DC Split Air Conditioner 3500

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Introduction

Introduction!	This is the Installation manual for the Dantherm DC Split Air Conditioner 3500. Please see the below table of content for further information about the sections.
Target group	The target group for this service manual are the technicians who install and maintain the DC Split Air conditioner 3500 unit, as well as the users of the unit.
Copyright	Copying of this service manual, or part of it, is forbidden without prior written permission from Dantherm Air Handling A/S.
Reservations	Dantherm reserves the right to make changes and improvements to the product and the service manual at any time without prior notice or obligation.

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Product description

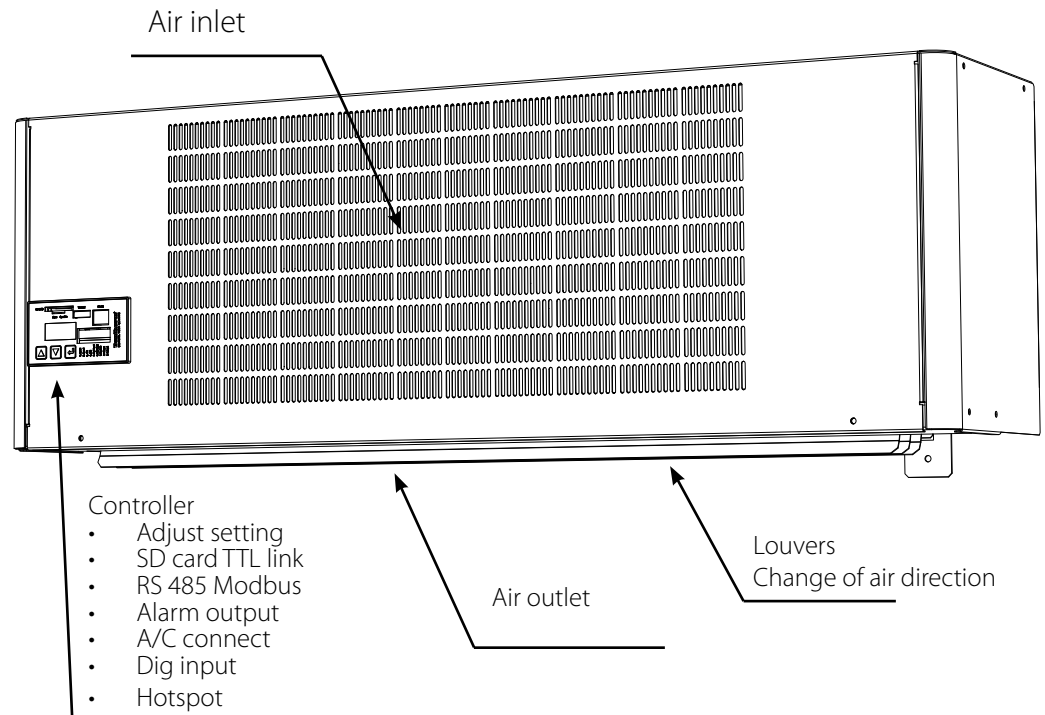|	
Introduction!	This section describes the overall product, and its functionality
Usage of the DC Split Air conditioner 3500	The DC Split Air conditioner 3500 is designed to control the internal temperature of an outdoor enclosure. The DC Split Air conditioner 3500 removes dissipated heat from electronic equipment and it´s designed to maintain correct temperature for electronic equipment.
Cooling system	The DC Split Air Conditioner 3500 is equipped with a hermetically sealed cooling system. The outdoor unit is pre-filled with 1100gram refrigerant R134a. The GWP (Global Warming Potential) is1430
Important	Dantherm Air Handling recommends that the cooling system should be powered continuously!

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Product description, *continued*

Indoor unit	This illustrates visible parts of the indoor unit.

Air inlet

Controller
· Adjust setting
· SD card TTL link
· RS 485 Modbus
· Alarm output
· A/C connect
· Dig input
· Hotspot

Air outlet

Louvers
Change of air direction
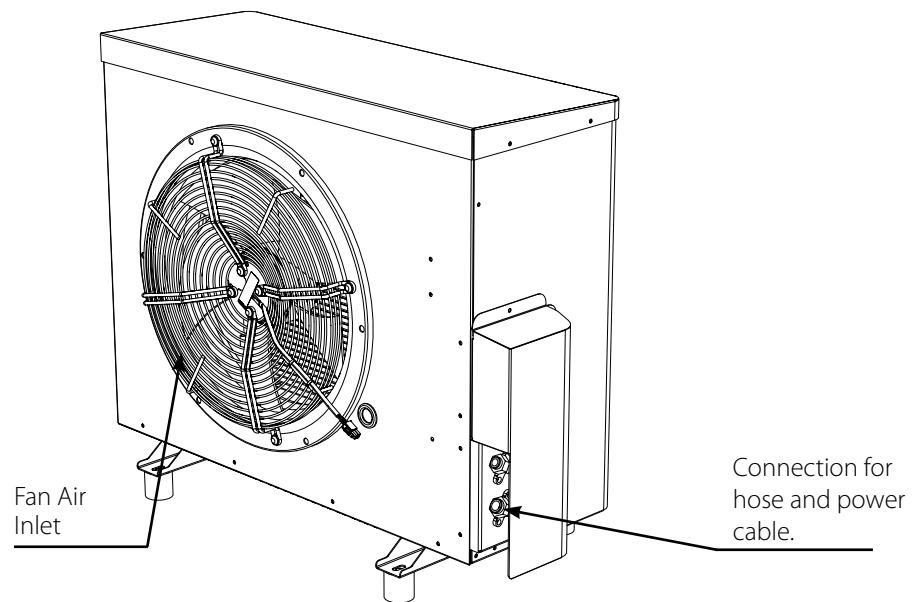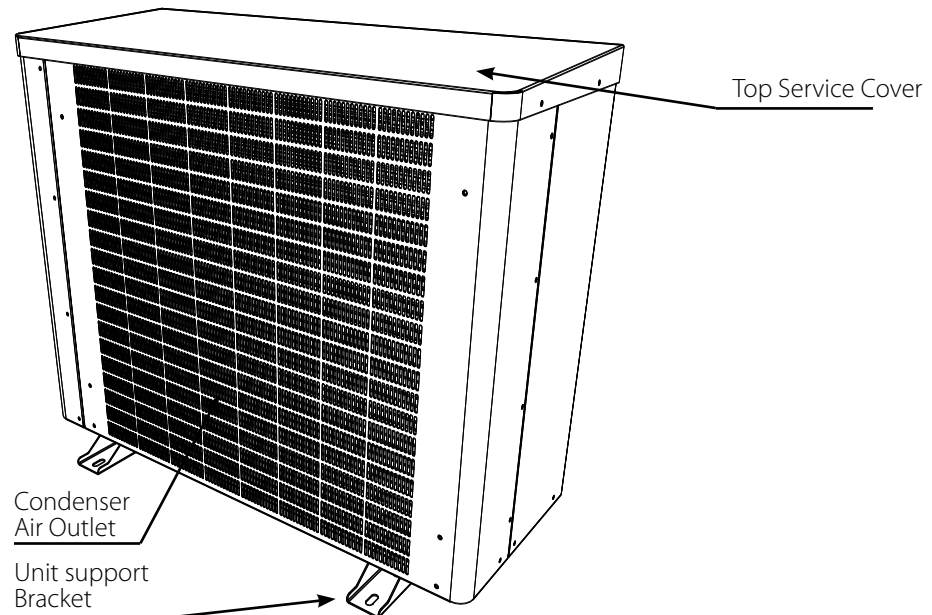
Parts description indoor unit	The Indoor unit contains the evaporator coil, two evaporator fans and the main controller CC0. The warm air is sucked in through the front, and blown out at the bottom of the unit, the air direction can be adjusted to horizontal by the adjustable louver.

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Product description, *continued*

Outdoor unit	This illustrates the visible parts of the outdoor units

Top Service Cover

Condenser
Air Outlet

Unit support
Bracket

Fan Air
Inlet

Connection for
hose and power
cable.

Parts description outdoor unit	The outdoor unit contains the condenser coil, condenser fan, compressor, compressor drive and 48VDC Power input for the entire unit.

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Accessories

Art. No.	Description	
092957	Wall bracket and two bars for outdoor unit. Including screws. Dimension (H x L x W): 254 x 446 x 52 mm	
097025	Light model rubber feet for outdoor unit made of durable recycled rubber. Reduces vibration from the unit and provides stability. Aluminium channel securely anchored in top for easy fixation of the unit. Quick and simple installation. Boxed kit with fixings. Including two bars and screws. Dimension (H x L x W): 95 x 450 x 160 mm Weight: 4,8 kg	
097026	Heavy model rubber feet for outdoor unit made of durable recycled rubber which reduces vibration and provides stability. Aluminium channel securely anchored in top for easy fixation of the unit. Quick and simple installation. Boxed kit with fixings. Including two bars and screws. Dimension (H x L x W): 95 x 1000 x 160 mm Weight: 10,3 kg	
074666	Shock and vibration absorber includes a set of four absorbers for outdoor units. The absorbers can be mounted on wall brackets or ground mats.	

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Accessories

Art. No.	Description	
097027	Adapter bars for mounting the outdoor unit on existing wall brackets. Including two bars and fixation. Length: 1000 mm	
097028	Condensate pump for drainage for indoor unit. Voltage: 230V/50 Hz Max: 1,6 Amps Max. 200 litres per hour at lift height 4 m. Tank capacity: 1,8 litre For indoor use only. Kit includes: • Pump with tank and level sensor • 5m 3/8" tube for drainage outlet • Wall bracket is built in the tank	
097079	3 m copper tubes 3/8" & 1/2" with 10 mm insulation and UV protection. Tubes are prepared for easy connection with flares and flare nuts.	
097029	5 m copper tubes 3/8" & 1/2" with 10 mm insulation and UV protection. Tubes are prepared for easy connection with flares and flare nuts.	
097030	10 m copper tubes 3/8" & 5/8" with 10 mm insulation and UV protection. Tubes are prepared for easy connection with flares and flare nuts.	
096873	Hot spot sensor with 8000 mm cord.	
075210	Dantherm RS485 display unit.	
087432	SD card 2 GB for logging data.	

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Installation

Included in the package

Description	Number	Please note
Indoor unit	1	-
Wall bracket, indoor unit	1	-
Outdoor unit	1	Incl. refrigerant R134a, 1100 gram.
Communication cable	10m	Installed at outdoor unit. Fit with connector for indoor unit.
Power supply cable, 2 x 4mm^2	9m	Installed at outdoor unit. Flying leads at opposite end.
Alarm connector 9 pin for Controller	1	
Flarenut for 3/8" copper tube indoor unit	1	
Flarenut for 1/2" copper tube indoor unit	1	
Flarenut for 3/8" copper tube outdoor unit	1	
Flarenut for 1/2" copper tube outdoor unit	1	
Drainage hose for indoor drain pan	3m	1/2" Reinforced plastic.
Clamp for drainage hose	1	
Manual	1	Part number: 095106

Parts needed for installation

There might be need for further installations parts whicha are not supplied with the Dantherm DC Split Air Condition 3500.
- Any screws for mounting indoor and outdoor unit
- Ø85mm plastic sleeve for wall hole
- Sealant for wall hole
- Wall bracket for outdoor unit

Required tools
For installation

To perform a proper installation you need the following tools before starting the installation.
- Level gauge
- Electric Drill
- Suitable drill according to the wall type
- Hole core drill Ø85mm
- Screw driver for Torx
- 2 adjustable wrench
- Refrigerant gas leak detector
- Nitrogen for drying the cooling system
- Wacuum pump

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Safety Precautions

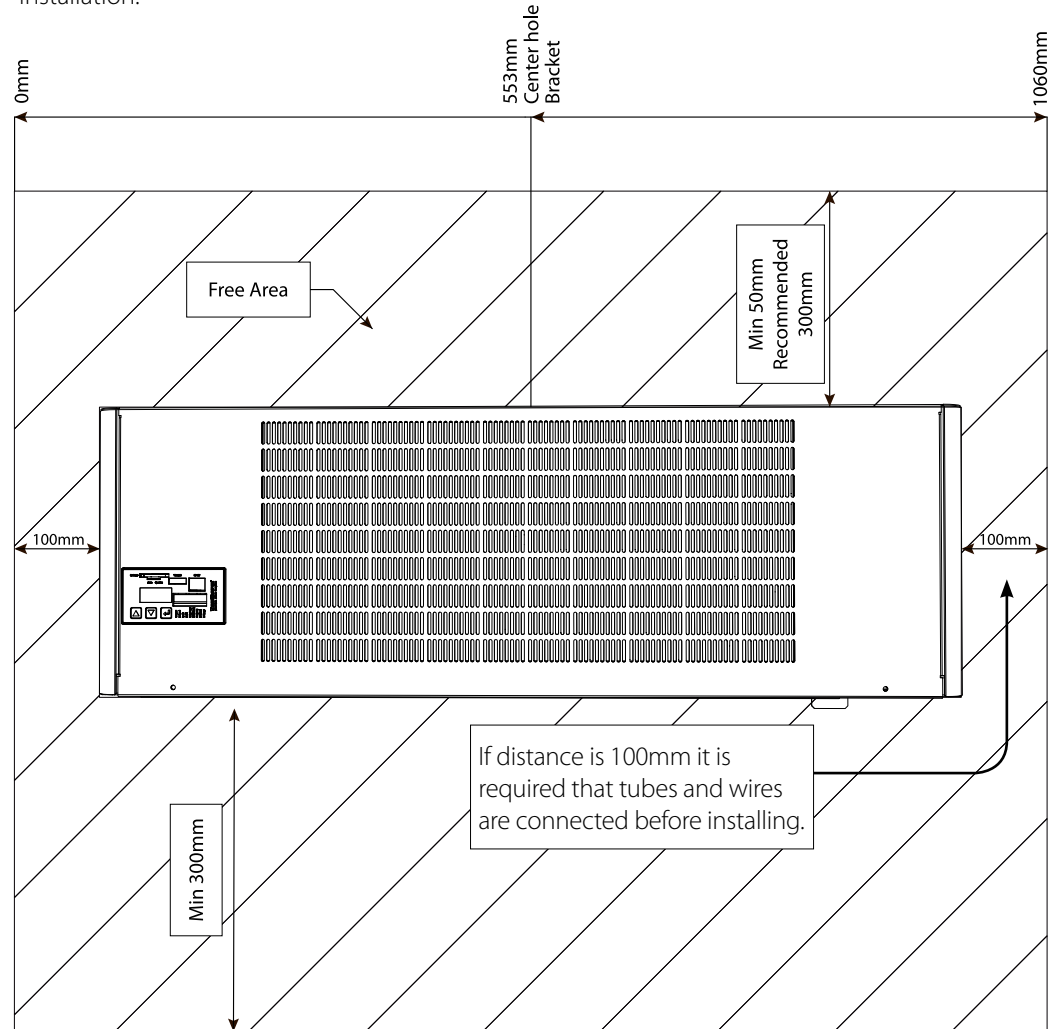|	
Before Installation	To prevent the injury of user or other people and property damage, the following in-structions must be followed • Be sure to read before installing the DC Split Air Condition 3500 • Be sure to observe the cautions specified here as they include important safety related issues • Incorrect operation due to ignoring instruction will cause harm or damage
Installation	• Always ground the unit • Securely connect the electrical power • Ensure that the cover connections of the outdoor unit are not damaged. • Do not install the product in a high place with the risk of it falling down. • Install the drain hose to ensure that condensed water can be drained. • Always inspect for gas leakage after installation and repair of the product
Installation requirements	Incorporate the following when installing the electrical connections: 1. DC external supply should be protected with an external circuit breaker at 35 Amps 2. Label disconnected devices, stating rated voltage and rated current. 3. It is imperative to secure and install all connections to prevent any damage to equipment and/or humans. Secure all cables with cable ties or appropriate cable fasteners.
Operation	**WARNING** • Make sure all power is disconnected prior to installation, maintenance or service. • Do not allow water to run into electrical parts • Do not place obstacles around the air flow inlet or outlet

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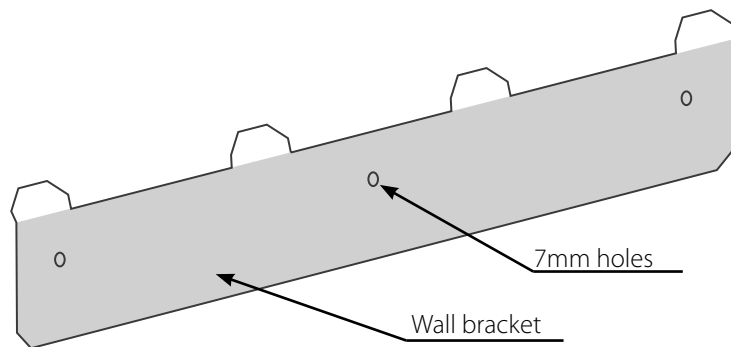CONTROL YOUR CLIMATE

Installation of indoor, outdoor unit

Select the best location

To ensure maximum effieciency mount the indoor unit near but not too close to the ceiling. Secure the unit in a manner so there is ample room for maintenance and service after installation.

0mm

553mm
Center hole
Bracket

1060mm

Free Area

Min 50mm
Recommended
300mm

100mm

100mm

If distance is 100mm it is required that tubes and wires are connected before installing.

Min 300mm

Wall Bracket

Level and mount the bracket for indoor unit.

7mm holes

Wall bracket

Installation of indoor, outdoor unit, *continued*

The outdoor unit can´t be installed further from the indoor unit than the enclosed cables and copper tubes can be used without any extensions. The length is 3,5m.

This is easily obtained by installing the indoor unit near the ceiling and the outdoor unit on the other side of the wall near the ground.

The outdoor unit needs some free space between the wall and air intake, see below
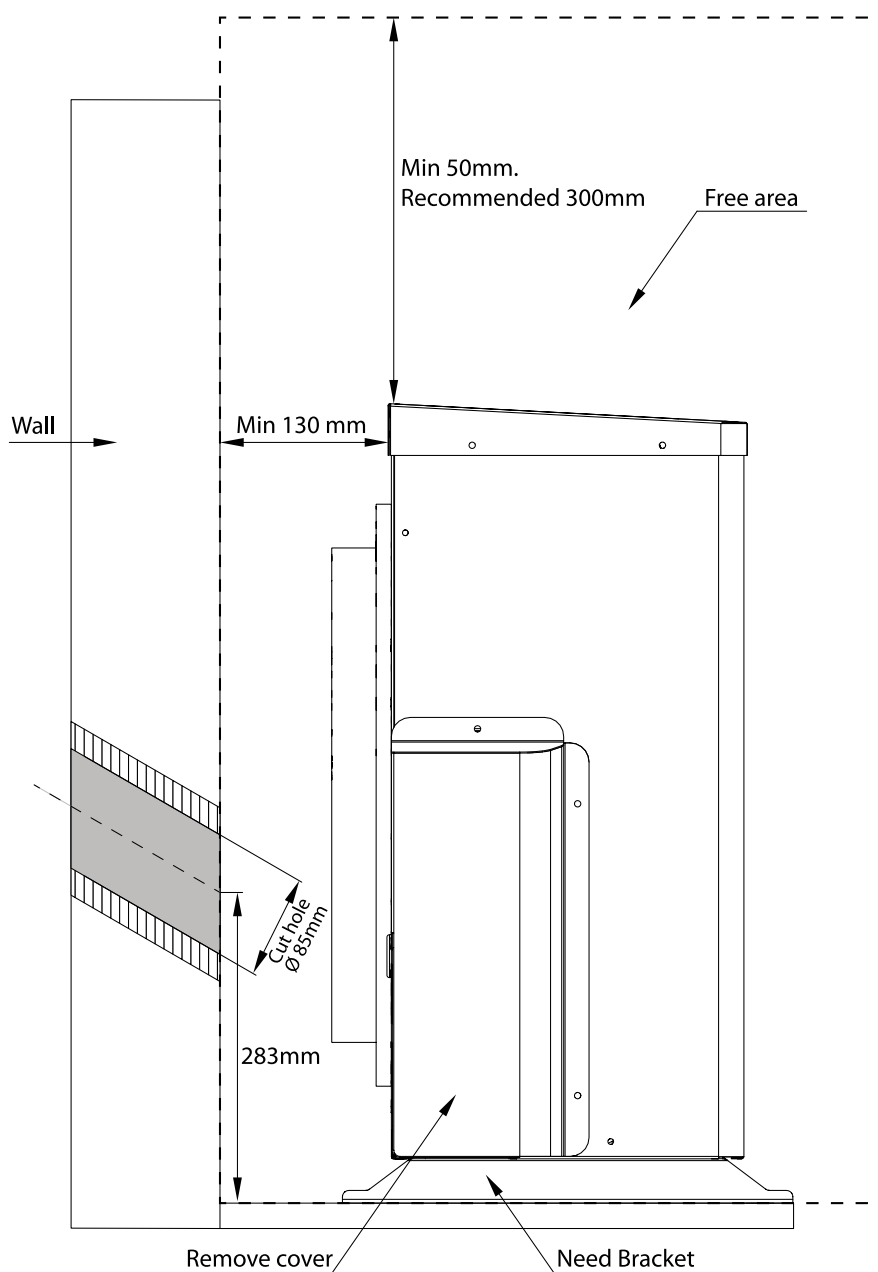

If the outdoor unit is to be installed close to the seaside, direct exposure to the sea should be avoided. Install the outdoor unit at the opposite side of wind direction or install a windbreaker in front of the Outdoor unit but not closer than 70cm.

The height of the windbreaker should be 150% of the height of the outdoor unit

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Installation of indoor, outdoor unit, *continued*

Preparing **Indoor unit**	Unscrew the four screws and remove the right end cover of the indoor unit as shown below.
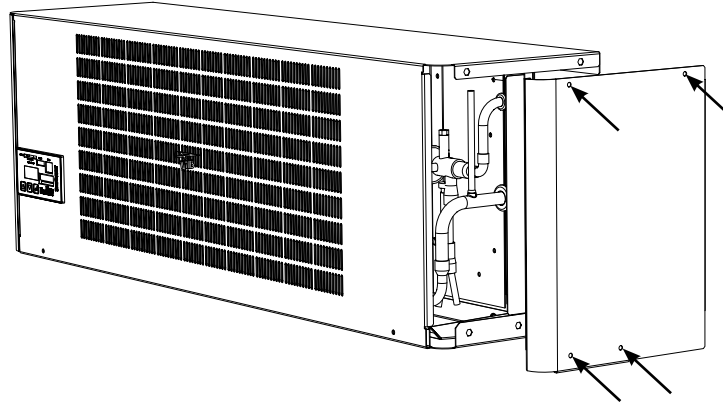
Prepare piping between **indoor and outdoor unit**	The piping between the indoor and the outdoor unit is not included in the DC Spilt Ari Conditioner 3500. It can be provided from Dantherm or it can be prepared by the installer. Dantherm can provide prepared piping sets at 3, 5 or 10 meters. See accessories list. **For installers providing the copper piping.** • For liquid line: use 3/8" pipe • For suction line: use 1/2" pipe Flare nuts are to be used with both indoor and outdoor units. The flare nuts are included. Measure and cut the required lengths of pipe. Put a flare nut on the pipe and make a flare on the pipe. This is to be done at both ends of the pipe.

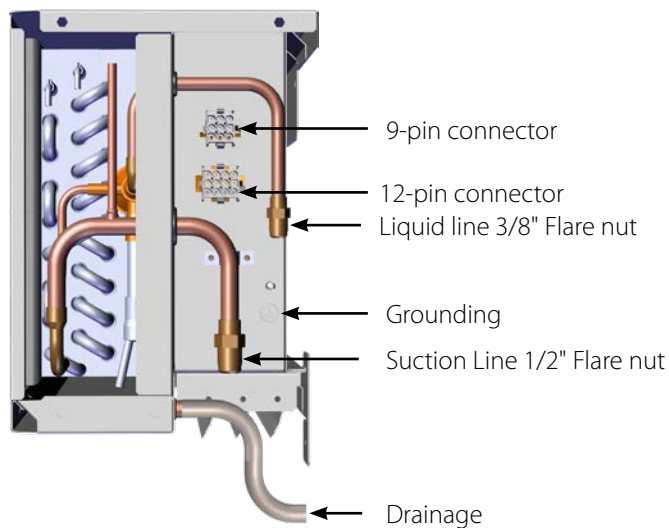|	
Pre-charged outdoor unit	The outdoor unit comes pre-charged with 1100 grams of refrigerant R134a. This is for piping lengths up tp 3 m. For longer pipings additional 20 grams of refrigerant R134a per meter is needed. Examples:

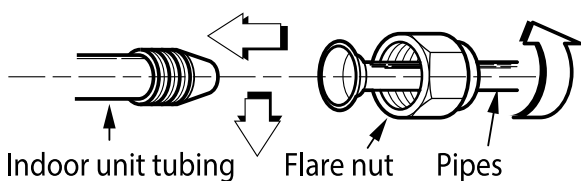| Pipe length	Additional refrigerant R134a
5m	40 grams
10m	140 grams

Installation of indoor, outdoor unit, *continued*
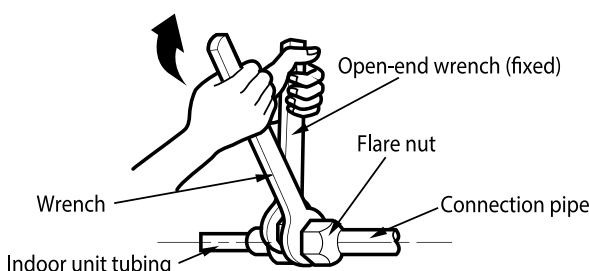
Connecting the piping

Find the two insulated cubber hoses and connect the flares to the indoor Unit.
Align the Center of the pipe/hose and tighten the flare nut by hand
And then tighten the flare nut with a wrench

- 9-pin connector
- 12-pin connector
- Liquid line 3/8" Flare nut
- Grounding
- Suction Line 1/2" Flare nut
- Drainage

How to connect the cooling pipes.

Indoor unit tubing   Flare nut   Pipes

Flare nut	Tightening Torque [Nm]
3/8 liquid line	20 to 25
½" suction line	34 to 47

Open-end wrench (fixed)

Flare nut

Wrench

Connection pipe

Indoor unit tubing

Secure the drainage hose with the hose clamp.

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Installation of indoor, outdoor unit, *continued*

Wall hole for piping and drain   Drill a Ø85 hole through the wall for piping, cabling and drain hose,
See sketch below

Wall

Outside

Cut hole
Ø 85mm

Inside   283mm
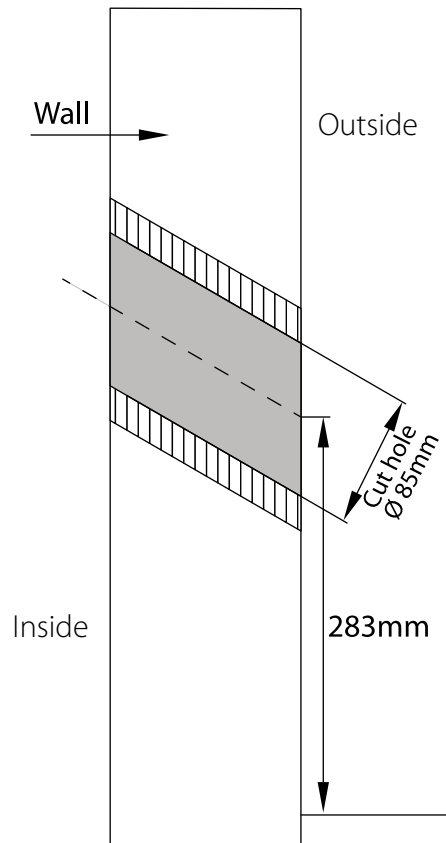
Secure the hole with a plastic sleeve in order to avoid sharp edges, this can also be done with heavy duty tape

Mount indoor unit   Place the indoor unit on the hooks of the wall bracket, and secure the unit with two screws at the bottom of the unit and into the wall.

Prepare the outdoor unit   The outdoor unit comes with pre-installed cables, one supply power cable with two wires: red + and blue -. The cable length is 9 m. The power cable must be connected in a Circuit breaker with max load of 35 Amps inside the shelter.
The other cable is also pre-installed to the outdoor unit. This cable contains 20 wires for communication between indoor and outdoor unit and power to the indoor unit.
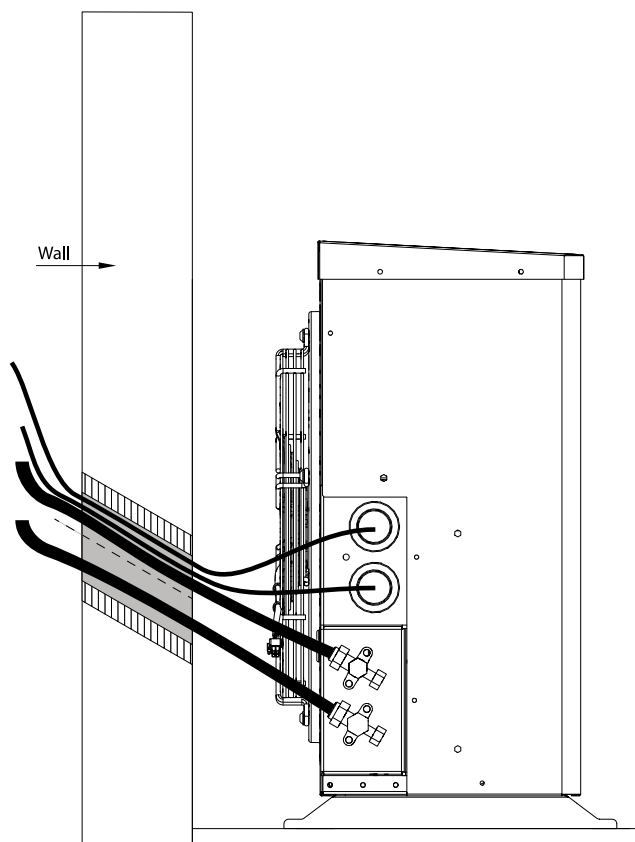The cable length is 10 m and should not be extended.
The communication cable is fitted with two AMP connectors:
one with 9 pins and one with 12 pins.
The AMP connectors fit the indoor unit.
Find the right position for the outdoor unit and fix it to the ground or wall bracket.

Installation of indoor, outdoor unit, *continued*

Wall

Cables and flares

Put the the two cables through the hole in the wall.
Next pull the cooling pipes and drainage from inside through the hole in the wall.
Do not bend or block the drain hose.
Be careful not to make a sharp bend at the refrigerant pipes.
Connect the flares from the hoses to the service valves.

½" - 20 UNF
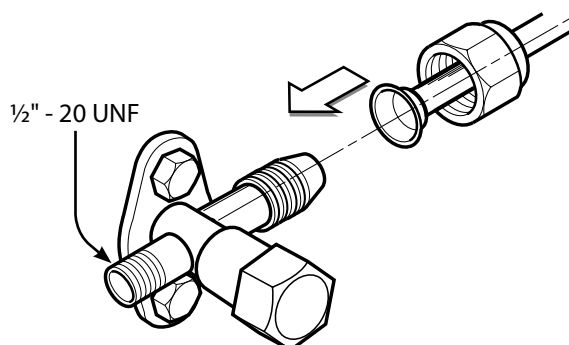
Tighten the flare nut carefully first by hand and afterwards use the wrench to tighten up.

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Installation of indoor, outdoor unit, *continued*

Electrical installation

Plug the communication cable into the plug on the right side of the indoor unit

9-pin connector
12-pin connector
Liquid line 3/8" Flare
Screw this on shielded cable
Grounding
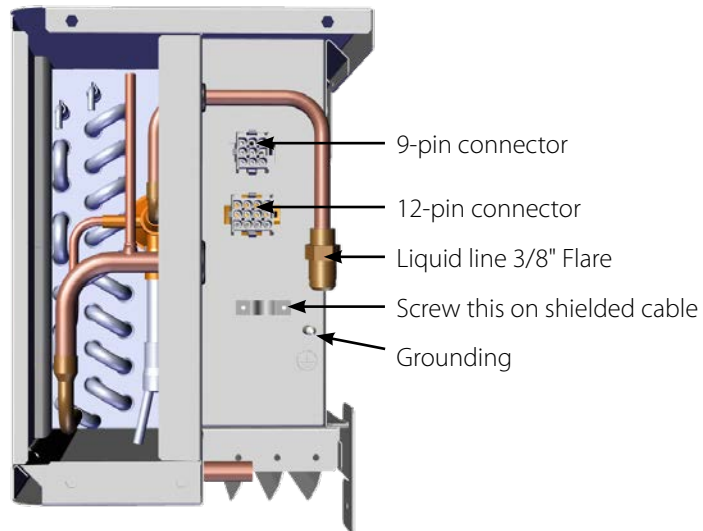
The communication cable is a shielded cable and needs a secure grounding at the indoor unit, use the metal cable tie at the indoor unit to make that grounding

Connect the Power cable + and – to the 48VDC circuit breaker
Ground the unit.
Do not power on yet.

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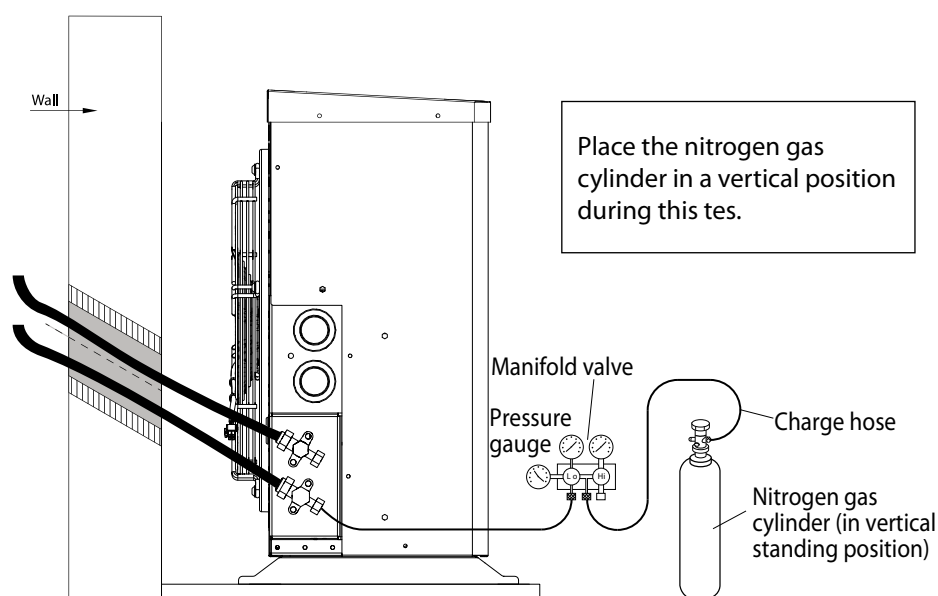CONTROL YOUR CLIMATE

Leakage test

Leakage Test

The Outdoor unit is filled with refrigerant R134a for the whole system. This unit is hermetically sealed. The only access is through the two service valves located on the side of the unit.
The indoor unit and the piping is open and the connections need to be checked for leakage .
Check that each tube-both liquid and gas side tubes have been properly connected.
Remove the service valve caps from both liquid and gas side on the outdoor unit.
Check that both liquid and gas side service valves on the outdoor unit are kept closed at this stage.

Connect a manifold valve with pressure gauges and dry nitrogen gas to the service port with gas side (large valve.)

Be sure to use a manifold valve for leak testing. The high side manifolds must always be closed.

Wall

Place the nitrogen gas cylinder in a vertical position during this tes.

Manifold valve
Pressure gauge
Charge hose
Nitrogen gas cylinder (in vertical standing position)

Pressurize the system with dry nitrogen gas to more than 10 bar.
Close the valve when the gauge reading reaches 10 bar.

Test the for flare connection with liquid soap
Bubbles indicate a leak, and the connection needs to be redone until no leakage remains.
After the system is found to be free of leaks relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen gas cylinder.

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Evacuation

Evacuation

Connect the charge hose end to the vacuum pump to evacuate the tubing and indoor unit.
Confirm the Lo knob of the manifold valve is open.
Then, run the vacuum pump.
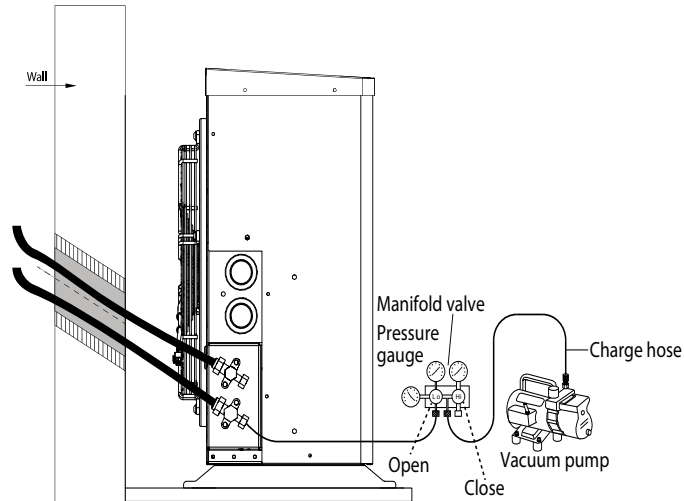
The vacuum pump must be operated at less than 0,8torr of the gauge pressure
When the desired vacuum is reached, close the Lo knob of the manifold valve and stop the
vacuum pump.

Charging and finish
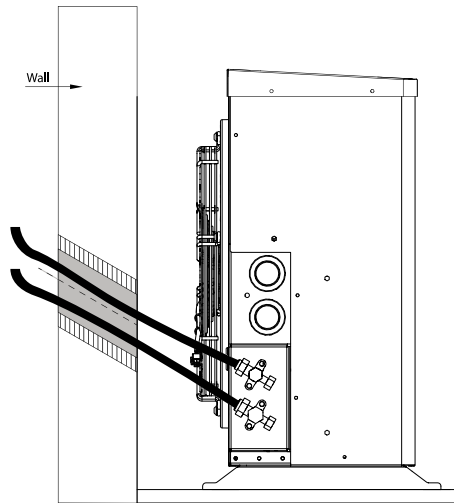
1.   Use a wrench to turn the valve stem of **liquid side valve** counter- clockwise to fully
        open the valve
2.   Turn the valve stem of **gas side valve** counter-clockwise to fully open the valve
3.   Loosen the charge hose connected to the gas side service port slightly to release the
        pressure, then remove the hose
4.   Replace the flare nut and its bonnet on the gas side service port and fasten the flare
        nut securely with an adjustable wrench.
        This process is very important to prevent leakage from the system!
5.   Replace the valve caps at both gas and liquid side service port and fasten them tightly

This completes air purging with the vacuum pump and fill the whole system with refrigerant.
The DC split Air condition 3500 is now ready for its´ first test run.

Operation

The adaptive cooling strategy guarantees the lowest power consumption at all time during operation.
Reduces wear and tear of cooling system, and lowers acoustical noise level.

- • SD card* socket for data logging and configuration.
- • RS 485 RTU ModBus*. (Monitoring and remote user panel)
- • Real time clock and calendar.
- • 7 segment display* for temperature readout and setpoint adjust.
- • Digital input and Alarm output*

Components

The CC0 controller has two onboard LEDs.
Green LED indicates operation, red LED will indicate fail or lock mode
During SD card read/write process, green LED will flicker.

A onboard 4 digit, 7 segment display, is available for temperature information and adjustment of cooling and heating setpoint.
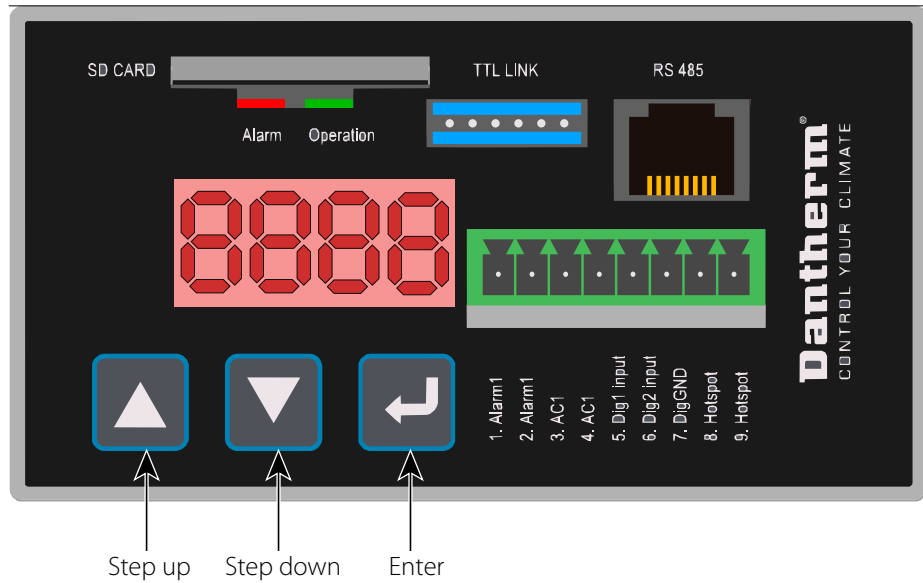The CC0 has a RTU ModBus communication protocol.
Hardware layer, RS 485, RJ 45 connector.
Baud rate: 9600,n,8,1

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Operation, *continued*

Menu structure and navigation.

Step up   Step down   Enter

Step up/down to jump through menues, end.
Enter to select the parameter to read or change

Step		Action	Display
Hibernate mode shows the actual room tempereature. After 3 minutes without activity on the keys, the controller exits any menu and shows this. Use up/down to select menu point below			24
COOL	Cooling setpoint parameter	Press enter for 2 seconds to change value. Enter to save.	C25
HEAt	Heater setpoint parameter	Press enter for 2 seconds to change value. Enter to save. **Note: Heater is not installed in this product**	H05
Err	Operation error list. See list below.	Press enter for 2 seconds to change reading to see if more errors are present simultaneously.	E05
tESt	Override test. This will run a series of tests. See list on next page.	Press enter for 2 seconds to start test cycle. The test steps will increase automatically by one after 60 seconds or changed manually using up/down. If it is left idle, the test will auto disable after 30 minutes.	r 12
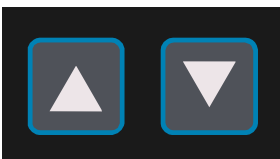
Alarm mode

Via onboard navigation keys and display, alarm mode can be initiated. Can be used for service purpose, and fault finding.
Press up/down key, until "err" is visible in display. Now press enter.
By use of up/down key, it is now possible to toggle between error codes.
Error codes shown in display, are masked error codes, related to which errors/alarms that are mapped to the alarm relay output.
See section about controller configuration.

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Error list

If any failure happens at the cooling mode an error code will show in the display. The error - Exx and the corresponding corrective action can be found in the table below.

Display error No.	Error description	What to do
E01	The supply voltage is higher than the pre-set 60VDC, and the Controller stop the unit.	Check the rectifier and adjust the supply voltage to below VDC and the unit start up automatically.
E02	The supply voltage is lower than the pre-set 40VDC, and the Controller stop the unit.	Check the batteries and rectifier and rose the supply voltage to over VDC and the unit start up automatically.
E03	The actual Amps are higher than the pre-set 30A and the Controller stops the unit.	The cooling unit is out of normally operation conditions, the unit will starts up again automatically when compressor restart time out has expired. (90 sec)
E04	The actual amps are lower than the pre-set 1A.	The cooling unit is out of normal operation conditions. An alarm can be given if configured.
E05	The room temperature is higher than the preset 40°C or lower than the preset 0°C. The unit will continue running.	This is a temperature warning that tells the room temperature is far away from the cooling setpoint.
E06	Internal Fans have failure and have stopped or they are not working properly.	Check the internal fans, and replace them if necessary.
E07	The Condenser Fan has failure and has stopped or it is not working properly.	Check the Condenser fan, and replace if necessary.
E08	The compressor motor has failure and is stopped or not working properly.	Check the electric circuit, check the compressor connections.
E09	The room temperature sensor mounted at the indoor unit has fail and are not working properly.	At the indoor unit, check the room temperature sensor, either shortcut or a missing connection.
E13	The temperature sensor mounted at the condenser coil has failed and is not working properly.	At the outdoor unit, check the temperature sensor at the Condenser coil, either shortcut or a missing connection.
E14	Digital input 1 active.	Depending of what the Customer have connected to digital input 1.
E15	Digital input 2 active.	Depending of what the Customer have connected to digital input 2.
E16	The cooling system have high pressure more than 28barg the unit short down in order to protect the unit. If more than 6 times,HP failure within 1 hour, compressor will be locked. Needs restart of unit.	Lack of air flow due to clogged condenser/oil or airways at outdoor unit. Check the airways and the condenser Coil, and clean them. The cooling unit start up automatically when pressure is equalized.
E17	The electronic located at the top of the outdoor unit is hot, and the Cooling unit close down to protect the unit.	Lack of air flow due to clogged condenser/coil or airways at outdoor unit. Check the airways and the condenser Coil, and clean them. The unit will start up again automatically when the electronics is cooled down.
E18	The compressor is too warm and the thermal cut off stop the compressor.	This happens only in extreme conditions where the outdoor temperature is above 55°C. The unit will start up again automatically when the compressor is cooled down and restart time out has expired.
E19	The low pressure switch stops the cooling unit in order to protect the compressor.	Can happen in low outdoor temperature below -15°C and or lack of refrigerant in the cooling system, rechargeR134a to the cooling system, The cooling unit start up automatically when pressure is equalized.

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Connections

Front of CC0:

Step up   Enter

Step down
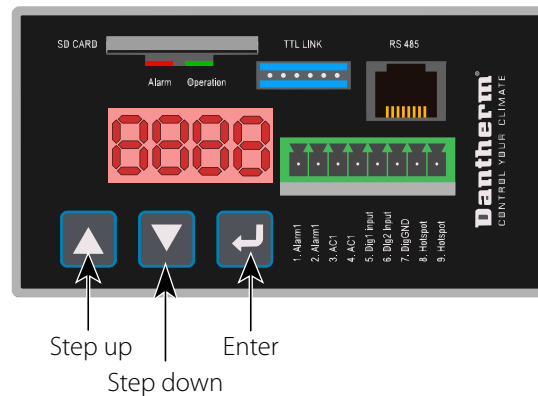
No.	Name	Description
1	Alarm 1	Dry contact NC, can be changed to NO in the configuration file and uploaded to CC0 via SD card. Jumper on PCB for change of NO/NC relay contact. Max voltage 60V DC/100mA.
2	Alarm 1	
3	AC 1	Dry contact NO, can be changed to NC in the configuration file and uploaded to CC0 via SD card. Jumper on PCB for change of NO/NC relay contact. Max voltage 60V DC/100mA.
4	AC 1	
5	Digital input 1	For use with dry contacts. (fire alarm, etc) 1K ohm internal pull up to 12V DC, 10mA
6	Digital input 2	For use with dry contacts. (Cooling on demand, etc) 1K ohm internal pull up to 12V DC, 10mA
7	Digital ground	GND reference for digital input 1&2
8	Hotspot temperature sensor	See accessories list, the sensor can be placed at a critical temperature hotspot. Hotspot sensor can be enabled/disabled in config file.
9	Hotspot temperature sensor	

SD Card Interface

How to upload new configurations files:

If an SD card is inserted during normal operation, controller will check for new config file, and load this into CC0 memory. Any old configuration in the CC0 memory is erased.

During system power up mode, controller checks for SD card with config file.

If config file is present it will be loaded into memory and old controller configuration is erased.

If an empty SD card is put into the CC0 the present configurations file will automatically be stored on the SD card.

Logging data:

The CC0 is set up to log operation data every minute to the SD card.

The data is temperatures, rpm data from Fans and Compressor, operational status, etc

The data can afterwards be exported from the SD card to an Excel spreadsheet

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Modifying the Configuration file

How to set up fire/ smoke alarm:	Connect the smoke detector to the digital input 1. **Ensure that the smoke detector has a dry contact.** If there is voltage at the digital input, the CC0 controller will be damaged. When the smoke detector gives input the DC Air Conditioner will stop Digital 1 and 2 is pre-set to NO, but can be changed to NC. See below.
How to change NO to NC or vice versa:	Put in an empty SD card and the present configuration file will be downloaded. Open the config file by wordpad Go to section CONTROL Configurations No:

16.	Alarm NO/NC Type	[ALtype]	[0/1]: **1**
17.	Alarm1 delay sec	[Alm Dly]	[0-100]: 10
18.	Dig.1 NO/NC Type	[Dig1]	[0/1]: **0**
19.	Dig.2 NO/NC Type	[Dig2]	[0/1]: **0**

Change the marked 1 to 0 for changing to NO
Change the marked 0 to 1 for changing to NC
Save the change and put the SD card into the CC0 controller, and the controller will automatically update the new Config file.

How to install a hot spot sensor:	Be sure to have the temperature sensor from the accessory list and connect to the CC0 pin 8 & 9 For set up the hot spot sensor at the controller, put in an empty SD card and the present configuration file will be downloaded. Open the config file using Wordpad. Go to section CONTROL Configurations No:

10.	Shelter Temp(RA/HS/BOTH)	[STsel]	[0-2]:**0**

Change the marked 0 with 1 for using the hot spot sensor as cooling reference or 2 for using both hotspot or the room temperature sensor at the indoor Unit as reference, The highest value will be used for determining cooling.
Save the change and put the SD card into the CC0 controller, and the controller will automatically update the new Config file.

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Modifying the Configuration file, *Continued*

How to connect an Air conditioner unit to the DC split air conditioner 3500:

Connect the air conditioner to pin 3 & 4.

This is a dry contact (potential free) which can handle an input of max 60V, 100mA.

By default the DC Split Air conditioner is set to start the external A/C unit 4°C above the cooling setpoint ± 2°C

To change values open the config file using Wordpad or another text editor and go to Air Con. Configuration

			Compr		**A/C 1**
1	ON Temp	dT0][-40-80]:	20.0	:	24.0
2	OFF Temp	dT1][-40-80]:	18.0	:	22.0
3	Override - Digi.1	[x/0/1]:	x		x
4	Override - Digi.2	[x/0/1]:	x		x
5	Override - Sensor fail	[x/0/1]:	x		x
6	Min. ON Duration. Sec.	[60-1800]:	180	:	60
7	Restart time-out. Sec	[60-1800]:	180	:	60
8	Sens.Sel. RA/HS/EI/EO/CO/ST	[0-5]:	5	:	5
9	Enable	[0/1]:	0	:	1

Change the marked value in line 1 and 2 to the values you want.

There is a possibility to run lead lag with the DC Split Air Conditioner 3500 and an Extern A/C unit.

Leadlag means that either the DC Split Air Conditioner 3500 or an external A/C starts everytime there is a cooling requirement.

This means that over time both units will have had appoximately the same amount of running hours.

To enable Leadlag function open the config file by wordpad and go to CONTROL funtions

12	Lead-Lag Dis/Ena.	[LLe][0/1]:	0

Change the marked 0 to 1.

Save the change and put the SD card into the CC0 controller, and the controller will automatically save the new Config file onto the SD card.

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Modifying the Configuration file, *continue*

|	
How to run Cooling on demand	There are two different set ups regarding cooling on demand: 1. Two DC Split air Conditioner 3500 in same room connected 2. DC Split Air Conditioner 3500 connected to a Free Cooling unit for example Dantherm Flexibox 900. See below:
Two DC Split air Conditioner 3500 in same room connected	When two DC Split Air condition 3500 are connected one is master and the other one should be set in cooling on demand (slave) Connect A/C output from DC Air Condition to digital 2 input at the other DC Split Air conditioner 3500 (slave). Open the config file by wordpad and go to Air Con. Configuration to 11 Cool on Demand Dis/Ena. [COD][0/1]: 0 Change the marked 0 to 1. Save the change and put the SD card into the CC0 controller At the DC Air Conditioner that is slave. and the controller will automatically save the new Config file.
DC Split Air Conditioner 3500 connected to a Free Cooling unit	Cooling on demand can be managed from the CC 3000, which is a Free cooling controller (Flexibox 900). This means that the free cooling unit is master and can start and stop the DC Split Air Conditioner 3500 by cooling on demand. Connect a max 60V 100mA to digital 2 at DC Split Air conditioner 3500. This requires a new Configuration file for the DC Split Air Conditioner, Contact Dantherm for getting this Configuration file which is named CC0_CFG_Cooling on demand Save the configuration file at a SD card and put card into the CC0 controller. The controller will automatically update the new Config file.

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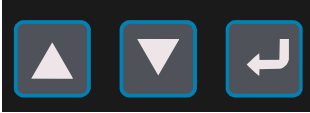
Test Mode

Via onboard navigation keys and display, test mode can be initiated. Can be used for service purpose, and fault finding.

Press up/down key, until test is visible in display. Now press enter.

Controller will now automatically go through pre-defined test steps, or up/down key can be used for manually selection of test step.

Test Step

NONE	0	
AC_COMPR	1	Internal compressor ON
AC_1	2	AC 1 relay output ON
AC_FAN_1	3	Internal AC fan 1 ON (return air fan)
AC_FAN_2	4	Internal AC fan 2 ON (condenser fan)
HEATER	5	Internal heater ON
EC_FAN_1	6	Internal DC/EC fan 1 ON
EC_FAN_2	7	Internal DC/EC fan 2 ON
DC_COMPR	8	Internal DC compressor ON
ALARM	9	Alarm out relay ON

RS485
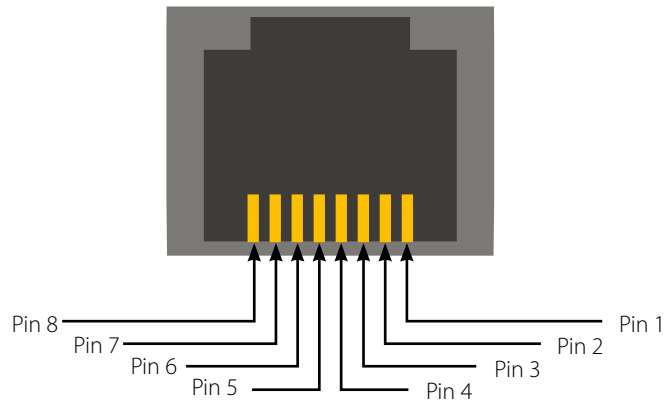
Pin 1	GND	Pin 5	+12V Display (fused 350mA)
Pin 2	B	Pin 6	+12V Display (fused 350mA)
Pin 3	GND	Pin 7	GND
Pin 4	A	Pin 8	GND

Electrical schematic – Outdoor unit

Electrical schematic

Outdoor Unit

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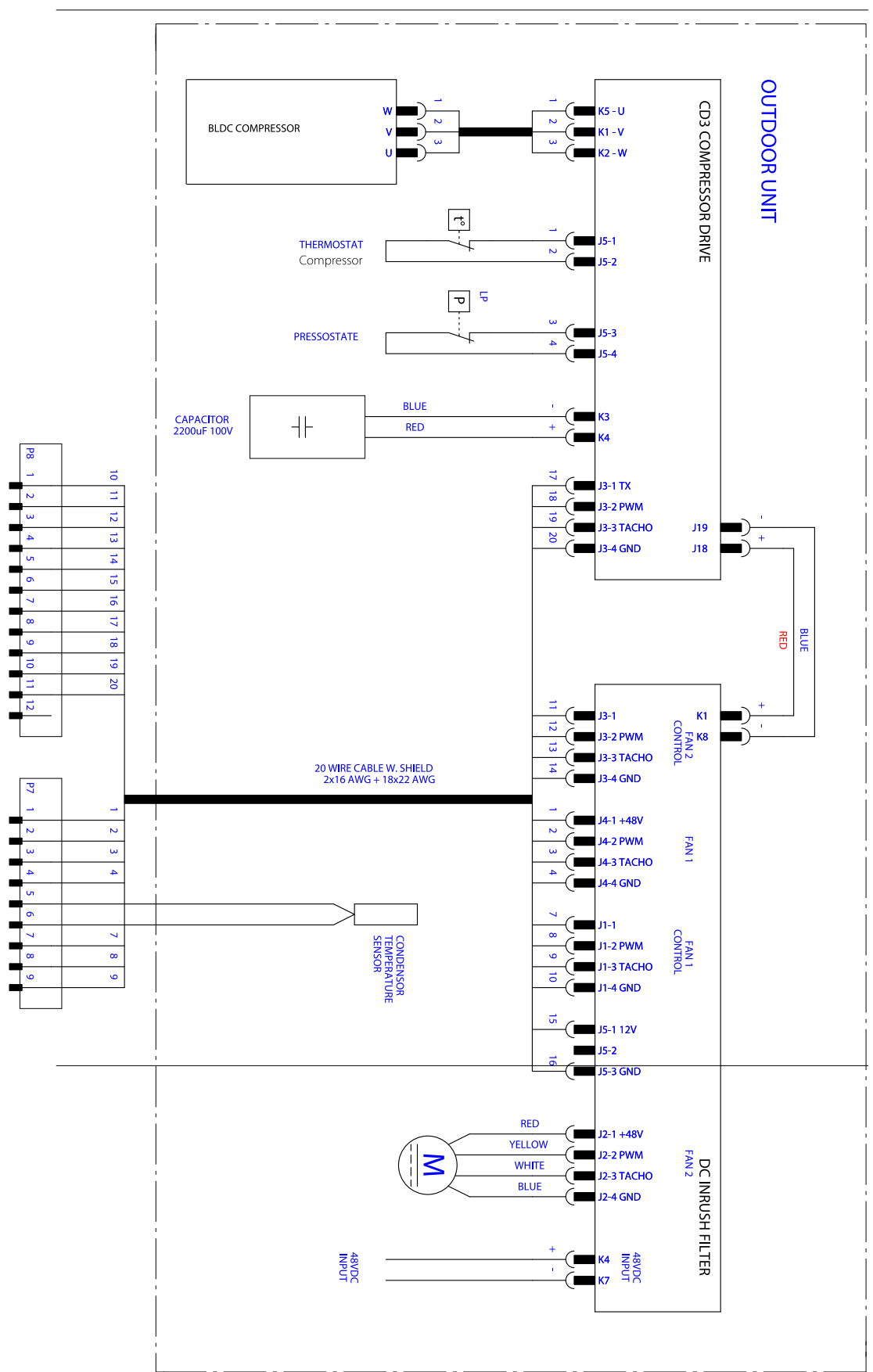
Electrical schematic - Indoor unit

Electrical schematic

Indoor Unit

INDOOR UNIT

CCO CONTROLLER

TTL LINK

RS485

GREY/PINK — J2-1 12V
J2-2
RED/BLUE — J2-3 GND

P8

BLUE — J16-1 NC
RED — J16-2 PWM
BLACK — J16-3 TACHO
VIOLET — J16-4 GND

FAN 2

WHITE/GREEN — J22-1 RX
BROWN/GREEN — J22-2 PWM
WHITE/YELLOW — J22-3 TACHO
YELLOW/BROWN — J22-4 GND

COMPRESSOR

ROOM TEMPERATURE SENSOR

J7-1 ROOM TEMPERATURE SENSOR
J7-2
J7-3 CONDENSOR TEMPERATURE SENSOR
J7-4
J7-5 EVAP. IN TEMPERATURE SENSOR
J7-6
J7-7 EVAP. OUT TEMPERATURE SENSOR
J7-8

INTERNAL FAN 2
RED
YELLOW
BLUE

J5-1
J5-2
J5-3
J5-4
J5-5
J5-6
J5-7
J5-8

INTERNAL FAN 1
RED
YELLOW
WHITE
BLUE

P7

GREEN — J11-1 NC
YELLOW — J11-2 PWM
GREY — J11-3 TACHO
PINK — J11-4 GND

FAN 1

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Connections

Outdoor side
Connectors to In-rush filter
and Compressor Drive

To indoor	Pin No:	Colour	Pin No:	Connector
9 Pins	1	Black 1	1	J4 Fan 1 Inrush filter
	2	Black 2	2	
	3	Black 3	3	
	4	Black 4	4	
	5	Black 5	3	Condenser sensor
	6	Black 6	4	
	7	Black 7	1	J1 Internal Fan Inrush filter
	8	Black 8	2	
	9	Black 9	3	
12 Pins	1	Black 10	4	
	2	Black 11	1	J3 Condenser Fan Inrush filter
	3	Black 12	2	
	4	Black 13	3	
	5	Black 14	4	
	6	Black 15	1	J5 12V suply
	7	Black 16	3	
	8	Black 17	1	J3 Com drive
	9	Black 18	2	
	10	Black 19	3	
	11	Black 20	4	
	12	Empty		

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Connections, *continued*

Indoor side Connection from outdoor unit

To indoor	Pin No:	Colour	Pin No:	Connector	Description
9 Pins	1	Red	1	Fan	Internal fan
	2	Yellow	2		
	3	White	3		
	4	Blue	4		
	Temp sensor	Black	1	CC0 J7	Return sensor
		Black	2		
	5	Black	3		Condenser temp.
	6	Brown	4		
	7	Red	1	CC0 J11	Fan1
	8	Orange	2		
	9	Yellow	3		
	1	Green	4		
	2	Blue	1	CCO J16	Fan 2
	3	Violet	2		
	4	Gray	3		
	5	White	4		
	6	Pink	1	CC0 J2	Supply 12V
	7	White/black	3		
	8	Brown/black	1	CC0 J22	Compressor
	9	Red/black	2		
	10	Orange/Black	3		
	11	Yellow/black	4		
	12	Empty			

Cooling circuit

|	
Introduction	This section describes the active cooling system
WARNING	Before any installation, maintenance or service, disconnect the DC power supply by disconnecting devices from external power supply. Service on any cooling circuit with cooling refrigerant is only to be carried out by a trained cooling technician.
Cooling circuit	This is the cooling circuit schematic:
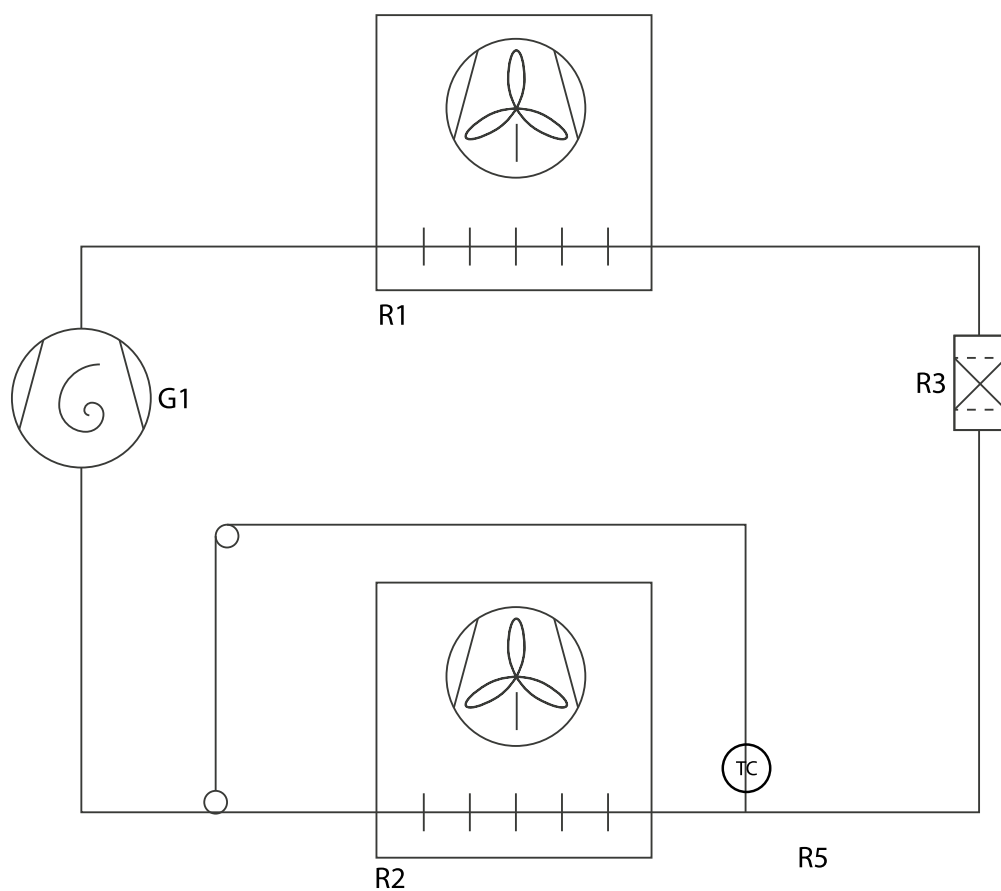
Part designation

This table shows the part designation for cooling schematic shown above

Pos.	Description
G1	Rotary cooling compressor
R1	Condenser
R2	Evaporator
R3	Dry filter
R5	Thermo valve with external capillary sensor

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Technical data

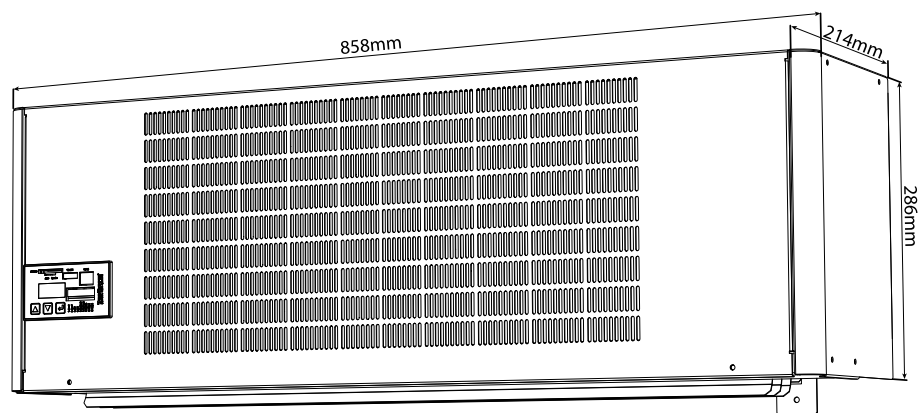| Product overview	Category	
DC Split Air Conditioner 3500	DC Air Conditioning	
Dantherm No.	364000	
Capacity & Performance		
Operating range - temperature	°C	-15 to +55
Cooling capacity at 35°C internal and 35°C ambient	W	3624
Cooling capacity at 35°C internal and 25°C ambient	W	3822
Efficiency ratio at 35°C internal and 35°C ambient	COP	3.5
Airflow, maximum internal	m³/h	860
Airflow, maximum external	m³/h	1950
DC supply voltage connection	Type	Flying leads
Input voltage range	VDC	44 to 57
Power consumption (35°C int./35°C ext.)	W	1138
Maximum current, 100%	A	30
Max start current	A	5
Seasonal Energy Efficiency Ratio	SEER	4.5
Max sound level, 1m distance from outdoor unit	dB(A)	57
Expected operation life	Years	10
Dimensions, weight & mounting		
Unit dimensions (H X W X D) indoor	mm	286 x 858 x 214
Unit dimensions (H x W x D) outdoor	mm	628 x 785 x 364
Net weight indoor / outdoor	kg	16 / 41
Single package weight incl. unit	kg	75
Single packing dimensions (height × length × depth)	mm	785 x 980 x 640
Storage relative humidity, min./max.	RH %	-5 to +80
Storage temperature, min./max.	°C	-40 to +70
Mounting method		Wall-mounted
Controller details		
Controller	Dantherm CC0	Ready for remote climate control
Communication interface		RS485
Mounting method		Built-in
Certifications		
Outdoor unit protection according to EN 60529	IP	55
Indoor unit protection according to EN 60529	IP	21
Refrigerant		R134a / 1100gram
Complies with standards	Code	EN60950 & EN60335-2-40
Colour	RAL	7035

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Technical data, *continued*

Dimensions

Outdoor Unit

785mm 330mm

628mm

135mm

355mm

355mm

Indoor Unit

858mm 214mm

286mm

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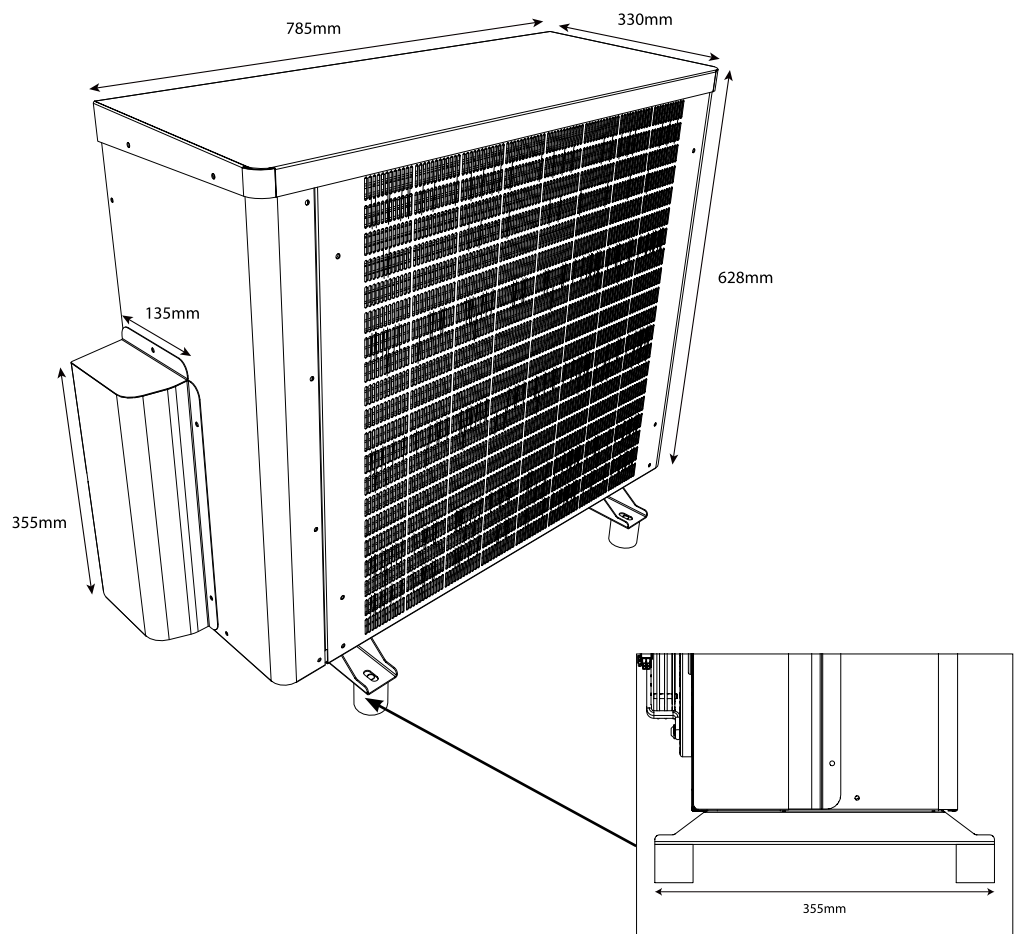
Spare parts

Outdoor Unit

Ref.	Spare part No:	Description
1	096461	DC Compressor DC Split Air Con 3500
2	096453	Capacitor 2200μF / 100V
3	087956	Low pressure switch, DC Split Air Con 3500
4	096454	DC Inrush Filter , DC Split Air Conditioner 3500
5	096457	Condenser Fan DC Split Air Con 3500
6	094665	Dryfilter, DCL 053S, DC Split Air Con 3500
7	096455	CD3 Compressor drive, DC split Air Conditioner 3500
8	097513	Temperature sensor (For condensor)

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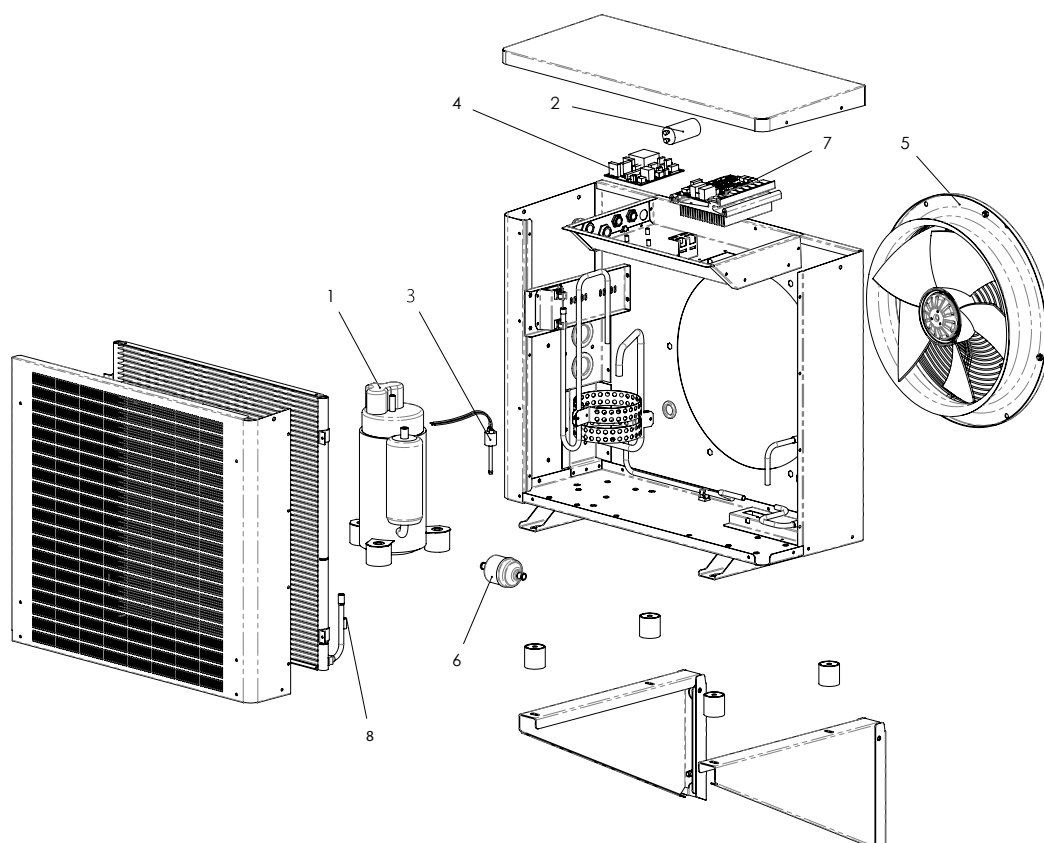
Spare parts, *continued*

Indoor unit

Ref.	Spare part No:	Description
A	096456	CC0 controller with Config file DC Split
B	096452	Temperature sensor
C	096458	Internal Fan DC Split Air Con 3500
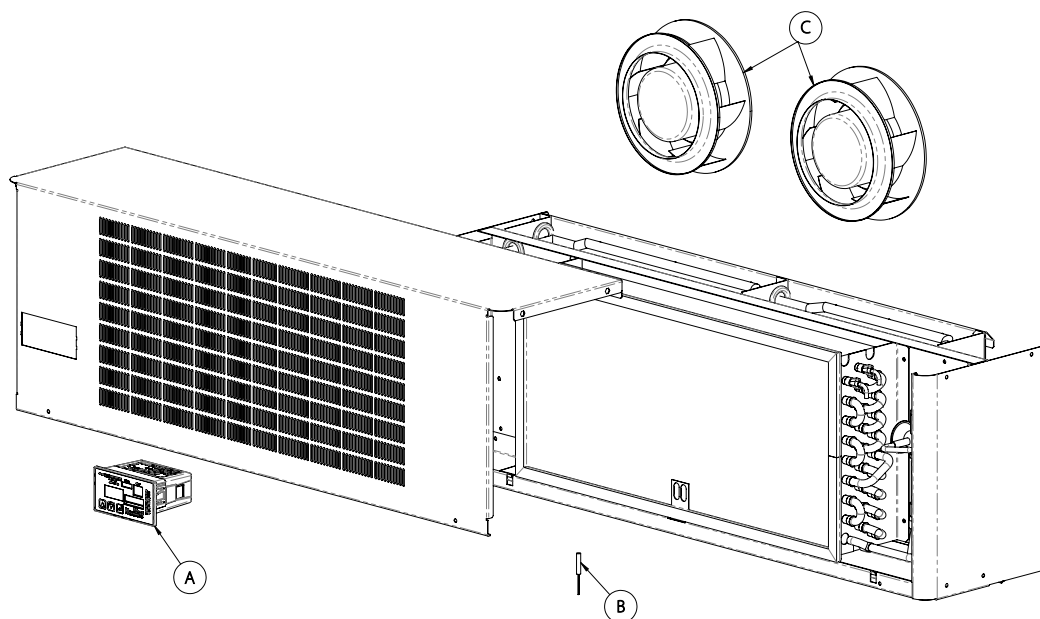
Declaration of Conformity

Declaration of Conformity

Dantherm Air Handling A/S, Marienlystvej 65, DK-7800 Skive hereby declare that the units
DC Split Air Conditioner 3500 is in conformity with the following directives:

2006/42/EC	Directive on the Safety of Machines
2014/35/EU	Low Voltage Directive
2004/108/EC	EU EMC Directive (December 2004)
2014/68/EU	The Pressure Equipment Directive

Skive, 22.09.2017

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Dantherm Air Handling A/S
Marienlystvej 65
7800 Skive
Denmark

Phone   +45 96 14 37 00
Fax   +45 96 14 38 00

infodk@dantherm.com
www.dantherm.com

Dantherm AS
Postboks 4, 3101 Tønsberg
Norway
Besøksadresse: Løkkeåsvn. 263138
Skallestad

Phone   +47 33 35 16 00
Fax   +47 33 38 51 91

dantherm.no@dantherm.com
www.dantherm.com

Dantherm Air Handling AB
Fridhemsvägen 3
602 13 Norrköping
Sweden

Phone   +46 (0) 111 930 40
Fax   +46 (0) 121 133 70

infose@dantherm.com
www.dantherm.se

Dantherm Air Handling
Suite # 1009 Prism Tower
Business Bay
Dubai, UAE

Mobile   +971 56 831 7466
Direct   +45 60 23 55 29

frb@dantherm.com
www.dantherm.com

Dantherm Limited
12 Windmill Business Park
Windmill Road, Clevedon
North Somerset, BS21 6SR
England

Phone   +44 (0)1275 87 68 51
Fax   +44 (0)1275 34 30 86

infouk@dantherm.com
www.dantherm.co.uk

Dantherm Cooling A/S
4th Dobryninskiy Lane 8
Office C 11-01
119049 Moscow
Russia

Mobile   +7 903 700 69 01
Phone   +7 495 642 95 60
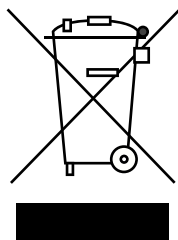Fax   +44 (0)1275 34 30 86

thj@dantherm.com
www.dantherm.com

Dantherm Cooling GmbH
Ziegler Str. 19
D-86199 Augsburg
Deutschland

Mobile   +49 172 627 02 87
Direkt: +49 821 297 00 297
Fax   +49 821 297 00 298

KW@dantherm.com
www.dantherm.com

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