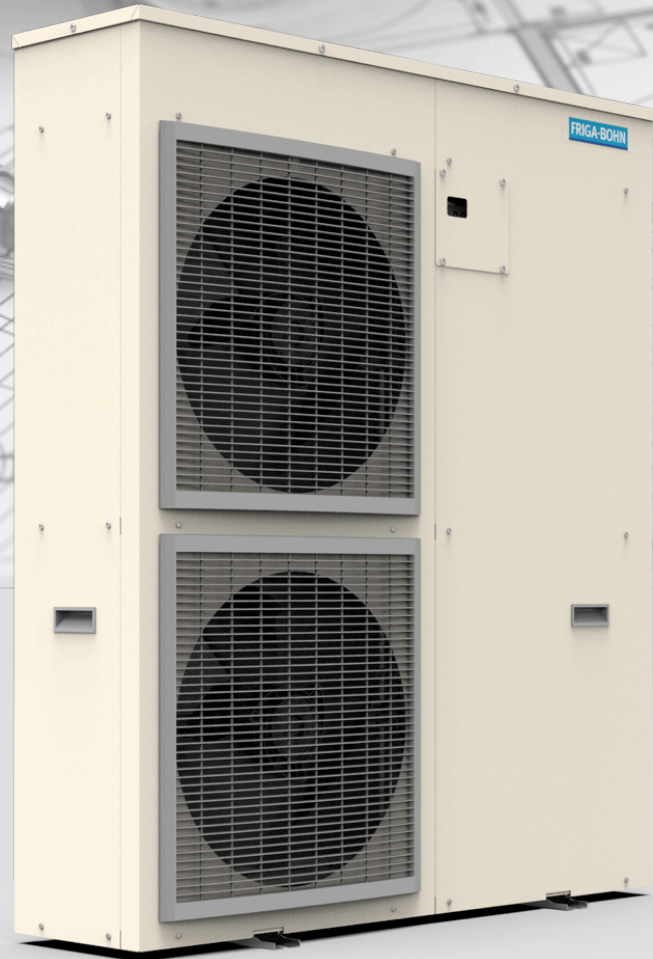


INSTALLATION INSTRUCTIONS



Split System

eCO2Boost XS 2

N° IN0043100-A
06.2019



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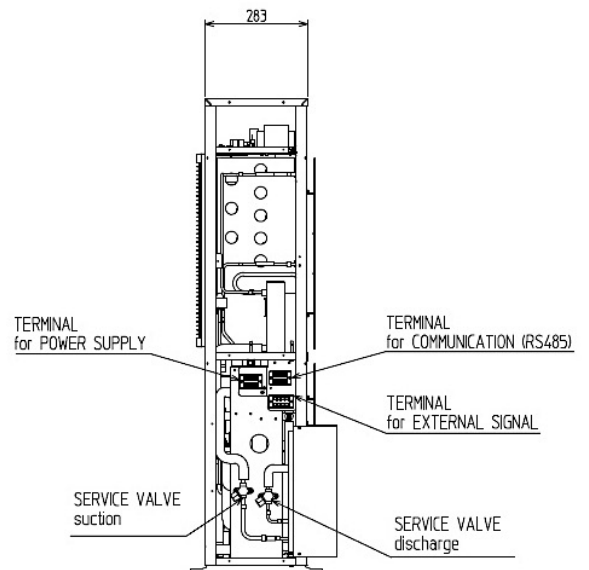
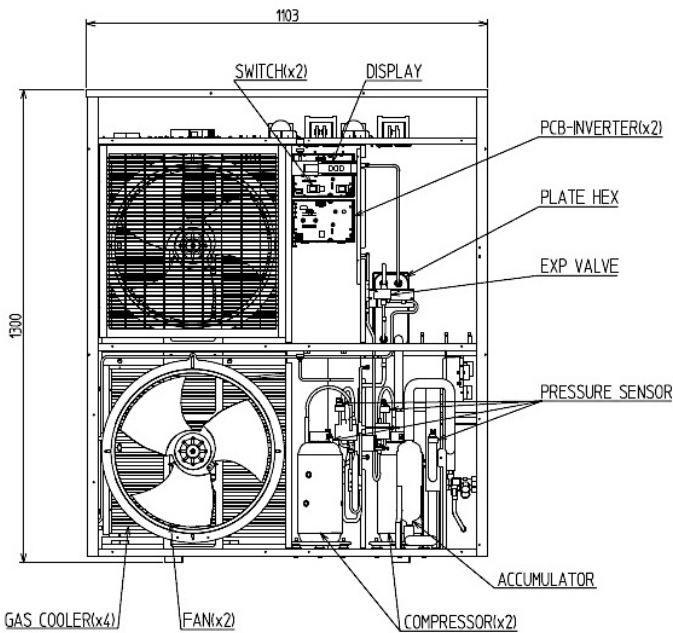
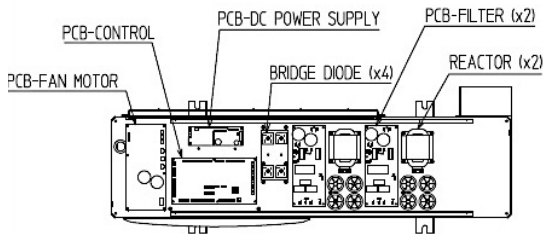
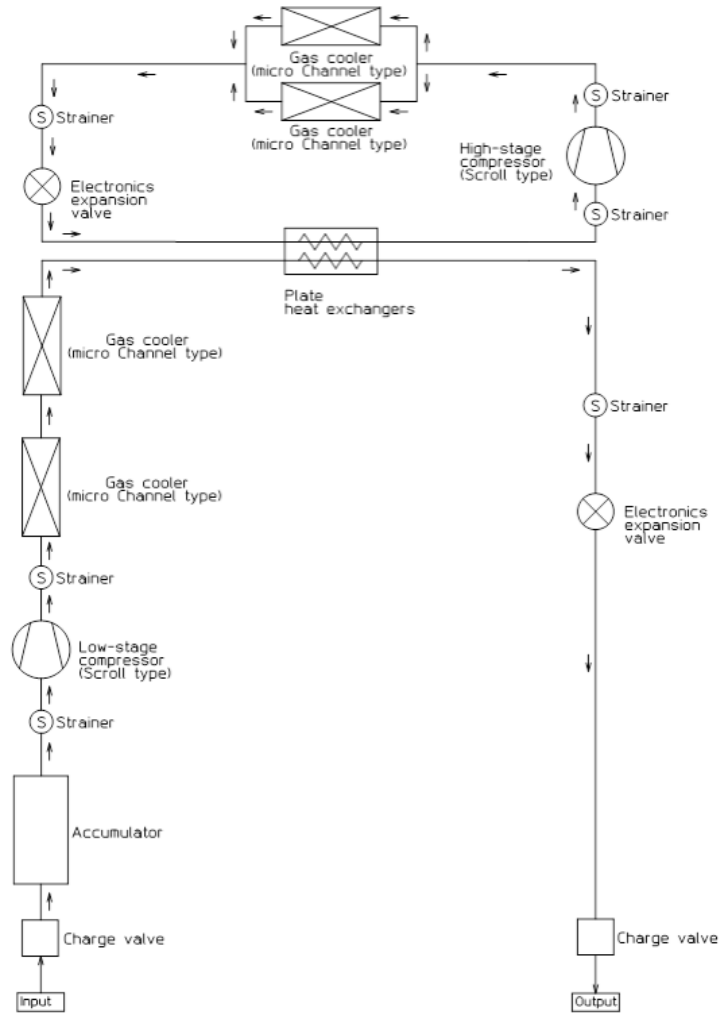
1. Product specifications

Evaporating temperature	-35 °C	-30 °C	-10 °C	-5 °C	+5 °C
Cooling capacity	2.0 kW	2.16 kW	4.33 kW	4.87 kW	5.6 kW
Electric power input	2.11 kW	2.13 kW	2.62 kW	2.76 kW	2.78 kW
Operation temperature	Evaporation (Min/Max)		-35 ~ +5 °C		
	Ambient (Min/Max)		-25 ~ +43 °C		
Dimensions*	Height x Width x Depth		1.300 x 1.100 x 281 mm		
Weight	107 kg				
Noise level (1)	1 meter away		49 dB(A)		
Compressor	Type		Inverter hermetic Scroll		
	Speed (Min/Max)		35 ~ 80 Hz		
Heat exchanger	Type		Aluminium microchannel		
Refrigerant	Type / GWP		R744 CO ₂ / 1		
Power supply	Phases / Voltage / Frequency		1 phase / 230 / 50 or 60 (-V/Hz)		
Communication	Standard		Modbus		
PED	Category		1		
Maximum working pressure (MWP)	High pressure side		14 MPa		
	Low pressure side		9 Mpa		

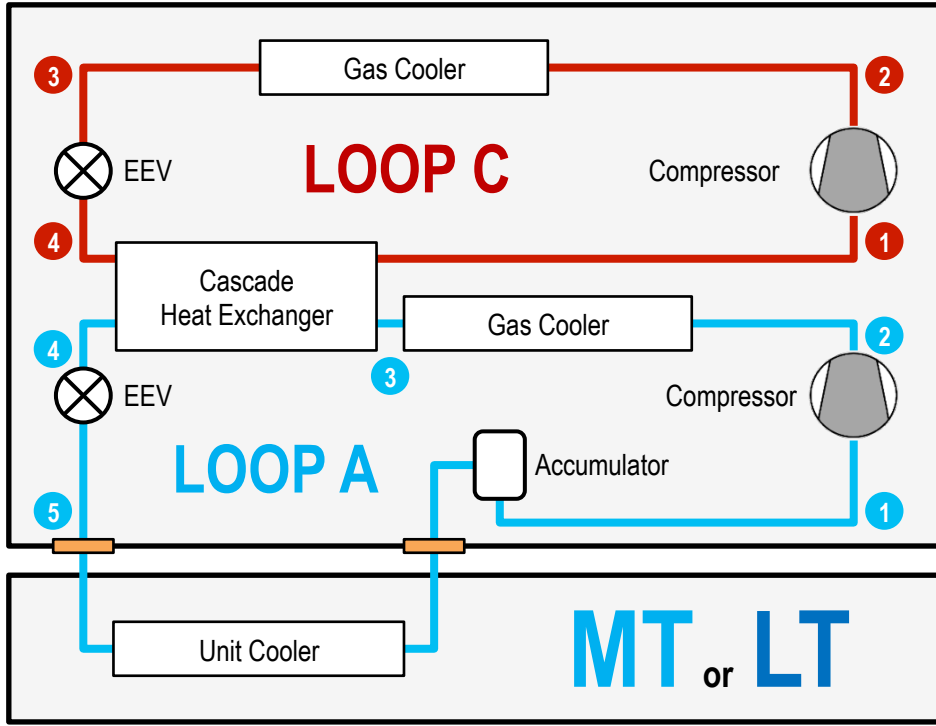
(1) Conditions: T° Ambient + 32°C, Compressor speed: 80hz

* without pipe cover

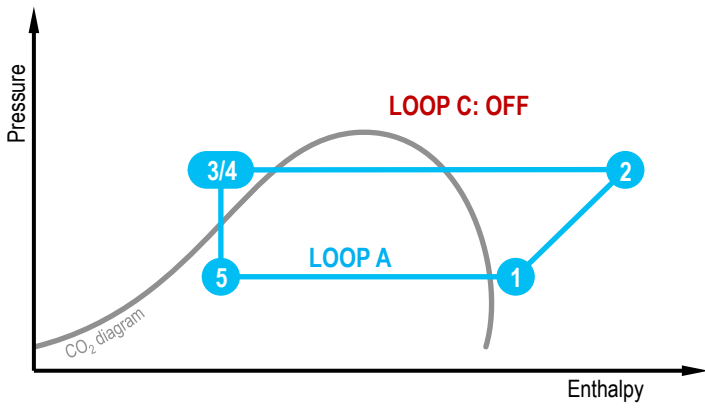
2. Product diagram



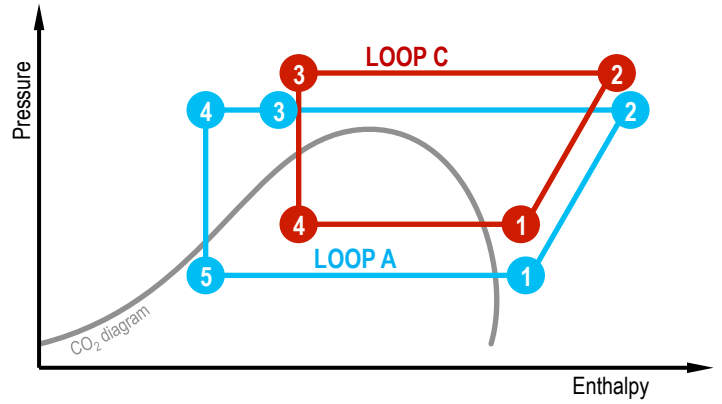
3. Operation diagrams



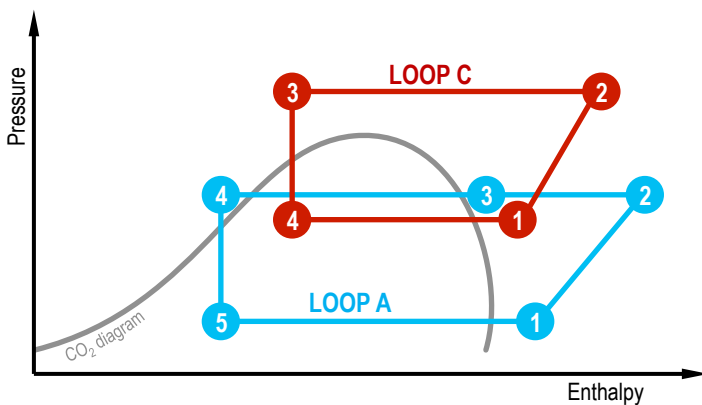
MT loop A ($T_e -5^\circ\text{C}$ / $T_{\text{ambient}} 10^\circ\text{C}$)



MT loop A ($T_e -5^\circ\text{C}$ / $T_{\text{ambient}} 25^\circ\text{C}$)



LT loop A ($T_e -30^\circ\text{C}$ / $T_{\text{ambient}} 25^\circ\text{C}$)



4.1. Installation design of CDU

Requirement for CDU* installation design conditions

1. Piping length

MT: < 30m (risk of capacity drop & poor lubrication if > 30m)

LT: < 20m (risk of capacity drop & poor lubrication if > 20m)

2. Evaporator volume

MT : < 15,000cc (risk of poor lubrication if > 15,000cc)

LT: < 5,000cc (risk of poor lubrication if > 5,000cc)

3. Cooling capacity

Capacity [kW]								
Ambient Temperature (°C)	Evaporating temperature (°C)							
	-35	-30	-20	-15	-10	-5	0	+5
32	2.00	2.16	2.46	3.47	4.33	4.87	5.44	5.60
38	1.91	2.02	2.40	2.81	4.02	4.70	5.06	5.19

4. Performance drop

Pipe length [m]	10 m	20 m	30 m
MT @ Te -5°C	1.2%	2.4%	3.6%
LT @ Te -30°C	2.3%	4.5%	-

* Please follow requirement to avoid performance drop and ensure good lubrication of the compressor.

4.2. Installation place

Installation conditions:

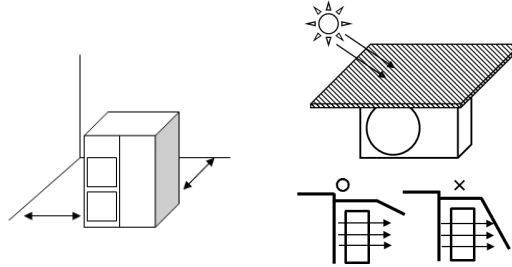
Provide space above the equipment to allow it to be opened (access for maintenance / repair operations).

Provide at least 500 mm of free space on the right-hand side.

Provide at least 500 mm of free space on the left-hand side and the front and back.

CDU :

Distance 500 mm
from wall or barrier



Protect direct sunlight and
then do not disturb fan air flow

Installation conditions

- Provide space on the top of product for the opening of product casing.
- Provide at least 500 mm of free space on the left and right-hand side and the front and back.

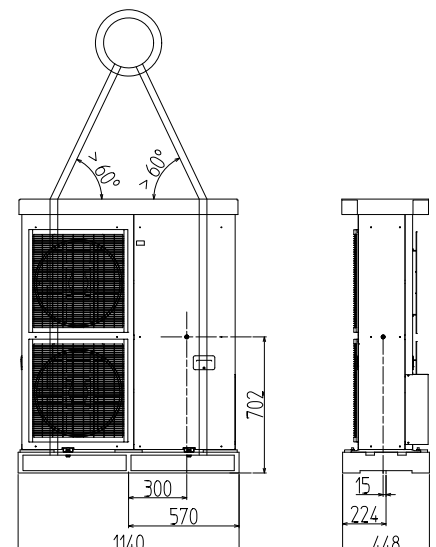
4.3. Installation condition

1. Install the equipment in a dry and well-ventilated location, where air isn't recycled.
2. Place the equipment in a location sheltered from direct sunlight, heat sources and cold wind. If exposing the equipment to direct sunlight is unavoidable, protect the device with a canopy.
3. Choose a location where the noise produced by the refrigerating unit will not disturb any close neighbors. The noisiest parts are located on sides and at the back of the unit.
4. The air outlet must not be directed towards house windows or plantations.
5. Place the equipment on a solid, smooth surface.
6. Place the equipment in a location where dust and debris do not risk being sucked into the evaporator fins.
7. In regions where significant snowfalls occur, always place the equipment under a roof, a shelter or a snow-proof tarpaulin.
8. Choose a location that is protected from strong winds.
9. Avoid locations exposed to oil splashes, salt (within 2km from coast), sulfur gas (nearby hot water springs), volcanic area.
10. To avoid any interference, the refrigerating unit must be installed at a minimum distance of 3 m from any device producing or receiving electromagnetic waves (e.g. radio).

5. Handling

When raising the refrigerating unit, always observe the following safety precautions:

1. Protect any parts that are in contact with hoisting ropes, e.g. using cardboard.
2. When the refrigerating unit is raised, do not go beneath it.
3. Weight CDU: Product weight: 95kg
Total weight including packaging: 105kg
4. This product's weight is not evenly distributed.
In particular, take care to avoid any shocks and sudden movements when transporting and raising the equipment.

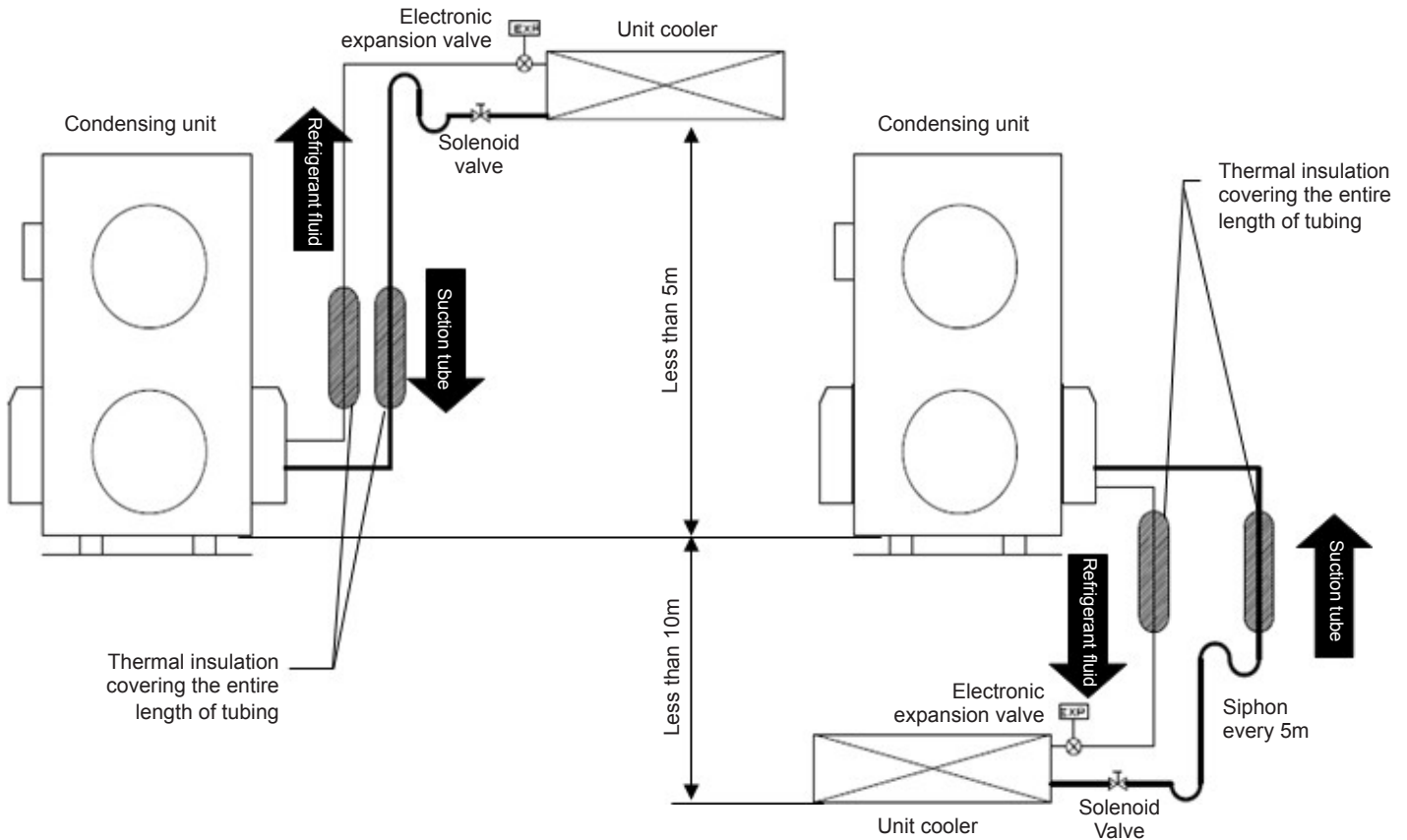
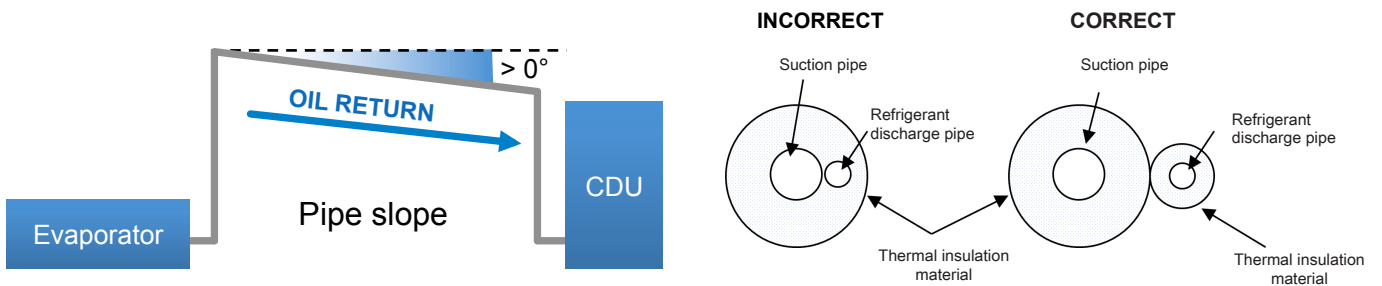


6.1. Piping connection

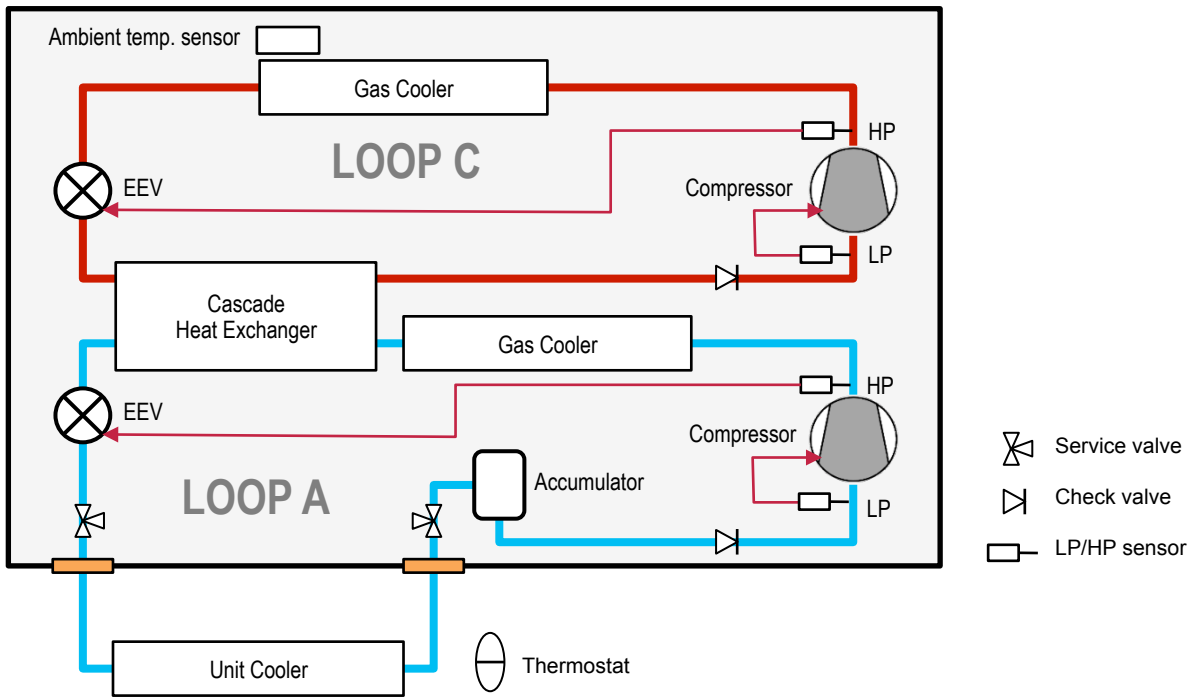
- Optimal distance between CDU and evaporator :
 MT: < 30m (risk of capacity & lubrication)
 LT: < 20m (risk of capacity & lubrication)
- Pipes Material

CDU connection	Diameter	Material	Thickness [mm]	MWP [bar]
Discharge pipe only	1/4" (6,35 mm)	Hard copper	1	245
Both (discharge and suction pipe)	3/8" (9,52 mm)	K65	0.65	120
		Hard copper	1	155

- Pipes insulation: 32 mm.
- Avoid CO₂ pipes contact with other conducts or pipes.
- Avoid installation in corrosive environment.



6.2. Fluid connection



UNIT COOLER VOLUME

MT : < 15000cc (if more risk of poor lubrication).

LT : < 5000cc (if more risk of poor lubrication).

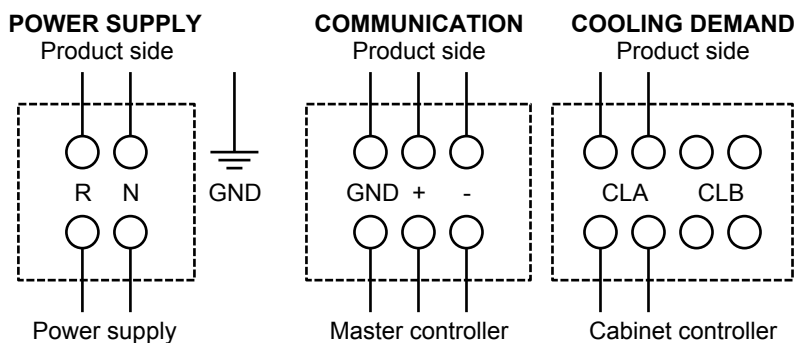
REMARKS

It's not necessary to add expansion valve on unot cooler because the CDU has its own expansion valve.

Add just thermostat device with defrost control

7. CDU power supply connection

Single Phase 230V electrical connection



Rated power	3,6 kW
Voltage	230V/1 AC
Frequency	50-60Hz
Electric consumption	2,4 kW
Rated current	10,7 A
Electrical power	4,2 kVA
Ground fault circuit breaker	12 A

For neutral systems requiring differential protection (TT mode for example) select a protection type:

- **Class B** differential switch - 300 mA, when a circuit breaker is already installed upstream.
- **SI type** differential circuit breaker - 300 mA, if no circuit breaker is installed.

8.1. External ON/OFF control signal

SYSTEM CONTROL LOGIC

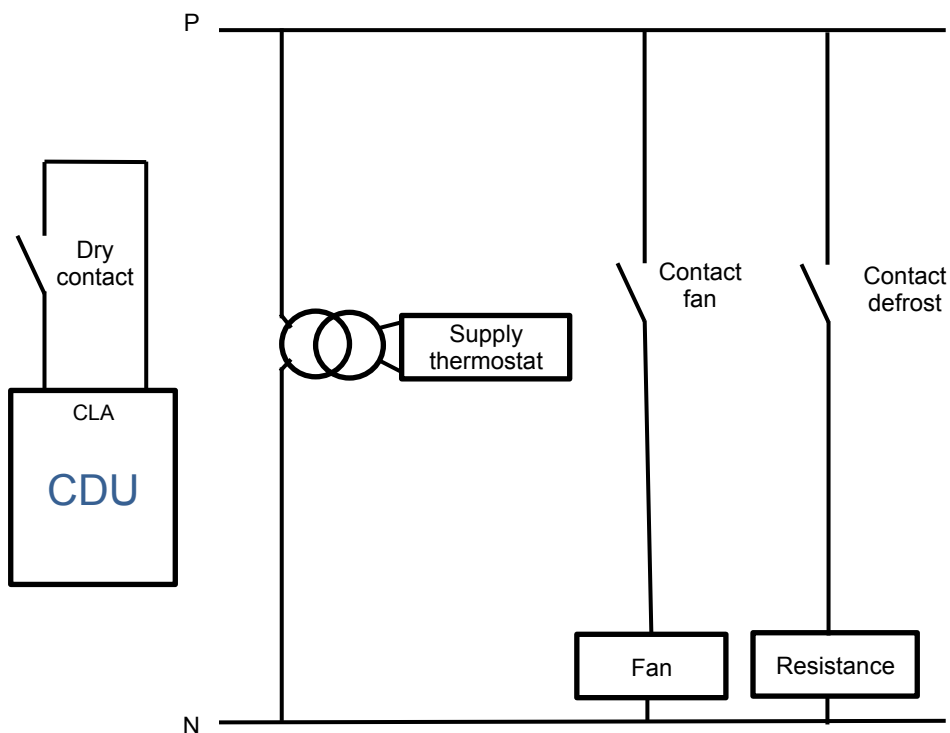
1. The compressor speed will change in order to achieve the low pressure set point decided by installer.
2. The low pressure is function of the evaporating temperature required for the showcase
($T_{ev} = T_{air_sc} - \Delta T$).
3. CDU EEV control the high pressure of each cycle. (optimal value as function of ambient temperature)

DEFROST CONTROL LOGIC

1. CDU compressors and fans should stop before the evaporator defrost.
2. Defrost(compressor stop) signal should be sent to CDU before the EEV controller.
3. Compressors will stop gradually before 3 minutes.



8.2. Electrical connection (Thermostat & 1 evaporator)



9.1. Piping and vacuuming process

1. Brazing connection pipe

- 1-1. Check that cabinet EEV is completely opened.
- 1-2. Before brazing, insert 2bar nitrogen gas flow into pipe for preventing deposition of any oxide film on the inner surface of the piping, and also avoid heating up service valve by wet towel cover etc.
- 1-3. During brazing, be careful for burning insulation and any CDU components.

2. Leakage test

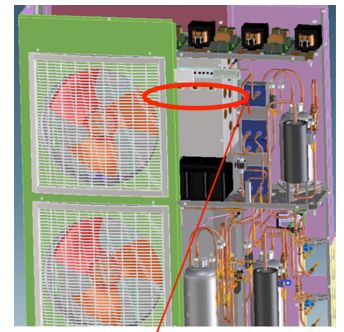
- 2-1. Power supply on CDU & wait 20 sec for initializing system.
- 2-2. Charge Nitrogen gas in 80bar or 55bar if using 60bar relief valve.
- 2-3. Check brazed part using leakage detector or leakage test liquid (formability).

3. Vacuuming

- 3-1. Set R744(CO₂) manifold, vacuuming pump, CO₂ vessel and CDU service port.
- 3-2. Connect CO₂ charge tube, vacuuming tube, and each equipment.
- 3-3. Check connector and each tube are closed tightly.
- 3-3. Loose service valve rod in middle position (3 way opening) before vacuuming.
- 3-4. Vacuuming for 2-3 hours inside pressure keeping -1bar (vacuuming status).

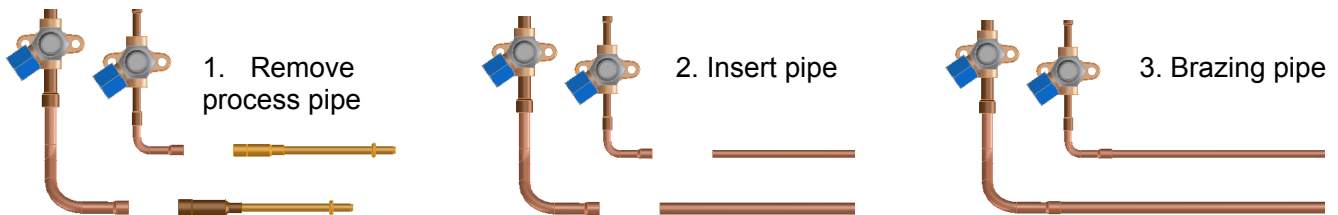
4. Setting parameter value

- 4-1. Change loop parameter set depending on target evaporating temperature during vacuuming process (suction pressure default value 3,0MPa).

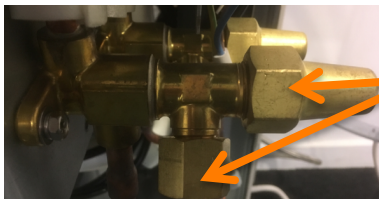


ON / OFF operation switch

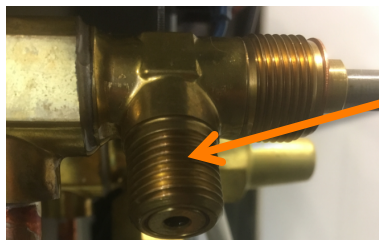
9.2. CDU connection to the unit coolers



9.3. Service valves connexion and handling



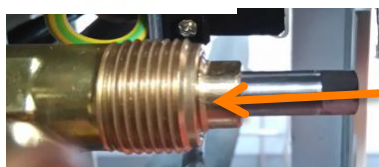
1. Untightened the protection caps



2. Connect the CDU to the manifold
Outlet Male G 3/8"

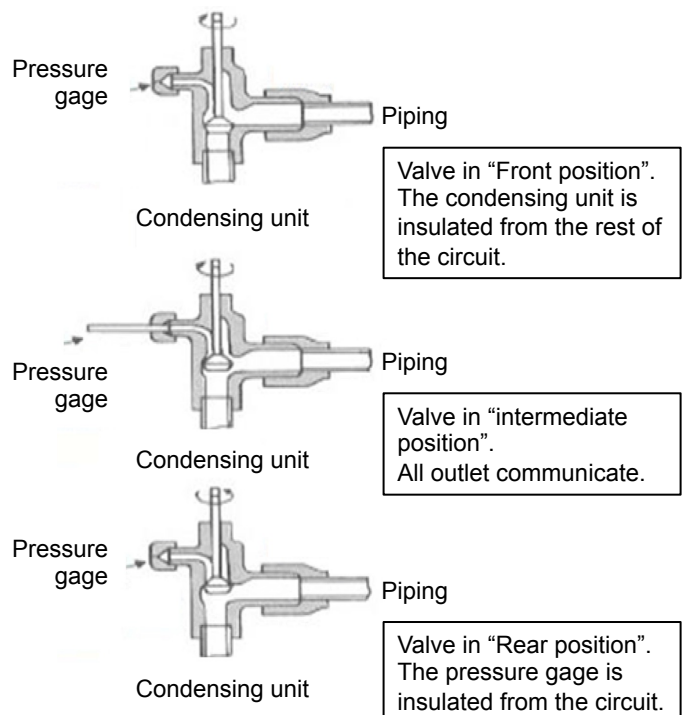


Example of connexion
Inlet G 3/8" female
Outlet 1/4" SAE



3. Untightened the compression packing

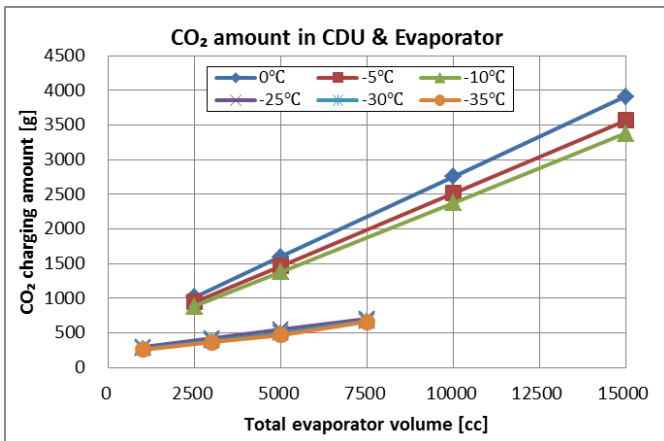
4. Service valve handling



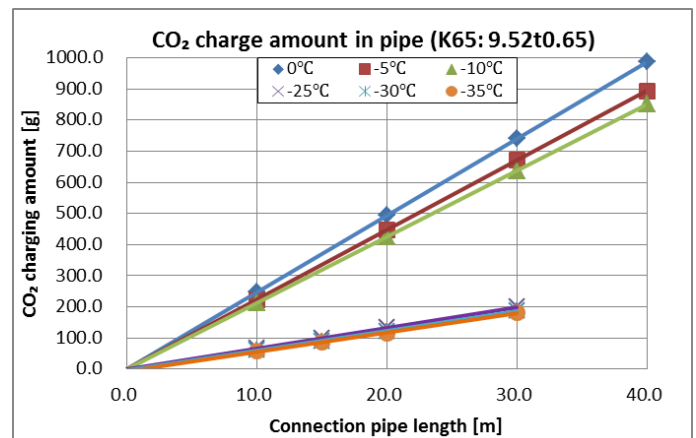
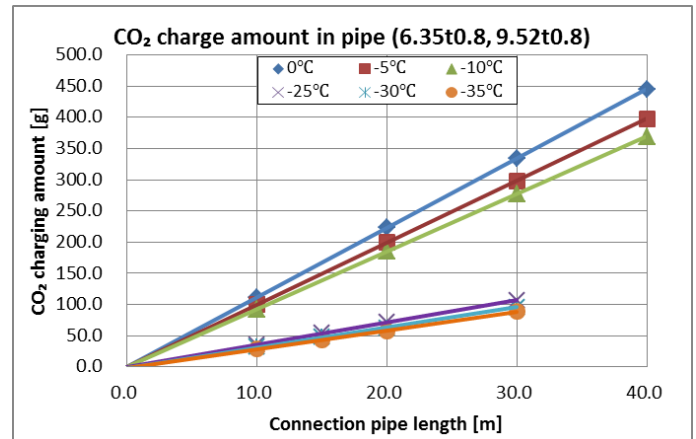
10.1. CO₂ charging process

1. Check CO₂ amount for each unit cooler and piping volume from graph (see paragraph 10.2).
2. Set CO₂ vessel on the weight scale, purge air inside charge tube and 0 setting scale before charging.
3. Break the vacuum by charging the installation in gas state up to a pressure of 10 bar on all the circuits.
4. Charge CO₂ without compressor running (liquid state) (charging from suction side service valve).
5. Compressor start running(push operation SW) if CO₂ charging stop before reaching target weight.
6. Close service valve after CO₂ weight reaching target amount.
7. Keep & check cooling operation until unit cooler air or cabinet temperature is reached at target temperature.
8. Check low pressure until reaching target & operation conditions(both of CO₂ & air side) are stable.
9. Compare actual high pressure & discharge pressure from the target table (see paragraph 10.3).
10. Charge more 50g CO₂ if high pressure is lower or discharge temperature is higher than table value.
11. Continue "5.10" process until operation status within ± 0.2 MPa in pressure, ± 5 K in discharge temperature for each target value.

10.2. CO₂ charging amount estimation



Unit cooler volume



Piping length

10.3. Check operation value

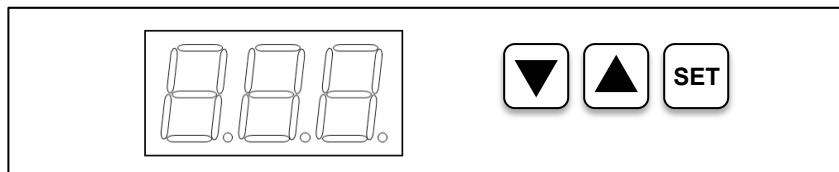
1. High pressure target

Target discharge temperature T_dis[°C]											
		Ambient temperature T_amb[°C]									
		40	35	30	25	20	15	10	5	0	-5
Evaporating temperature T_e[°C]	5	9.86	9.86	9.45	8.78	8.11	7.43	6.76	6.50	6.50	6.50
	0	9.86	9.86	9.45	8.78	8.11	7.43	6.76	6.50	6.50	6.50
	-5	9.86	9.86	9.45	8.78	8.11	7.43	6.76	6.50	6.50	6.50
	-10	9.00	9.00	9.00	8.78	8.11	7.43	6.76	6.50	6.50	6.50
	-15	8.00	8.00	8.00	8.00	8.00	7.43	6.76	6.50	6.50	6.50
	-20	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
	-25	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
	-30	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
-35	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	

2. Discharge temperature target

Target discharge temperature T_dis[°C]											
		Ambient temperature T_amb[°C]									
		40	35	30	25	20	15	10	5	0	-5
Evaporating temperature T_e[°C]	5	93.3	93.3	89.1	81.8	74.1	64.4	55.5	51.9	51.9	51.9
	0	101.6	101.6	97.4	89.9	82.0	72.0	62.9	59.2	59.2	59.2
	-5	110.5	110.5	106.1	98.5	90.4	80.2	70.9	67.1	67.1	67.1
	-10	110.3	110.3	110.3	107.7	99.4	89.0	79.5	75.6	75.6	75.6
	-15	107.6	107.6	107.6	107.6	107.6	98.4	88.7	84.7	84.7	84.7
	-20	96.1	96.1	96.1	96.1	96.1	94.5	94.5	94.5	94.5	94.5
	-25	98.3	98.3	98.3	98.3	98.3	96.8	96.8	96.8	96.8	96.8
	-30	100.4	100.4	100.4	100.4	100.4	98.8	98.8	98.8	98.8	98.8
-35	102.2	102.2	102.2	102.2	102.2	100.7	100.7	100.7	100.7	100.7	

11.1. CDU parameters change process



ENTERING COMMON PARAMETER LIST (P-PARAMETER)

1. Press only right button (SET) for 3 secs from normal display
2. "P00" blinking on display (P-parameter)
3. Press right button (SET) if moving other P-parameter (P01, P02, ...)
4. Press ▼ or ▲ if changing parameter set value
5. Press only right button (SET) for 3 secs if going back to normal display

ENTERING EACH CYCLE PARAMETER LIST (A, B, & C-PARAMETER)

1. Press simultaneously 3 button : ▼+▲+ right button (SET) for 3 secs from normal display
2. "CLA" blinking on display (A-parameter)
3. Press ▼ or ▲ if changing each parameter set as "CHC"
4. Press right button (SET) if entering each loop parameter set (A00, A01, ...)
5. Press ▼ or ▲ if changing parameter set value
6. Press only right button (SET) for 3 secs if going back to normal display

11.2 Parameters adjustment according to evaporator temperature set point

Parameter	Unit	Factory set	Te _v ≥ -5°C	Te _v ≥ -10°C	Te _v ≥ -15°C	Te _v ≥ -20°C	Te _v ≥ -25°C	Te _v ≥ -30°C	Te _v ≥ -35°C
P08	MPa	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0
A/B01	MPa	2.0	2.0	1.8	1.6	1.3	1.1	0.9	0.9
A/B02	MPa	3.0	3.0	2.5	2.2	1.9	1.6	1.3	1.1
A/B05	°C	-10	-25	-25	-25	-25	-25	-25	-25
A/B14	°C	33	33	27	19	14	12	33	33
A/B20	/	134	134	134	134	134	134	0	0
A/B23	/	21	21	21	21	21	21	21	19
C01	MPa	2.0	2.0	2.0	2.0	2.0	1.5	1.5	1.5
C26	°C	8	8	11	8	8	8	8	8
C27	Hz	40	40	40	35	35	35	35	35
C44	°C	5	5	8	5	5	5	5	6
C45	K	5	5	0.5	0.5	0.5	0.5	0.5	0.5

11.3. Reading parameters list

N°	Code	Content	Range	Unit	Step
1	PH	Superheat temperature (= tu - ti) for CHC	-99 to +99	K	1
2	TS	Suction temperature (CLA & CLB)	-50 to +90	°C	1
3	PS	Suction pressure	0 to +15.0	MPaG	0.1
4	PD	Discharge pressure	0 to +15.0	MPaG	0.1
5	TD	Discharge temperature	-40 to +156	°C	1
6	TI	Plate heat exchanger inlet temperature	-50 to +90	°C	1
7	TU	Plate heat exchanger outlet temperature	-50 to +90	°C	1
8	TR	EEV opening degree	0 to 990	pls	1
9	CI	Compressor speed	0 to 255	Hz	1
10	TOL	PCB box temperature (N/A)	-50 to +106	°C	1
11	TAR	Ambient temperature	-50 to +106	°C	1
12	FF1	Gas cooler fan motor speed (lower side)	0 to 999	rpm	1
13	FF2	Gas cooler fan motor speed (upper side)	0 to 999	rpm	1
14	FU1	Gas cooler fan DCV output (lower side)	0 to 6.00	V	0.01
15	FU2	Gas cooler fan DCV output (upper side)	0 to 6.00	V	0.01
16	PSO	Target suction pressure	-0.8 to +14.0	MPaG	0.1
17	PDO	Target discharge pressure	-0.8 to +14.0	MPaG	0.1
18	CO	Target compressor speed	0 to 90	Hz	1

11.4. CO₂ main properties

Pressure as function of evaporating temperature

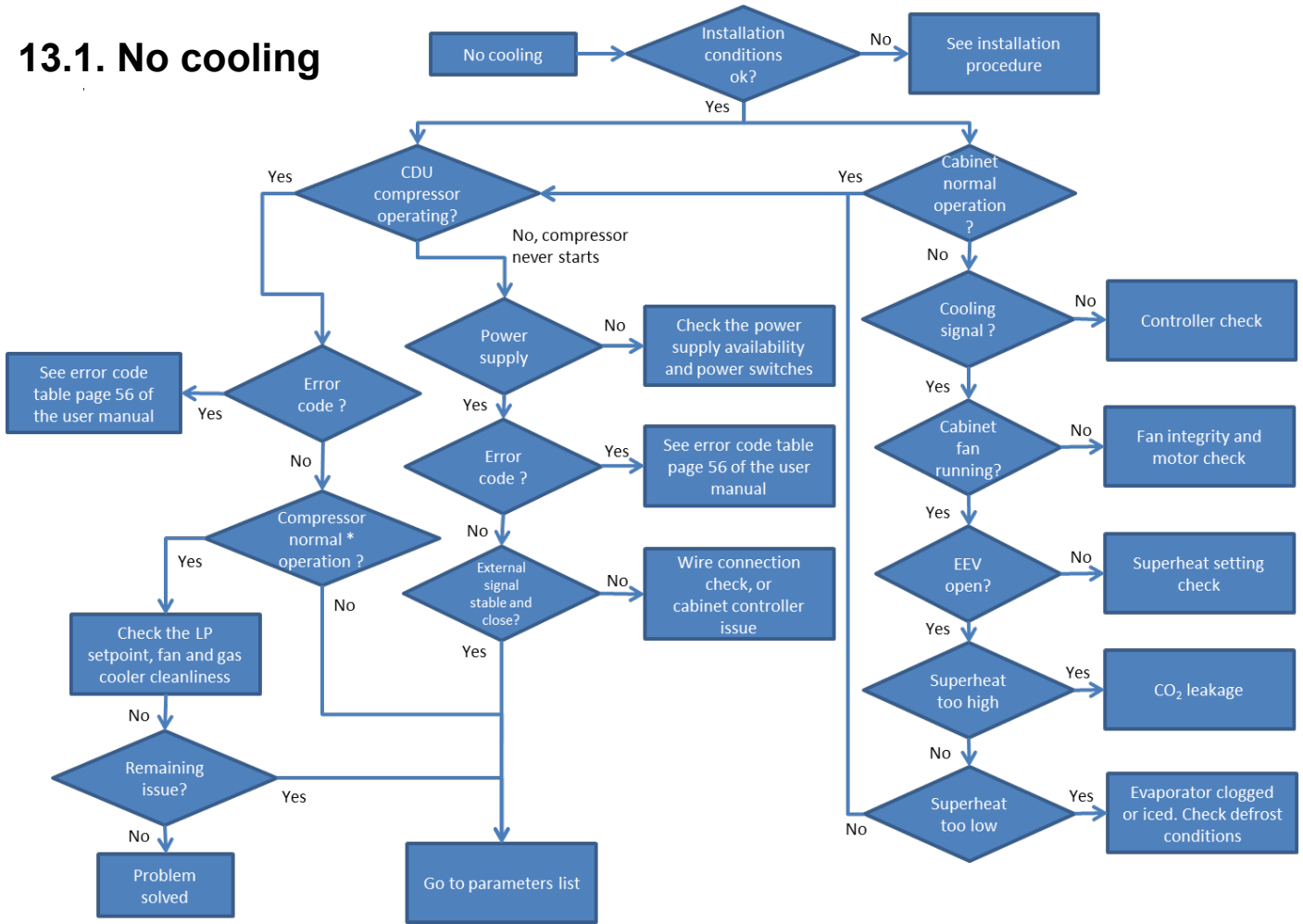
Point	Temperature	Relative pressure	Absolute pressure	Densité Liquide	Liquid density	Liquid enthalpy	Steam enthalpy	Liquid entropy	Steam entropy
	(C)	(MpaG)	(MPa)	(kg/m ³)	(kg/m ³)	(kJ/kg)	(kJ/kg)	(kJ/kg-K)	(kJ/kg-K)
1	-35	1,1	1,2024	1096,4	31,216	123,05	436,23	0,70794	2,023
2	-34	1,1	1,2452	1092,4	32,326	125,1	436,37	0,71634	2,018
3	-33	1,2	1,2891	1088,3	33,469	127,15	436,51	0,72474	2,0129
4	-32	1,2	1,3342	1084,1	34,644	129,2	436,62	0,73311	2,0079
5	-31	1,3	1,3804	1079,9	35,854	131,27	436,73	0,74148	2,0029
6	-30	1,3	1,4278	1075,7	37,098	133,34	436,82	0,74982	1,998
7	-29	1,4	1,4763	1071,5	38,378	135,41	436,9	0,75816	1,993
8	-28	1,4	1,5261	1067,2	39,696	137,5	436,96	0,76649	1,988
9	-27	1,5	1,577	1062,9	41,051	139,59	437,01	0,77481	1,9831
10	-26	1,5	1,6293	1058,6	42,445	141,69	437,04	0,78311	1,9781
11	-25	1,6	1,6827	1054,2	43,88	143,79	437,06	0,79141	1,9732
12	-24	1,6	1,7375	1049,8	45,356	145,91	437,06	0,79971	1,9683
13	-23	1,7	1,7935	1045,3	46,875	148,03	437,04	0,80799	1,9633
14	-22	1,8	1,8509	1040,8	48,437	150,16	437,01	0,81627	1,9584
15	-21	1,8	1,9096	1036,3	50,045	152,3	436,96	0,82455	1,9535
16	-20	1,9	1,9696	1031,7	51,7	154,45	436,89	0,83283	1,9485
17	-19	1,9	2,031	1027	53,402	156,61	436,81	0,8411	1,9436
18	-18	2,0	2,0938	1022,3	55,155	158,77	436,7	0,84937	1,9386
19	-17	2,1	2,1581	1017,6	56,959	160,95	436,58	0,85765	1,9337
20	-16	2,1	2,2237	1012,8	58,816	163,14	436,44	0,86593	1,9287
21	-15	2,2	2,2908	1008	60,728	165,34	436,27	0,87421	1,9237
22	-14	2,3	2,3593	1003,1	62,697	167,55	436,09	0,88249	1,9187
23	-13	2,3	2,4294	998,14	64,725	169,78	435,89	0,89078	1,9137
24	-12	2,4	2,501	993,13	66,814	172,01	435,66	0,89908	1,9086
25	-11	2,5	2,574	988,06	68,967	174,26	435,41	0,90739	1,9036
26	-10	2,5	2,6487	982,93	71,185	176,52	435,14	0,91571	1,8985
27	-9	2,6	2,7249	977,73	73,471	178,8	434,84	0,92405	1,8934
28	-8	2,7	2,8027	972,46	75,829	181,09	434,51	0,9324	1,8882
29	-7	2,8	2,8821	967,12	78,261	183,39	434,17	0,94076	1,883
30	-6	2,9	2,9632	961,7	80,77	185,71	433,79	0,94915	1,8778
31	-5	2,9	3,0459	956,21	83,359	188,05	433,38	0,95756	1,8725
32	-4	3,0	3,1303	950,63	86,032	190,4	432,95	0,96599	1,8672
33	-3	3,1	3,2164	944,97	88,794	192,77	432,48	0,97444	1,8618
34	-2	3,2	3,3042	939,22	91,647	195,16	431,99	0,98293	1,8563
35	-1	3,3	3,3938	933,38	94,596	197,57	431,46	0,99145	1,8509
36	0	3,4	3,4851	927,43	97,647	200	430,89	1	1,8453
37	1	3,5	3,5783	921,38	100,8	202,45	430,29	1,0086	1,8397
38	2	3,6	3,6733	915,23	104,07	204,93	429,65	1,0172	1,834
39	3	3,7	3,7701	908,95	107,46	207,43	428,97	1,0259	1,8282
40	4	3,8	3,8688	902,56	110,98	209,95	428,25	1,0346	1,8223
41	5	3,9	3,9695	896,03	114,62	212,5	427,48	1,0434	1,8163
42	6	4,0	4,072	889,36	118,41	215,08	426,67	1,0523	1,8102
43	7	4,1	4,1765	882,55	122,34	217,69	425,81	1,0612	1,8041
44	8	4,2	4,2831	875,58	126,44	220,34	424,89	1,0702	1,7977
45	9	4,3	4,3916	868,44	130,71	223,01	423,92	1,0792	1,7913
46	10	4,4	4,5022	861,12	135,16	225,73	422,88	1,0884	1,7847

12. First level of maintenance

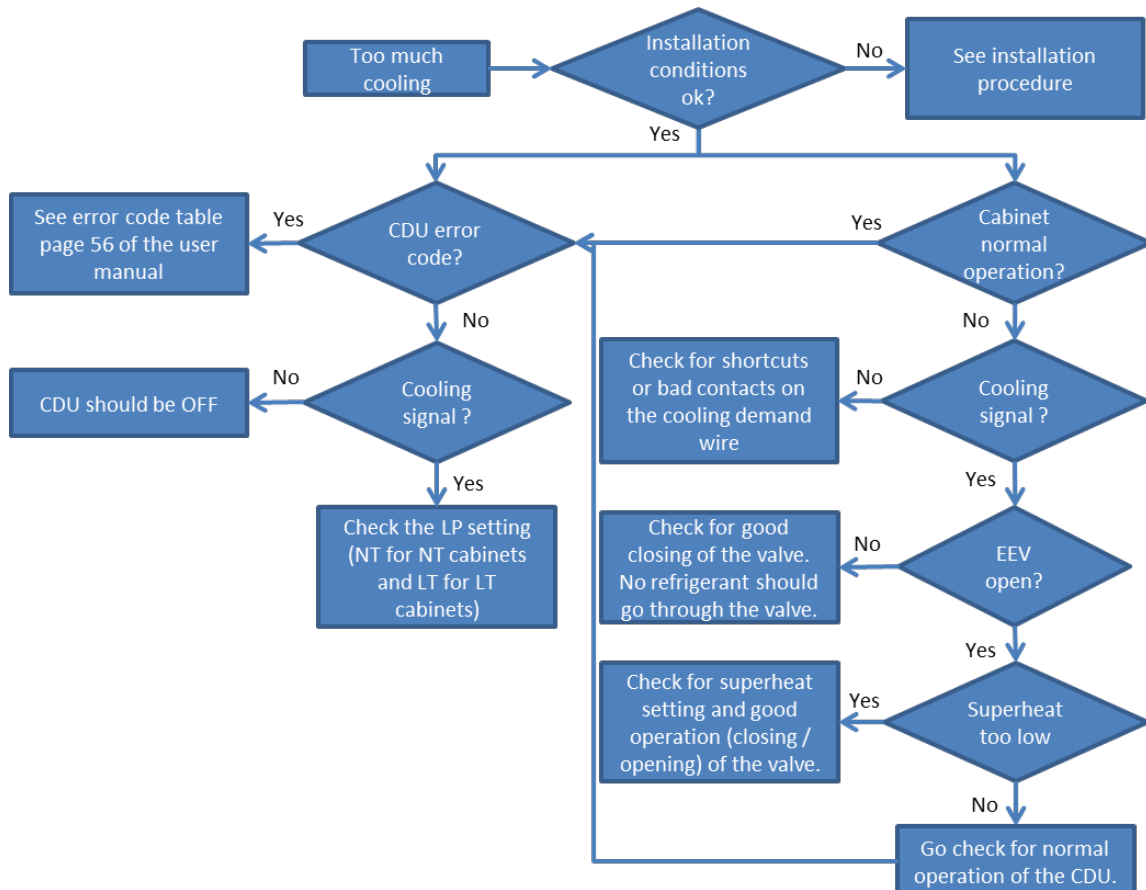
1. Regular inspections
2. In case of dirt inside the CDU, clean the outdoor heat exchangers with soft brush or vacuum cleaner.
3. Water can be used in case of clogged heat exchanger.
(Noted: CDU operation should be stopped when using water cleaning for heat exchanger)

13. Fault Tree Analysis

13.1. No cooling



13.2. Too much cooling



14. Installation check-up

Item	Check-up	Result
Installation	Falling risks prevented with anchor bolts or other attachment systems?	
	300 mm space around the heat exchanger's air intake surface ?	
	500 mm space in front of the unit ?	
	Height difference between CDU and evaporator cabinet/chamber ?	
	Less than 30 m Distance between CDU and evaporator ?	
Electrical wiring	Differential circuit breaker installed?	
	Suitable earth fault differential circuit breaker power rating?	
	Rated current	
	Rated sensitivity?	
	Ground wiring correctly connected?	
	Screws correctly tightened?	
	Power supply insulation (230V circuit), ground earth capacity 10 MΩ minimum	
	Suitable wiring power capacity?	
	Power supply equal to 230 V ?	
Piping	Service vavles opened	
	Leakage observed (oil mark on pipe) ?	
	Piping clogged (too much brasing material) ?	
	Piping insulation (suction and discharge pipe)?	
CO2	Quantity of refrigerant fluid introduced? [R744 refrigerant]	
	Refrigeration circuit A [quantity: kg] - Circuit B [quantity: kg]	
	Refrigerant fluid leak?	

15. Code error list

Error	Error type	Alarm conditions	CDU status	In case of master controller	Recovery Conditions
EEE	Microprocessor error	Microprocessor failure	no operate	Alarm activation no operate	Repair
Err	EEPROM error	Parameters have been set out of range	no operate	Alarm activation no operate	Repair
E01	Maximum discharge temperature triggered	$T_d \geq$ (Parameter P01) $^{\circ}$ C during (Parameter P02) sec. Default value: P01=120 and P02=60	no operate	No alarm	Automatic recovery if : $T_d \leq$ (Parameter P03) $^{\circ}$ C after (Parameter P30) x10sec. Default: P03=100 and P30=30
E02	Maximum discharge pressure triggered	$P_d \geq 14$ MPa	no operate	No alarm	Automatic recovery if: $P_d \leq 10$ MPa after (Parameter P30) x10sec. Default: P30=30
E10	Inverter compressor error	Next page E10-H...	Next page E10-H...	Next page E10-H...	
E16	Gas cooler (top) fan speed error	$FF2 \leq$ (Parameter P64)x10rpm x (Parameter P65) time. Default value: P64=30 and P65=2	no operate	Alarm activation CDU no operate	Repair
E17	Gas cooler (bottom) fan speed error	$FF1 \leq$ (Parameter P66)x10rpm x (Parameter P67) time. Default value: P64=30 and P65=2	no operate	Alarm activation CDU no operate	Repair
E20	High-pressure sensor error	$0 \text{ MPa} \geq P_d \geq 15 \text{ MPa}$ during 3 seconds 0MPa=0,17V 15MPa=4,90V	no operate	Alarm activation CDU no operate	Automatic recovery if : $0 \text{ MPa} \leq P_d \leq 15 \text{ MPa}$
E21	Low-pressure sensor error	$0 \text{ MPa} \geq P_s \geq 15 \text{ MPa}$ during 3 seconds 0MPa=0,17V 15MPa=4,90V	no operate	Alarm activation CDU no operate	Automatic recovery if : $0 \text{ MPa} \leq P_s \leq 15 \text{ MPa}$

15. Code error list

Error	Error type	Alarm conditions	CDU status	In case of master controller	Recovery Conditions
E23	Ambient air temperature sensor error	-30°C ≥ TAR ≥ 100°C during 3 seconds -30°C = 129,3kΩ 100°C=1,02kΩ	operate EEV=(A10paramete) pls Default value=480	Alarm activation CDU operate	Automatic recovery if : -30°C ≤ TAR ≤ 100°C
E24	Discharge temperature sensor error	-15°C ≥ Td ≥ 200°C during 3 seconds -15°C = 162kΩ 200°C=892Ω	no operate	Alarm activation CDU no operate	Automatic recovery if : -15°C ≤ Td ≤ 200°C
E26	Heat exchanger inlet temperature sensor error	-30°C ≥ Ti ≥ 100°C during 3 seconds -30°C = kΩ 100°C=Ω	operate	Alarm activation CDU operate	Automatic recovery if : -30°C ≤ Ti ≤ 100°C
E27	Heat exchanger outlet temperature sensor error	-30°C ≥ TU ≥ 100°C during 3 seconds -30°C = kΩ 100°C=Ω	operate	Alarm activation CDU operate	Automatic recovery if : -30°C ≤ TU ≤ 100°C
E40	Communications error with master controller (if using an external communication system)	No communication during 10 minutes	operate with local target value	Alarm activation CDU operate	Automatic recovery if : communication restart with master
E42	Inverter communications error	No communication during 30 seconds	no operate	Alarm activation CDU no operate	Automatic recovery if : communication restart
E50	EEV control error 1	Calculation error	no operate	Alarm activation CDU no operate	Automatic recovery if : calculation is OK
E51	EEV control error 2	Calculation error	no operate	Alarm activation CDU no operate	Automatic recovery if : calculation is OK
E70	Inverter control error 1	Calculation error	no operate	Alarm activation CDU no operate	Automatic recovery if : calculation is OK
E71	Inverter control error 2	Calculation error	no operate	Alarm activation CDU no operate	Automatic recovery if : calculation is OK

15. Code error list

Error	Error type	Alarm conditions	CDU status	In case of master controller	Recovery Conditions
E10-HO4 E10-HO8 E10-HOA E10- H20	Inverter overcurrent error	compressor overload	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec.
E10-HOC	Heat sink high level temperature error	$\geq 90^{\circ}\text{C}$	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec and $\leq 80^{\circ}\text{C}$
E10-H10	Inverter overload error	compressor overload	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec.
E10-H14	Inverter low input voltage error	Inverter input $\leq 194\text{ V}$ or $\leq 220\text{V}$ with variation of $\geq 50\text{ V}$ during 1s	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec and $\geq 194\text{ V}$
E10-H18	Inverter high input voltage error	$\geq 380\text{ V}$	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec and $\leq 380\text{ V}$
E10-H1C	Inverter controller communication error	No connection during 30 sec	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec and communication restart
E10-H24 E10-H28 E10-H30	Inverter voltage drop detection	Inverter input $\leq 140\text{ V}$	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec. And $\geq 140\text{ V}$
E10-H2C	Control PCB power supply error	no signal on controller	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec. And signal receive from controller
E10-H38	Inverter phase shift error	Rotor and stator phase shift	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec.
E10-H40	Heat sink thermistor error	$-20^{\circ}\text{C} > T > 130^{\circ}\text{C}$	no operate	Alarm Activation	Automatic recovery after (Parameter P30) x10sec. And $-20^{\circ}\text{C} < T < 130^{\circ}\text{C}$
E10-H44 E10-H46 E10-H48 E10-H4C	Converter overcurrent error	compressor overload	no operate	No alarm	Automatic recovery after (Parameter P30) x10sec.
E10-H50 E10-H52 E10-H54 E10-H56	Compressor operation error	compressor do not start	no operate	Alarm Activation	Automatic recovery after (Parameter P30) x10sec.

16. Troubleshooting

EEE: Microcomputer error		
Likely cause	Check points	Solution
Control PCB failure	ON / OFF operation switch	Replace the control PCB
Err: EEPROM error		
Likely cause	Check points	Solution
Control PCB failure Parameters out of range	Confirm setting adjustment value	Reintegrate the 7 segments' values
E01: Maximum discharge temperature triggered		
Likely cause	Check points	Solution
Dust and dirt clogging the gas cooler fins	Confirm clogging (e.g. dust) in the gas cooler.	Clean the gas cooler
EEV failure	Switch OFF and back ON Check if a pulsating initialisation noise is heard inside the EEV	If no pulsating noise is heard, take the following corrective measures: ① Replace the EEV coil ② Replace the control PCB ③ Replace the expansion valve
CO2 load	Check HP/LP and superheat conditions	If an anomaly is found, adapt CO2 amount
Inlet air short circuit on the gas cooler	Refer to installation conditions	Avoid air short-circuit
E02: Maximum discharge pressure triggered		
Likely cause	Check points	Solution
Dust and dirt clogging the gas cooler fins	Confirm clogging (e.g. dust) in the gas cooler.	Clean the gas cooler
EEV failure	Switch OFF and back ON Check if a pulsating initialisation noise is heard inside the EEV	If no pulsating noise is heard, take the following corrective measures: ① Replace the EEV coil ② Replace the control PCB ③ Replace the expansion valve
CO2 load	Check HP/LP and superheat conditions	If an anomaly is found, adapt CO2 amount
Inlet air short circuit on the gas cooler	Refer to installation conditions	Avoid air short-circuit
E10: Inverter error		
Likely cause	Check points	Solution
EEV failure	Switch OFF and back ON Check if a pulsating initialisation noise is heard inside the EEV	If no pulsating noise is heard, take the following corrective measures: ① Replace the EEV coil ② Replace the control PCB ③ Replace the expansion valve
Inlet air short circuit on the gas cooler	Refer to installation conditions	Avoid air short-circuit

16. Troubleshooting

E16: Gas cooler (top) fan speed error		
E17: Gas cooler (bottom) fan speed error		
Likely cause	Check points	Solution
Propeller Fan locked	Check for any object blocking the fan	Remove object
Fan motor failure	Fan motor connector input signal	Replace fan motor
Fan motor wire failure	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
Fan motor PCB failure	Fan motor PCB input and output signal	Replace fan motor PCB
Control PCB failure	Control PCB output signal sent to FM PCB	Replace control PCB
E20: High-pressure sensor error		
E21: Low-pressure sensor error		
Likely cause	Check points	Solution
Sensor connection	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
Control PCB failure	Control PCB output signal sent to pressure sensor	Replace control PCB
Pressure sensor failure	Pressure sensor output signal	Replace the pressure sensor
E23: Ambient air temperature sensor error		
Likely cause	Check points	Solution
Sensor connection	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
Control PCB failure	Control PCB output signal sent to pressure sensor	Replace control PCB
Sensor failure	Check sensor resistance	Replace the temperature sensor
E24: Discharge temperature sensor error		
Likely cause	Check points	Solution
Sensor connection	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
Control PCB failure	Control PCB output signal sent to pressure sensor	Replace control PCB
Sensor failure	Check sensor resistance	Replace the temperature sensor
E26: HEX inlet temperature sensor 1 error		
E27: HEX outlet temperature sensor 1 error		
Likely cause	Check points	Solution
Sensor connection	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
Control PCB failure	Control PCB output signal sent to pressure sensor	Replace control PCB
Sensor failure	Check sensor resistance	Replace the temperature sensor

16. Troubleshooting

E40: Communications error with master controller (if using an external communication system)		
Likely cause	Check points	Solution
Bad contact on communication wire Communications cable disconnected	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
Control PCB failure	Control PCB output signal sent to master controller	Replace control PCB
E42: Inverter communications error		
Likely cause	Check points	Solution
Bad contact on communication wire between inverter and control PCB	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
Inverter power supply input problem	Reactor resistance Filter PCB input and output Bridge Diode input and output	1. Replace reactor 2. Replace bridge diode 3. Replace Filter PCB check details measurement point point on annexes page
Control PCB failure	PCB control input and output	Replace the control PCB
Inverter board failure	Inverter board input and output	Replace the inverter board
E50: EEV PID calculation error 1		
E51: EEV PID calculation error 2		
Likely cause	Check points	Solution
EEV coil connection problem	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace EEV coil
control PCB failure	PCB control input and output	Replace the control PCB
E70: Inverter PID calculation error 1		
E71: Inverter PID calculation error 2		
Likely cause	Check points	Solution
PID bad parameters	PID parameters	change parameter (default value)
Inverter connection problem	Wiring connection and conductivity	1. Plug and unplug the connector 2. Replace wire
control PCB failure	PCB control input and output	Replace the control PCB
Inverter board failure	Wear and tear on panel, traces of humidity, etc.	Replace the inverter

LENNOX EMEA reserves itself the right to make changes at any time without preliminary notice.



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