

Direct expansion: Commissioning – VRV

Installer		Performed by	
Company name		Company	
Contact person		Technician	
		Certificate	
End customer		Date	
Name			
Street – N°			
Zip code – City			
Country			

Installation			
Model name		Master	Slave 1/sub unit
Construction year		Model name	
Reference installation		Serial number	
AirNet address		Refrigerant type	
Centralized controller	Installed <input type="checkbox"/> of <input type="checkbox"/>	Standard weight	<input type="text"/> kg
Remote monitoring	<input type="checkbox"/> Yes <input type="checkbox"/> No	Additional weight	<input type="text"/> kg
		Total weight	<input type="text"/> kg
Number of VRV indoor units	<input type="text"/>	Number of Split indoor units	<input type="text"/>
Number of BSV boxes	<input type="text"/>	Number of Biddle units	<input type="text"/>
Number of BSV ports	<input type="text"/>	Number of air handling units	<input type="text"/>
		Number of hydro modules	<input type="text"/>

(For more details, see Annex 1: indoor units)

Safety / last minute risk analysis			
Safe access to the installation	<input type="checkbox"/> Yes <input type="checkbox"/> No	Other safety hazards	<input type="checkbox"/> Yes <input type="checkbox"/> No
Enclosed workplace	<input type="checkbox"/> No <input type="checkbox"/> Yes	Emergency exits	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Working at heights	<input type="checkbox"/> No <input type="checkbox"/> Yes	Presence of necessary personal protection equipment	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Electrical hazards	<input type="checkbox"/> No <input type="checkbox"/> Yes		

Precommissioning			
N2 Test data available	<input type="checkbox"/> Yes <input type="checkbox"/> No	Vacuum test data available	<input type="checkbox"/> Yes <input type="checkbox"/> No
N2 start pressure	<input type="text"/> bar	Vacuum test start pressure	<input type="text"/> mbar
N2 test time	<input type="text"/> hours	Vacuum test time	<input type="text"/> hours
N2 end pressure	<input type="text"/> bar	Vacuum test end pressure	<input type="text"/> mbar
Power ON 6 hours before commissioning	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Visual inspection			
Outdoor installation connection rate	<input type="text"/>	Air side outdoor unit correct	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Indoor installation connection rate	<input type="text"/>	Water side outdoor unit correct	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
System index	<input type="text"/> %	Air side indoor unit correct	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Piping distance Ø6.4 mm	<input type="text"/> m	Vibrations/frictions	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Piping distance Ø9.5 mm	<input type="text"/> m	Noise	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Piping distance Ø12.7 mm	<input type="text"/> m	Unit height	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Piping distance Ø15.9 mm	<input type="text"/> m	Communication bus	<input type="checkbox"/> OK <input type="checkbox"/> Not OK
Piping distance Ø19.1 mm	<input type="text"/> m		
Piping distance Ø22.2 mm	<input type="text"/> m	Condenser with glycol	<input type="checkbox"/> Yes <input type="checkbox"/> No
Piping limits within limits	<input type="checkbox"/> Yes <input type="checkbox"/> No	Presence of installation mistakes	<input type="checkbox"/> Yes <input type="checkbox"/> No
Position/angle refnet correct	<input type="checkbox"/> Yes <input type="checkbox"/> No	Sales selection data available	<input type="checkbox"/> Yes <input type="checkbox"/> No
System charged	<input type="checkbox"/> Automatic <input type="checkbox"/> Manual	Logbook available and complete?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Test run	<input type="checkbox"/> Short <input type="checkbox"/> Long	Airco energy audit requested?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Settings

Outdoor unit				Indoor unit			
Setting	Description	Default value	New value	Setting	Description	Default value	New value
				2-02	Reference thermistor	01	
				2-05	Controller thermistor info to central control	01	
				2-06	Use controller thermistor for group temperature	01	

Electrical system

Main voltage 400 V AC			Control voltage			230 V AC		560 V DC	
	L1	L2	L3						
Master	V	V	V	Master	V	V	V	V	V
Slave 1	V	V	V	Slave 1	V	V	V	V	V
Slave 2	V	V	V	Slave 2	V	V	V	V	V

	Isolating switch		Fuse outdoor unit		Fuse indoor unit		Cable section	
Master	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Slave 1	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Slave 2	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK

Operation check

Operation mode											
Indoor unit set point	°C										
Installation capacity	%										

	OnOff/Inv	Freq.	L1 (A)	L2 (A)	L3 (A)	DC °C(*)	DC SH(*)	Abnormal noise		Crankcase heater	
Master						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Inverter 1						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Standard 1/inverter 2						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Standard 2						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK

(*) DC °t=discharge temperature / DC SH=discharge superheat

	OnOff/Inv	Freq.	L1 (A)	L2 (A)	L3 (A)	DC °C(*)	DC SH(*)	Abnormal noise		Crankcase heater	
Slave 1						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Inverter 1						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Standard 1/inverter 2						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Standard 2						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK

(*) DC °t=discharge temperature / DC SH=discharge super heat

	OnOff/Inv	Freq.	L1 (A)	L2 (A)	L3 (A)	DC °C(*)	DC SH(*)	Abnormal noise		Crankcase heater	
Slave 2						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Inverter 1						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Standard 1/inverter 2						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Standard 2						°C	K	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK

(*) DC °t=discharge temperature / DC SH=discharge superheat

	Master	Slave 1	Slave 2		First(*)	Middle(*)	Last(*)
Number of running compressors				Electronic expansion valve opening	pulse		
Opening electronic expansion valve main condenser	pulse			Liquid temperature	°C		
Opening electronic expansion valve sub condenser	pulse			Gas temperature	°C		
Opening electronic expansion valve subcooler	pulse			(*) Nearest, middle and farthest indoor unit.			
Suction pressure	bar						
Evaporating temperature	°C			Compressor capacity building up		<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Suction temperature	°C			Room temperature in- or decreasing		<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
Suction superheat	K						
Discharge pressure	bar						
Condensation temperature	°C						
Liquid temperature	°C						
Subcooling	K						

Outdoor unit

	Master	Slave 1	Slave 2
Inlet temperature	°C		
Outlet temperature	°C		
Approach temperature	K		

Air cooled condenser

	Master	Slave 1	Slave 2
Fan 1 state	<input type="checkbox"/> OK	<input type="checkbox"/> OK	<input type="checkbox"/> OK
	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK
Fan 2 state	<input type="checkbox"/> OK	<input type="checkbox"/> OK	<input type="checkbox"/> OK
	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK

Water cooled condenser

	Pump 1	Pump 2	L1 (A)	L2 (A)	L3 (A)	FLA

Electrical checks

Electrical connections	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK					
Contactors contacts	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK					
			Master	Electrical insulation		Winding resistance	
			Inverter 1	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Standard 1/inverter 2	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Standard 2	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Slave 1	Electrical insulation		Winding resistance	
			Inverter 1	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Standard 1/inverter 2	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Standard 2	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Slave 2	Electrical insulation		Winding resistance	
			Inverter 1	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Standard 1/inverter 2	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK
			Standard 2	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> OK	<input type="checkbox"/> Not OK

Regulation checks

	Master	Slave 1	Slave 2			
Low pressure sensor calculation	<input type="checkbox"/> OK	<input type="checkbox"/> OK	<input type="checkbox"/> OK	Flow switch check		<input type="checkbox"/> OK
	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK			<input type="checkbox"/> Not OK
High pressure sensor calculation	<input type="checkbox"/> OK	<input type="checkbox"/> OK	<input type="checkbox"/> OK			
	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK	<input type="checkbox"/> Not OK			

Analysis reports

Water analysis (on demand) OK Not OK Thermographic analysis (on demand) OK Not OK
Glycol analysis condenser (on demand) OK Not OK

Overall result

The installation is working: Good Not good Follow-up site visit needed? Yes No
 Safe Not safe

Shortcomings and measures to be taken

General remarks:

Shortcomings that were not fixed during the commissioning:

Measures to be taken in order to resolve the remaining shortcomings:

Signature certified technician

Annex 1: indoor units

Unit number	Unit model	Serial number	Unit location	Central address	Airnet address
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02					
03					
04					
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