HITACHI

Maintenance

Cooling & Heating

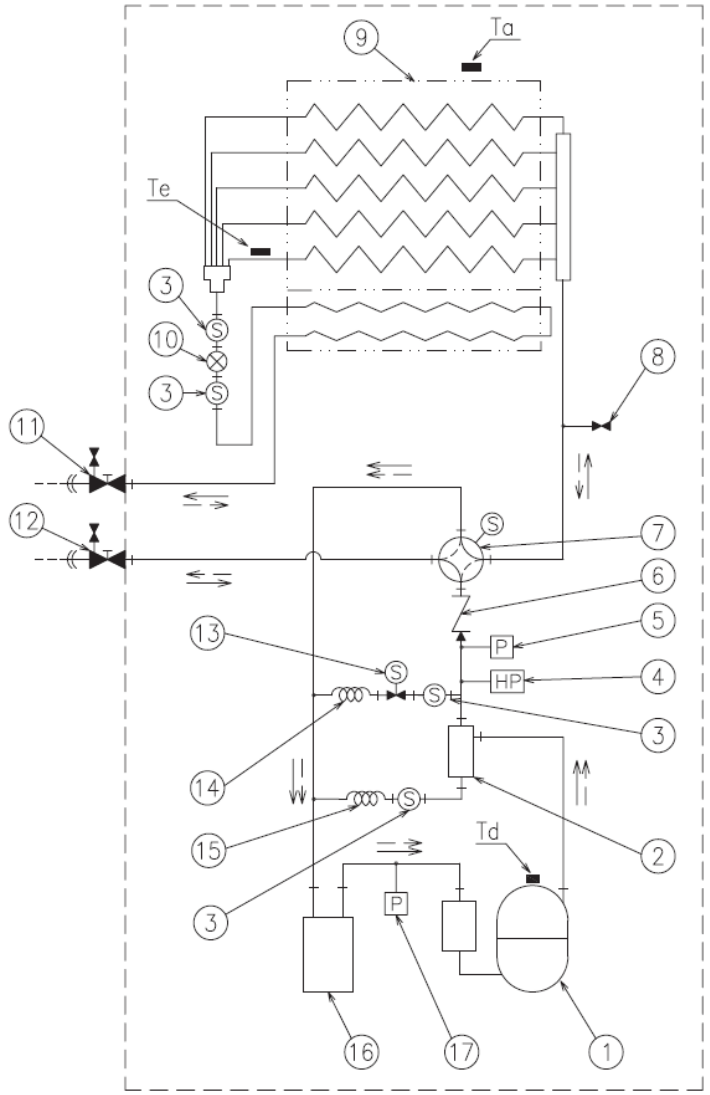
1. Refrigerant Cycle Description

- Heat Recovery
- Cooling Mode (2 Pipes & 3 Pipes)
- Heating Mode (2 Pipes & 3 Pipes)
- CH-Box unit Heating Mode
- CH-Box unit Mainly Cooling Mode
- CH-Box unit Cooling Mode

2. Refrigerant Cycle Description

Heat Pump

RAS-(4-5-6)FS(V)NME



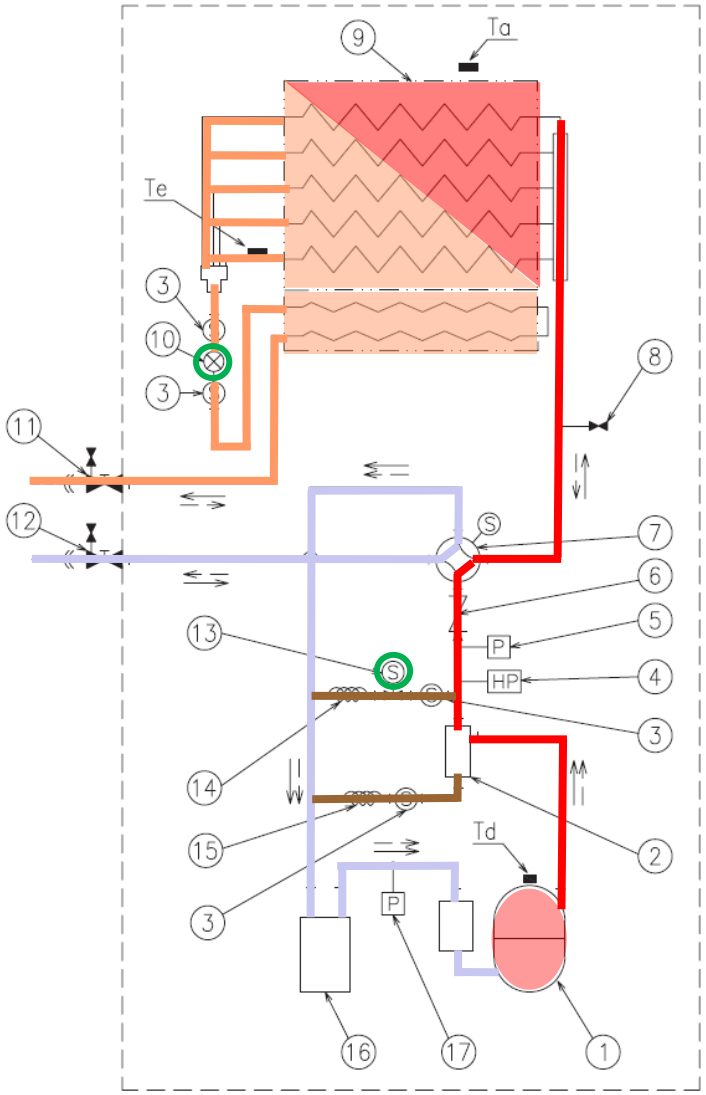
: Refrigerant flow direction (Cooling)
: Refrigerant flow direction (Heating)
: Field refrigerant Piping
: Flare connection
: Brazing connection
: Thermistor

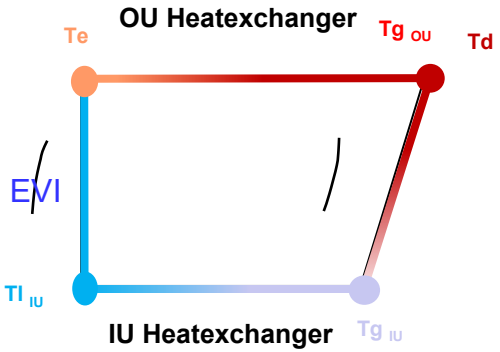
N°	Name of parts	N°	Name of parts	N°	Name of parts
1	Compressor	7	4-way valve	13	Solenoid valve
2	Oil separator	8	Check joint	14	Capillary (gas by-pass)
3	Strainer	9	Heat exchanger	15	Capillary (oil return)
4	Pressure switch (high pressure)	10	Expansion valve	16	Accumulator
5	Pressure switch (control)	11	Stop valve (liquid line)	17	Pressure sensor
6	Check valve	12	Stop valve (gas line)		

2. Refrigerant Cycle Description

Cooling Mode

RAS-(4-5-6)FS(V)NME





MV1: Fully Open (depending on ref. cycle condition to contol Pd)

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

Oil Supply: Always open

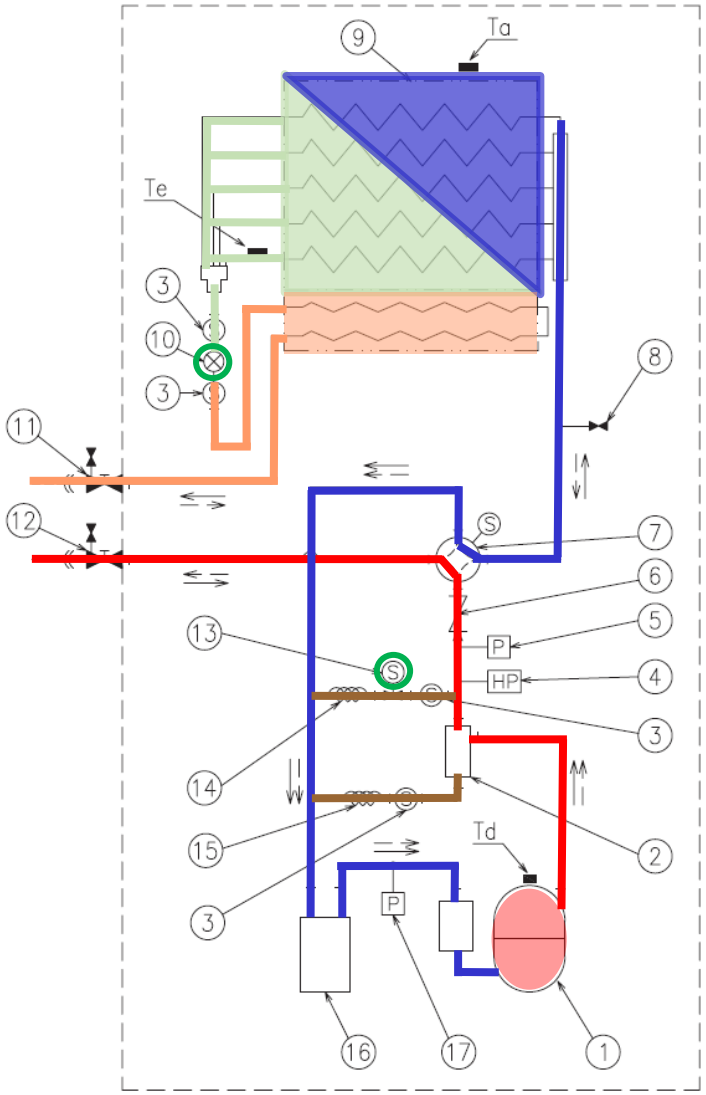
: *Refrigerant flow direction (Cooling)*
: *Refrigerant flow direction (Heating)*
: *Field refrigerant Piping*
: *Flare connection*
: *Brazing connection*
: *Thermistor*

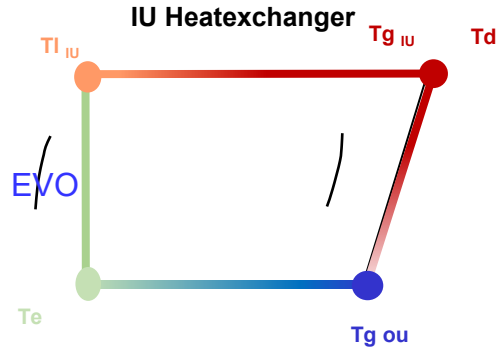
N°	Name of parts	N°	Name of parts	N°	Name of parts
1	Compressor	7	4-way valve	13	Solenoid valve
2	Oil separator	8	Check joint	14	Capillary (gas by-pass)
3	Strainer	9	Heat exchanger	15	Capillary (oil return)
4	Pressure switch (high pressure)	10	Expansion valve	16	Accumulator
5	Pressure switch (control)	11	Stop valve (liquid line)	17	Pressure sensor
6	Check valve	12	Stop valve (gas line)		

2. Refrigerant Cycle Description

Heating Mode

RAS-(4-5-6)FS(V)NME





MV1: Fully Open (depending on ref. cycle condition to contol Pd)

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

Oil Supply: Always open

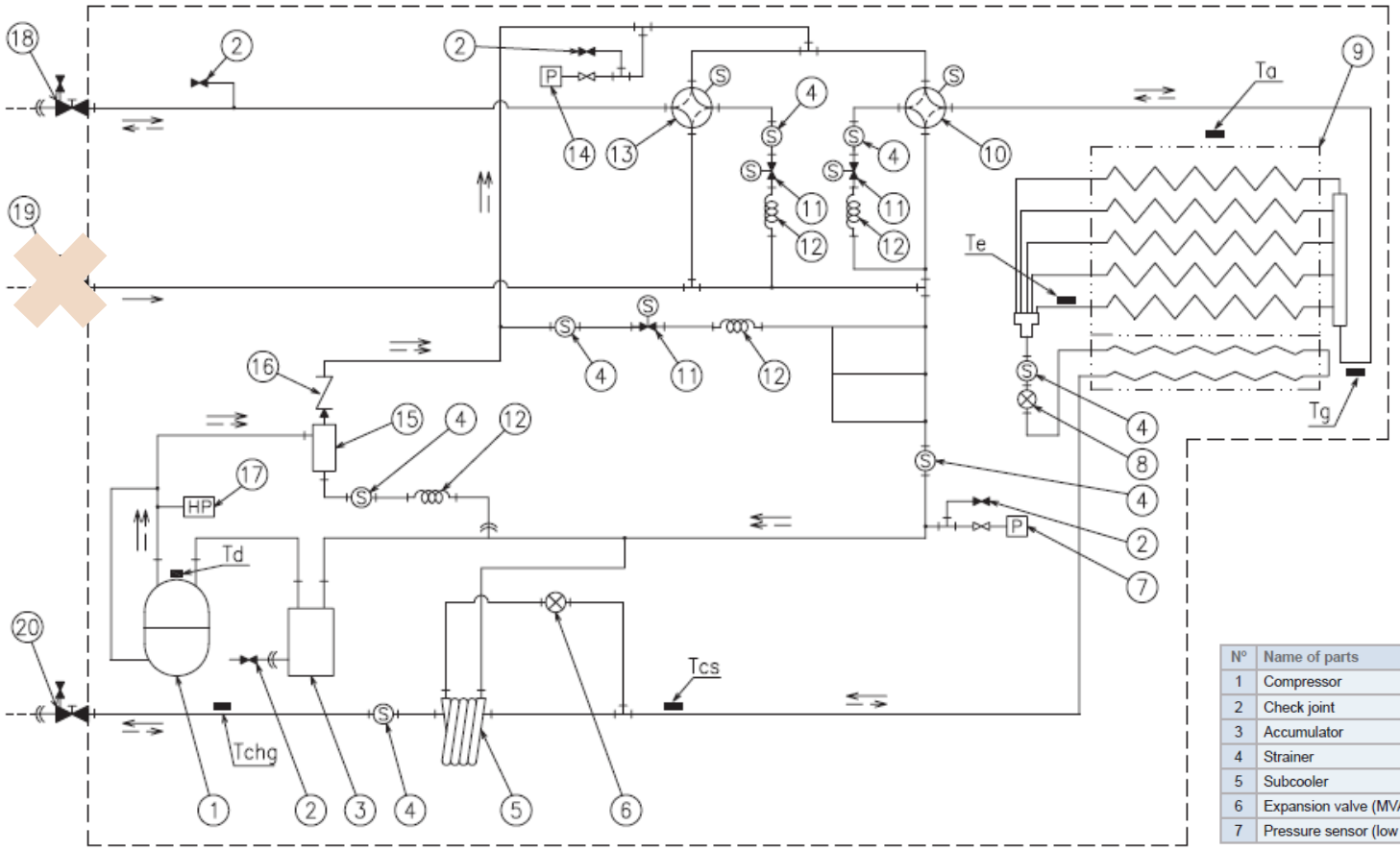
: *Refrigerant flow direction (Cooling)*
: *Refrigerant flow direction (Heating)*
: *Field refrigerant Piping*
: *Flare connection*
: *Brazing connection*
: *Thermistor*

N°	Name of parts	N°	Name of parts	N°	Name of parts
1	Compressor	7	4-way valve	13	Solenoid valve
2	Oil separator	8	Check joint	14	Capillary (gas by-pass)
3	Strainer	9	Heat exchanger	15	Capillary (oil return)
4	Pressure switch (high pressure)	10	Expansion valve	16	Accumulator
5	Pressure switch (control)	11	Stop valve (liquid line)	17	Pressure sensor
6	Check valve	12	Stop valve (gas line)		

2. Refrigerant Cycle Description

Heat Pump / Recovery

RAS-(8-10-12)FSXNME



N°	Name of parts	N°	Name of parts	N°	Name of parts
1	Compressor	8	Expansion valve (MV1)	15	Oil separator
2	Check joint	9	Heat exchanger	16	Check valve
3	Accumulator	10	4-way valve (RVR2)	17	Pressure switch (high pressure)
4	Strainer	11	Solenoid valve	18	Stop valve gas line (High/Low)
5	Subcooler	12	Capilary	19	Stop valve gas line (Low)*
6	Expansion valve (MVA)	13	4-way valve (RVR1)	20	Stop valve (Liquid line)
7	Pressure sensor (low pressure)	14	Pressure sensor (high pressure)		

: *Refrigerant flow direction (Cooling)*

: *Refrigerant flow direction (Heating)*

: *Field refrigerant Piping*

: *Flare connection*

: *Brazing connection*

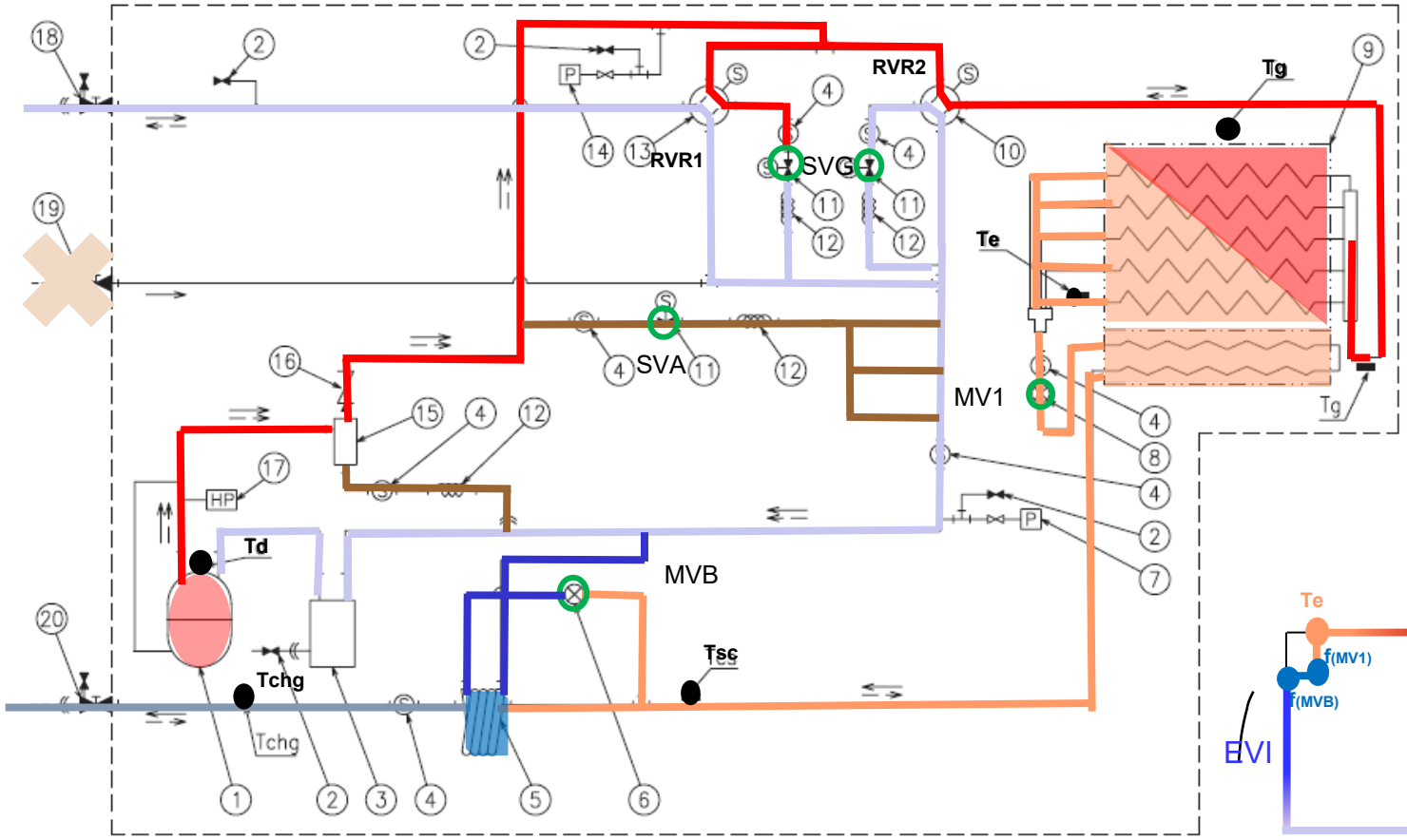
: *Thermistor*

2 Pipes Mode

2. Refrigerant Cycle Description

Cooling Mode 2 pipes

RAS-FSXNME



2 Pipes Mode

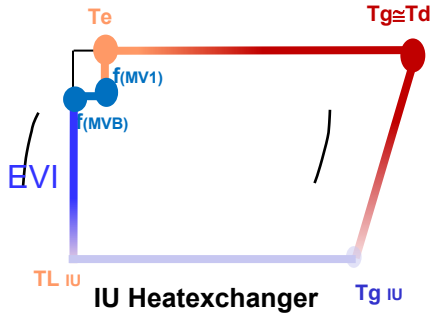
SVG: High & Low Pressure shut off valve
Compressor Run: ON
Compressor Stop: OFF

MV1: Fully Open (depending on ref. cycle condition to contol Pd)

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

MVB: Tsc - Tchg

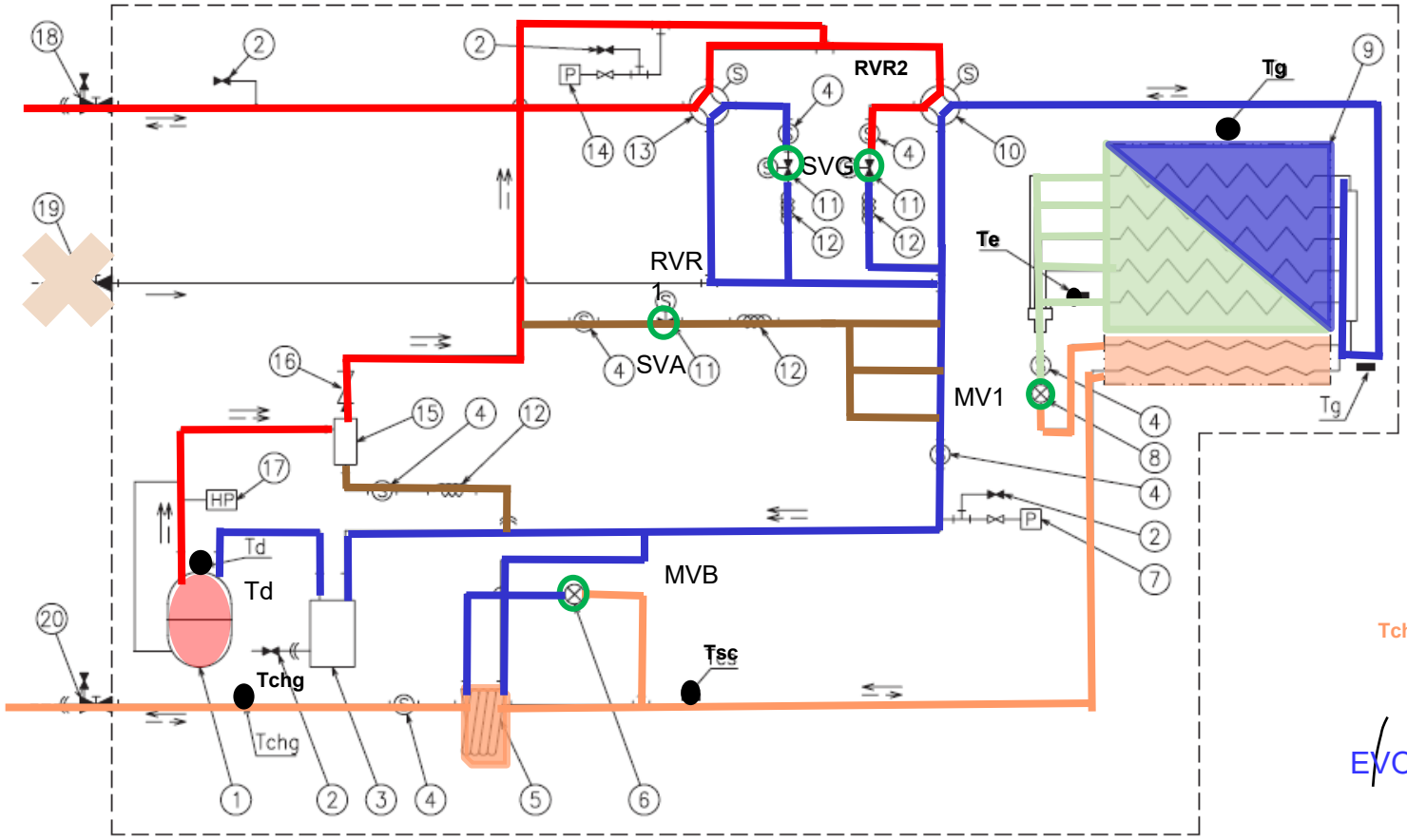
Oil Supply: Always open



2. Refrigerant Cycle Description

Heating Mode 2 pipes

RAS-FSXNME



2 Pipes Mode

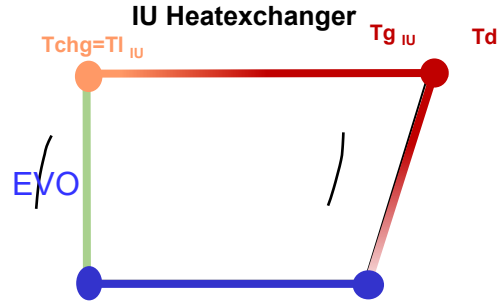
SVG: High & Low Pressure shut off valve
Compressor Run: ON
Compressor Stop: OFF

MV1: PI control on ref. cycle condition to achieve the value of OU HEX SH

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

MVB: Tchg-Tsc

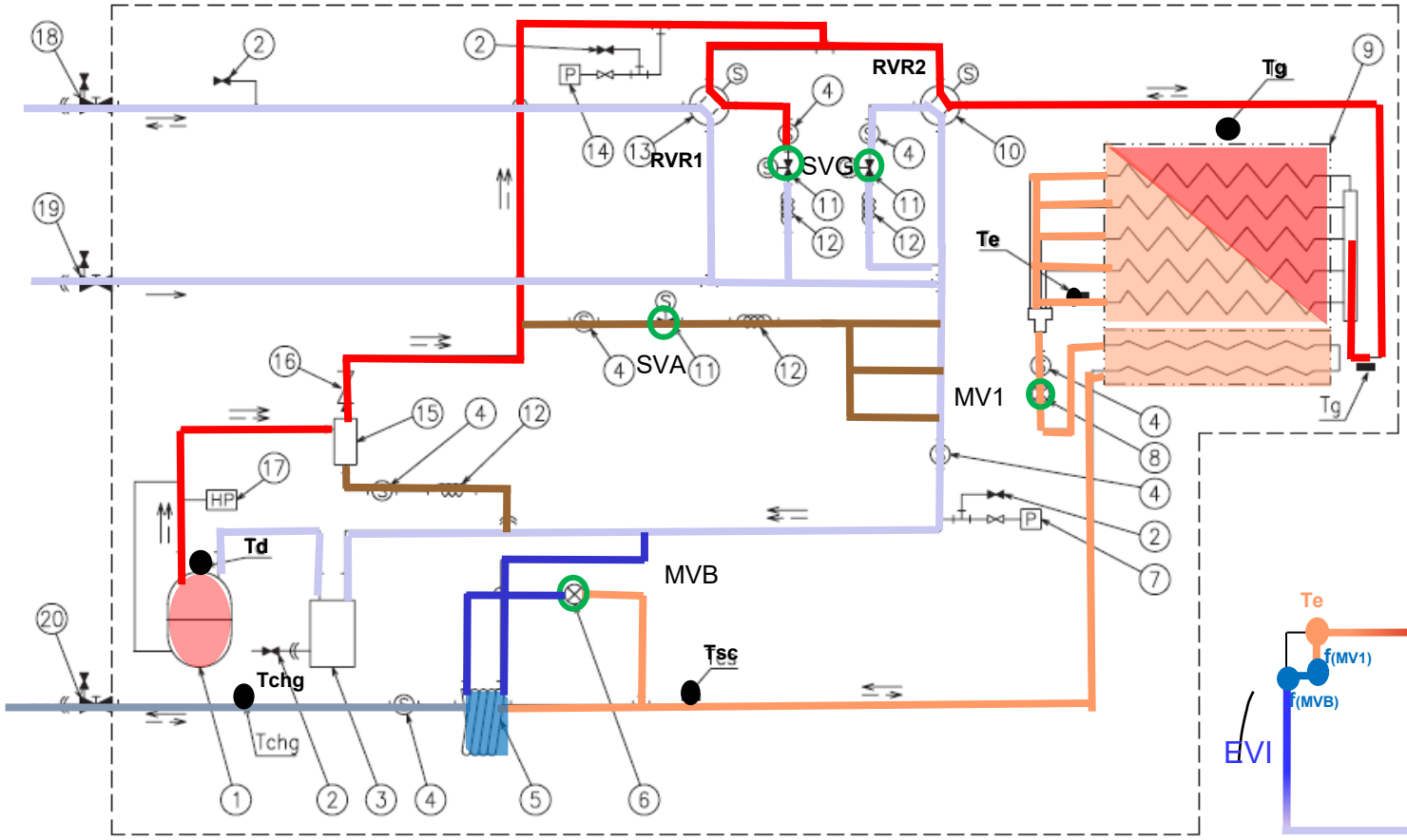
Oil Supply: Always open



2. Refrigerant Cycle Description

All Cooling Mode 3 pipes

RAS-FSXNME



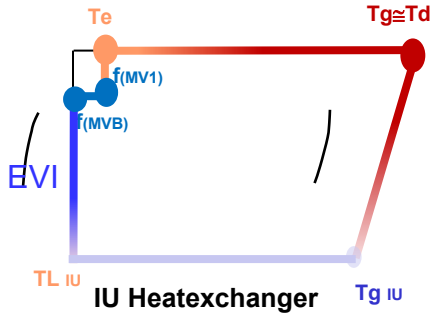
SVG: High & Low Pressure shut off valve
Compressor Run: ON
Compressor Stop: OFF

MV1: Fully Open (depending on ref. cycle condition to contol Pd)

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

MVB: Tsc - Tchg

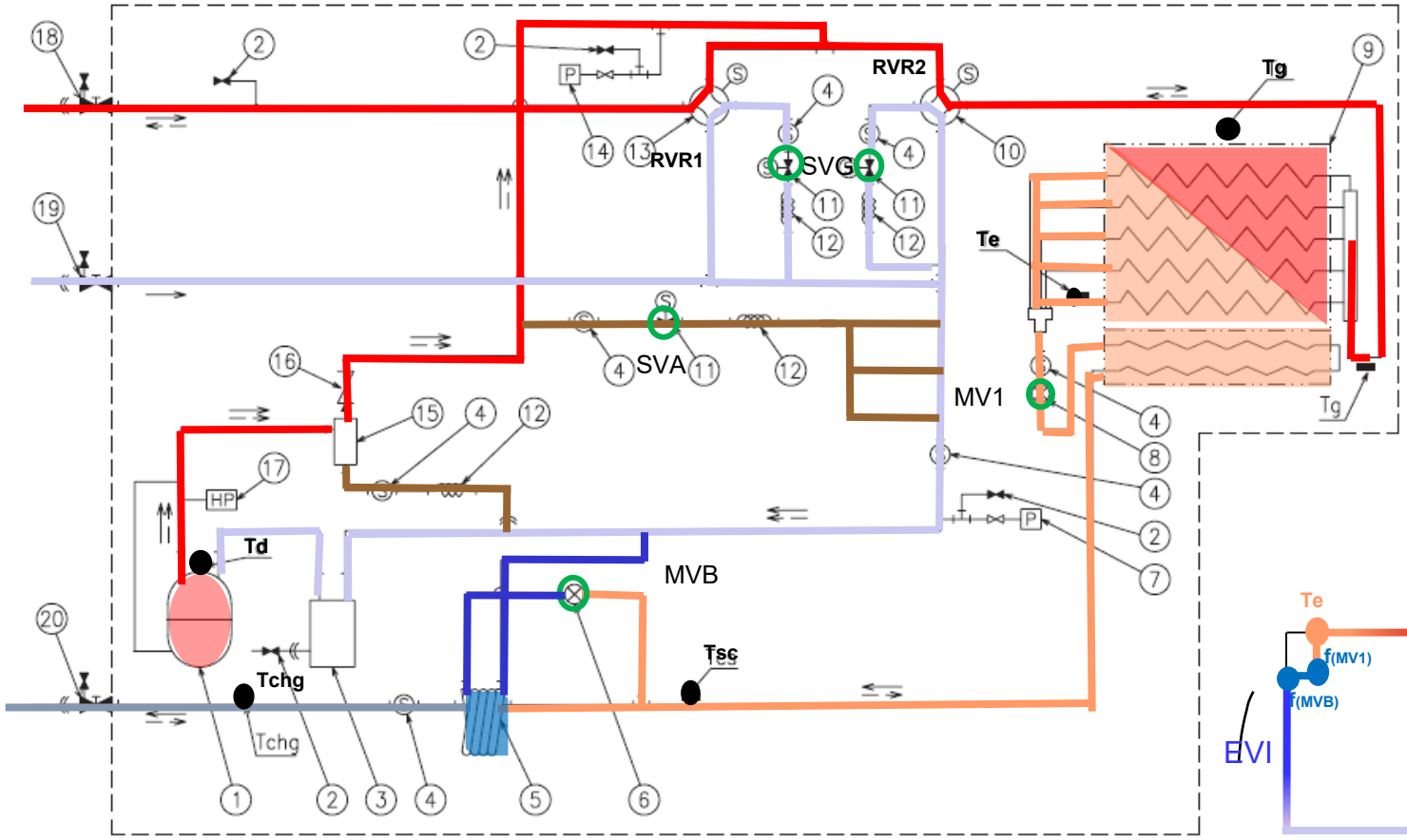
Oil Supply: Always open



2. Refrigerant Cycle Description

Mainly Cooling Mode

RAS-FSXNME



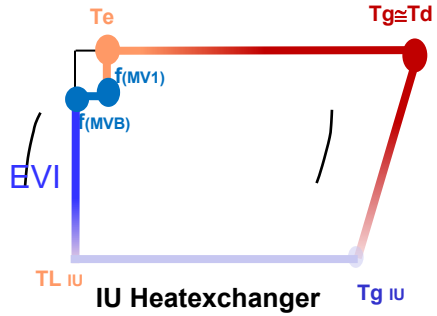
SVG: High & Low Pressure shut off valve
Compressor Run: ON
Compressor Stop: OFF

MV1: Fully Open (depending on ref. cycle condition to contol Pd)

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

MVB: Tsc - Tchg

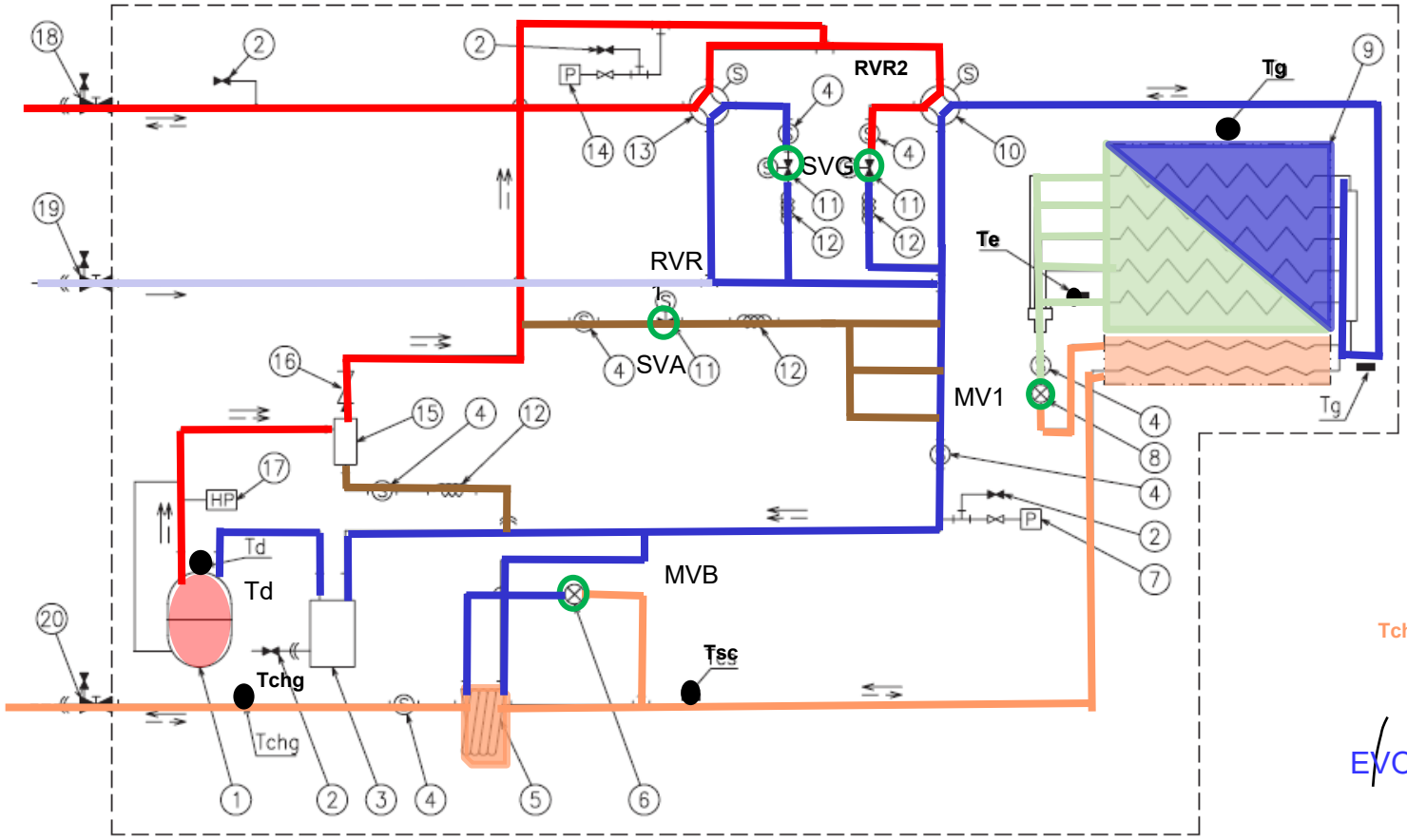
Oil Supply: Always open



2. Refrigerant Cycle Description

Mainly Heating Mode

RAS-FSXNME



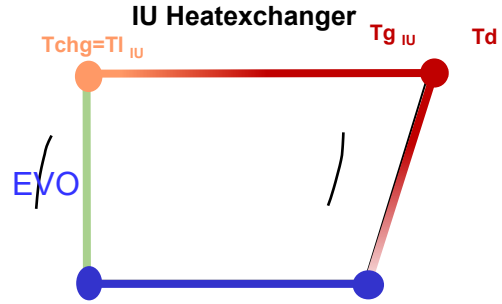
SVG: High & Low Pressure shut off valve
Compressor Run: ON
Compressor Stop: OFF

MV1: PI control on ref. cycle condition to achieve the value of OU HEX SH

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

MVB: Tchg-Tsc

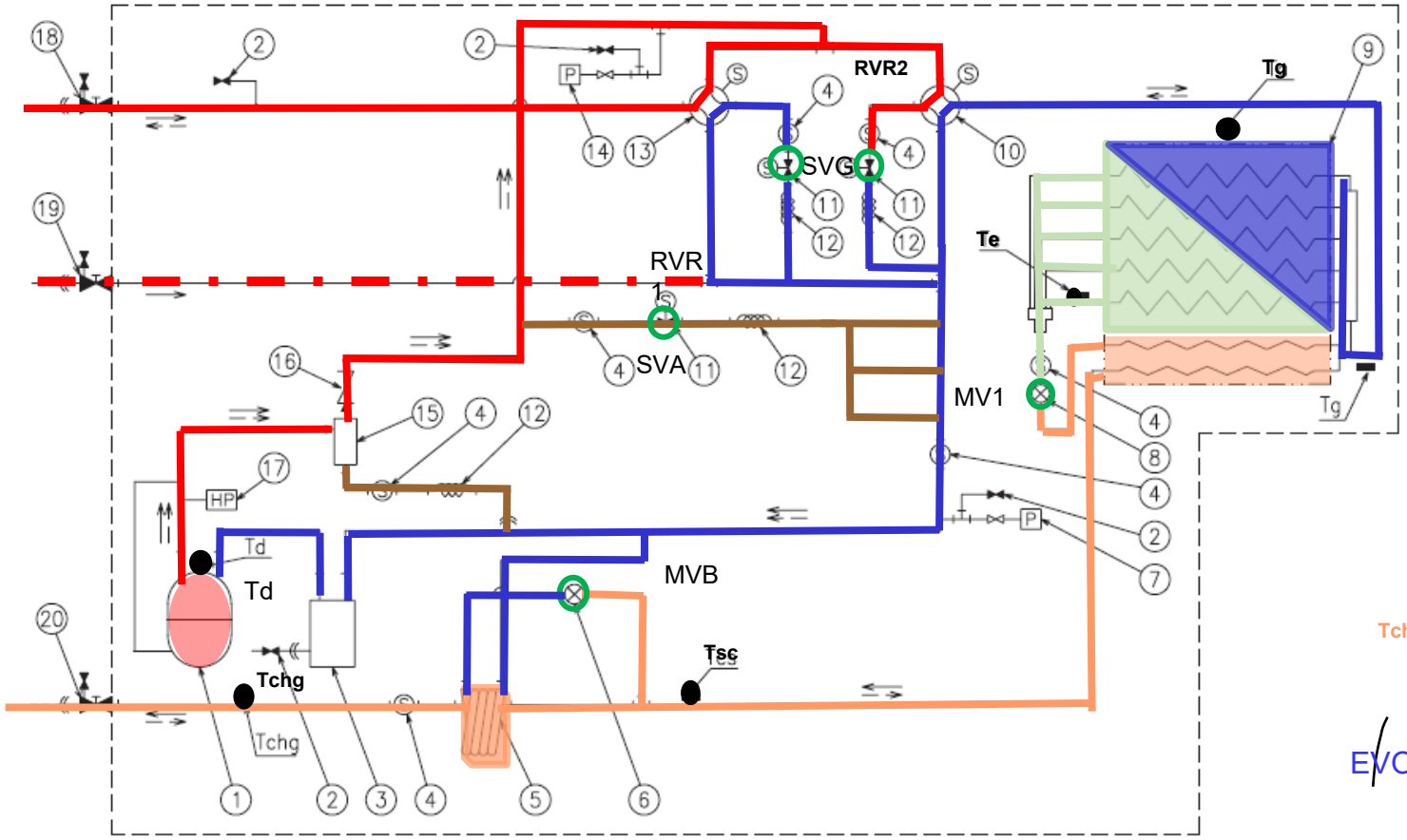
Oil Supply: Always open



2. Refrigerant Cycle Description

All Heating Mode

RAS-FSXNME



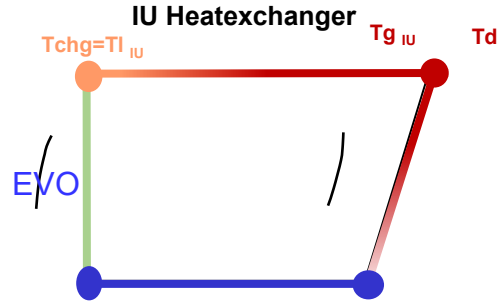
SVG: High & Low Pressure shut off valve
Compressor Run: ON
Compressor Stop: OFF

MV1: PI control on ref. cycle condition to achieve the value of OU HEX SH

SVA: Pd increase protection
Pd> 3.6 Mpa: ON
Ps decrease protection
Ps< 0.15 Mpa: ON

MVB: Tchg-Tsc

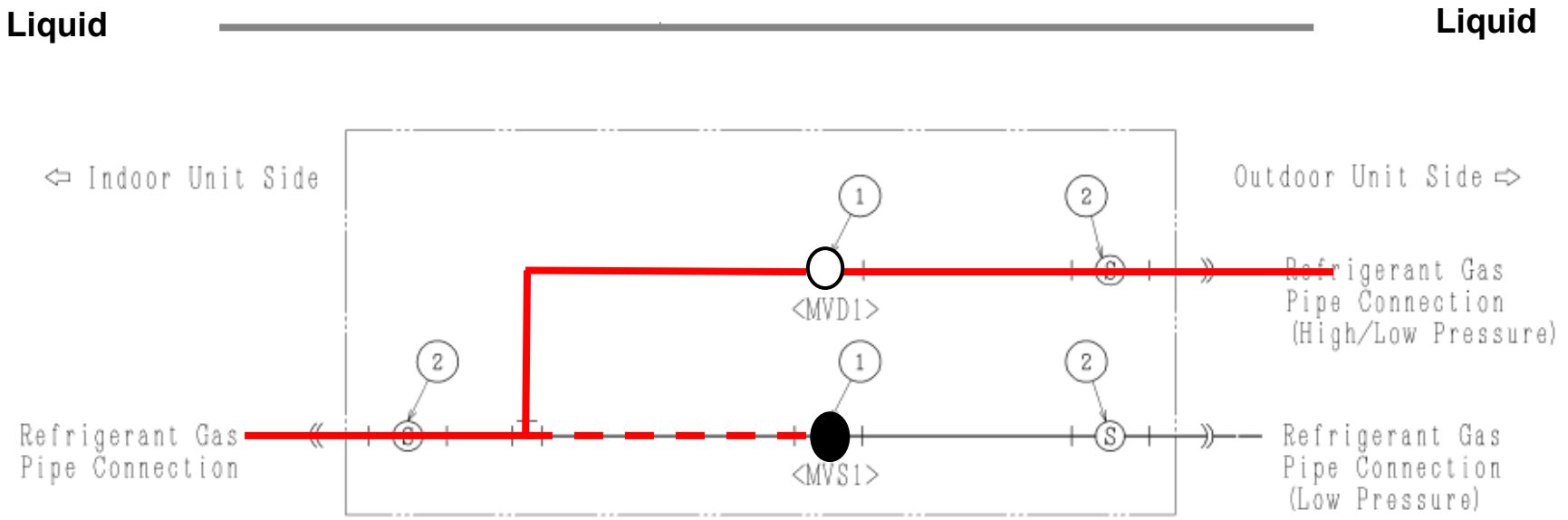
Oil Supply: Always open



2. Refrigerant Cycle Description

CH-Box Unit Heating Mode

■ CH-AP160SSX & CH-AP280SSX



Mark	Part Name
①	Electronic Expansion Valve
②	Strainer

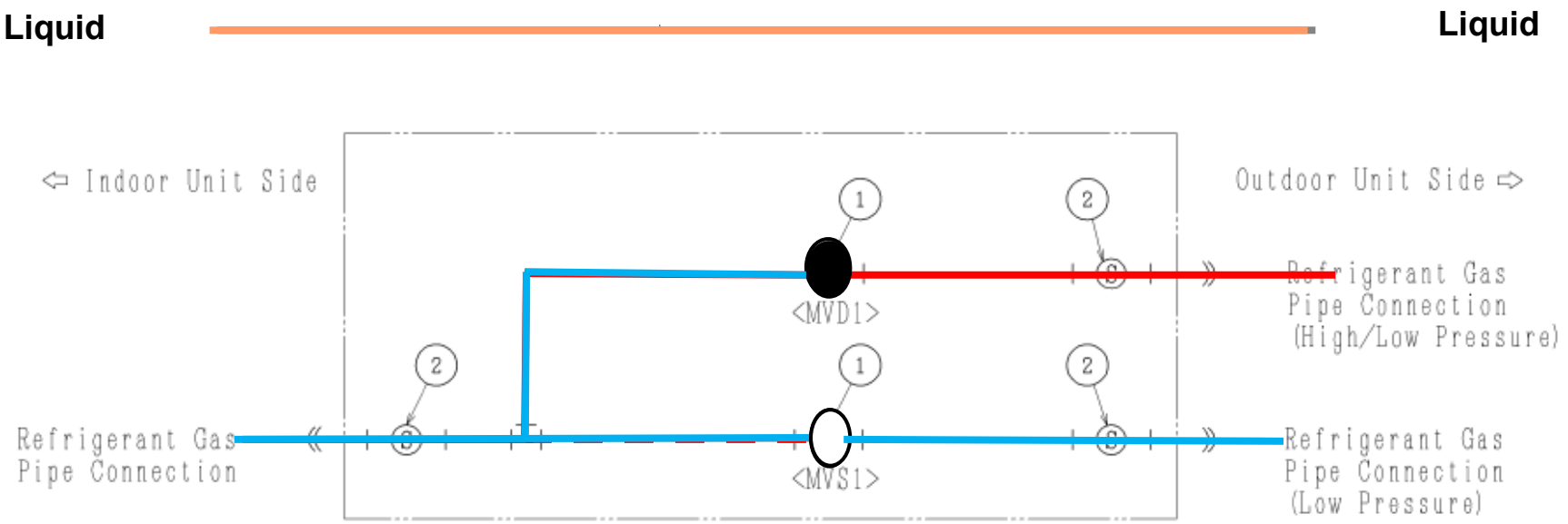
Note:The mark inside"< >"is shown in the electrical wiring diagram.

: Field Refrigerant Piping
: Flare Connection
: Brazing Connection
: Change-Over Box

2. Refrigerant Cycle Description

CH-Box Unit Mainly Cooling Mode

■ CH-AP160SSX & CH-AP280SSX



Mark	Part Name
①	Electronic Expansion Valve
②	Strainer

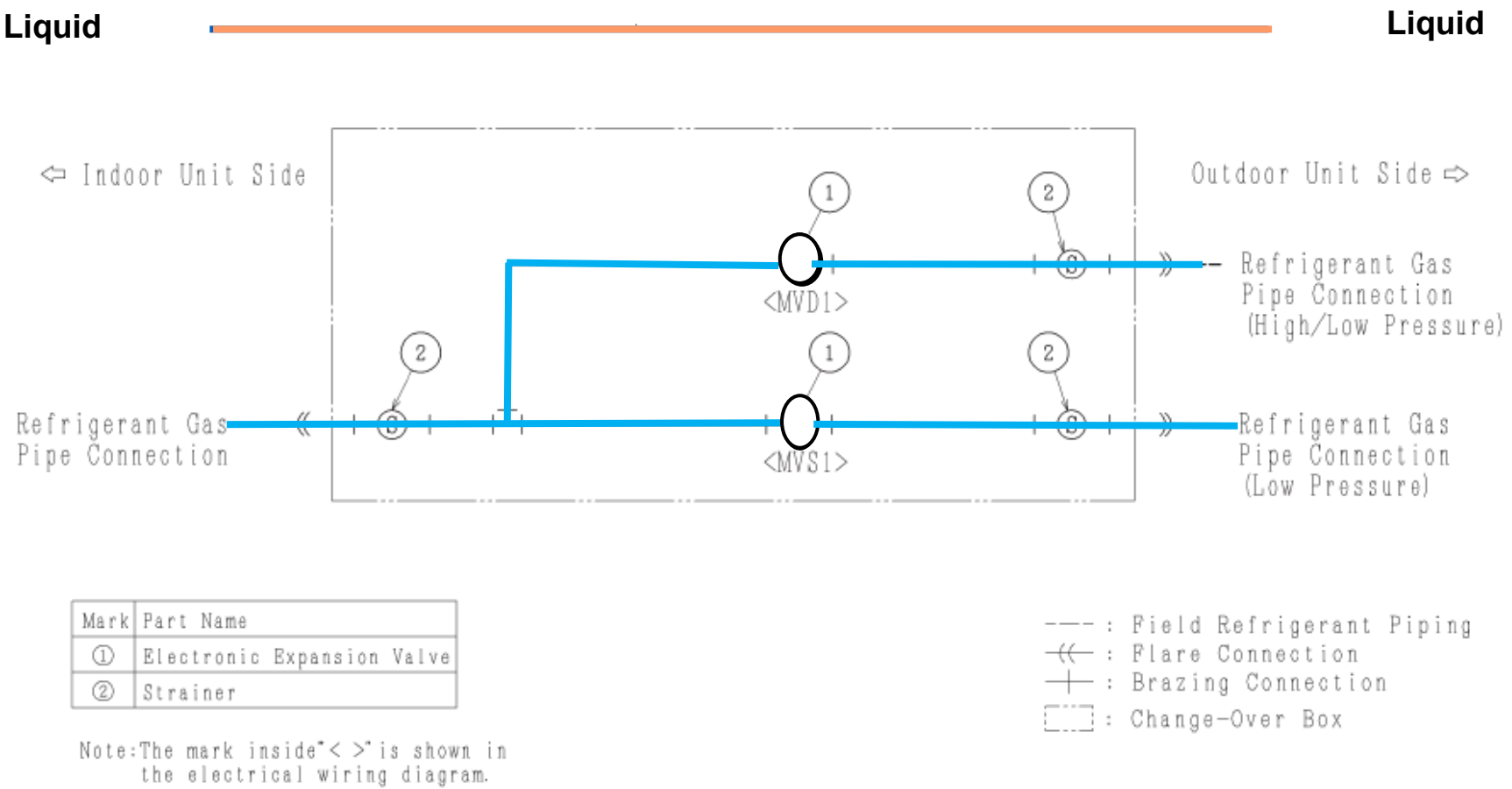
Note:The mark inside"< >"is shown in the electrical wiring diagram.

: Field Refrigerant Piping
: Flare Connection
: Brazing Connection
: Change-Over Box

2. Refrigerant Cycle Description

CH-Box Unit Cooling Mode

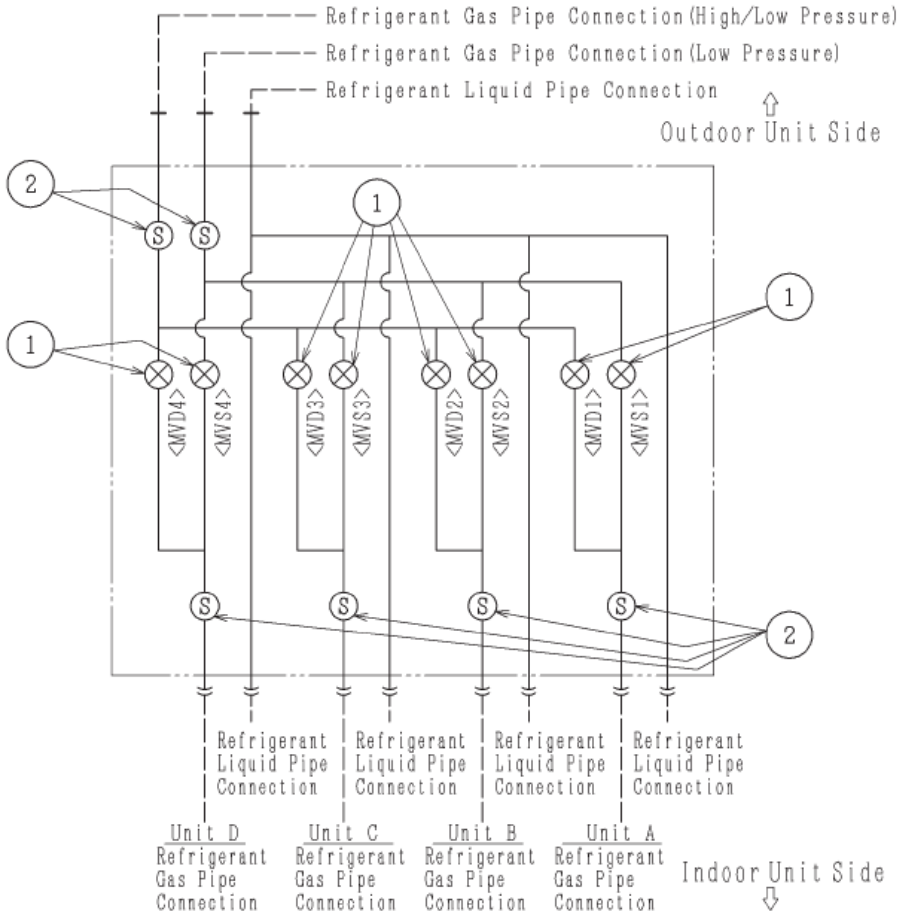
■ CH-AP160SSX & CH-AP280SSX



2. Refrigerant Cycle Description

CH-Box Multiple

■ CH-AP04MSSX - CH-AP08MSSX - CH-AP12MSSX - CH-AP16MSSX



: Field Refrigerant Piping
: Flare Connection
: Brazing Connection
: Change-Over Box

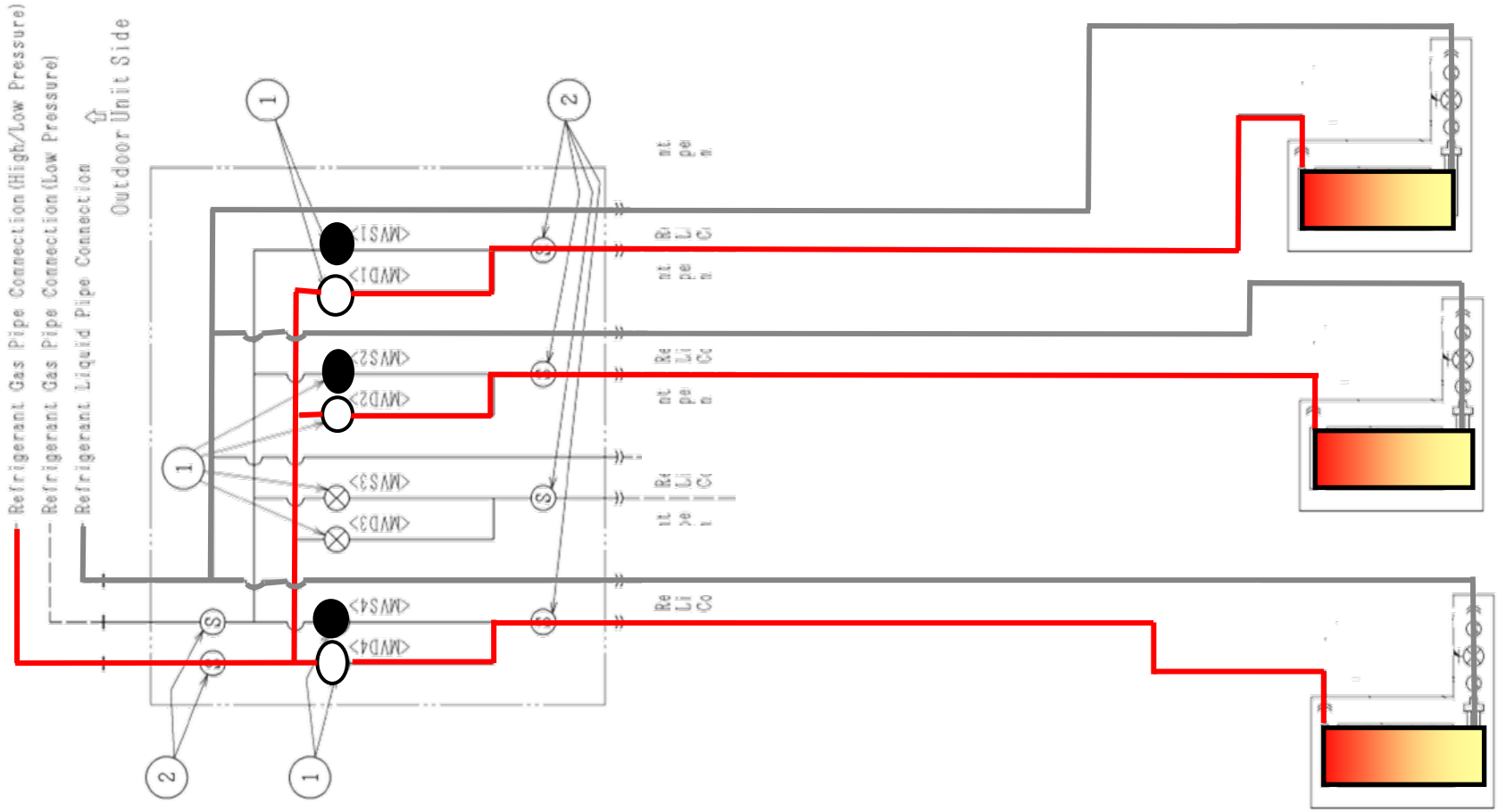
Mark	Part Name
①	Electronic Expansion Valve
②	Strainer

Note: The mark inside "< >" is shown in the electrical wiring diagram.

2. Refrigerant Cycle Description

CH-Box Unit Heating Mode

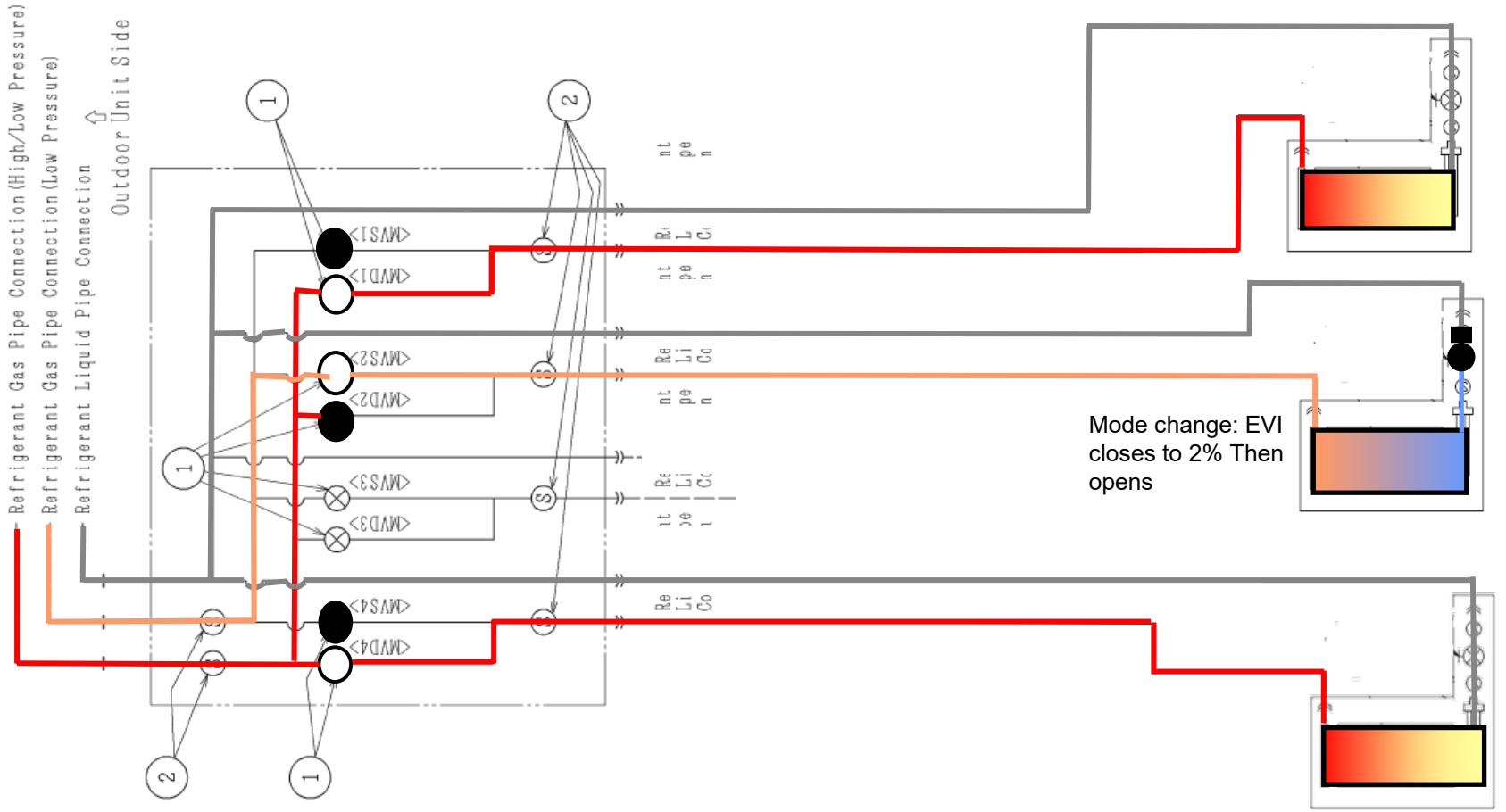
- CH-AP04MSSX - CH-AP08MSSX - CH-AP12MSSX - CH-AP16MSSX



2. Refrigerant Cycle Description

CH-Box Unit Mainly Heating Mode

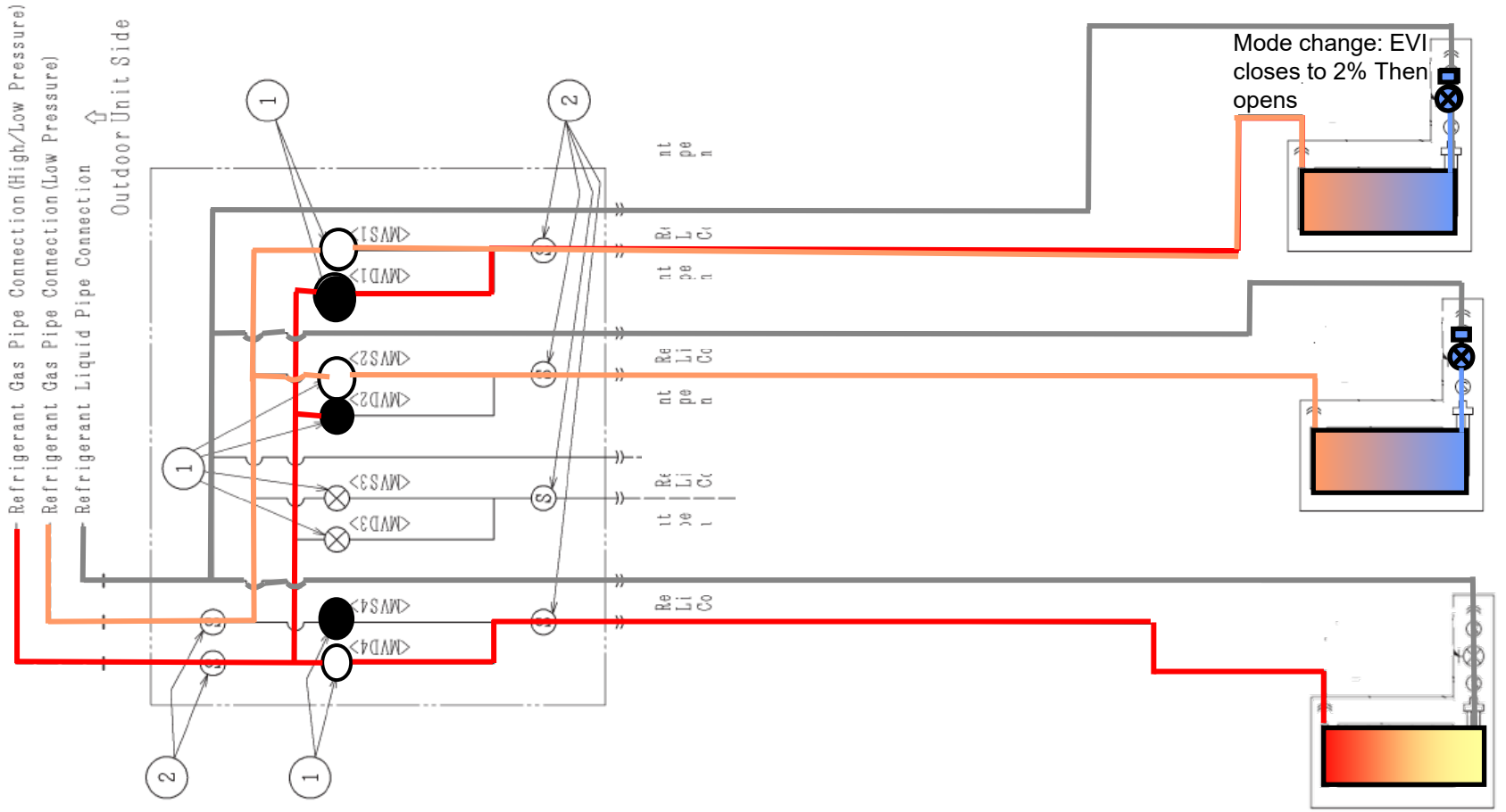
- CH-AP04MSSX - CH-AP08MSSX - CH-AP12MSSX - CH-AP16MSSX



2. Refrigerant Cycle Description

CH-Box Unit Mainly Cooling Mode

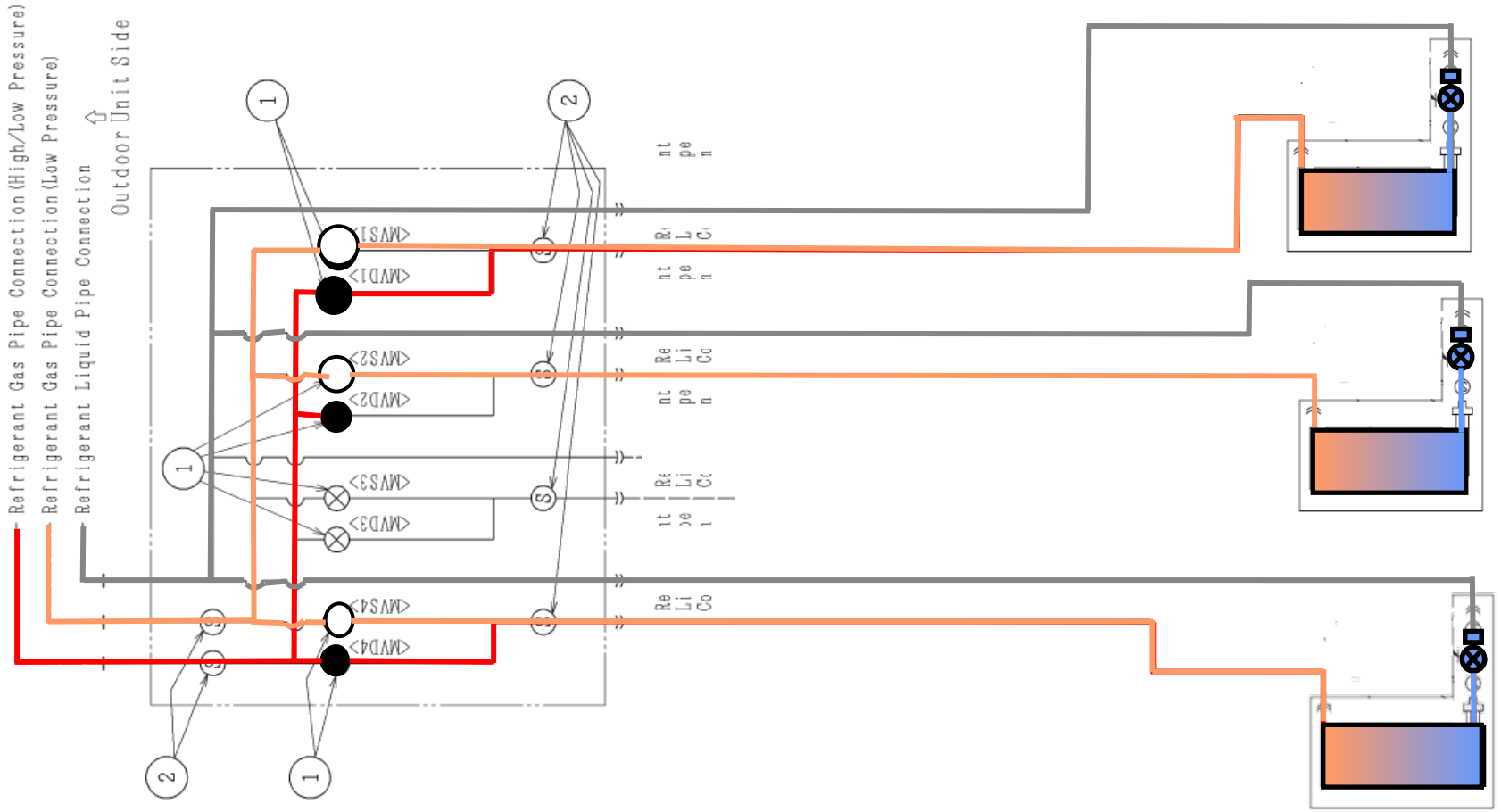
- CH-AP04MSSX - CH-AP08MSSX - CH-AP12MSSX - CH-AP16MSSX



2. Refrigerant Cycle Description

CH-Box Unit Cooling Mode

- CH-AP04MSSX - CH-AP08MSSX - CH-AP12MSSX - CH-AP16MSSX

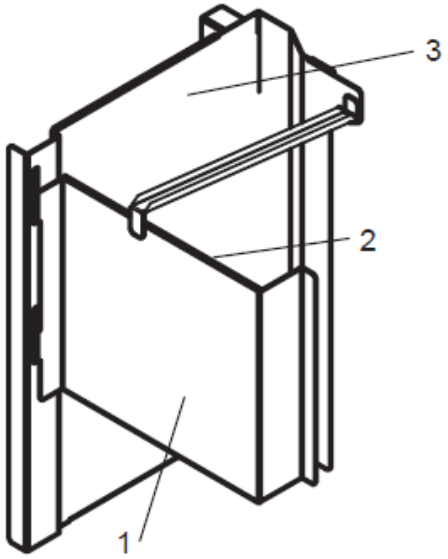


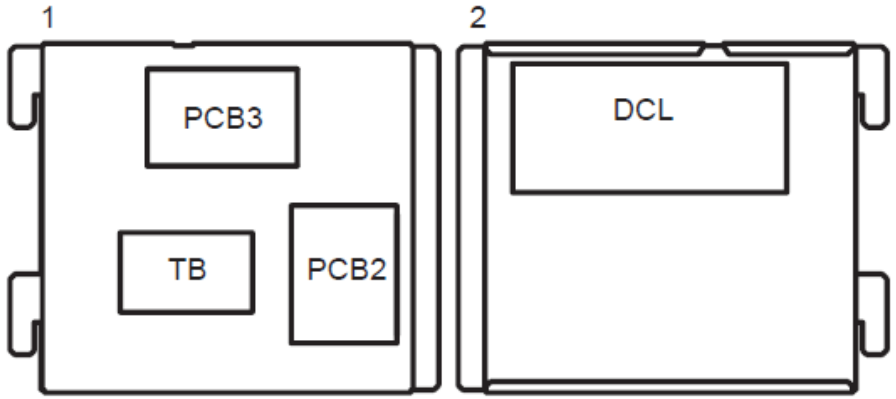
3. Electric Box

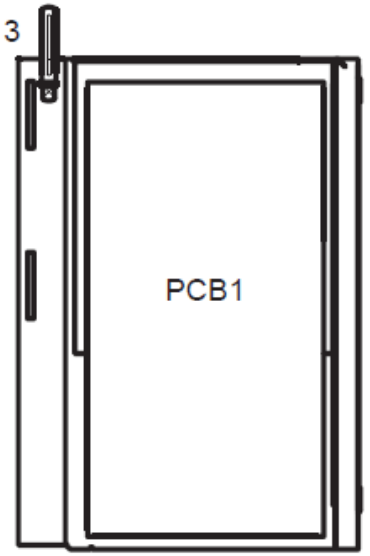
- 2 & 3 Pipes

3. Electric Box

RAS-4~6FSVNME





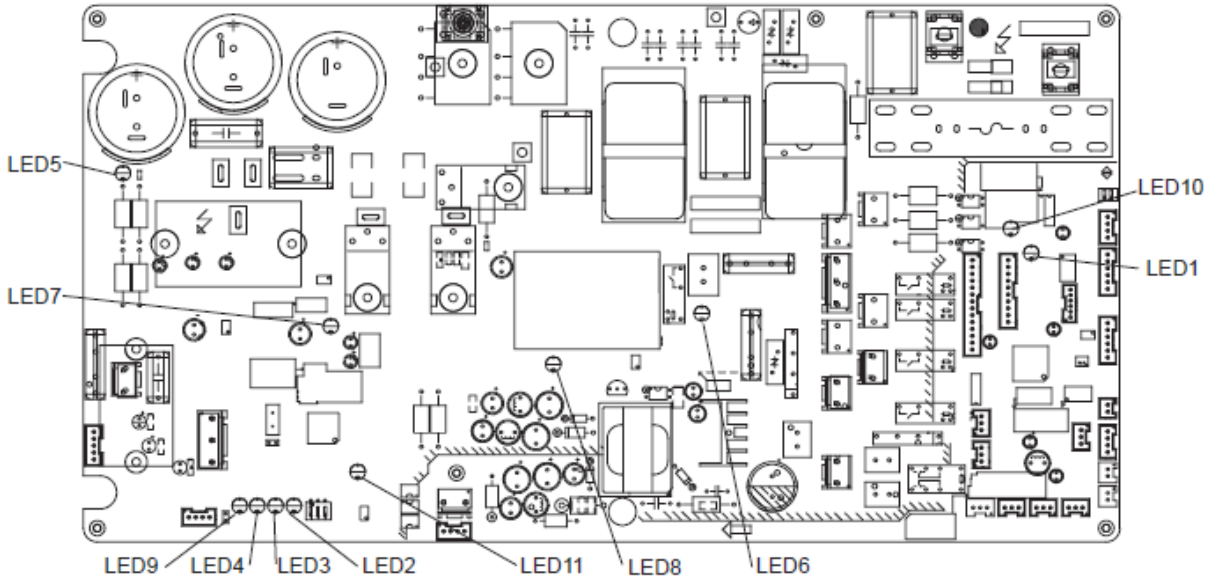


Symbol	PCB	Purpose
PCB1	Control and Inverter PCB	1. Transmission between the indoor and outdoor units. 2. Processing for sensor input. 3. Processing for dip switch input. 4. Operation control for parts 1 to 3. Compressor operating control, control of the bypass valve, fan control and overcurrent control. 5. Processing of the safety device input. 6. Processing of the relay output. 7. Detection of reverse phase for power source.
PCB2	DSW-PCB	1. 7-segment display indication. 2. Transmission dip switch input to PCB1.
PCB3	Fan PCB	Drive Fan1 Motor.
DCL	Reactor	Used for the Power Factor Correction.

3. Electric Box

RAS-4~6FSVNME

PCB1



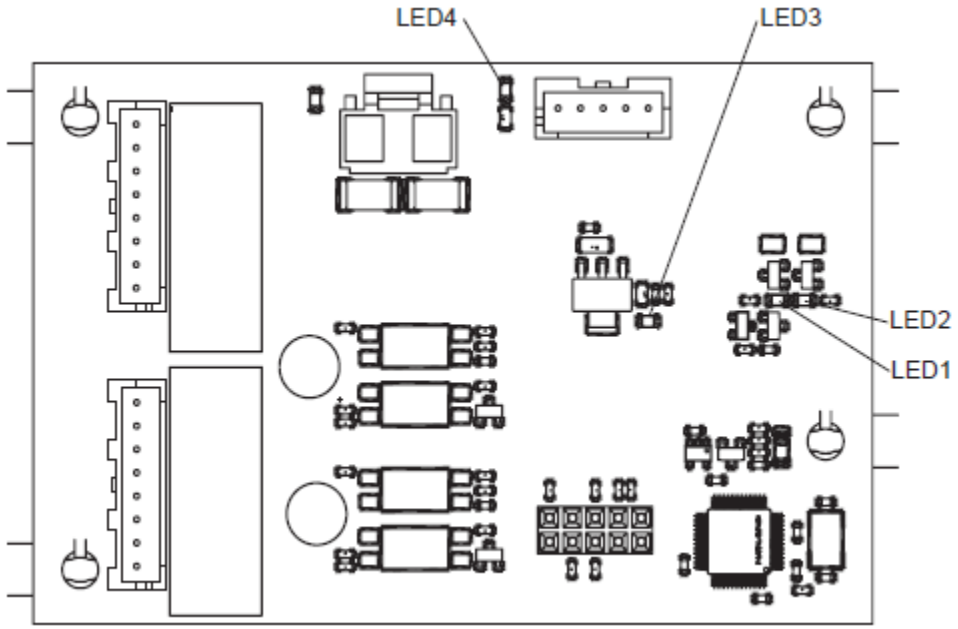
Part name	Contents of functions
LED1 (Red)	Power source indicator for main control of the PCB1 (5V). Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED2 (Red)	It indicates: “Alarm”.
LED3 (Yellow)	It indicates: “Alarm”.
LED4 (Green)	It indicates: “Alarm”.
LED5 (Red)	Indicator for DC Bus Voltage Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED6 (Red)	Power source indicator for Precharge Relay. Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.

Part name	Contents of functions
LED7 (Green)	Power source indicator for inverter control of the PCB1 (3.3V). Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED8 (Red)	Power source indicator for Main Relay. Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED9 (Orange)	It indicates: “Alarm”.
LED10 (Yellow)	It indicates the communication state between the indoor unit and outdoor unit. Normal condition: Activated / Flash. Abnormal condition: Deactivated / OFF.
LED11 (Green)	It indicates the communication state between the main control and inverter control of PCB1. Normal condition: Activated / Flash. Abnormal condition: Deactivated / OFF.

3. Electric Box

RAS-4~6FSVNME

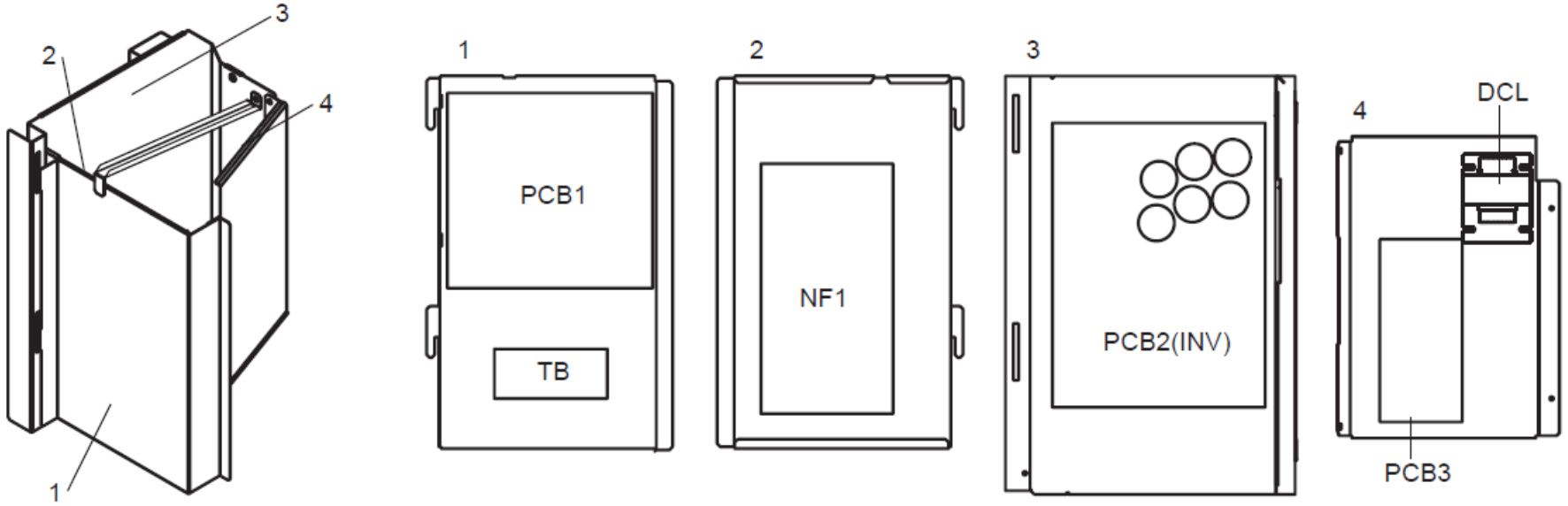
PCB3



Part name	Contents of functions
LED1 (Yellow)	Communication Indicator. Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED2 (Red)	Communication Indicator. Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED3 (Green)	Power source indicator for Fan PCB (3.3V). Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED4 (Green)	Power source indicator for Fan (15V). Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.

3. Electric Box

RAS-4~6FSNME

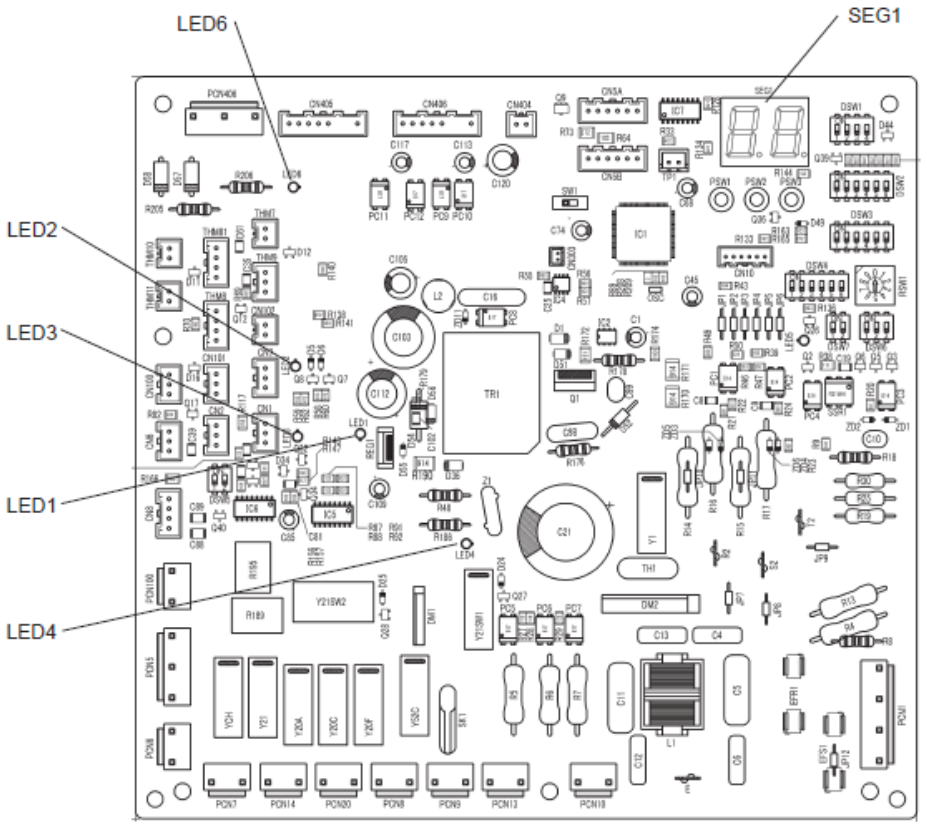


Symbol	PCB	Purpose
PCB1	Control PCB	1. Transmission between the indoor and outdoor units. 2. Processing for sensor input. 3. Processing for dip switch input. 4. Processing of the safety device input. 5. Processing of the relay output. 6. 7-segment display indication.
PCB2	Inverter PCB for control	1. Operation control for parts 1 to 3. Compressor operating control, control of the bypass valve, fan control and overcurrent control.
PCB3	Fan PCB	Drive Fan1 Motor.

3. Electric Box

RAS-4~6FSNME

PCB1

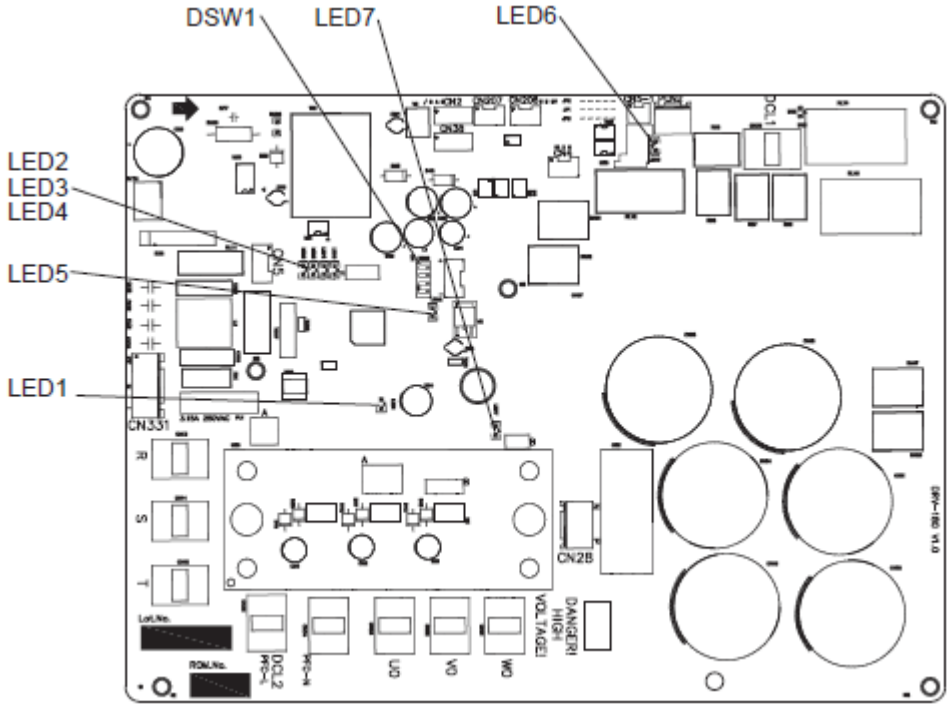


Part name	Contents of functions
LED1 (Red)	Power source indicator for main board (Low Voltage). Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED2 (Green)	It indicates the communication state between the Main Board and Driven Board. Normal condition: Flashing. Abnormal condition: Deactivated / OFF.
LED3 (Yellow)	It indicates the communication state between the indoor unit and outdoor unit. Normal condition: Flashing. Abnormal condition: Deactivated / OFF.
LED4 (Red)	Power source indicator for Outdoor Unit PCB (280VDC). Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED6 (Red)	Power source indicator for Outdoor Unit PCB (from PCB2). Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.

3. Electric Box

RAS-4~6FSNME

PCB2



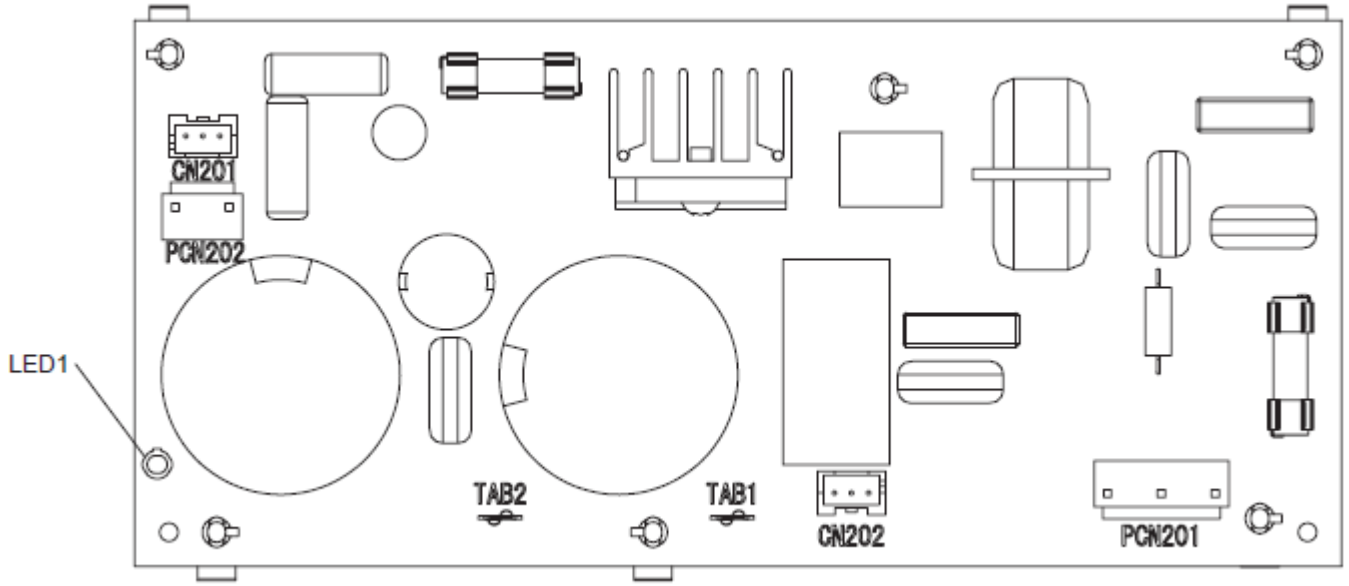
Part name	Contents of functions
LED1 (Green)	Communication Indicator. Normal condition: Flashing. Abnormal condition: ON / OFF.
LED7 (Red)	Power Source Indicator for Driver Board Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED5 (Green)	Power Source Indicator for Control Part. Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED6 (Red)	Power source indicator for Precharge Relay. Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.
LED1 (Green)	Communication Indicator. Normal condition: Flashing. Abnormal condition: ON / OFF.

Part name	Contents of functions
LED4 (Green) LED3 (Yellow) LED2 (Red)	Compressor is Working ON OFF OFF
	Frequency Decrease for Overcurrent ON ON OFF
	Frequency Limit for Overcurrent ON ON ON
	Frequency Limit for Overheat ON Flash OFF
	Frequency Decrease for Overheat ON Flash Flash
	Compressor is Ready to Operate. (The Main Relay is Activated) Flash OFF OFF

3. Electric Box

RAS-4~6FSNME

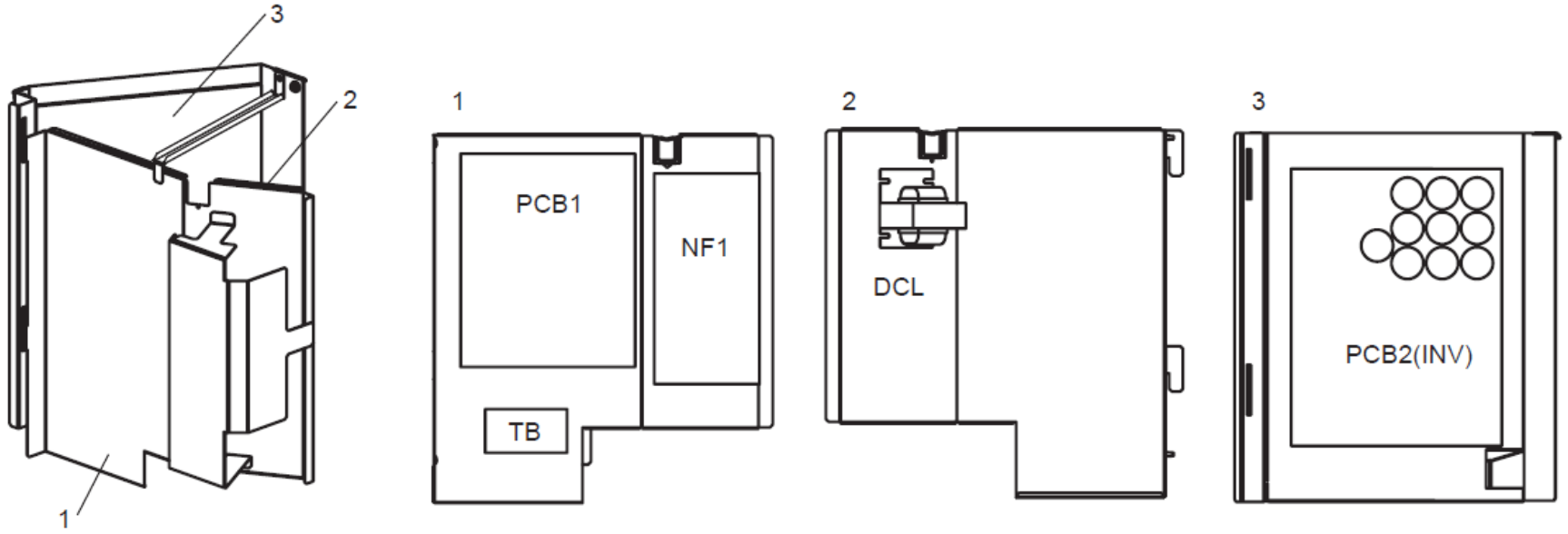
PCB3



Part name	Contents of functions
LED1 (Red)	PCB1 power indication Normal condition: Activated / ON. Abnormal condition: Deactivated / OFF.

3. Electric Box

RAS-8~12FSXNME

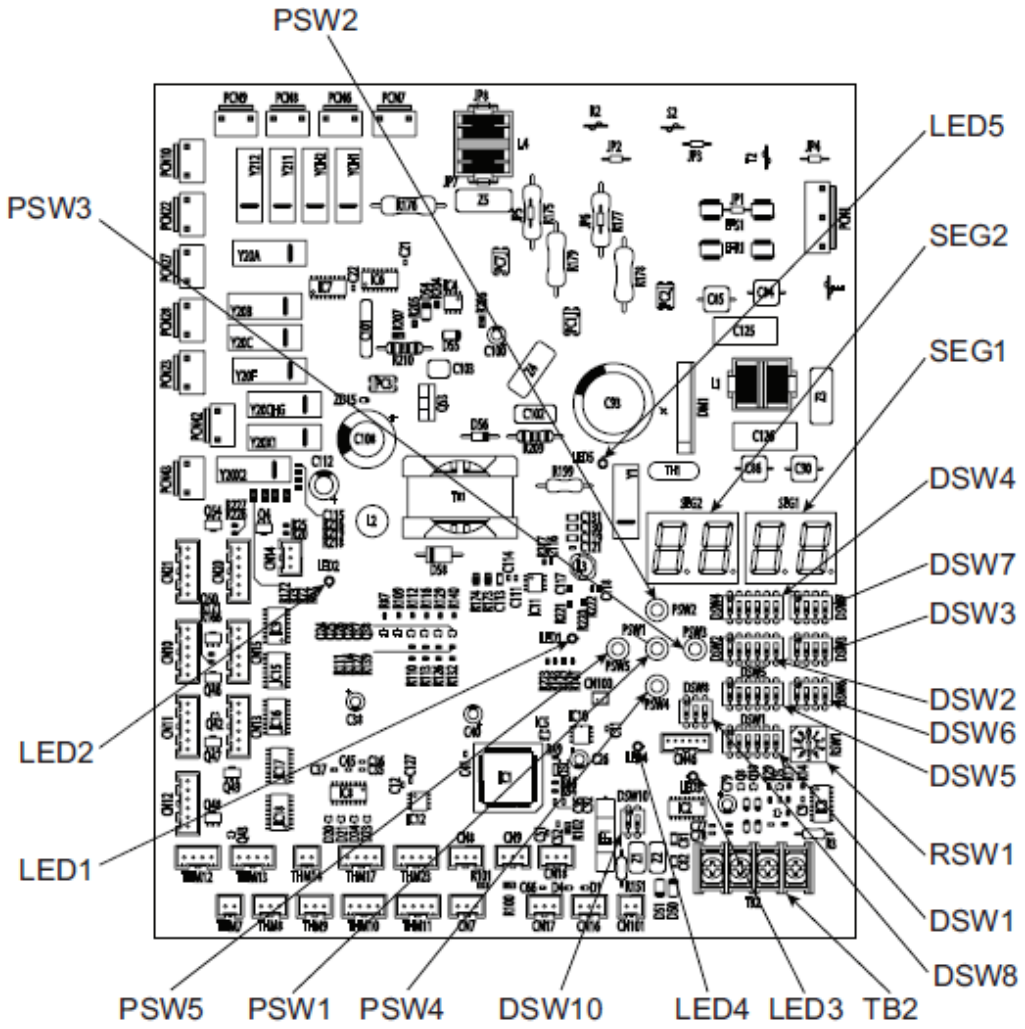


Symbol	PCB	Purpose
PCB1	Outdoor unit PCB	1. Transmission between the indoor and outdoor units. 2. Processing for sensor input. 3. Processing for dip switch input. 4. Operation control for parts 1 to 3. Compressor operating control, control of the bypass valve, fan control and overcurrent control. 5. 7-segment display indication. 6. Processing of the safety device input. 7. Processing of the relay output. 8. Detection of reverse phase for power source.
PCB2	Inverter PCB	1. Inverter components are driven by outdoor unit PCB to drive compressor. 2. Overcurrent control. 3. Protection control for inverter part. 4. DC fan motor speed control.

3. Electric Box

RAS-8~12FSXNME

PCB1

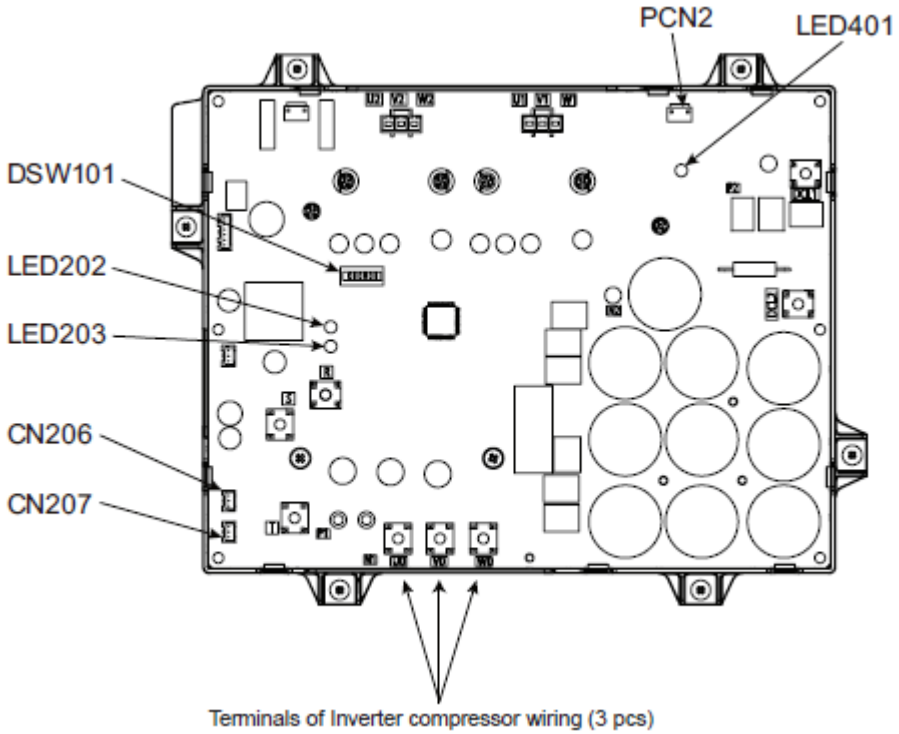


Part name	Contents of functions
LED1 (Red)	PCB1 power indication (Low voltage). Normal condition: activated. Abnormal condition: not activated.
LED2 (Green)	LED2 indicates the transmission status between outdoor unit PCB1 and inverter PCB. Normal condition: flashing. Abnormal condition: activated or not activated.
LED3 (Yellow)	LED3 indicates the transmission status between the indoor and outdoor units. Normal condition: flashing. Abnormal condition: activated or not activated.
LED4 (orange)	LED4 indicates the transmission status between outdoor units. Normal condition: flashing. Abnormal condition: activated or not activated.
LED5 (Red)	PCB1 power indication (High voltage). Normal condition: activated. Abnormal condition: not activated.

3. Electric Box

RAS-8~12FSXNME

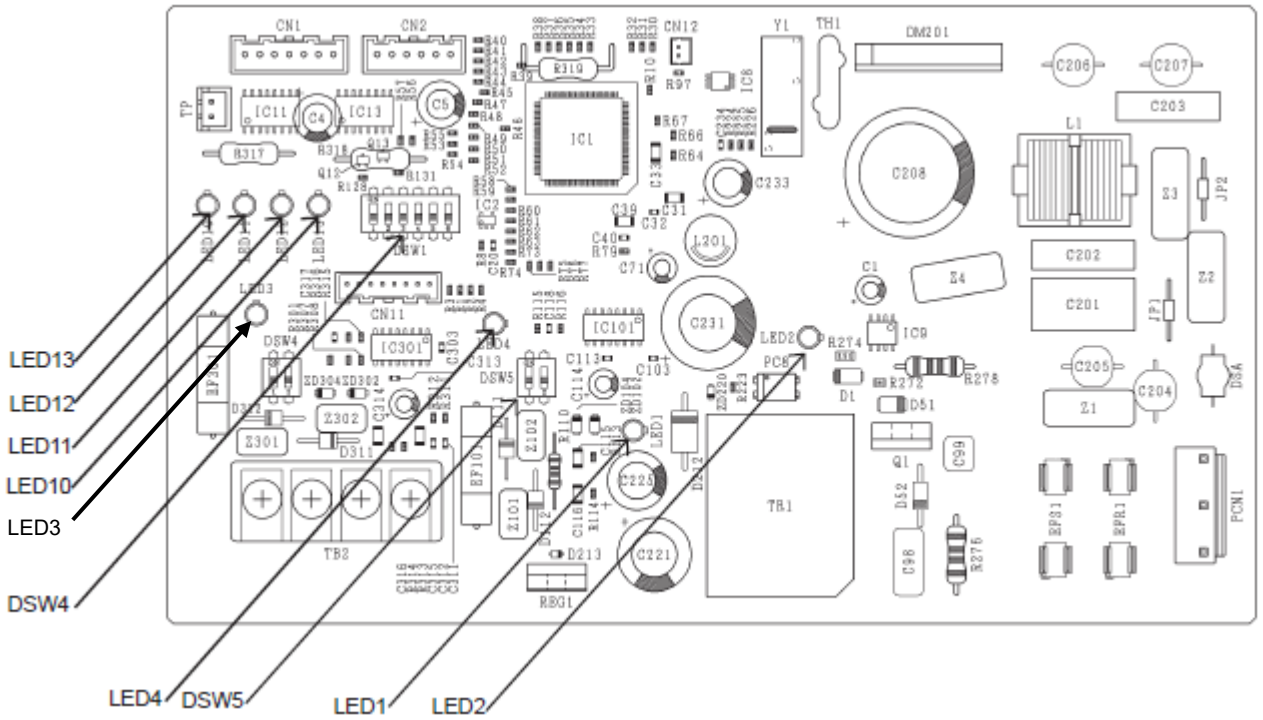
PCB2 INV



Part name	Contents of functions
LED401 (Red)	Power source indicator for inverter PCB. Normal condition: activated. Abnormal condition: not activated.
LED201 (Yellow)	This indicates the state of the microcomputer Normal condition: activated. Abnormal condition: not activated.
LED202 (Green)	This indicates the state of communication between inverter PCB and fan controller. Normal condition: activated. Abnormal condition: not activated.

3. Electric Box

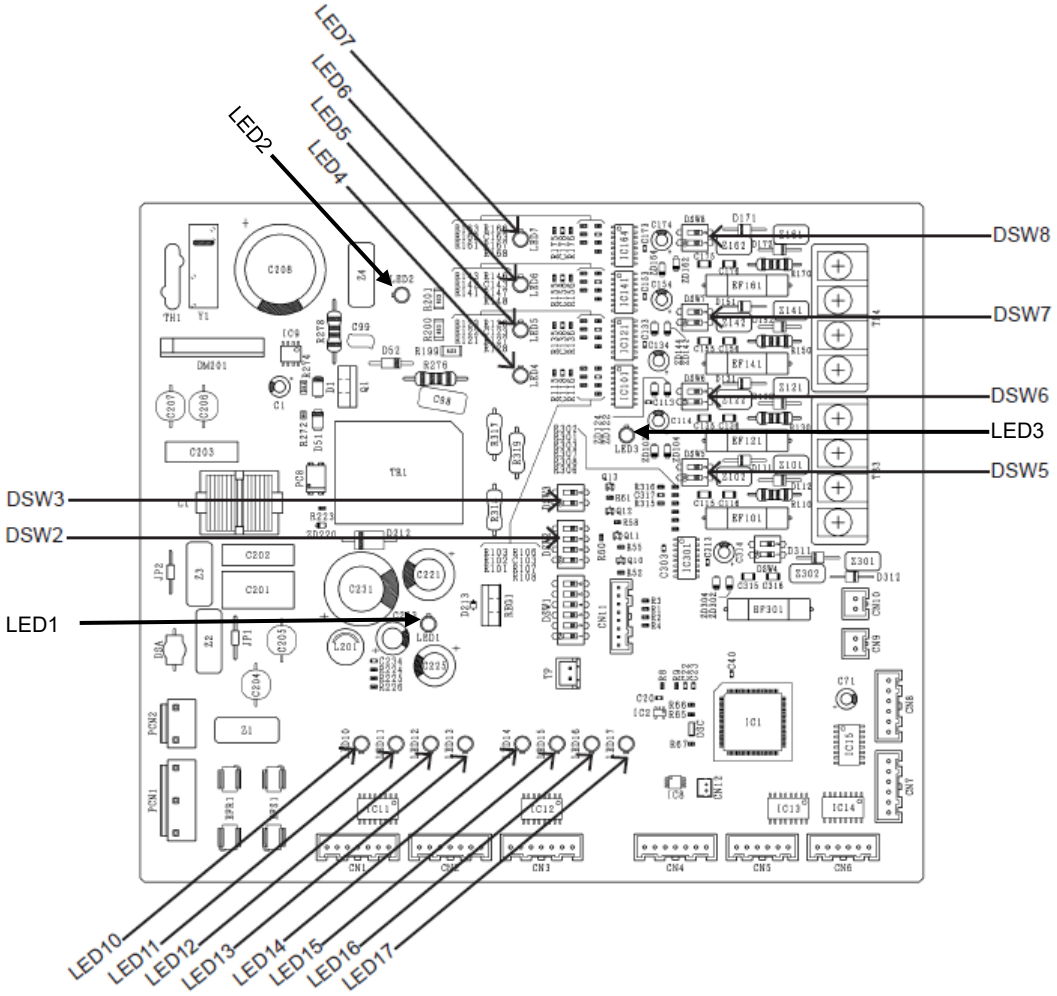
CH-Box Single



Part name	Contents of functions
LED1 (Red)	Power source indication for CH-Box PCB. (For AC Power supply)
LED2 (Red)	Power source indication for CH-Box PCB. (For DC Power supply)
LED3 (Yellow)	This indicates the state of communication between CH-Box and outdoor unit.
LED4 (Yellow)	This indicates the state of communication between CH-Box and indoor unit.
LED10 (Green) MVD1	Operation confirmation of expansion valve. Check the alarm codes
LED11 (Green) MVS1	
LED12 (Green)	
LED13 (Green)	

3. Electric Box

CH-Box Multi

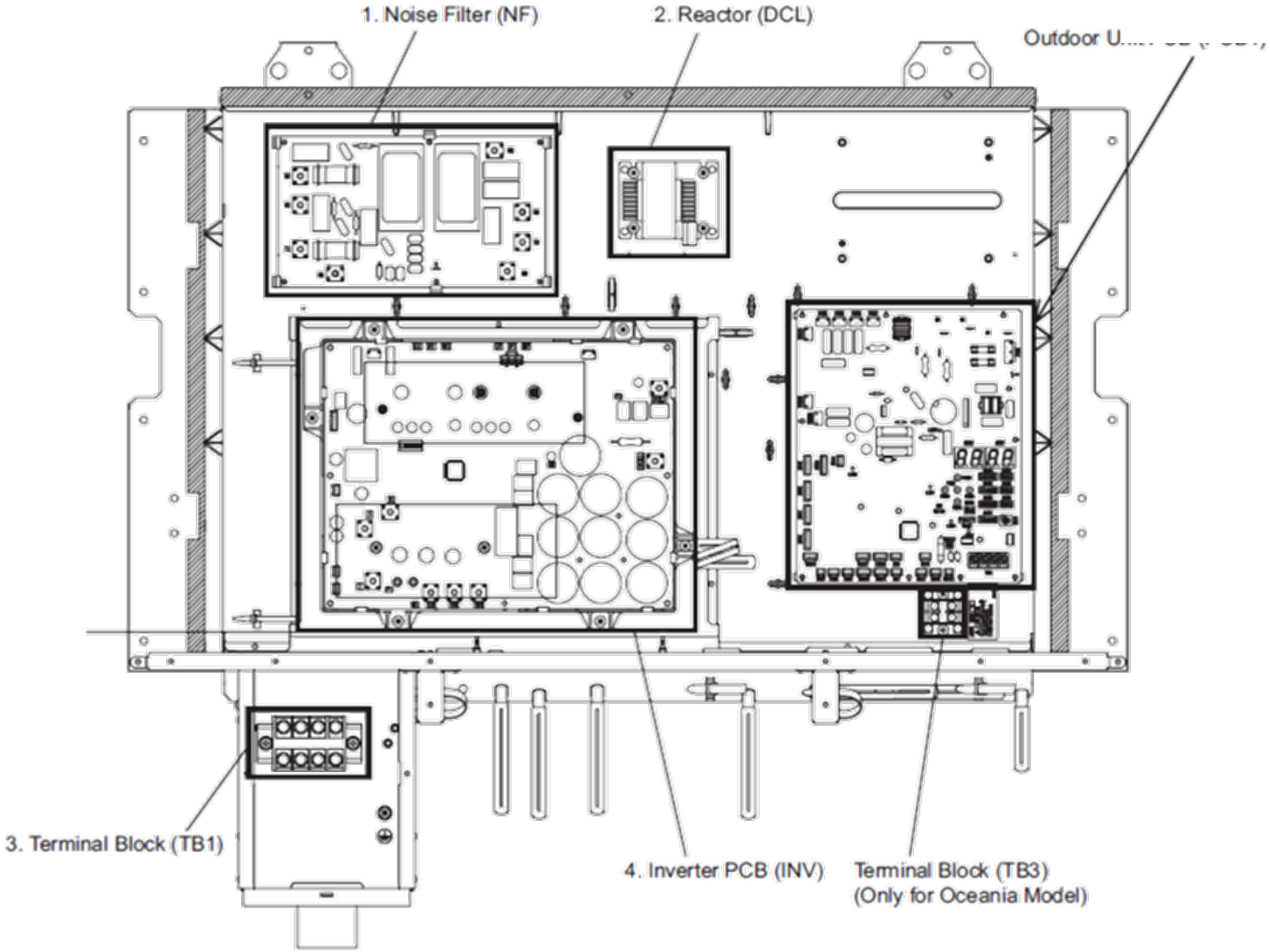


Part name	Contents of functions
LED1 (Red)	Power source indication for CH-Box PCB. (For AC Power supply)
LED2 (Red)	Power source indication for CH-Box PCB. (For DC Power supply)
LED3 (Yellow)	This indicates the state of communication between CH-Box and outdoor unit.
LED4 (Yellow)	This indicates the state of communication between CH-Box and indoor unit.
LED5-7 (Yellow)	
LED10 (Green) MVD1	Operation confirmation of expansion valve. Check the alarm codes
LED11 (Green) MVD2	
LED12 (Green) MVD3	
LED13 (Green) MVD4	
LED14 (Green) MVS1	
LED15 (Green) MVS2	
LED16 (Green) MVS3	
LED17 (Green) MVS4	

3. Electric Box

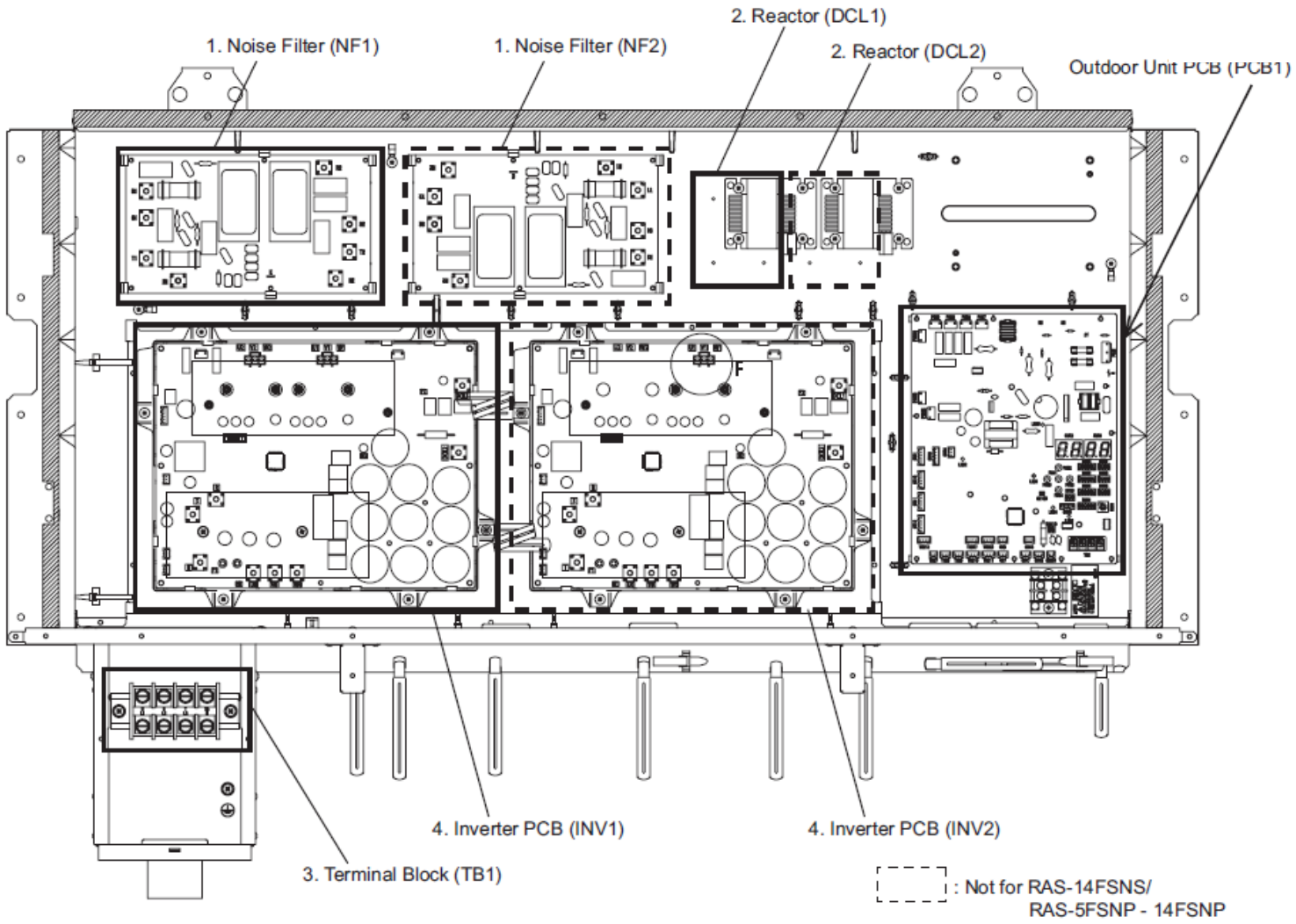
Sigma

- RAS-(8-12)FSXNSE / RAS-(5/6)FSXNPE 400V/50Hz



3. Electric Box
Sigma

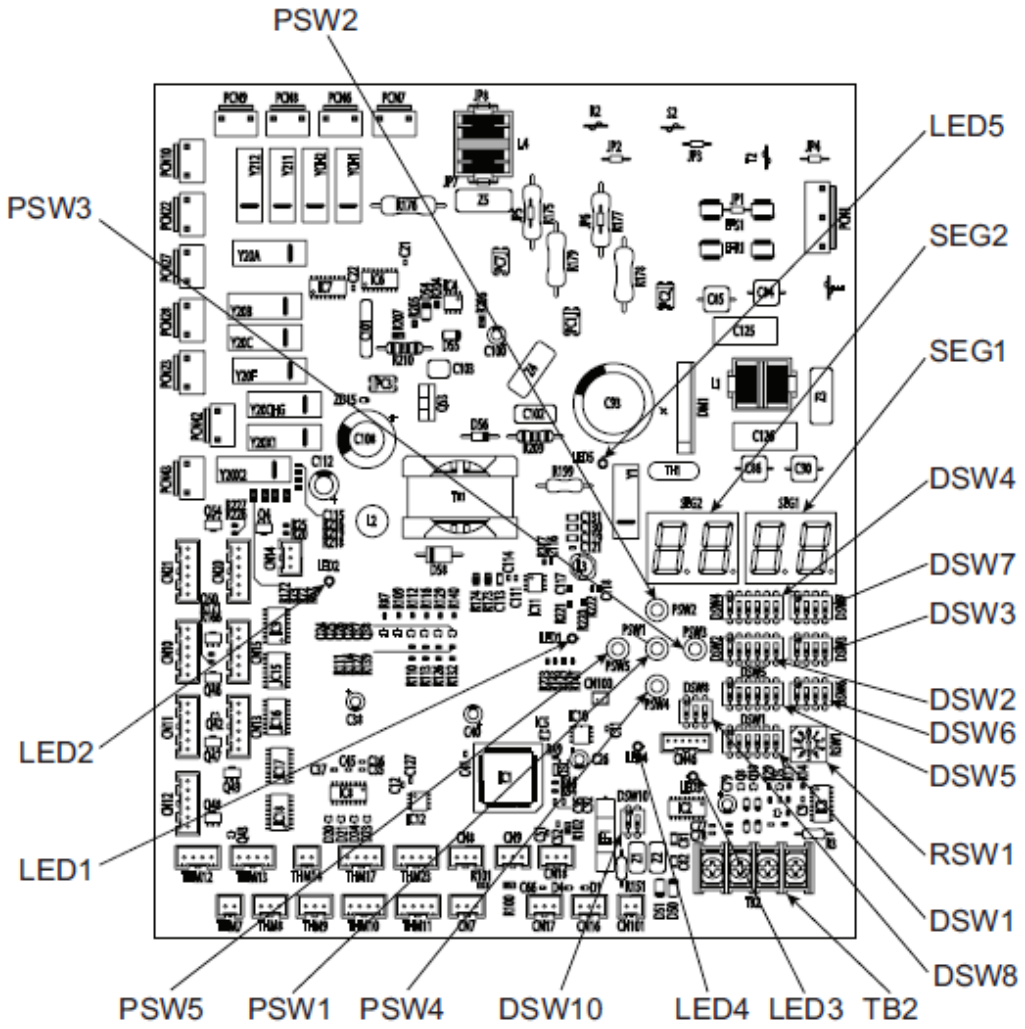
■ RAS-(14-24)FSXNSE / RAS-(8-18)FSXNPE 400V/50Hz



3. Electric Box

Sigma

PCB1

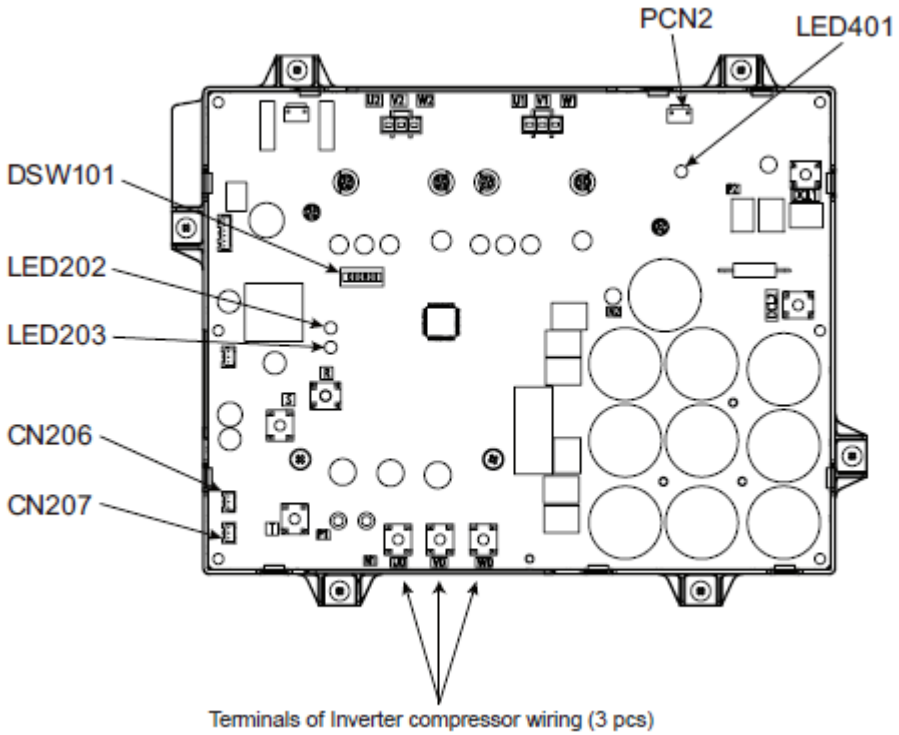


Part name	Contents of functions
LED1 (Red)	PCB1 power indication (Low voltage). Normal condition: activated. Abnormal condition: not activated.
LED2 (Green)	LED2 indicates the transmission status between outdoor unit PCB1 and inverter PCB. Normal condition: flashing. Abnormal condition: activated or not activated.
LED3 (Yellow)	LED3 indicates the transmission status between the indoor and outdoor units. Normal condition: flashing. Abnormal condition: activated or not activated.
LED4 (orange)	LED4 indicates the transmission status between outdoor units. Normal condition: flashing. Abnormal condition: activated or not activated.
LED5 (Red)	PCB1 power indication (High voltage). Normal condition: activated. Abnormal condition: not activated.

3. Electric Box

Sigma

PCB2 INV



Part name	Contents of functions
LED401 (Red)	Power source indicator for inverter PCB. Normal condition: activated. Abnormal condition: not activated.
LED201 (Yellow)	This indicates the state of the microcomputer Normal condition: activated. Abnormal condition: not activated.
LED202 (Green)	This indicates the state of communication between inverter PCB and fan controller. Normal condition: activated. Abnormal condition: not activated.

HITACHI

4. Troubleshooting

- **Alarms**
- **Check Mode**

4. Troubleshooting

Alarms

Code	Category	Content of abnormality	Possible Cause
01	Indoor unit	Protection device activation (float switch)	Float switch activation (high water level in drain hose or abnormality in drain pipe, float switch or drain pan).
02	Outdoor unit	Protection device activation (disconnection due to high pressure)	PSH activation (pipe clogging, excess refrigerant, mixture of inert gas).
03	Communication	Abnormality between indoor and outdoor	Incorrect wiring, loose terminals, disconnect cable, blown fuse, outdoor unit switched off.
04		Abnormality between inverter PCB and outdoor PCB Inverter PCB - Outdoor PCB transmission fault (loose	Inverter PCB - Outdoor PCB transmission fault (loose connector, broken cable, blown fuse).
05	Supply Phase	Abnormality in the power phases	Incorrect power supply, inverted phase connection, open phase.
06	Voltage	Abnormal inverter voltage	Outdoor voltage drop, insufficient power.
07	Cycle	Drop in discharge gas superheat	Excessive refrigerant charge, thermistor fault, incorrect wiring, incorrect pipe connection, expansion valve locked in open position (connector disconnected).
08		Increase in discharge gas temperature	Insufficient refrigerant charge, pipe clogging, thermistor fault, incorrect wiring, incorrect pipe connection, expansion valve locked in closed position (connector disconnected).
0A	Communication	Abnormality between outdoor and indoor	Incorrect wiring, broken cable, loose terminals.
0b	Outdoor Unit	Incorrect outdoor unit address setting	Duplicate address setting of outdoor units (secondary units) in the same refrigerant cycle system.
0C		Main unit of the outdoor unit incorrectly set	Two (or more) outdoor units defined as the “main unit” in the same refrigerant cycle system.
11	Indoor Unit Sensor on	Air inlet thermistor	Incorrect wiring, disconnected wiring, broken cable, short circuit.
12		Air outlet thermistor	
13		Frost protection thermistor	
14		Gas pipe thermistor	
15		Abnormality of outdoor air thermistor	
16		Abnormality of remote sensor	
17		Abnormality of thermistor built-in remote controller	
18	Indoor Fan Motor	Abnormality of indoor fan system	Abnormality of indoor fan motor, indoor fan controller failure.
19		Indoor fan protection device activation	Fan motor overheating, locking.

4. Troubleshooting

Alarms

Code	Category	Content of abnormality	Possible Cause
21	Outdoor Unit Sensor on	High pressure sensor	Incorrect wiring, disconnected wiring, broken cable, short circuit.
22		Outdoor air thermistor	
23		Discharge gas thermistor at top of compressor	
24		Heat exchanger liquid pipe thermistor	
25		Heat exchanger gas pipe thermistor	
29		Low pressure sensor	
31	System	Incorrect capacity setting on outdoor and indoor units	Combination capacity incorrectly set. Excessive or insufficient total indoor unit capacity.
35		Indoor unit no. incorrectly set	Indoor unit no. duplicated in same reference group.
36		Incorrect of indoor unit combination	Duplication of indoor unit number in same refrigerant group.
38		Abnormality in the collection circuit for outdoor unit protection	Protection detection device fault (incorrect wiring of outdoor PCB).
39	Compressor	Abnormal operation current in constant speed compressor	Overcurrent, blown fuse, current sensor fault, instant power failure, voltage drop, abnormal power supply.
3A	Outdoor Unit	Abnormal outdoor unit capacity.	Outdoor unit capacity >36 HP.
3b		Voltage or combination of outdoor unit models incorrectly set	Voltage or combination of secondary and main units incorrectly set.
3d		Abnormal transmission between the main unit and the secondary unit(s)	Incorrect wiring, disconnected wiring, broken cable, PCB fault.
3E		Abnormal combination between inverter PCB and outdoor PCB	Incorrect combination between inverter PCB and outdoor PCB.
43	Protection Device	Low-pressure decrease protection device activation	Defective compression (compressor or inverter fault, loose power supply connection).
44		Low-pressure increase protection device activation	Overload during cooling, high temperature with heating, locked expansion valve (loose connector).
45		High pressure increase protection device activation	Overload (clogging, short pitch), pipe clogging, excess refrigerant, mixture of inert gas.
47		Low-pressure decrease protection device activation (vacuum protection)	Insufficient refrigerant, refrigerant pipes, clogging, expansion valve locked in open position (loose connector).
48		Inverter overcurrent protection device activation	Overload, compressor fault.

4. Troubleshooting

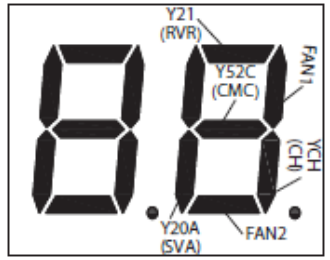
Alarms

Code	Category	Content of abnormality	Possible Cause
51	Inverter	Abnormal inverter current sensor	Current sensor fault
53		Inverter error signal detection	Controller IC error signal detection (overcurrent, low-voltage and short-circuit protection)
54		Abnormal inverter fin temperature	Abnormal inverter fin thermistor, heat exchanger clogging, fan motor fault
55		Inverter fault	Inverter PCB fault
57	Fan controller	Fan controller protection activation	Controller IC error signal detection (overcurrent, low-voltage and short-circuit protection), instant overcurrent
5A		Abnormal fan controller fin temperature	Fin thermistor fault, heat exchanger clogging, fan motor fault
5b		Overcurrent protection activation	Fan motor fault
5C		Abnormal fan controller sensor	Current sensor fault (instant overcurrent, increased fin temperature, low voltage, earthing fault, step-out)
b1	Outdoor unit number setting	Unit number or address number of the outdoor unit incorrectly set	A number greater than 64 has been set for the refrigerant cycle or address
b5	Indoor unit number setting	Connection number of the indoor unit incorrectly set	There are more than 17 units not corresponding to H-LINK II connected to one system
C1	CH unit	Incorrect indoor unit connection	There are 2 or more CH units connected between the outdoor and indoor units
C2		Connection number of the indoor unit incorrectly set	There are 9 or more indoor units connected to the CH unit
C3		Incorrect indoor unit connection	Indoor units from different refrigerant cycles have been connected to the CH unit
EE	Compressor	Compressor protection alarm (cannot be reset from the remote controller)	This alarm code is displayed when the following alarms are triggered three times within six hours: 02, 07, 08, 39, 43 to 45, 47
1A	Indoor fan controller	Abnormality of fan controller fin temperature	Abnormality of fin thermistor or fan controller, heat exchanger clogging, abnormality of fan motor
1b		Activation of overcurrent protection	Abnormality of fan motor
1C		Problem with current sensor	Abnormality of fan controller current sensor
1d		Activation fan controller protection	Driver IC error signal detection, instantaneous overcurrent.
1E		Abnormality of indoor fan controller	Indoor voltage decrease, insufficient capacity of power supply wiring.

4. Troubleshooting

Check Mode RAS-FS(V)NME

- Start of setting
  - Press PSW1 for 3 seconds or more
  - Press PSW2 or PSW3 can be selected the next required Mode:



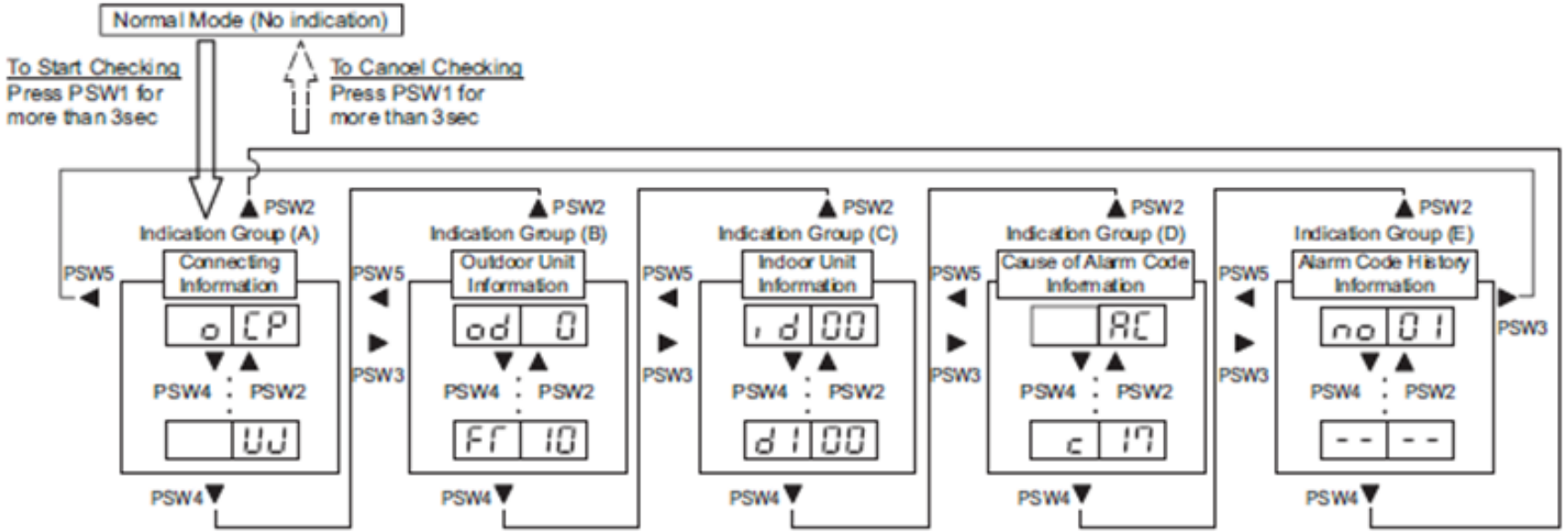
	Item	7-Segment Display SEG	Details
1	Output State of Outdoor Micro-Computer	SC	Output State of Outdoor Micro-Computer Indication Refer to "Arrangement of Push Switches and 7-Segment Display"
2	Total Capacity of Operated I.U.	oP	Total Capacity of Operated Indoor Units Refer to "Indoor Unit Capacity Table".
3	No. of Control Software	SP	Control Software No. in use is indicated.
4	No. of Comp. Inverter Software	,P	Comp. Inverter Software No. in use is indicated.
5	Running Frequency of Inverter Compressor MC1	H1	Running Frequency of No.1 Compressor Indication [Hz]
6	Outdoor Fan Step	Fo	Outdoor Fan Step Indication (0 to 27 [Step])
7	Speed of Outdoor Fan 1	FS.	0~1000(rpm)
8	Speed of Outdoor Fan 2	F.S.	0~1000(rpm)
9	Outdoor Electronic Expansion Valve Opening	Eo	0~100(%)
10	High (Discharge) Pressure (Pd)	Pd.	0.1~4.9(MPa)
11	Low (Suction) Pressure (Ps)	PS.	0.0~1.9(MPa)
12	Discharge Gas Temperature on Top of Compressor MC1	Td	1~142(°C)
13	Outdoor Heat Exchanger Liquid Temperature (Te1)	TE	-19~80(°C)
14	Ambient Air Temperature (Ta)	To	-19~80(°C)
15	Liquid Stop Valve Temperature (Tchg)	TC	-19~80(°C)
16	Inverter Fin Temperature	TF	-19~127(°C)
17	Inverter Primary Current	A1	0~199(A)

	Item	7-Segment Display SEG	Details
18	Inverter Secondary Current	A2	0~199(A)
19	Indoor Unit Address	nA	0~63 (Indoor Unit No.) *4
20	Indoor Electronic Expansion Valve Opening	EA	0~100(%) *4
21	Liquid Pipe Temp. of Indoor Unit	LA	-19~127(°C) *4
22	Gas Pipe Temp. of Indoor Unit	uA	-19~127(°C) *4
23	Indoor Unit Inlet Air Temp	,A	-19~127(°C) *4
24	Indoor Unit Outlet Air Temp	oA	-19~127(°C) *4
25	Cause Code of Indoor Unit Stoppage	dA	0~99 *4
26	Accumulated Operation Time of Compressor MC1	UU	[10 Hours]
27	Accumulated Operation Time of Compressor MC1 (Resettable)	cU	[10 Hours] Accumulated operation time can be reset. *2
28	Outdoor Unit Alarma Code	AC	0~FF
29	Cause Code of Inverter Stoppage 1	,F	Cause of INV Compressor MC1 Stoppage Refer to "Cause Code of Inverter Stoppage"
30	Adnormal Data Record (No.1)	n1	Accumulated Operating Time. Alarm Code or Cause Cide of I.U. Stoppage, Cause Code of Inverter Fan Stoppage
31	.....	...	
32	Adnormal Data Record (No.9)	n9	
33	Capacity of Outdoor Unit	oC	Capacity Code of Outdoor Unit, For example, 40 represent that 40÷8[5]HP.
34	Total Capacity of Connected Indoor Units	CP	Total Capacity of Connected Indoor Units
35	Connected I.U. Number	AA	Connected Indoor Unit Number
36	Refrigerant Cycle No.	CA	Refrigerant Cycle No.

4. Troubleshooting

Check Mode RAS-FSXNME

- Start of setting
  - Press PSW1 for 3 seconds or more
  - Press PSW2 or PSW can be selected the next required Mode:



4. Troubleshooting

Check Mode RAS-FSXNME

■ Connecting Information

- This information is indicated only on **Main Unit.**
- To read information about other OU connected on the same Refrigerant Cycle.
- Press PSW4 PSW2 to choose the unit.
- Press PSW3 to read the information.
- Press PSW5 to return to unit selection.

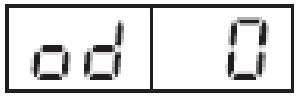
Unit	Indication
Unit A (No.1)	od00
Unit B (No.2)	od02
Unit C (No.3)	od03

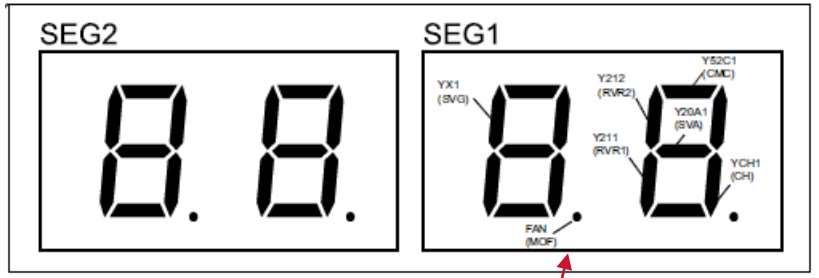
	Item	SEG2	SEG1	Details
1	Total Capacity of Connected Outdoor Units	o	CP	Total Capacity of O.U. Combination Refer to “Capacity table for the outdoor units"
2	O.U. Constitution Quantities	o	AA	Constitution quantities of outdoor unit combination
3	Total Capacity of Connected Indoor Unit	i	CP	Total capacity of the connected indoor units
4	Connected I.U. Number	i	AA	Number of connected indoor units
5	Refrigerant Group		GA	Refrigerant group number (0 to 64)
6	Total Capacity of Operated I.U.		oP	Total capacity of the operating indoor units. Refer to the "Capacity table for the indoor units"
7	Total Comp. Frequency		Ht	Units: Hz
8	Accumulated Operation Time		UJ	Units: hour (indication x 10 hours)

4. Troubleshooting

Check Mode RAS-FSXNME

■ Outdoor Unit Information





- This information is indicated only on Main Unit.
- To read information about other OU connected on the same Refrigerant Cycle.
- Press PSW4 PSW2 to choose the unit.
- Press PSW3 to read the information.
- Press PSW5 to return to unit selection.

Unit	Indication
Unit A (No.1)	od 0
Unit B (No.2)	od 1
Unit C (No.3)	od 2

Item		SEG2	SEG1 *1)	Details
1	Outdoor Unit No.	od	0	Outdoor Unit No. Indication
2	Outdoor Unit Capacity	CA	0	Unit capacity indication. Refer to the "Capacity table for the outdoor units".
3	Output State of Outdoor Micro-Computer	SC	0	Output status of the outdoor unit microcomputer. Refer to section "location of pushswitches and the 7-segment display".
4	Running Frequency of Inverter compressor MC1	H1	0	Running frequency of No. 1 compressor indication (Hz)
5	Running Frequency of Inverter compressor MC2 *2)	H2	0	Running frequency of No. 2 compressor indication (Hz)
6	Total Number of Running Compressor	CC	0	Indication of the total number of compressors running
7	Outdoor Fan Step	Fo	0	Outdoor fan step indication (0 to 27 steps)
8	Outdoor Expansion Valve MV1 Opening	E1	0	Opening indication of the expansion valve MV1 for outdoor unit (Unit: %)
9	Outdoor Expansion Valve MV2 Opening *3)	E2	0	Opening indication of the expansion valve MV2 for outdoor unit (Unit: %)

4. Troubleshooting

Check Mode RAS-FSXNME

■ Outdoor Unit Information

Item		SEG2	SEG1 *1)	Details
10	Opening of the expansion valve MVB of the outdoor unit for bypass	Eb	0	Opening indication of the expansion valve MVB for the bypass indication (Unit: %)
11	Discharge pressure (High)	Pd	0	Thermistor open circuit indication: 5.62 MPa Thermistor short-circuit indication: -0.62 MPa
12	Suction pressure (Low)	PS	0	Thermistor open circuit indication: 2.25 MPa Thermistor short-circuit indication: -0.25 MPa
13	Ambient air temperature (Ta)	?o	0	Thermistor open circuit indication: -127 °C Thermistor short-circuit indication: 127 °C
14	Discharge gas temperature at the upper part of the compressor MC1 (TD1)	?d	10	Thermistor open circuit indication: 0 °C Thermistor short-circuit indication: 255 °C
15	Discharge gas temperature at the upper part of the compressor MC2(TD2) *2)	?d	20	Thermistor open circuit indication: 0 °C Thermistor short-circuit indication: 255 °C Only 16 HP or more.
16	Evaporating temperature TE1 in heating	?E	10	Thermistor open circuit indication: -127 °C Thermistor short-circuit indication: 127 °C
17	Evaporating temperature TE2 in heating *4)	?E	20	Thermistor open circuit indication: -127 °C Thermistor short-circuit indication: 127 °C
18	Gas temperature in the outdoor unit heat exchanger	?G	0	Thermistor open circuit indication: -127 °C Thermistor short-circuit indication: 127 °C
19	Liquid stop valve temperature (Tchg)	?C	H0	Thermistor open circuit indication: -127 °C Thermistor short-circuit indication: 127 °C
20	Subcooling heat exchanger temperature (Tsc)	?S	C0	Thermistor open circuit indication: -127 °C Thermistor short-circuit indication: 127 °C

4. Troubleshooting

Check Mode RAS-FSXNME

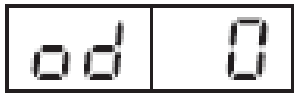
■ Outdoor Unit Information

	Item	SEG2	SEG1 *1)	Details
21	Inverter fin temperatura 1	□F	10	Unit: °C
22	Inverter fin temperatura 2 *2)	□F	20	Unit: °C
23	Fan controller fin temperatura 1	□F	10	Unit: °C
24	Fan controller fin temperatura 2 *4)	□F	20	Unit: °C
25	Compressor MC1 current *5)	A1	0	INV1 Primary Current [A]
26	Compressor MC2 current *2) *5)	A2	0	INV2 Primary Current [A]
27	Fan Motor MOF1 current *5)	AF	10	Fan Controller 1 Secondary Current [A]
28	Fan Motor MOF1 current *4) *5)	AF	20	Fan Controller 2 Secondary Current [A]
29	Accumulated operation time of compressor MC1	UJ	10	[10 hours]
30	Accumulated operation time of compressor MC2 *2)	UJ	20	[10 hours]
31	Accumulated operation time of compressor MC1 (Resettable)	cU	10	[10 hours] Accumulated operation time can be reset. *6)
32	Accumulated operation time of compressor MC2 (Resettable) *2)	cU	20	[10 hours] Accumulated operation time can be reset. *6)

4. Troubleshooting

Check Mode RAS-FSXNME

■ Outdoor Unit Information



Item		SEG2	SEG1 *1)	Details
33	Cause code of inverter stoppage 1	i	10	Cause of INV compressor MC1 stoppage refer to “Cause code of inverter stoppage”
34	Cause code of inverter stoppage 2 *2)	i	20	Cause of INV compressor MC2 stoppage refer to “Cause code of inverter stoppage”
35	Cause code of fan controller stoppage 1	F	10	Cause of fan motor MOF1 stoppage refer to “Cause code of fan controller stoppage”
36	Cause code of fan controller stoppage 2 *4)	F	20	Cause of fan motor MOF2 stoppage refer to “Cause code of fan controller stoppage”

*1): The outdoor unit No. is indicated on the one digit of "SEG1".
*2): Indication Item only for Outdoor Unit Model: 16HP or more
*3): Indication Item only for Outdoor Unit Model: FSXNS 20HP or more, FSXNP 16HP or more.
*4): Indication Item only for Outdoor Unit Model: FSXNS 14HP or more, FSXNP 8HP or more
*5): The indicated current is reference value. Use a clamp meter for the accurate current value.
*6): To reset the accumulated operation time, press "PSW1+PSW3" for 5 seconds while the accumulated data is indicated.

4. Troubleshooting

Check Mode RAS-FSXNME

■ Outdoor Unit Information

Cause of inverter stoppage (check the item dF)

Code	Cause
1	Driver IC Error Signal Detection
2	Instantaneous Overcurrent
3	Inverter fin temperature increase
4	Electronic Thermal Protection (Inverter Overcurrent)
5	Inverter voltage decrease
6	Inverter voltage increase
7	Abnormal Inverter transmission
8	Abnormal current sensor
9	Instantaneous Power Failure Detection
11	Microcomputer reset
12	Earth fault detection
13	Open-Phase Detection
16	Inverter failure
17	Abnormal Control
18	Forced stoppage by high pressure detection
19	Abnormality of picking up circuit for protection
21	Abnormal compressor motor (Step-out)
22	Abnormal combination of PCB
25	Abnormal instruction frequency

Cause for fan controller stoppage (Check the item Fd)

Code	Cause
1	Driver IC error signal detection
2	Instantaneous overcurrent
3	Fan Controller Fin Temperature Increase
4	Electronic Thermal Protection (Overcurrent)
8	Abnormal Current Sensor
12	Ground Fault Detection
15	Reverse Driving
16	Fan Controller Malfunction
21	Abnormal Fan Motor (Step-Out)
25	Abnormal Instruction Frequency

4. Troubleshooting

Check Mode RAS-FSXNME

■ Outdoor Unit Information

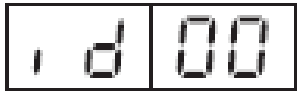
Cause of Indoor Unit Stoppage d1

Code	Cause	Code	Cause
0	Operation OFF, Power OFF	16	Retry due to Decrease of Discharge Gas Superheat
1	Thermo-OFF		
2	Alarm (Not always indicated)	17	Retry due to inverter tripping
3	Freeze Protection, Overheating Protection	18	Retry due to voltage decrease / Increase, other retry of inverter
5	Instantaneous Power Failure at Outdoor Unit	19	Expansion Valve Opening Difference Protection
6	Instantaneous Power Failure at Indoor Unit	21	Forced Thermo-OFF for Oil Return
7	Stoppage of Cooling Operation due to High/Low Outdoor Air Temperature Stoppage of Heating Operation due to High Outdoor Air Temperature	22	Enforced Thermo-OFF for Hot Start Control at Crankcase Heater Preheating
		26	Retry due to High Pressure Decrease
9	Stoppage of Reversing Valve Switching Control	28	Stoppage due to Outlet Temperature Decrease in Cooling
10	Demand Enforced Stoppage	30	Stoppage of Thermo-OFF due to Compressor Excepting
11	Retry due to Pressure Ratio Decrease	32	Retry due to Abnormal Communication of Outdoor Unit
12	Retry due to Low Pressure Increase	34	Stoppage of Thermo-OFF by Motion Sensor
13	Retry due to High Pressure Increase	36	Retry after Defrosting Operation
15	Retry due to Discharge Gas Temperature Increase, Retry due to Low Pressure Decrease	39	Stoppage of Thermo-OFF due to Power Saving Control

4. Troubleshooting

Check Mode RAS-FSXNME

■ Indoor Unit Information



- This information is indicated only on Main Unit.
- To read information about other IU connected on the same Refrigerant Cycle.

- Press PSW4 PSW2 to choose the unit.
- Press PSW3 to read the information.
- Press PSW5 to return to unit selection.

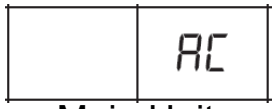
Unit No.	Indication
No. 0	□d00
No. 1	□d01
↓	↓
No. 63	i d63

	Item	SEG2	SEG1	Details
1	Indoor unit No.	i d	00	Indoor unit No. indication
2	Capacity of the indoor unit	CA	00	Unit capacity indication. Refer to the "Capacity table for the indoor units"
3	Opening of the expansion valve	□E	00	Unit: %
4	Heat exchanger liquid pipe temperature	□L	00	Unit: °C
5	Heat exchanger gas pipe temperature)	□G	00	Unit: °C
6	Air inlet temperature	□□	00	Unit: °C
7	Air outlet temperature	□o	00	Unit: °C
8	Unit stoppage cause code	d1	00	Indoor unit stoppage cause code indication. Refer to the "Indoor unit stoppage cause table"

4. Troubleshooting

Check Mode RAS-FSXNME

■ Cause of Alarm Code Information



- This information is indicated only on Main Unit.

- Press PSW4 PSW2 to read the information.
- Press PSW5 to return to unit selection.

Item		SEG2	SEG1	Details
1	Alarm Cause Code		AC	Latest O.U. Stoppage Alarm Code Indication. Refer to Alarm Code Table
2	Degeneracy Control for Pressure Ratio Decrease Protection	c	11	0 : Degeneracy Control is not Activated 1 : Degerneracy Control is Activated
3	Degeneracy Control for High Pressure Increase Protection	c	13	0 : Degeneracy Control is not Activated 1 : Degerneracy Control is Activated
4	Degeneracy Control for Inverter Fin Temp. Increase Protection	c	14	0 : Degeneracy Control is not Activated 1 : Degerneracy Control is Activated
5	Degeneracy Control for Discharge Gas Temp. Increase Portection	c	15	0 : Degeneracy Control is not Activated 1 : Degerneracy Control is Activated
6	Degeneracy Control for TdSH Decrease Protection	c	16	0 : Degeneracy Control is not Activated 1 : Degerneracy Control is Activated
7	Degeneracy Control for Overcurrent Protection	c	17	0 : Degeneracy Control is not Activated 1 : Degerneracy Control is Activated

4. Troubleshooting

Check Mode RAS-FSXNME

■ Alarm Code History

- This information is indicated only on Main Unit.
- To read information about different alrms

- Press PSW4 PSW2 to choose the alarm.
- Press PSW3 to read the information.
- Press PSW5 to return to unit selection.

Unit No.	Indication
No. 0	no 00
No. 1	no 01
↓	↓
No. 15	no15

	Item	SEG2	SEG1	Details
1	Indoor unit No.	i d	00	Indoor unit No. indication
2	Capacity of the indoor unit	CA	00	Unit capacity indication. Refer to the "Capacity table for the indoor units"
3	Opening of the expansion valve	□E	00	Unit: %
4	Heat exchanger liquid pipe temperature	□L	00	Unit: °C
5	Heat exchanger gas pipe temperature)	□G	00	Unit: °C
6	Air inlet temperature	□□	00	Unit: °C
7	Air outlet temperature	□o	00	Unit: °C
8	Unit stoppage cause code	d1	00	Indoor unit stoppage cause code indication. Refer to the "Indoor unit stoppage cause table"

HITACHI

Thank you

Cooling & Heating