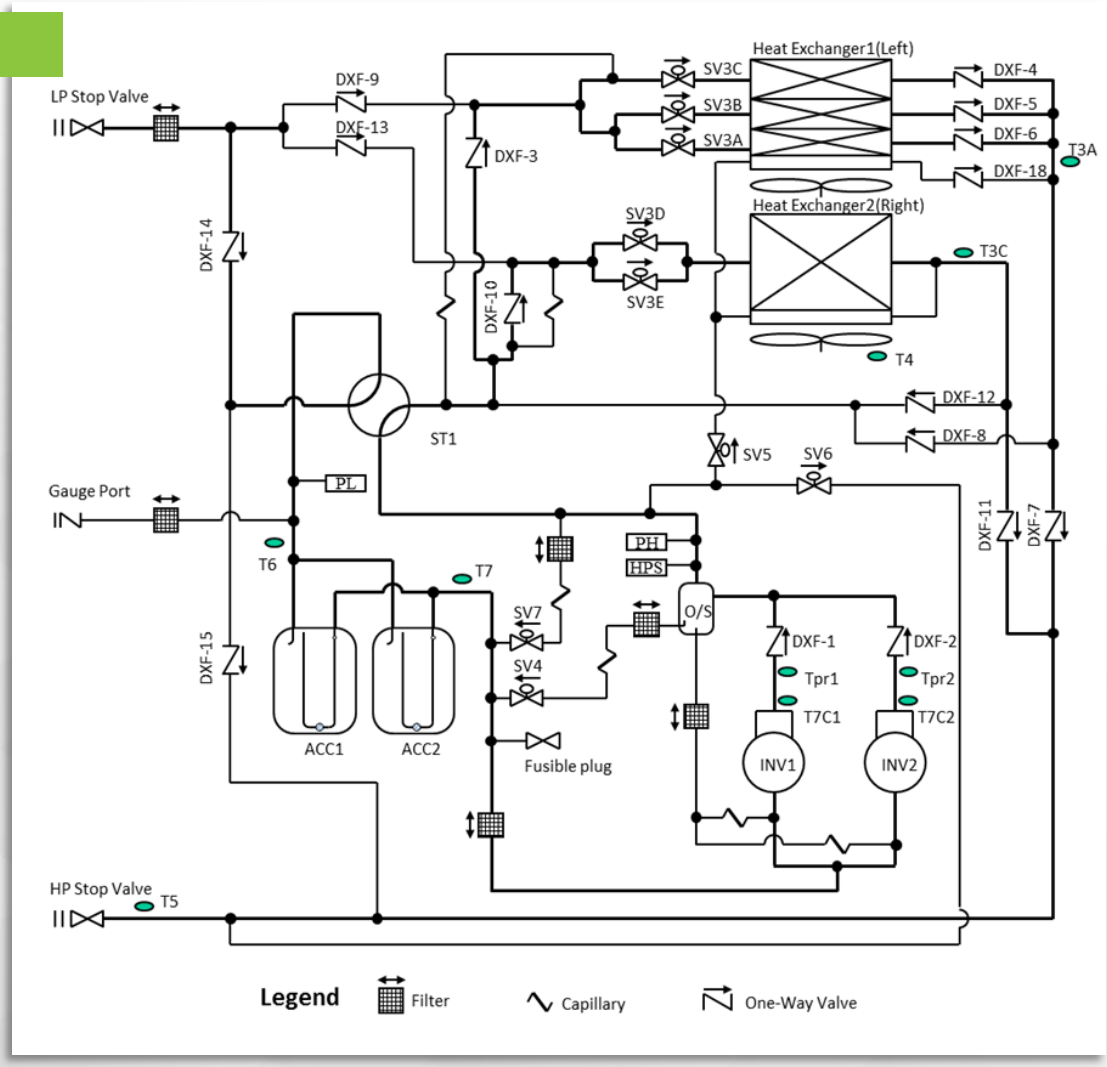
# PIPING AND COMPONENTS

38VMR144, 168, 192, 216, 240

## Heat Recovery

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# PIPING AND COMPONENTS

38VMR144, 168, 192, 216, 240

## Heat Recovery

| Name | Symbol | | Major Function |
|---|---|---|---|
| | Refrigerant Circuit Diagram | Electrical Wiring Diagram | |
| Inverter compressor | INV1 | Compressor A | Varies the refrigerant flow rate by adjusting the frequency based on objective pressure |
| | INV2 | Compressor B | |
| Oil separator | O/S | - | It is used to separate oil from high pressure gas refrigerant, which is pumped out from compressor. |
| Inverter fan | FANA | | Regulate the heat exchanger capacity by adjusting rotating speeds based on the operating pressure. |
| | FANB | | |
| 4-way valve | ST1 | | Switch the operation mode between heating and cooling |
| Heat exchanger | HEX | - | To transfer heat with surrounding air |
| Solenoid valve | SV3A | | Used to control heat exchanger areas |
| | SV3B | | |
| | SV3C | | |
| | SV3D | | |
| | SV3E | | |
| | SV4 | | Used for control the amount of oil from the oil separator to the compressor |
| | SV5 | | 1) High-pressure-rise prevention<br>2) To prevent the bottom of heat exchangers being frozen in heating mode |
| | SV6 | | 1) To supply hot gas for heating indoor units in cooling main mode<br>2) Bypass hot gas from compressor discharge in heating operation |
| | SV7 | | 1) Bypass pressure at start-up stage and control capacity at low load condition<br>2) High-pressure-rise prevention<br>3) Discharge superheat protection |
| Thermistor (Heat exchanger defrosting) | T3A | | Used to control defrosting during heating operation |
| | T3C | | |
| Thermistor (Outside air) | T4 | | Used to detect outdoor air temperature and control fan speed |
| Thermistor (High pressure pipe) | T5 | | Used to control SV6 based on the refrigerant status in cooling main mode |
| Thermistor (Accumulator inlet) | T6 | | Used for MDC to control EVXA and SVP |
| Thermistor (Compressor suction pipe) | T7 | | |
| Thermistor (INV.1 discharge pipe) | T7C1 | | Used to detect discharge temperature and calculate discharge superheat |
| Thermistor (INV.2 discharge pipe) | T7C2 | | |
| Thermistor (INV.1 discharge temperature protection) | Tpr1 | TP1-PRO | Provides high-temperature protection |
| Thermistor (INV.2 discharge temperature protection) | Tpr2 | TP2-PRO | |
| High pressure sensor | PH | H-YL1 | Used to detects high pressure |
| Low pressure sensor | PL | L-YL1 | Used to detects low pressure |
| High pressure switch | HPS | H-PRO-4 | These **2 switches** are used to prevent abnormal increase of high pressure, to which will activate at 4.0MPa and shut down compressors. |

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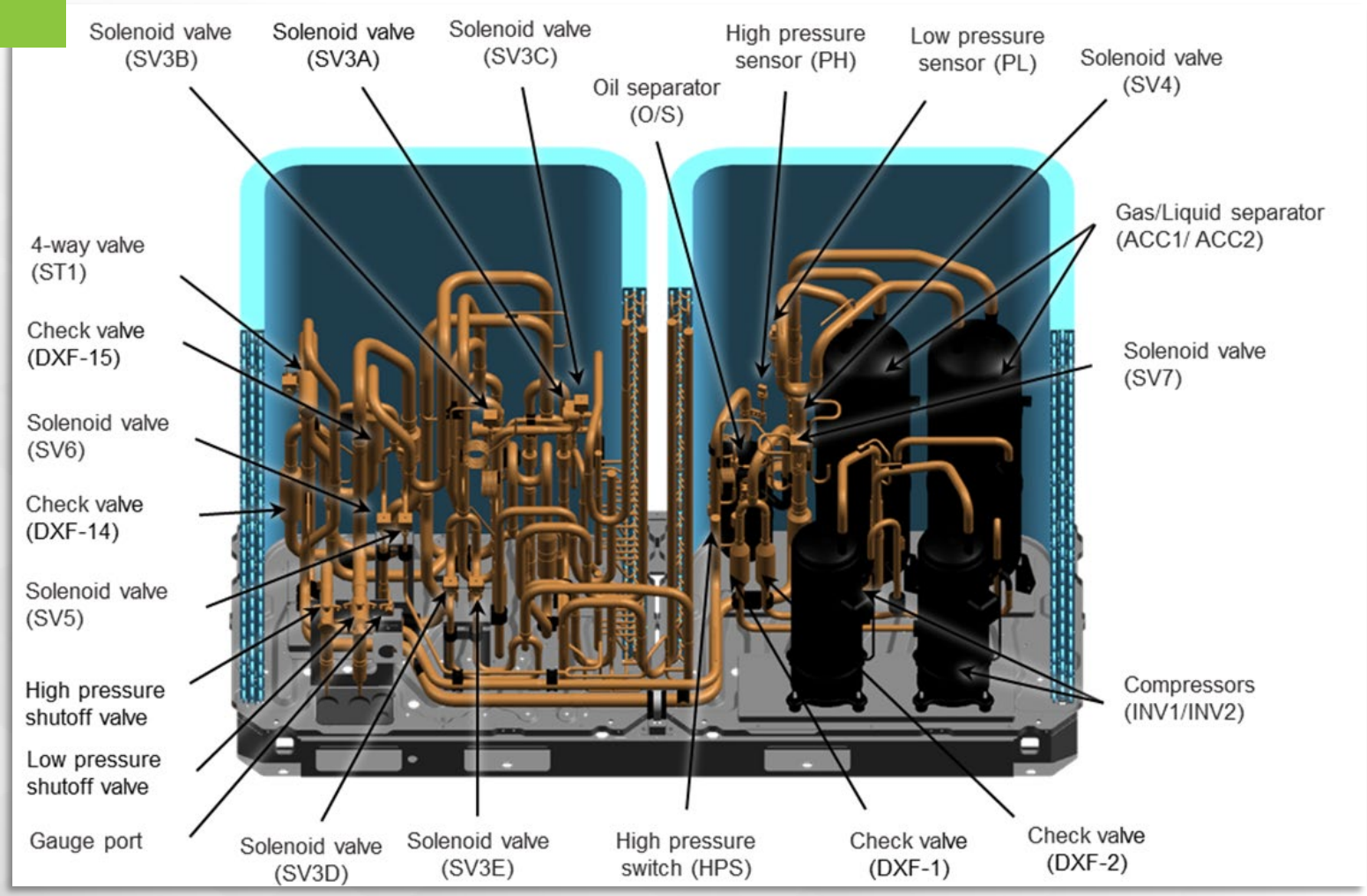
# PIPING AND COMPONENTS

38VMR144, 168, 192, 216, 240

**Heat Recovery**

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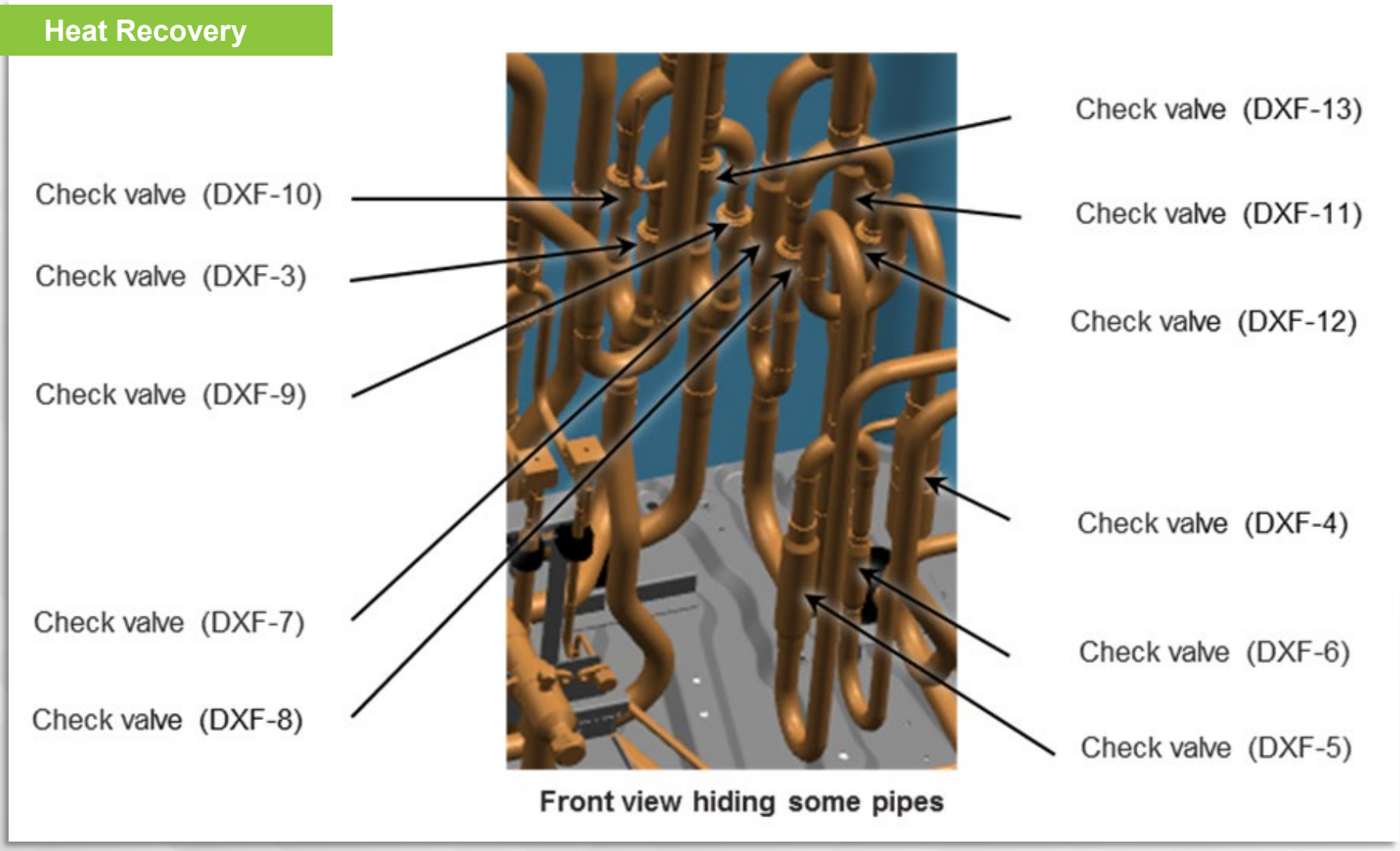
# PIPING AND COMPONENTS

38VMR144, 168, 192, 216, 240

**Heat Recovery**




Front view hiding some pipes

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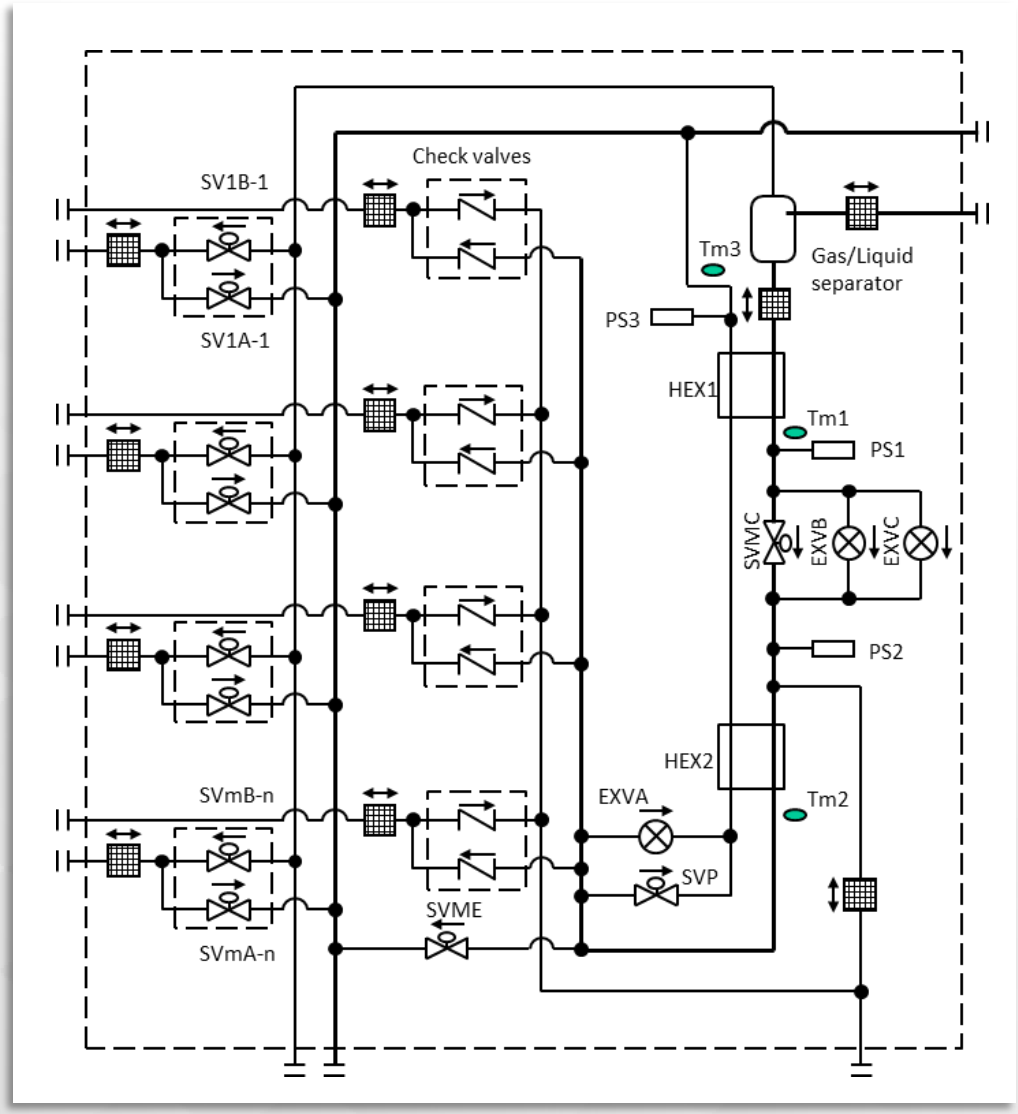
# PIPING AND COMPONENTS

## MDC

**MDC**

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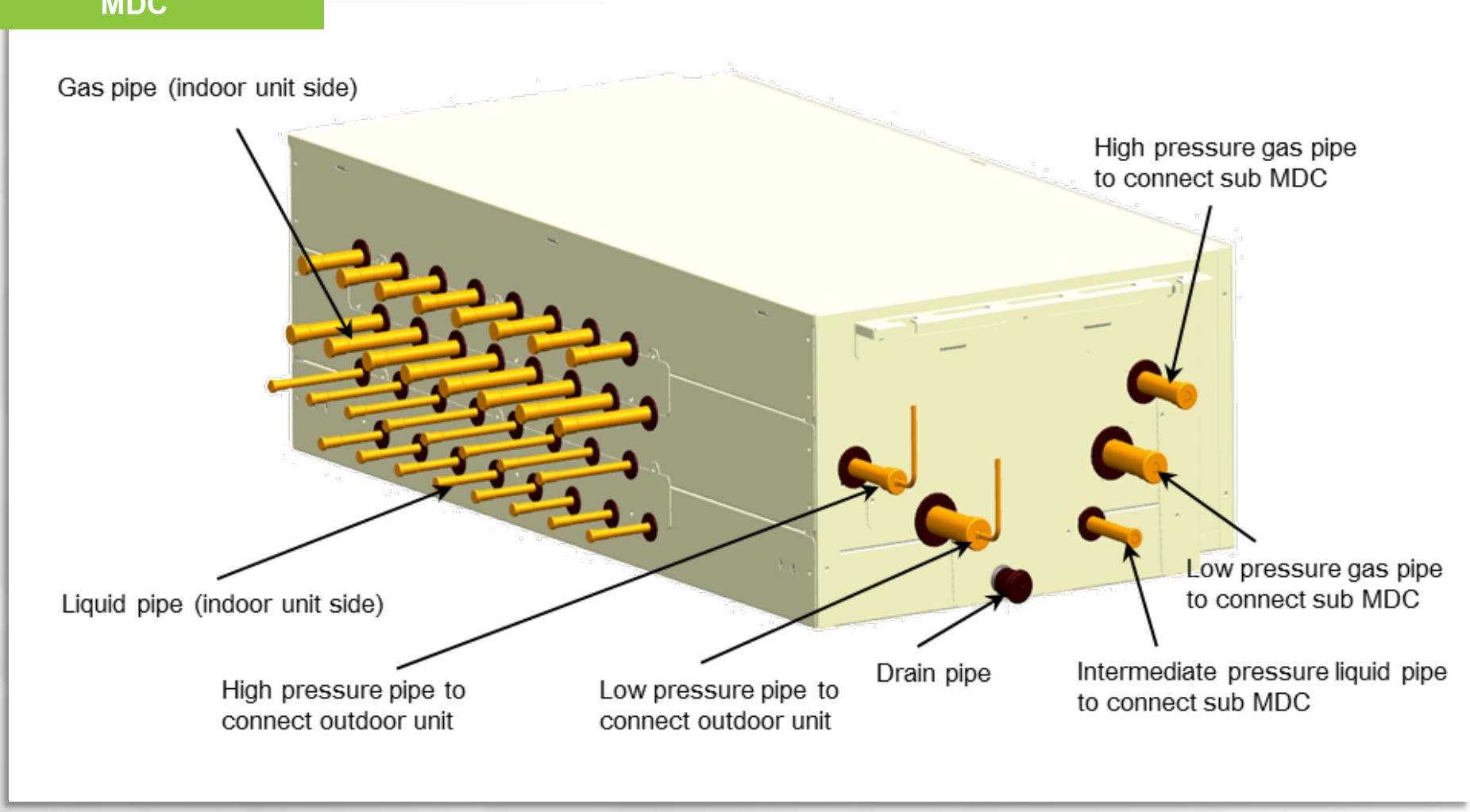
# PIPING AND COMPONENTS

## MDC

### MDC

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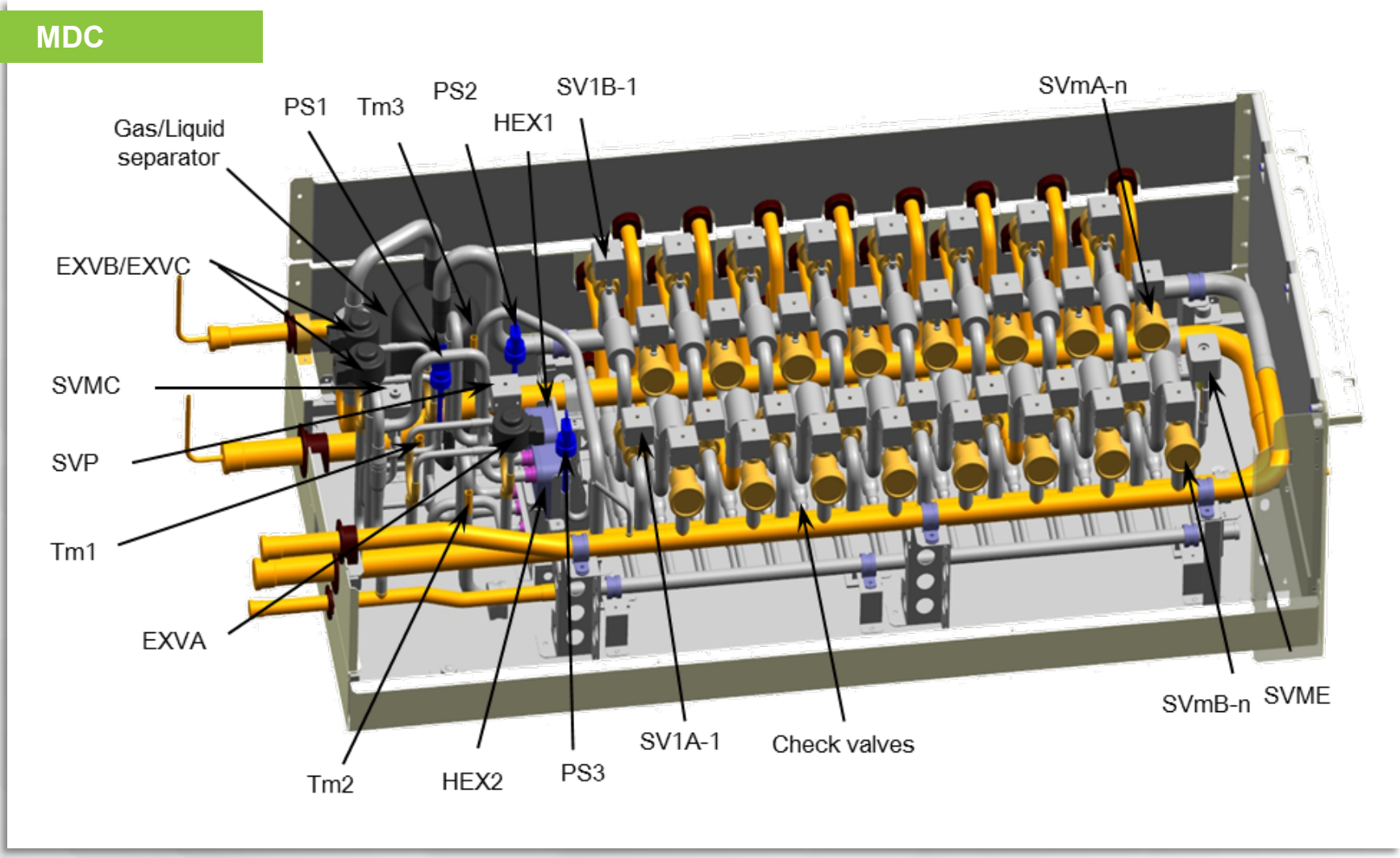
# PIPING AND COMPONENTS

## MDC

### MDC

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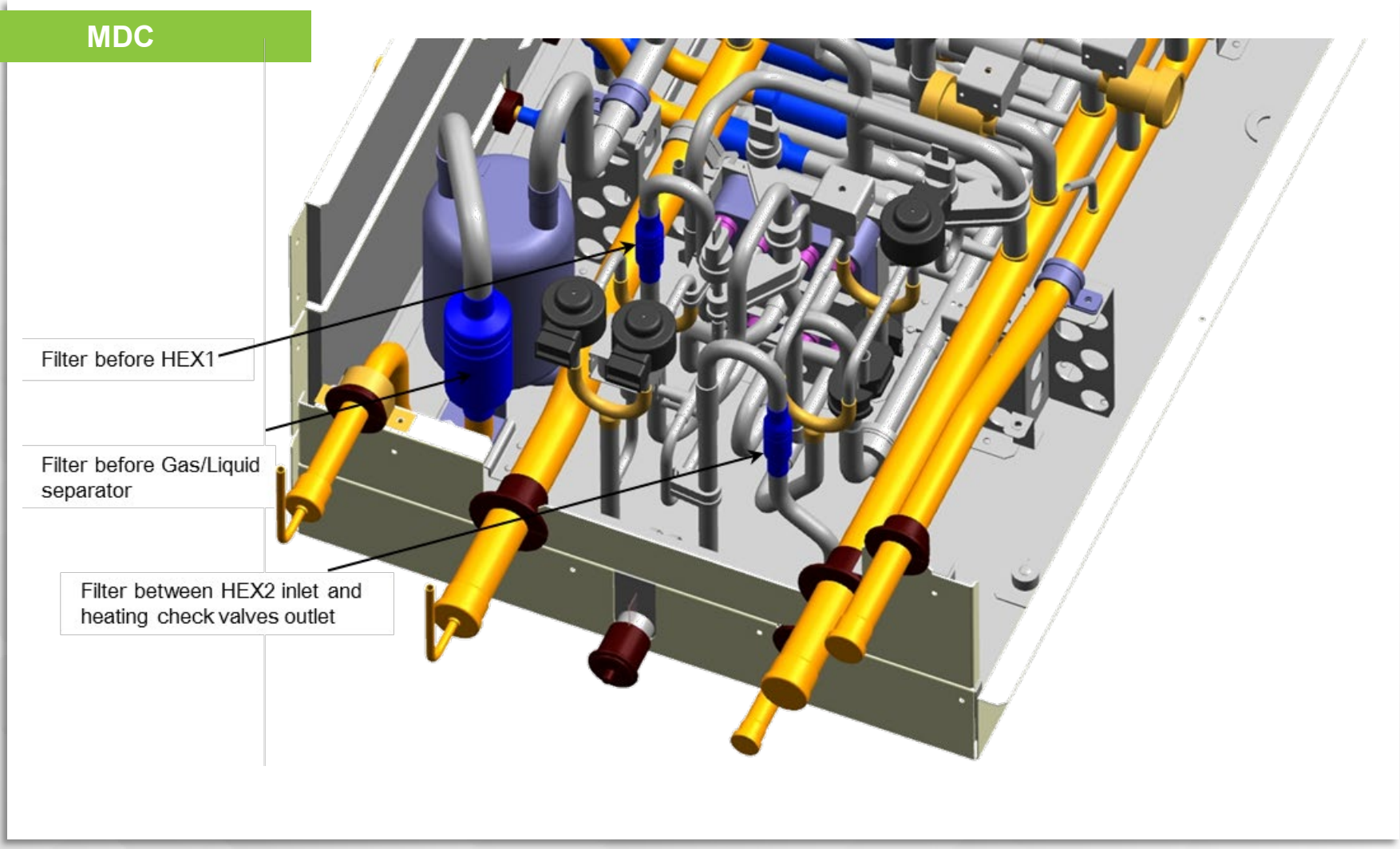
# PIPING AND COMPONENTS

## MDC

**MDC**

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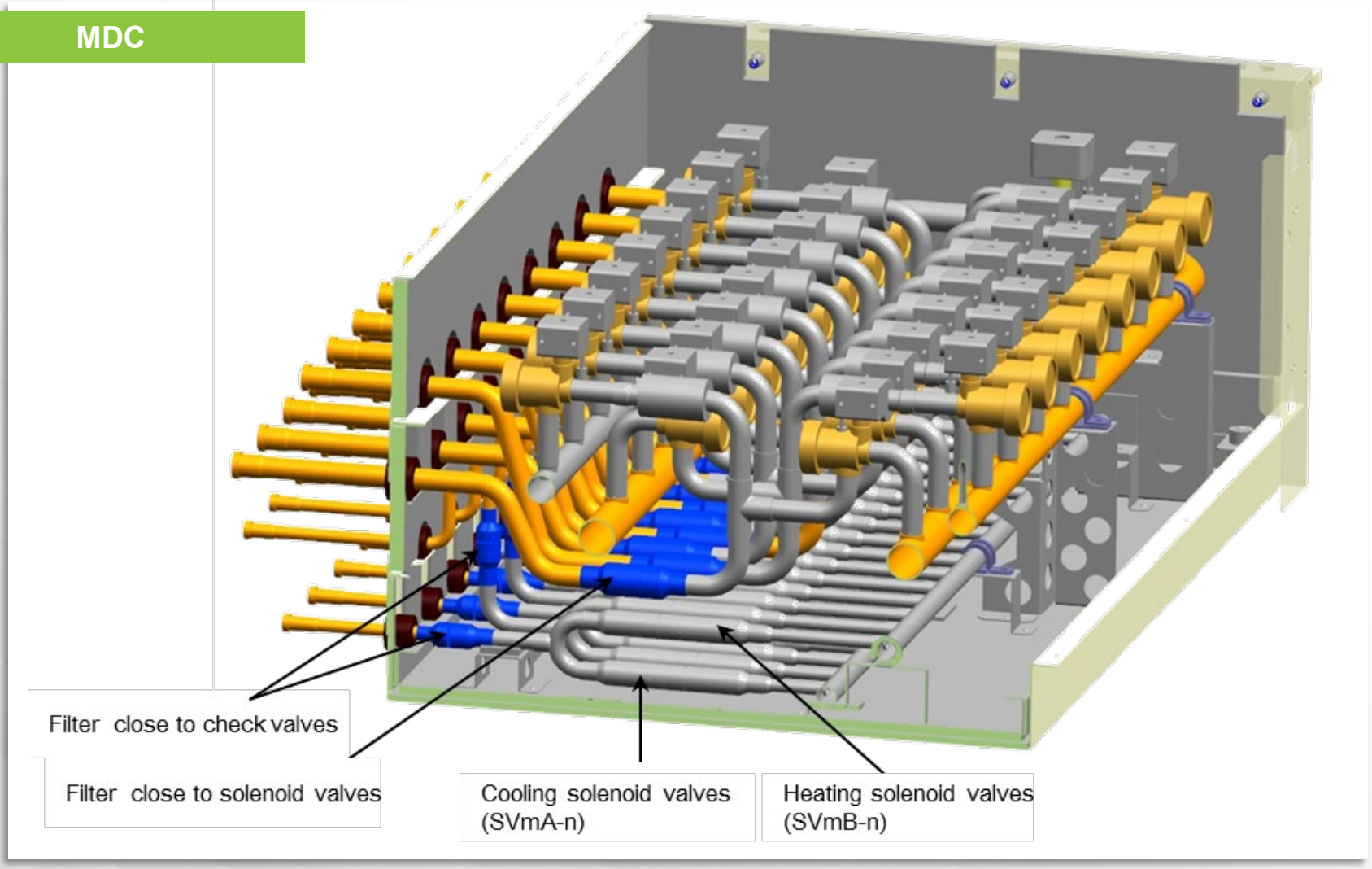
# PIPING AND COMPONENTS

## MDC

**MDC**

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# PIPING AND COMPONENTS

## MDC

### MDC

| Name | Symbol | | Major Function |
|---|---|---|---|
| | Refrigerant Circuit Diagram | Electrical Wiring Diagram | |
| Pressure sensor | PS1 | H-YL1 | Used to detect high pressure and control EXVB and EXVC |
| | PS2 | H-YL2 | Used to detect intermediate pressure and control EXVB and EXVC |
| | PS3 | L-YL1 | Used to detect low pressure and control EXVA |
| Thermistor | Tm1 | T1 | Used to calculate subcooling (SCm1) |
| | Tm2 | T2 | Used to calculate subcooling (SCm2) |
| | Tm3 | T3 | Used to calculate superheat degree (SHm3) |
| Solenoid valve | SVMC | | 1) Opens during cooling and defrosting operation<br>2) Abnormal High-pressure-rise prevention |
| | SVME | | Used for high-pressure prevention and high-temperature protection |
| | SVP | | 1) Superheat control in cooling mode<br>2) Used to control discharge superheat in heating mode |
| | SVmA-n ***Note** | | Provides refrigerant to indoor unit in cooling operation |
| | SVmB-n ***Note** | | Provides refrigerant to indoor unit in heating operation |
| Electronic expansion valve | EXVA | | Cooperate with SVP<br>1) Superheat control in cooling mode<br>2) Used to control discharge superheat in heating mode |
| | EXVB | | 1) Opens during cooling and defrosting operation<br>2) Pressure differential control during cooling main operation |
| | EXVC | | |

***Note**
SVmA-n: Cooling solenoid valve
SVmB-n: Heating solenoid valve

m, the micro-processor number of MDC board, can be in the range of 1 to 8.
n, the port No. of MDC unit, can be in the range of 1 to 16.

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# ODU Mode of Operation

VRF Technology

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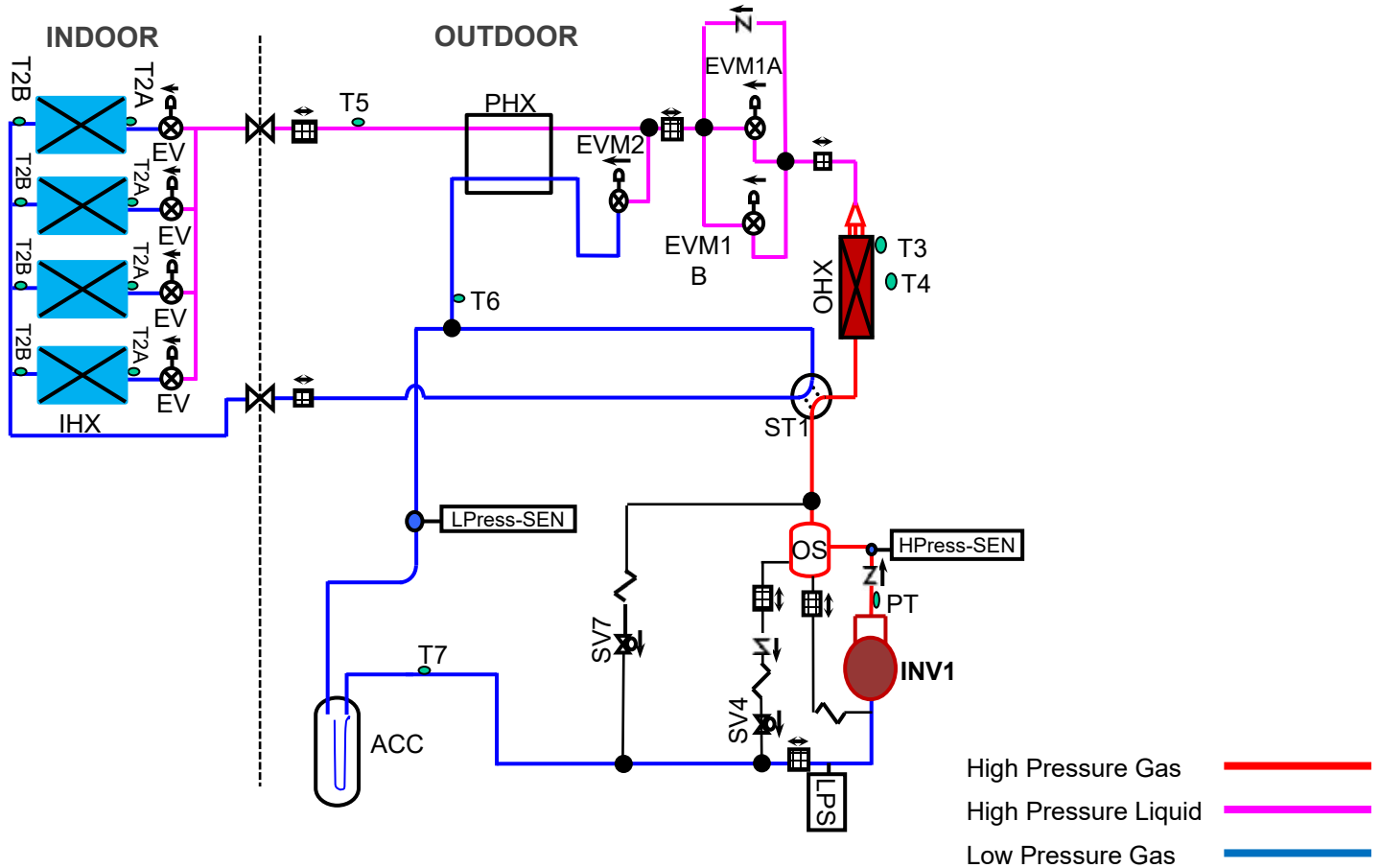
# ODU MODE OF OPERATION

## Heat Pump System

### Cooling Mode

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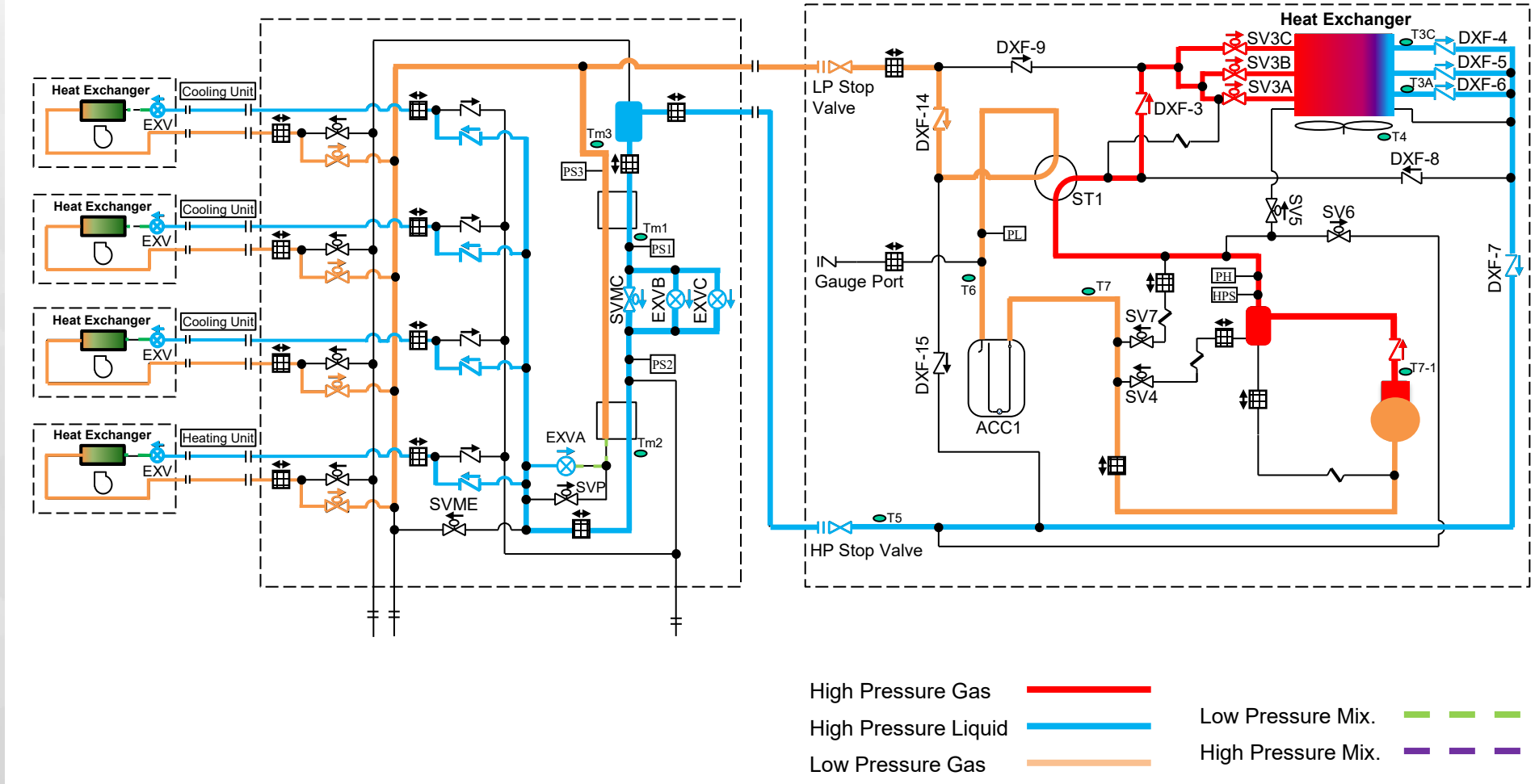
# ODU MODE OF OPERATION

## Heat Recovery System

### Cooling Only Mode

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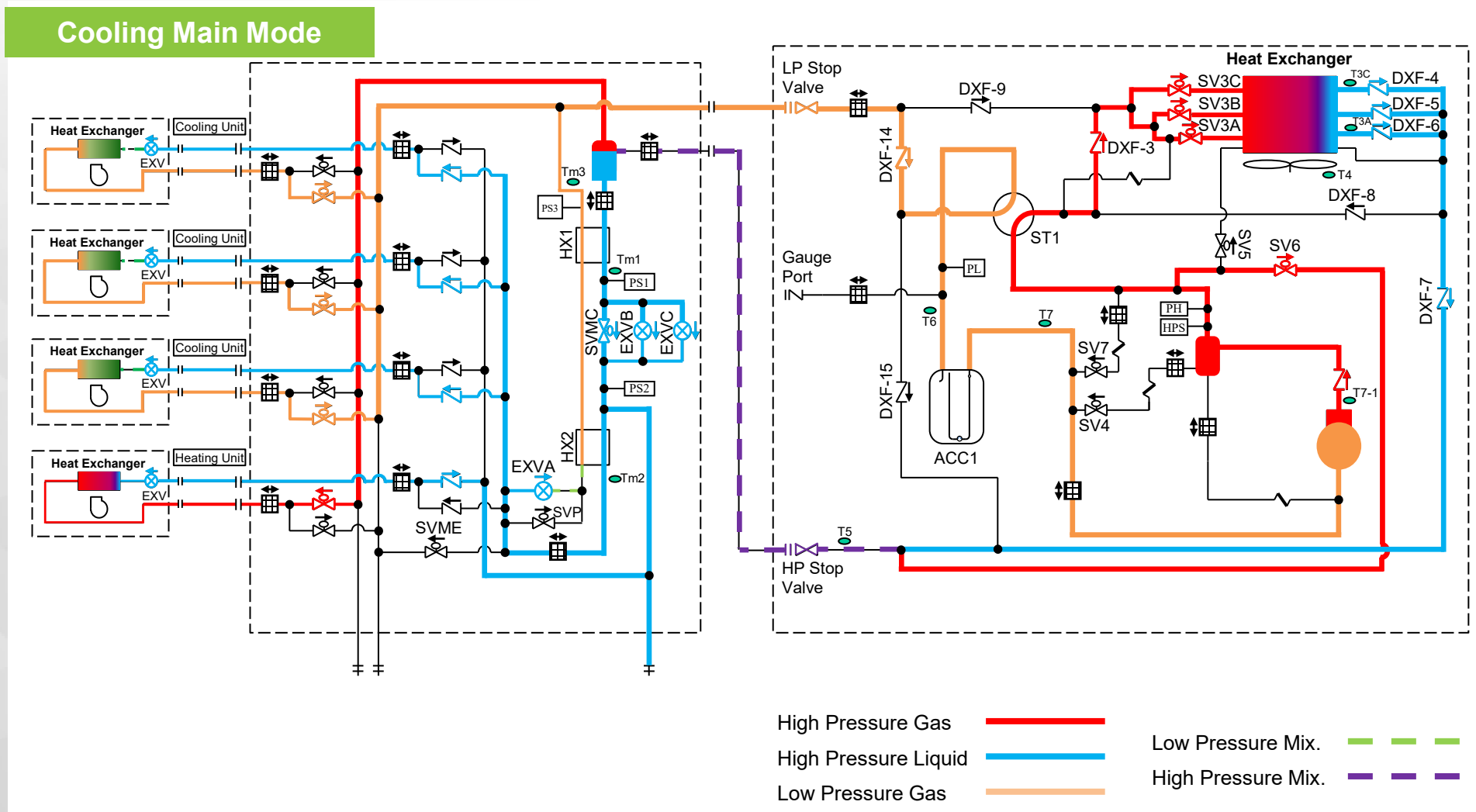
# ODU MODE OF OPERATION

## Heat Recovery System

### Cooling Main Mode

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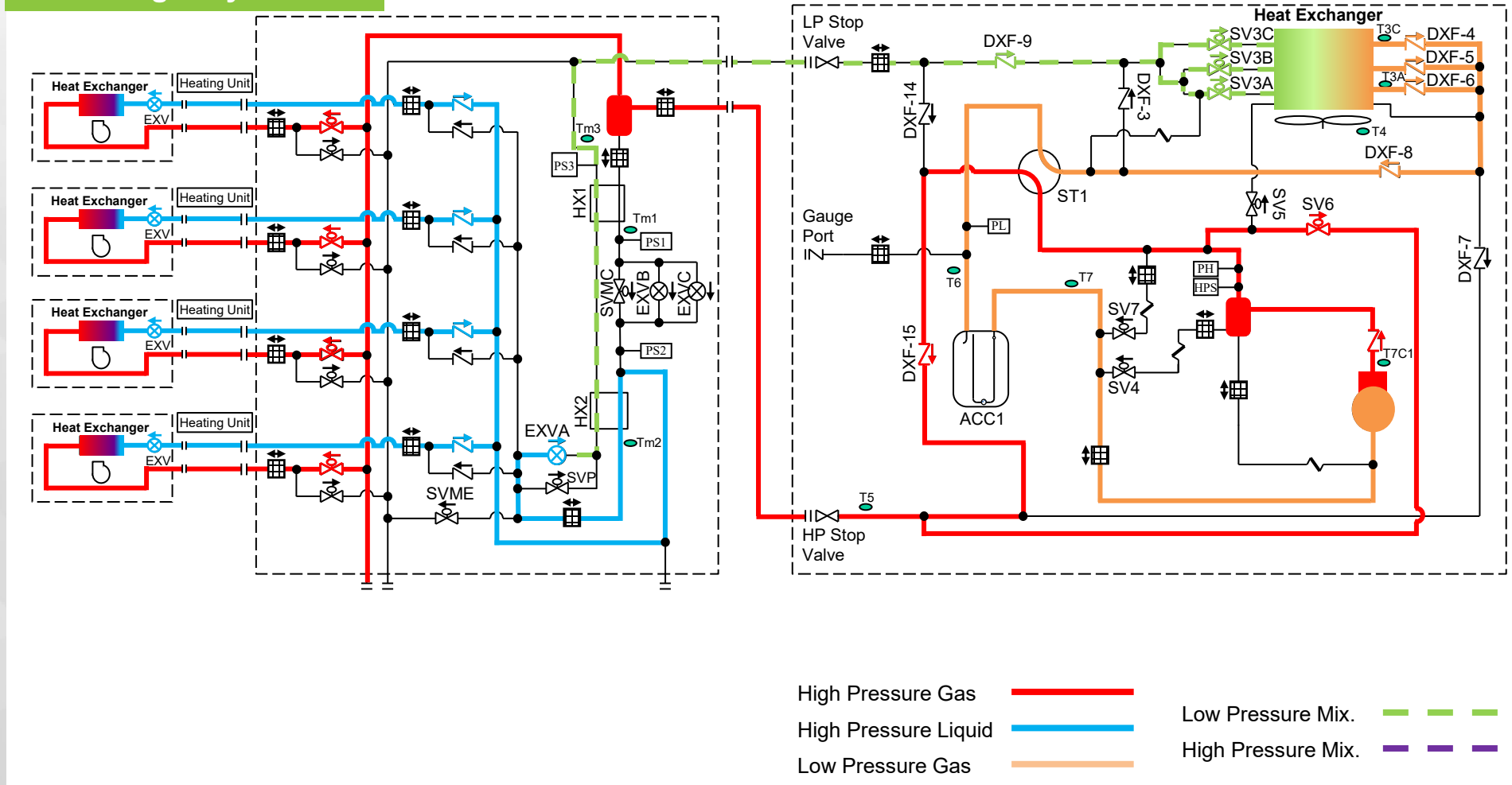
# ODU MODE OF OPERATION

## Heat Recovery System

### Heating Only Mode

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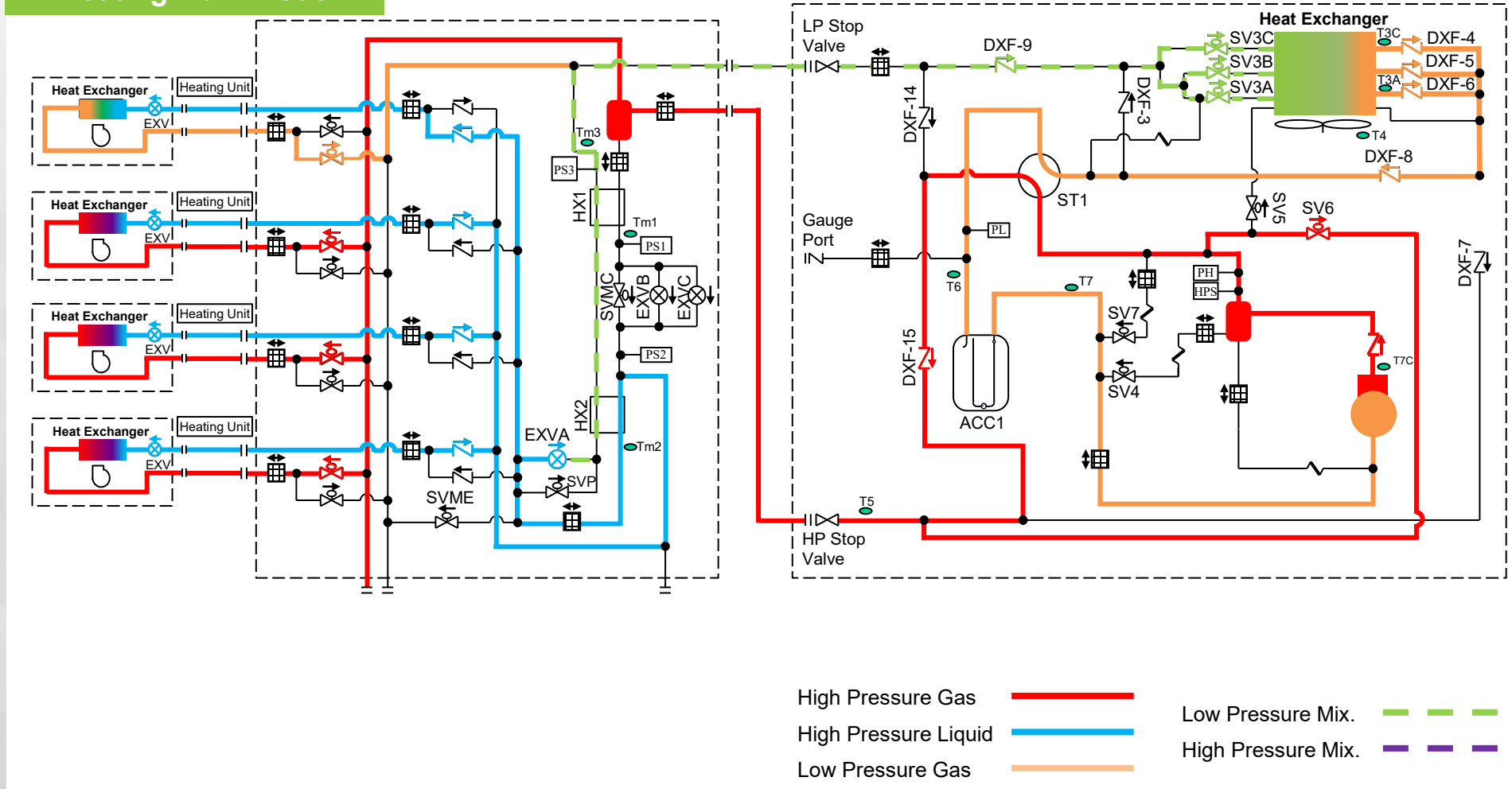
# ODU MODE OF OPERATION

## Heat Recovery System

### Heating Main Mode

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# Startup and Addressing

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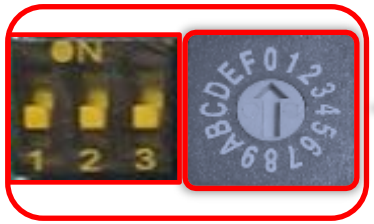
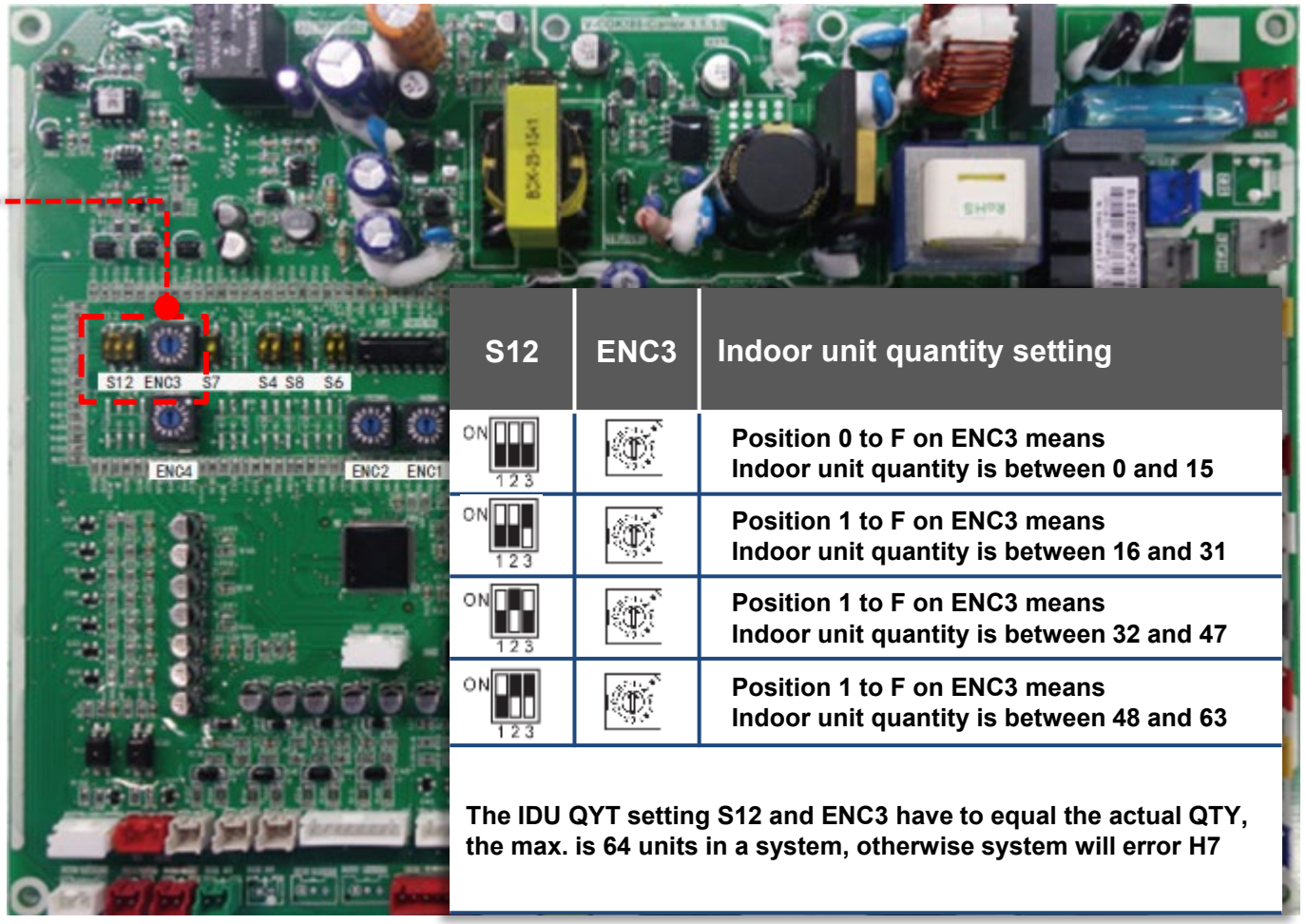
# STARTUP AND ADDRESSING

## Main Control Board

**S12+ENC3**




**IDU Quantity**




| S12 | ENC3 | Indoor unit quantity setting |
|---|---|---|
| ON 1 2 3 | | Position 0 to F on ENC3 means<br>Indoor unit quantity is between 0 and 15 |
| ON 1 2 3 | | Position 1 to F on ENC3 means<br>Indoor unit quantity is between 16 and 31 |
| ON 1 2 3 | | Position 1 to F on ENC3 means<br>Indoor unit quantity is between 32 and 47 |
| ON 1 2 3 | | Position 1 to F on ENC3 means<br>Indoor unit quantity is between 48 and 63 |

**The IDU QYT setting S12 and ENC3 have to equal the actual QTY, the max. is 64 units in a system, otherwise system will error H7**

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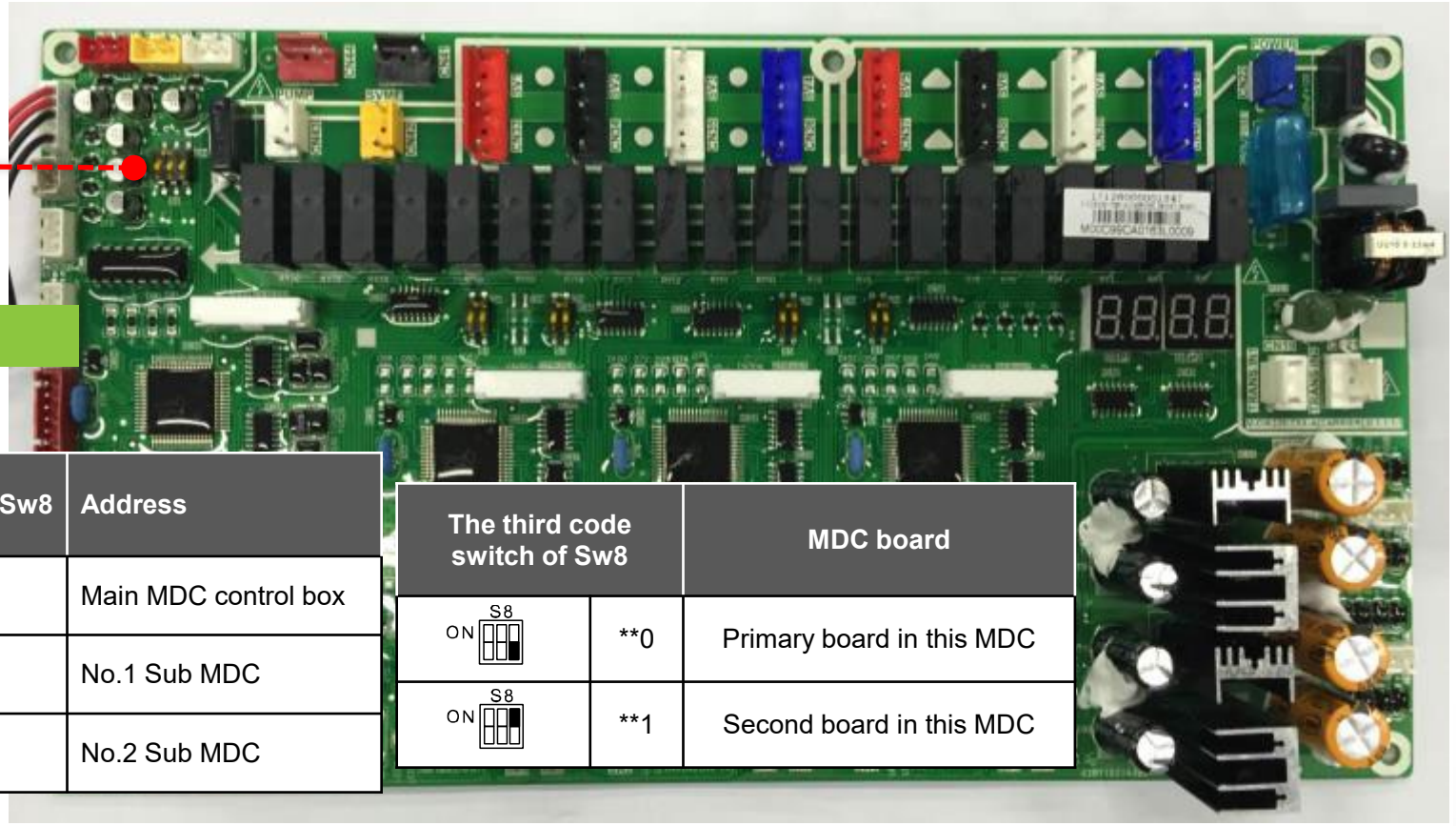
# STARTUP AND ADDRESSING

## Main Control Board (Heat Pump)

### MDC control board with 8 chips for 40VMD006, 008, 010, 016M(S)—3

**Sw8**

Address



**MDC Settings**

| The first two code switch of Sw8 | Address |
|---|---|
|  | 00* | Main MDC control box |
|  | 01* | No.1 Sub MDC |
|  | 10* | No.2 Sub MDC |

| The third code switch of Sw8 | | MDC board |
|---|---|---|
|  | **0 | Primary board in this MDC |
|  | **1 | Second board in this MDC |

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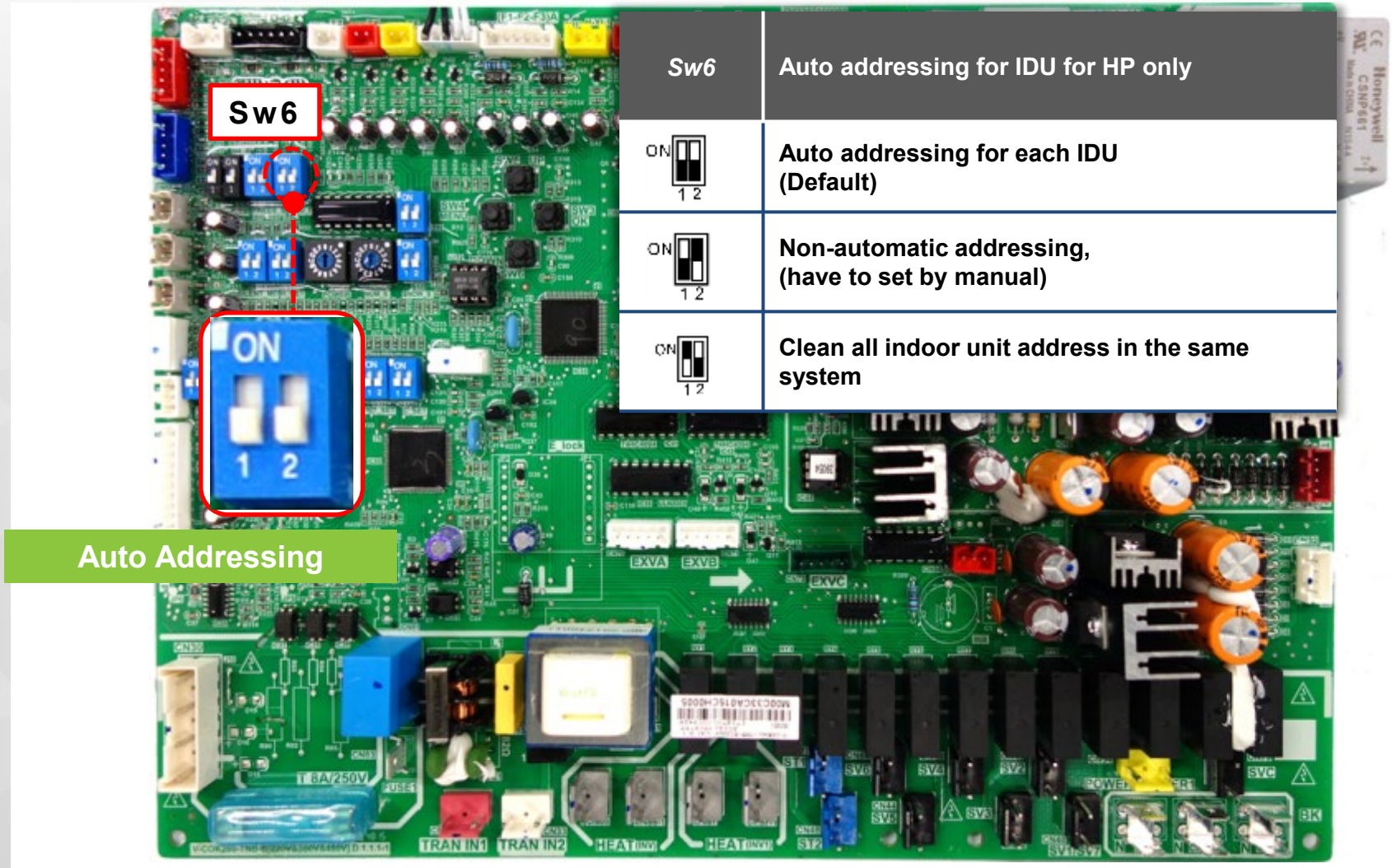
# STARTUP AND ADDRESSING

## Main Control Board




| *Sw6* | Auto addressing for IDU for HP only |
|---|---|
| ON 1 2 | Auto addressing for each IDU (Default) |
| ON 1 2 | Non-automatic addressing, (have to set by manual) |
| ON 1 2 | Clean all indoor unit address in the same system |



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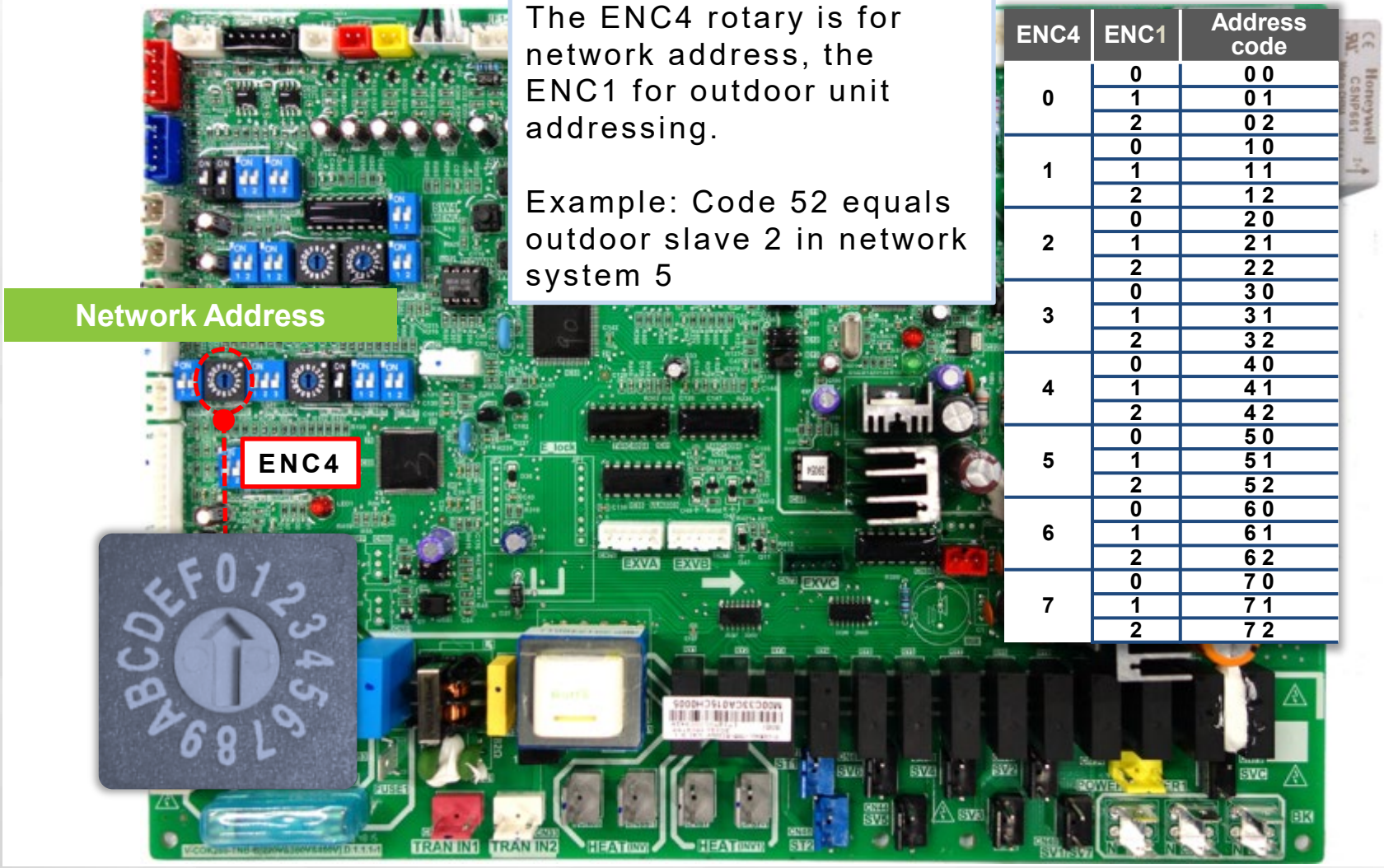
# STARTUP AND ADDRESSING

## Main Control Board




The ENC4 rotary is for network address, the ENC1 for outdoor unit addressing.

Example: Code 52 equals outdoor slave 2 in network system 5

| ENC4 | ENC1 | Address code |
|---|---|---|
| 0 | 0 | 0 0 |
| | 1 | 0 1 |
| | 2 | 0 2 |
| 1 | 0 | 1 0 |
| | 1 | 1 1 |
| | 2 | 1 2 |
| 2 | 0 | 2 0 |
| | 1 | 2 1 |
| | 2 | 2 2 |
| 3 | 0 | 3 0 |
| | 1 | 3 1 |
| | 2 | 3 2 |
| 4 | 0 | 4 0 |
| | 1 | 4 1 |
| | 2 | 4 2 |
| 5 | 0 | 5 0 |
| | 1 | 5 1 |
| | 2 | 5 2 |
| 6 | 0 | 6 0 |
| | 1 | 6 1 |
| | 2 | 6 2 |
| 7 | 0 | 7 0 |
| | 1 | 7 1 |
| | 2 | 7 2 |



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# STARTUP AND ADDRESSING

## Startup Procedure

Check work prior to turning power supply ON. Use the following procedure to conduct the initial test operation after installation.

**STEP 1**: *Check the power wiring and communication cable connection*
Does the power wires meet NEC code and local code?
Is the grounding work completed?
Are PQE connectors installed properly?

**STEP 2:** *Check on refrigerant piping and insulation*
Are the piping sizes correct?
Are all refrigeration lines insulated properly?
If condensate lines are susceptible to sweating, verify they are insulated.

**STEP 3**: *Pressure test and vacuum test*
Have the pressure test and the vacuum been conducted according to the procedure in the Installation Manual?

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# STARTUP AND ADDRESSING

## Startup Procedure

**STEP 4**: *Refrigerant charge check*
Has the liquid line been measured?
Was the additional charge calculated with the liquid line lengths?
Was the correct amount of additional charge added?

**STEP** *5: Outdoor Rotary Switches.*
Does S12+ENC3 match the total number of indoor units?
For HP models, are the master and slaves defined?

**STEP 6**: *MDC Settings*
Are the addresses for main/sub MDC correct?
Are the dial switches for merged port correct?

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# STARTUP AND ADDRESSING

## Startup Procedure

**STEP 7**: *Check communication cables connection*
Are the PQ & Ground (use the shielded layer) communication cables all connected for outdoor unit, MDC and indoor units?

**STEP 8**: *Service valves*
Our outdoor unit service valves fully open?
If valves are present on indoor unit piping, have you verified they are open?

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# STARTUP AND ADDRESSING

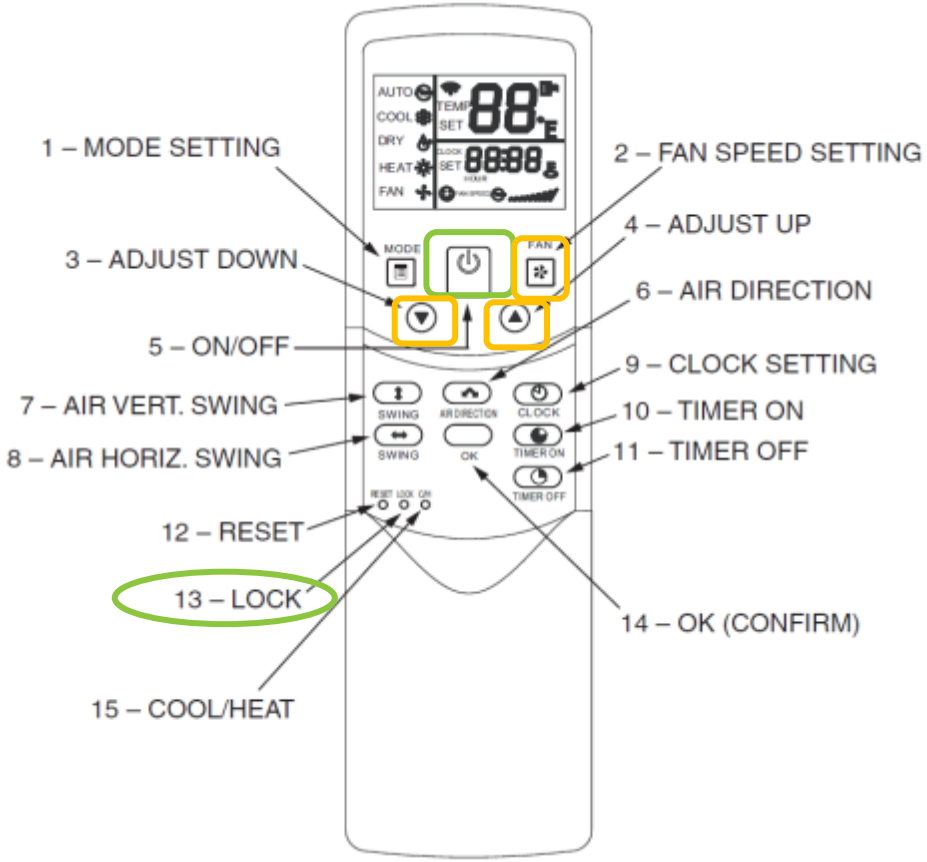
## Review - Manual Addressing

### STEP 1

Use tool to press and hold the “LOCK” button for more than 10se and press ⏻ button to activate

### STEP 2

Click ▲ or ▼ to select an address you want to set and press FAN to send the setting.

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# STARTUP AND ADDRESSING

## Review - Manual Addressing

### STEP 1

Press 

and 

together for 3sec into the right interface. It displays FE# 00 if there is no address for this indoor unit, otherwise displays current address of the indoor unit.


### STEP 2

Click 

or 

to change 00 to address number you want to set. Then press **OK** to confirm and exit the setting interface.

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# STARTUP AND ADDRESSING

## Review - Manual Addressing

**STEP 1** ☑

Press FAN and BACK simultaneously for 5sec to enter the interface for parameter settings.

**STEP 2** ☑

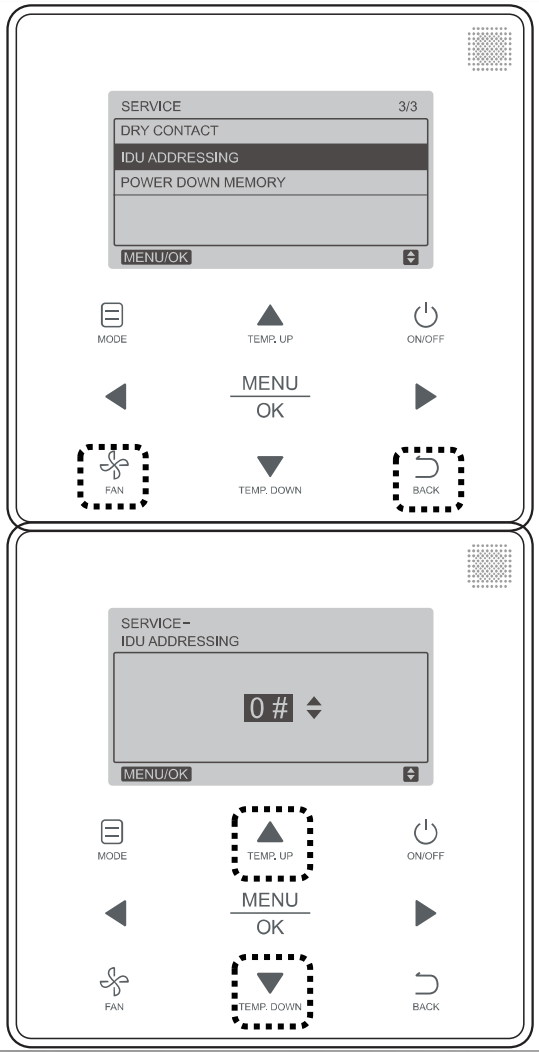
Press TEMP. UP or TEMP. DOWN to move the cursor down and choose IDU ADDRESSING, then MENU/OK to enter this setting.

**STEP 3** ☑

Press TEMP. UP or TEMP. DOWN to choose the address No. you want to set, then MENU/OK to send this address to the IDU.

**STEP 4** ☑

Press BACK twice or wait 30sec to automatically exit the parameter settings menu.

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5

# FURTHER TROUBLESHOOTING

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# WHAT IS TROUBLESHOOTING?

**Troubleshooting** is a form of problem solving, often applied to repair failed products or processes….Determining the most likely cause, **is a process of elimination.**

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# TROUBLESHOOTING

## First Steps

**Without taking off the front panel the following functions can be carried out from spot check board**

- Spot Check
- Code Error display
- Parameter setting
- etc

**Some troubleshooting must be check from main control board/ Compressor INV Board/Fan Board and so on.**

- Cooperating judgment from LED flashing or light off with code Errors

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# TROUBLESHOOTING

Error Codes

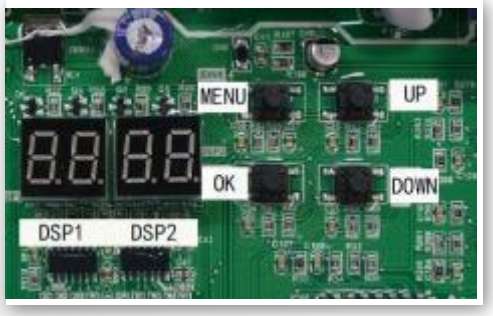
## TROUBLE DIAGNOSIS

### Checks and inspections

- When trouble has occurred in the AC system, an inspection code would be displayed on the numeric display.
- If the display has gone off, check the trouble by following the steps in “Checking the trouble history”

### Check the trouble history

- When trouble has occurred in the AC system, the trouble history can be checked no matter it is running or shut down.
- Push the Menu button at least 5sec and choose n31. Then the numeric LED displays history error code.




**Inspection code**

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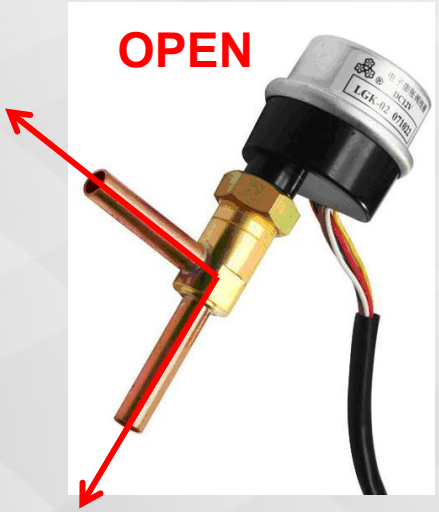
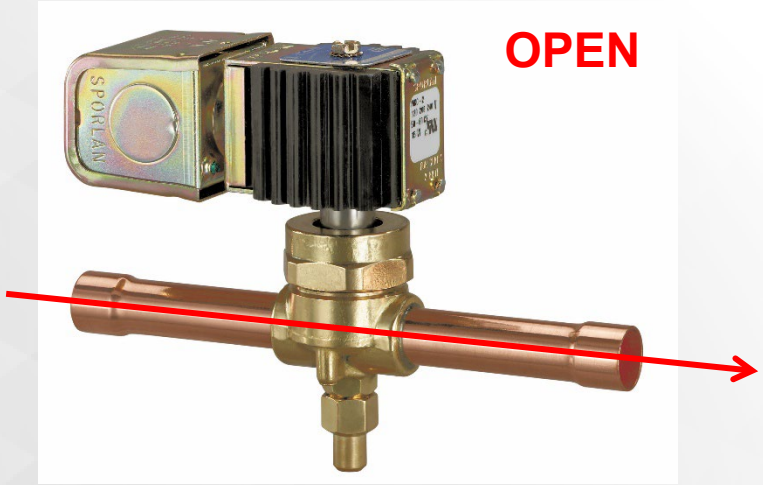
# TROUBLESHOOTING

## Solenoid Valve Control

This control is used to open solenoid valves and electronic expansion valves in the system. Make sure that the HP stop valve and LP stop valve are all fully opened. Then press **MENU** for 5sec. to the parameter setting interface, press “**Up/Down**” to select “n 23” and **OK** to confirm. The LED display r003 to activate this control. During the vacuum work, the high/low pressure sensor error and low-pressure protection are ineffective in this control. The four-way valve is OFF, and compressors or fans are prohibited to run.

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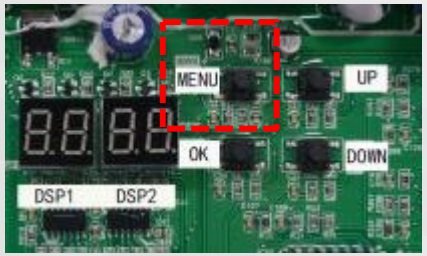
# TROUBLESHOOTING

## HR ODU Main Control Board

"SW4" **MENU** Button
Setting parameter




| Symbol | Function | Item | Description |
|---|---|---|---|
| n1_ | Special function for debug | n11 | Test operation mode |
| | | n16 | Forced defrosting |
| n2_ | Refrigerant recycle function | n21 | Refrigerant recycled to outdoor unit |
| | | n22 | Refrigerant recycled to indoor units |
| | | n23 | Refrigerant recycled to piping (Field vacuum to open valves) |
| n3_ | Error and version query | n31 | Historical malfunction query |
| | | n32 | Clear the historical malfunction |
| | | n33 | Version of fan inverter module |
| n4_ | Night time setting | n41 | 6/10h (Default) |
| | | n42 | 6/12h |
| | | n43 | 8/10h |
| | | n44 | 8/12h |
| n5_ | Silent mode setting | n51 | Night silent mode |
| | | n52 | Silent mode |
| | | n53 | Super silent mode |
| | | n54 | None silent mode (Default) |
| n6_ | Defrost mode setting | n61 | Easy to defrost |
| | | n62 | Standard mode (Default) |
| | | n63 | Hard to defrost |
| n7_ | Energy saving mode setting | n71 | Level 1 (Default) |
| | | n72 | Level 2 |
| | | n73 | Level 3 |
| | | n74 | Level 4 |
| | | n75 | Level 5 |
| | | n76 | Level 6 |

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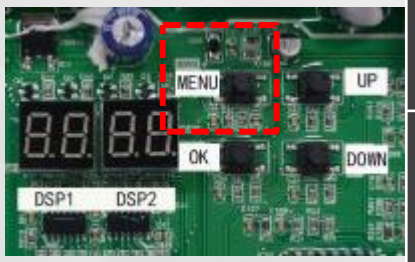
# TROUBLESHOOTING

## HR ODU Main Control Board

"SW4" **MENU** Button
Setting parameter




| Symbol | Function | Item | Description |
|---|---|---|---|
| n8_ | Static pressure mode setting | n81 | Standard static pressure mode (0in. Default) |
| | | n82 | Low static pressure mode |
| | | n83 | Medium static pressure mode |
| | | n84 | High static pressure mode |
| n9_ | Tes | n91 | Tes0=3C, automatically adjust (Default) |
| | | n92 | Tes0=0C, automatically adjust |
| | | n93 | Tes0=6C, automatically adjust |
| | | n94 | Low level 1 (Tes=9C), locked |
| | | n95 | Low level 2 (Tes=6C), locked |
| | | n96 | Medium level 1(Tes=3C), locked |
| | | n97 | Medium level 2 (Tes=0C), locked |
| | | n98 | High level (Tes0=-3C), locked |
| nA_ | Tcs | nA1 | Tcs0=48, automatically adjust (Default) |
| | | nA2 | Tcs0=51, automatically adjust |
| | | nA3 | Tcs0=45, automatically adjust |
| | | nA4 | Low level 1 (Tcs=42C), locked |
| | | nA5 | Low level 2 (Tcs=44C), locked |
| | | nA6 | Medium level 1 (Tcs=48C), locked |
| | | nA7 | Medium level 1 (Tcs=51C), locked |
| | | nA8 | High level (Tcs=54C), locked |
| nb_ | Temperature unit selection | nb1 | Temperature unit: C |
| | | nb2 | Temperature unit: F |
| nC_ | T4 value setting for auxiliary heating resource to start | nC1 | No limitation (Default) |
| | | nC2 | 5F |
| | | nC3 | 15F |
| | | nC4 | 25F |
| | | nC5 | 35F |
| | | nC6 | 45F |
| | | nC7 | 55F |
| | | nC8 | 65F |

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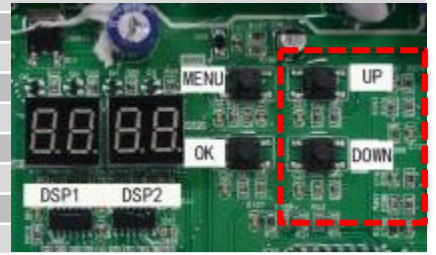
# TROUBLESHOOTING

## HR ODU Main Control Board

Spot check tables **(“SW5/SW6” Button or UP/DOWN**)

| Normal display | Description | Note |
|---|---|---|
| 0-- | Outdoor unit address | 0 |
| 1-- | Outdoor unit capacity | 6,8,10,……28Ton |
| 2-- | Modular outdoor unit Qty. | 1 |
| 3-- | Qty. setting of indoor units | Setting by ENC3+S12 |
| 4-- | Operation mode *1 | 0,2,3,5,6 |
| 5-- | Cooling capacity of indoor units | Horse power |
| 6-- | Heating capacity of indoor units | Horse power |
| 7-- | Total capacity demand of outdoor units | Compressor freq. step |
| 8-- | Speed of Fan A | Actual fan speed |
| 9-- | Speed of Fan B | Actual fan speed |
| 10-- | State of the outdoor heat exchanger | |
| 11-- | Condenser temp. (T3) | Actual value (The lowest of T3A and T3C) |
| 12-- | Ambient temp. (T4) | Actual value |
| 13-- | Inlet temp. of accumulator (T6) | Actual value |
| 14-- | Suction temp. (T7) | Actual value |
| 15-- | High pressure stop valve pipe temp. (T5) | Actual value |
| 16-- | Discharge temp. of compressor A | Actual value |
| 17-- | Discharge temp. of compressor B | Actual value |
| 18-- | Discharge temp. of compressor C | Actual value |
| 19-- | Heat sink temp. of compressor inverter | Actual value |
| 20-- | Saturated temp. of the discharge pressure | Actual value |
| 21-- | Saturated temp. of the suction pressure | Actual value |
| 22-- | Current of compressor A | Actual value |
| 23-- | Current of compressor B | Actual value |
| 24-- | Current of compressor C | Actual value |
| 25-- | High pressure | Actual value=Display value x0.1 MPa |
| 26-- | Low pressure | Actual value=Display value x0.01 MPa |
| 27-- | Objective evaporating temp. (TES) | Actual value |
| 28-- | Objective condensing temp. (TCS) | Actual value |
| ----- | ..... | ..... |

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# TROUBLESHOOTING

## Error Codes (Heat Recovery ODU)

| Code | Definition | Legend |
|---|---|---|
| 0 E1 | Phase loss error | |
| 0 E2 | Comm. fault with MDC and indoor unit | |
| 0 E4 | T3 or T4 temperature sensor error | |
| 0 E5 | Voltage protection | |
| 0 H0/20 H0 | Comm. error between Main control board and compressor INV.board | |
| 0 H1 | Comm. error between main control chip and communication chip on main board | |
| 0 H7 | Quantity of indoor units not match with setting in main board | ODU can't restart with 0 H7 |
| 0 H8 | High pressure sensor error | |
| 0 Hb | Low pressure sensor error | |
| 0 HC | The ODU capacity setting does not match the model of outdoor unit | |
| 0 F4 | T6 temp. sensor error | |
| 0 F5 | T7 temp. sensor error | |
| 0 F8 | MDC malfunction | |
| 0 P1 | 1) Current leakage(Be careful) or High pressure protection<br>2) Discharge temperature switch or high pressure protection | |
| 0 P2/0 H5 | Low pressure protection | ODU can't restart with 0 H5 |
| 0 P3 | Over current protection of Compressor | |
| 0 P4/0 H6 | Discharge temp. protection | ODU can't restart with 0 H6 |
| 0 P5 | Condenser temperature protection | |
| 0 P9/0 H9 | DC fan protection | ODU can't restart with 0 H9 |
| 0 PL/0 C7 | Inverter module temperature (Tf1, Tf2 or Tf3) protection | ODU can't restart with 0 C7 |
| 0 PP/0 F0 | Wet compression protection | ODU can't restart with 0 F0 |
| L0~L9 & 0H4/20H4 | Compressor INV module protection | ODU can't restart with *0 H4 |

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# TROUBLESHOOTING

Error Codes

## MDC UNIT FOR HR SYSTEM

| Code | Definition |
|---|---|
| S E0 | Comm. error with outdoor unit |
| S E1 | Tm1 temperature sensor error |
| S E2 | Tm2 temperature sensor error |
| S E3 | Tm3 temperature sensor error |
| S E4 | High pressure sensor malfunction |
| S E5 | Medium pressure sensor malfunction |
| S E6 | Low pressure sensor malfunction |
| S EP | Float switch error |
| S P1 | High pressure(PS1) protection |
| SC ER * | Commissioning test failure |
| no Id | No indoor unit under main chip (Indoor No.1) |
| no A0 | Faulty address for MDC |
| CS x | Indoor capacity overload under indoor No.y (y=x+1) |

* For commissioning test, if the main MDC DSP display “SC En”, which means commissioning test finish successfully.

The power must be cut off and on again, then the system can start again.

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# TROUBLESHOOTING

## Error Codes (Heat Pump ODU)

| Code | Definition |
|---|---|
| 0 E0 | Communication fault between ODUs (Display on the slave unit only) |
| 0 E2 | Comm. Fault between ODU and IDU |
| 0 E4 | T3 or T4 temperature sensor error |
| 0 E5 | Voltage protection |
| 0 E8 | Incorrect ODU address (Address≥3) |
| x H0 | Comm. error between Main control board and compressor INV board |
| 0 H1 | Comm. error between main control chip and communication chip |
| 0 H2 0 H3 | Unmatched ODU amounts compared with initial status (Display on the header unit only) |
| 0 H7 | Quantity of indoor units not match with setting in main board |
| 0 H8 | High pressure sensor error |
| 0 Hb | Low pressure sensor error |
| x0 F1 | PTC fault |
| 0 F3 | Temp. sesor (T5) error |
| 0 F4 | Temp. sensor (T6) error |
| 0 F5 | Temp. sensor (T7) error |
| 0 F6 | EEV error |
| x0 Hd | Slave unit fault (x is the No. of slave unit) |
| 0 P1 | Current leakage(Be careful) or High pressure protection |
| 0 P2/0 H5 | Low pressure protection |
| x0 P3 | Over current protection of Compressor |
| 0 P4/0 H6 | Discharge temp. protection |
| 0 P5 | High pipe temp. protection |
| 0 P9/0 H9 | DC fan protection |
| 0 PL/0 C7 | Module temp. protection |
| L0~L9 & 0 H4/20 H4 | Compressor INV module protection |
| A tL | Ambient temperature operation limited |

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# TROUBLESHOOTING

Error Codes

## INDOOR UNIT

| Code | Content |
|---|---|
| FE | No address to this indoor unit |
| dd | Mode conflict |
| E1 | Comm. Error with outdoor unit |
| E2 | Temp. sensor (T1) error |
| E4 | Temp. sensor (T2B) error |
| E5 | Temp. sensor (T2A) error |
| E6 | DC fan error |
| E7 | EEPROM error |
| E9 | Comm. Error with wired controller |
| Eb | EEV error |
| Ed | Outdoor unit error |
| EE | Water level alarm |

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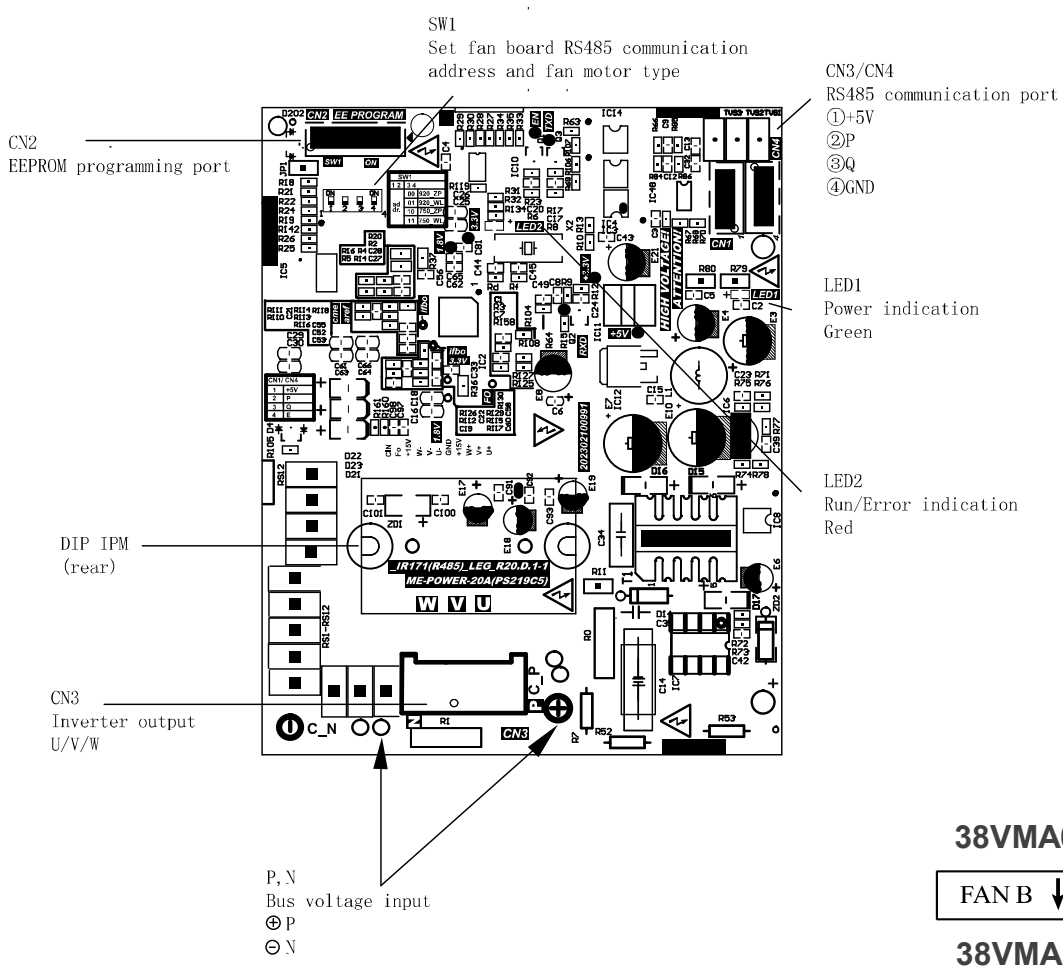
# TROUBLESHOOTING

## Fan Board (230V)




**38VMA***RDS5(L)-1 (208/230V-3Ph-60Hz)**

| Depiction | Flashing times of LED2 when Error comes, then stops 3sec |
|---|---|
| EEPROM error | 1 |
| Startup failure | 2 |
| Executive error of MCE | 3 |
| Processor error from MCE | 4 |
| Overcurrent for Motors | 5 |
| Extremely high DC voltage | 6 |
| Over DC voltage | 7 |
| Low DC voltage | 8 |
| Over speed for Motor | 9 |
| Zero speed for Motor | 10 |
| Phase loss for Motor | 11 |
| Over-speed for Catch spin | 12 |
| Over current for PFC | 13 |
| AD communication failure | 14 |

**38VMA072, 096, 120RD**


**38VMA144, 168,192, 216, 240RD**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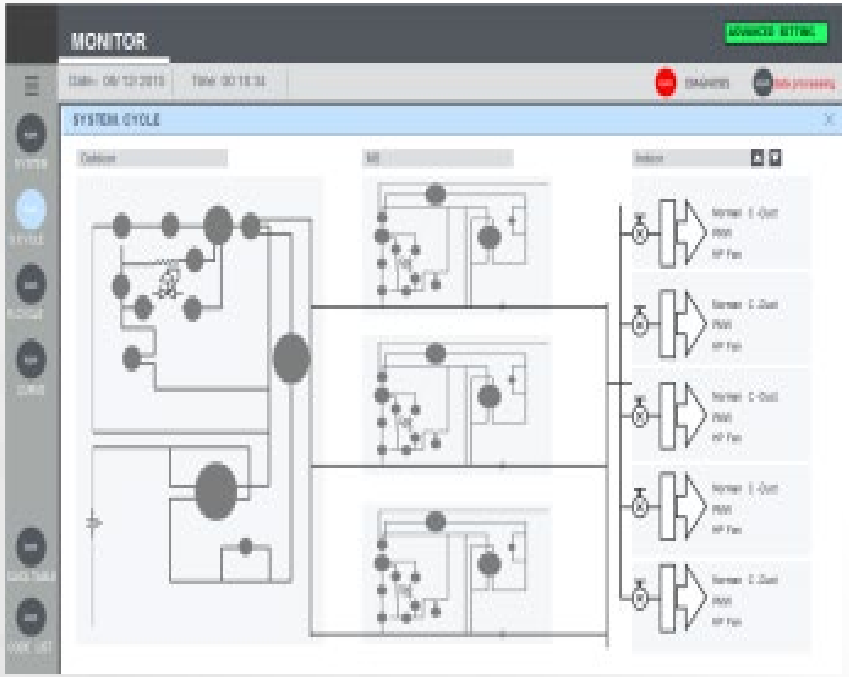
# TROUBLESHOOTING

## Service Interface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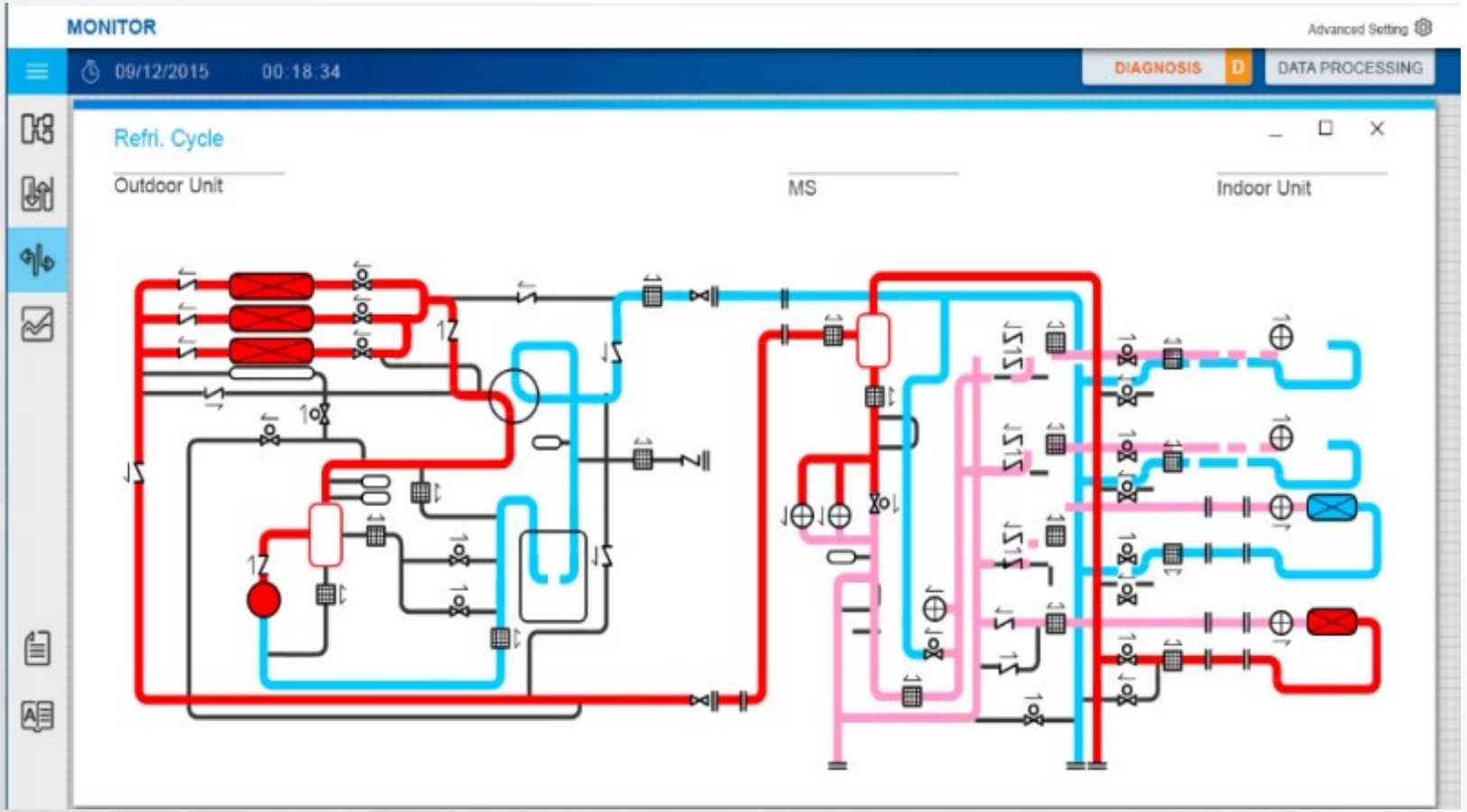
# TROUBLESHOOTING

## Service Interface

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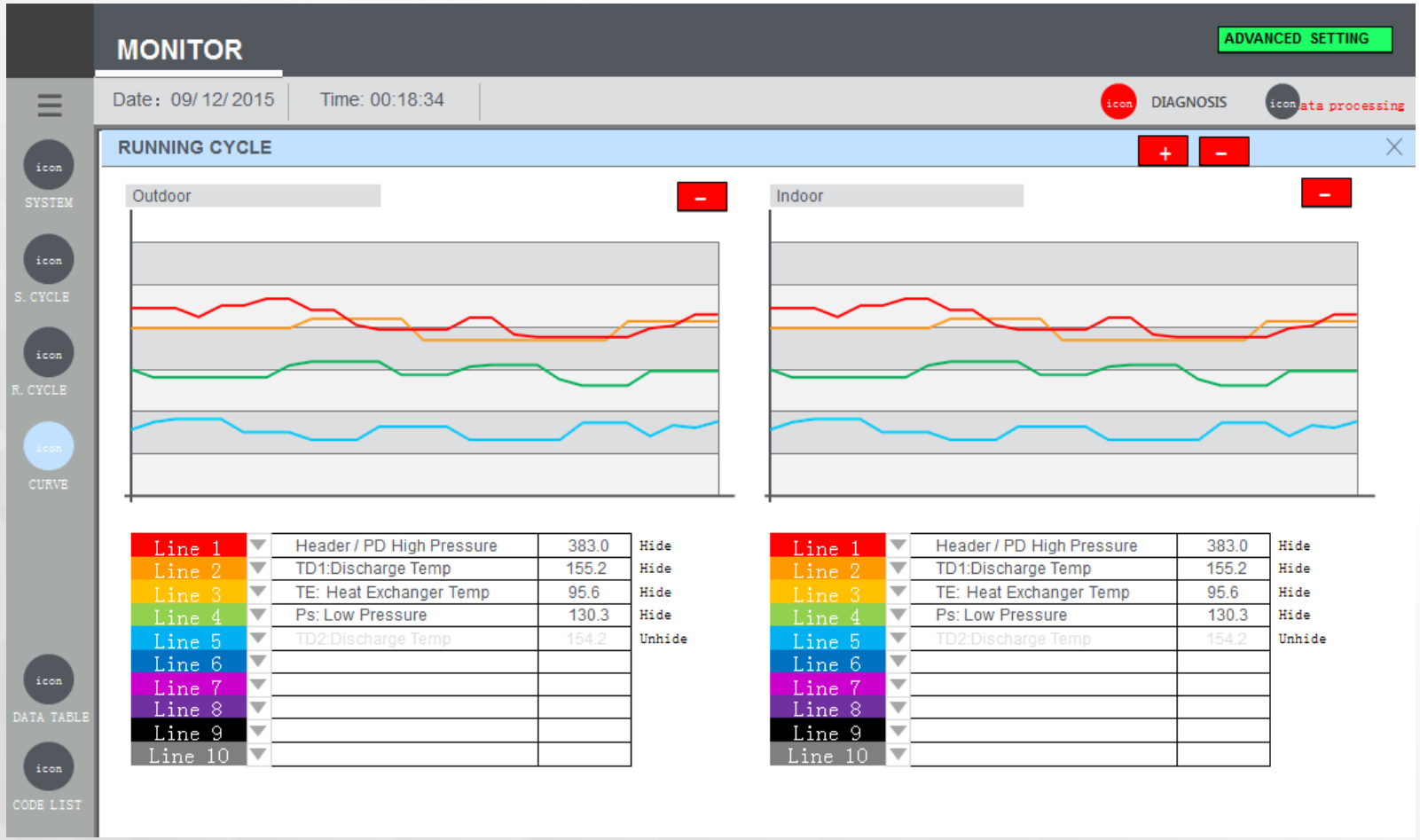
# TROUBLESHOOTING

## Service Interface

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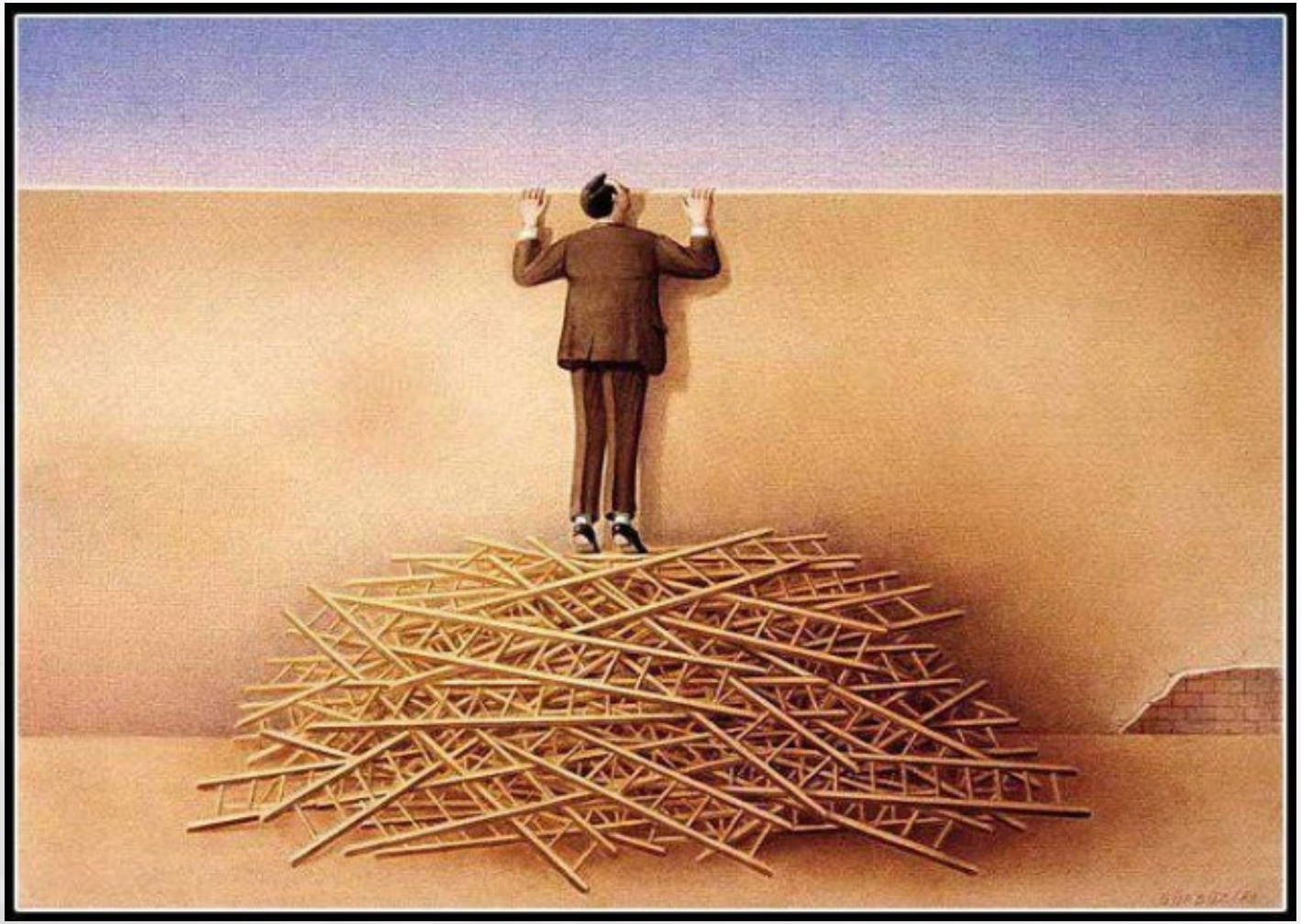
# FUNCTION AND OPERATION



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# THANK YOU!

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