REV	01
Data	December 2021
Supersedes	N/A

Service Manual

Startup Guide – EWWD~VZ, EWWH~VZ, EWWS~VZ

Original instructions

CE

Contents

LIST OF TABLES

1 Technician Qualifications

Initial startup on Daikin chillers must be performed only by Daikin Service Technicians or Authorized Service Providers. The contents of this manual are not intended as a substitute for professional skills training, or knowledge and practice of industry standards. Additional literature will be required that is product and component specific, including: product Installation Manuals, Service Bulletins, selection data, system control and piping specifications, etc. (see List of References on *Paragraph 2* for a list of some supplemental items).

The following information is intended only as a guide for authorized personnel with a sound basic knowledge of HVAC equipment, mechanical systems, electrical wiring, controls, & microprocessors. Attempts by untrained or unauthorized persons to start, operate and service this equipment can result in equipment failure, personal injury, or death, as well as invalidation of product warranty. It is the responsibility of the technician to ensure that proper safety equipment safe practices are used.

Be sure that before beginning any work, the Startup Service Technician has reviewed and is thoroughly familiar with all Daikin Factory Service Safety Policies and Procedures and has reviewed any Service Bulletins or Rapid News regarding this product.

2 Required Tools and Supplies

In addition to standard tools needed on most service jobs, be sure to bring the following items to the jobsite for Startup:

- ☑ Personal Protective Equipment (Safety)
- ☑ Commissioning Sheet
- ☑ Chiller Technical Data, Selection Sheet, and Certified Submittal Drawings
- ☑ Manuals:

  Note: Be sure that all manuals are the current revision appropriate for this unit.
  - This Manual: Startup Guide – EWWD~VZ, EWWH~VZ, EWWS~VZ.
  - Installation, Operation and Maintenance WATER-COOLED WATER CHILLERS WITH VARIABLE SPEED COMPRESSOR (D-EIMWC003H02-18_04EN)
  - Control Manual: WATER COOLED CHILLER AND HEAT PUMPS WITH INVERTER DRIVEN SCREW COMPRESSOR (D-EOMZC00106-17_05EN)
  - EWWD-VZ P&ID (last revision)
  - Wiring Diagram

- ☑ Other technical reference material as necessary
- ☑ Current operating software version downloaded and ready to install if needed:
  - Last ADAM version available on official repository

- ☑ Miscellaneous gauges and hand tools, including:
  - Electronic Leak Detector
  - Differential Pressure Gauge (*adequate for system pressures)*
  - Phase Rotation Meter
  - Refrigeration Gauge Manifold (*Range: 50bar, Accuracy: ±0.5% of Final Value, Resolution: 0.01bar/0.1psi/1kPa*)
  - Digital thermometer (*Range: -50°C/+150°C, Accuracy: ±0.1°C, Resolution: 0.1°C*)
  - Amp probe
  - Voltmeters
  - Recover refrigerant cylinder (*for eventual charge adjustments*)
  - Full refrigerant cylinder *(for eventual charge adjustments)*
  - Recovery pump (*for eventual charge adjustments*)

3 Collaboration and Responsibilities

Throughout the installation and startup process, members of the Daikin Service Department (Supervisor / Coordinator / Technician) must establish contact and meet regularly with the following persons and/or their designated representatives:

- Mechanical, Electrical, and Controls Contractors
- Installing Contractor
- Daikin Sales Department
- Customer/Owner
- Personnel to be trained in unit operation

It is the responsibility of the Daikin Service Representative to ensure that all items on the *Pre-Power On Checklist* are complete and the system is ready for start-up. Upon arrival at the jobsite, the DAIKIN Service technician will verify that all items on the *Pre-Power On Checklist* are complete.
The Chiller Start-up Technician must confirm that the unit installation conforms to Daikin specifications and requirements. This includes mounting and support, piping, electrical and control installations related to the unit. These items must, as a minimum, meet acceptable industry standards and Daikin published requirements. All factory supplied controls and valves must be set and, where required, calibrated. Electrical power and control wiring must be selected and sized as specified by Daikin and the applicable electrical code.
The various contractors associated with the installation have the responsibility to provide the following items (as noted on the Pre-Start Checklist), in accordance with the product IOM, applicable codes and acceptable practices for the trade involved. Note any discrepancies on Commissioning Sheet and notify Supervisor as appropriate. Ensure that access to appropriate systems is available for startup operations.

4 Before Arriving at Jobsite

- Review and Verify Pre-Commissioning Sheet received from the Installer/Customer (*Table D*) Company/Contractor.
- Review Required Materials List on (refer to paragraph 2) and gather necessary items.
- Review Unit Design Specifications.
- Review Unit Selection Sheet.
- Review Startup Guide and Commissioning Form.
- Review IOM.
- Review Control Manual.
- Establish estimated timeline and milestones for Startup.

5 Upon Arrival at Jobsite

Meet with Mechanical, Electrical, and Control Contractors to discuss Startup Process and identify any potential issues that may interfere with a successful startup.

Be sure to meet with the Controls Contractor to discuss and clarify the chiller control sequence and settings for the chiller, towers, pumps, BAS integration, etc…

6 Pre-Power on Checks

Initial Chiller Inspection has to be performed according to the ***Pre-Power On Checklist*** of the Commissioning Sheet by following the instruction below shown.

Verify that all the items are correct. If the system is not ready and/or items on the Pre-Power On Checklist are incomplete, the technician should immediately notify his supervisor and request direction on how to proceed. A separate work order authorization may be required.

6.1 Visual Inspection

- Inspect the chiller for shipping/installation damage including fans and internal parts of condenser.
- Verify that chiller is adequately located, and level mounted as per the IOM according to the minimum space requirements (***Paragraph 2.4***)
- Verify that appropriate anti-vibration pads are installed.
- Visually inspect for oil and refrigerant leaks.
- Record component model and serial numbers as appropriate on Commissioning Form.
- Clean the chiller from any foreign debris and surrounding area.

Note any issues in the Commissioning Form (***Pre-Startup Comments***)

6.2 Leak Test

Before to start with Leak Test, verify that during stock period (from Delivery Date), leak tests have been performed periodically as per local FGas Regulation. Collect all leak test reports for recording purpose.

Connect service gauges. Confirm pressure in the condenser and evaporator, to verify that charge was not leaked during storage/shipping. Using Electronic Leak Detector, leak check entire unit. Be sure to note any leaks found and repairs performed on the Commissioning Sheet. Follow all applicable industry and regulatory authority standards. If refrigerant loss is catastrophic, startup may need to be postponed until appropriate warranty leak repairs are completed.

Note any issues in the Commissioning Form (***Pre-Startup Comments***)

6.3 Water Piping System Check

- Verify water piping as per IOM (***Paragraph 2.7***). The water filter must be installed as close as possible to the chiller, as in Figs. 8 and 9. If the water filter is installed in another part of the water system, the Installer has to guarantee the cleaning of the water pipes between the water filter and the evaporator. Missing filter results withdraw of heat-exchangers warranty.
- Verify if proper glycol percentage for the application in accordance with Daikin specifications.
- Walk length of piping system (in equipment area). Ensure that connections are correctly installed, and piping is properly supported (i.e., not supported by the chiller). Flanges must not be stressed.
- Check evaporator piping for proper flow direction through vessels by consulting Dimensional Drawing. If flow is incorrect, notify Mechanical Contractor, Service Supervisor, and Sales Rep.
- Verify that water pressure gauges are installed at proper locations
- Confirm that all piping specialties (expansion tank, make-up, relief, vents, etc), water pumps are properly installed.

Note any issues in the Commissioning Form (***Pre-Startup Comments***)

6.4 Water Flow

Use Differential Pressure Gauge at the inlet/outlet nozzles of the unit connections to measure the pressure drop across the exchanger/exchangers.

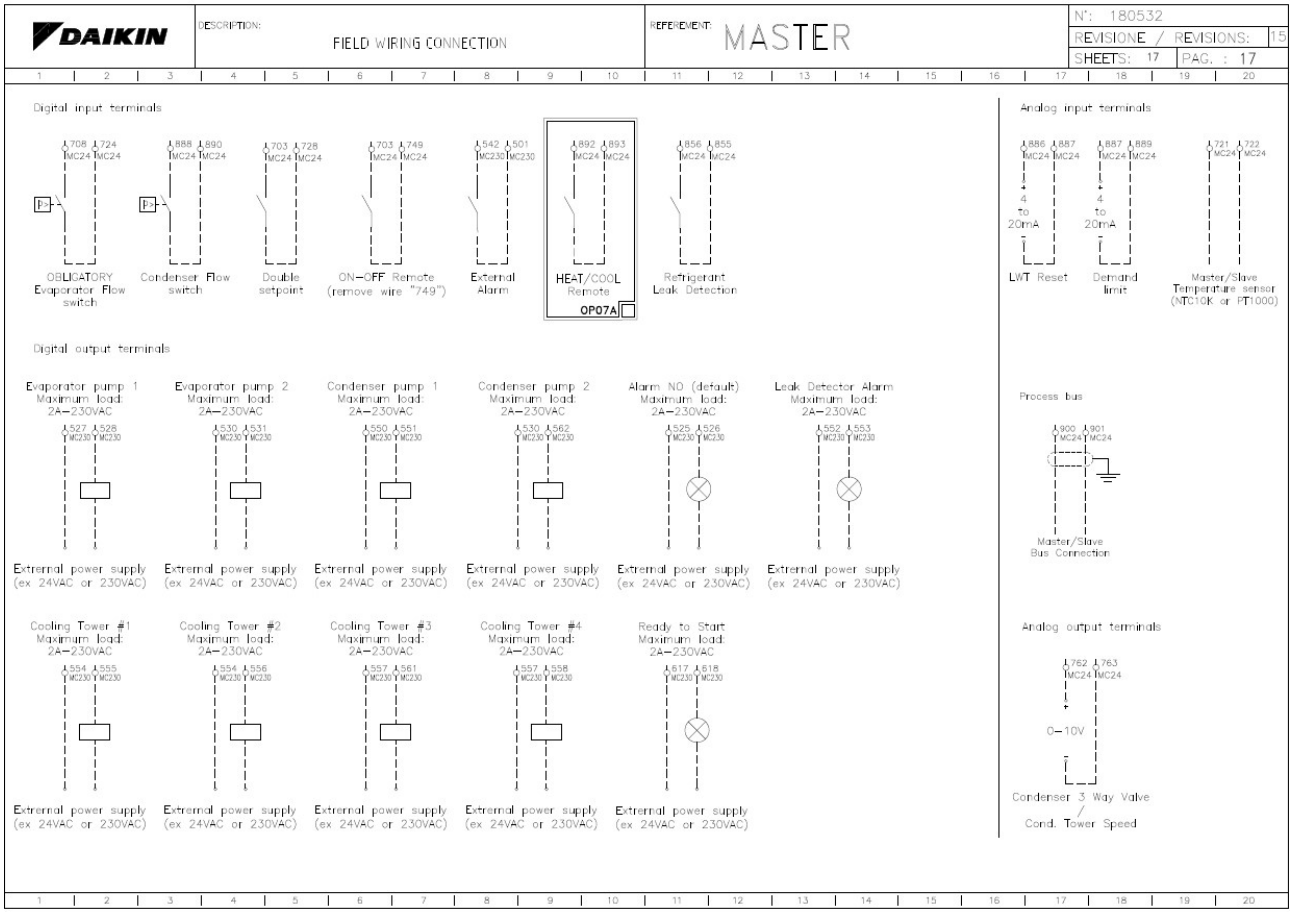
Compare actual flow with Pressure Drop specified on the Unit Selection Sheet. Verify that actual flow is in line with the selection data.

If the measured flow isn't in line with the selection data, then refer to the CSS (Chiller Selection Software) for the verification of allowability of the measured water flow.

If flow is outside of acceptable margins, corrective action is required. If flow is too high, valves may be adjusted to trim flow. If flow is too low, notify Installing Contractor, and note on the Commissioning Form. If flow is different from the selection data, notify Service Supervisor and Sales Rep. Correction may be required prior to startup.
Note any issues in the Commissioning Form (***Pre-Startup Comments***)

6.5 Electric Connections Check

- Verify the Electric connections, Cable requirements, Interconnection cables and Phase unbalance as per IOM.
- Verify the proper electrical phasing U-V-W of the loads (fans, compressors, and pumps) for L1, L2 and L3 respectively.
- Verify Field wiring correctness according to the unit wiring diagram



External power supply needed for Digital output terminals
Analog Inputs must be generated through external auxiliary voltage

Note any issues in the Commissioning Form (***Pre-Startup Comments***)

7 Pre-Startup Checks

Once the "*Pre-Power On Checks"* are completed, the technician can proceed with the Pre-Startup Checks by turning on the unit main switch.
Pre-Startup checks must be performed according to the ***Pre-Startup Checklist*** of the Commissioning Sheet by following the instruction below shown.

Make sure that unit switch (Q0) is set in OFF state before turning on the unit main switch

Verify that all the items are correct. If the system is not ready and/or items on the Pre-Startup Checklist are incomplete, the technician should immediately notify his supervisor and request direction on how to proceed. A separate work order authorization may be required.

7.1 Voltage Check

- Verify the electric Main voltage and frequency
- Verify all on-board auxiliary transformer voltages
- Check the Compressor Heater current

Note any issues in the Commissioning Form (***Pre-Startup Comments***)

7.2 Flow Switches

- Check the water flow safety switches: verify that field-installed flow switches are installed as per the manufacturer's instructions and IOM.
- Any differential pressure switch connections must be made across the vessel they protect.
- Field-installed Flow switches should not be located close to any source of turbulence and should be located in inlet or outlet piping of the vessel away from any shutoff valves or isolation devices.
- Verify flow switches operation, by throttling the flow and verify that switch opens when flow rate falls below 50% of nominal operating flow rate.

Note any issues in the Commissioning Form (***Pre-Startup Comments***)

7.3 Control Settings

- Check all MicroTech 4 controller settings to verify they are optimized for application conditions.
- Download and/or install updated software as needed.
- Verify settings of all safety and operating controls.

7.3.1 Unit Configuration

On the unit controller, enter the "Technician Password" and go into

Main Menu → Commission Unit → Configuration → Unit

Setpoint	Default	Range	Description
Apply Changes=	No	No Yes	Use this command to reset the controller to confirm the configuration made
Apply / Save	No	No Yes	Use this command to save the configuration made
Mfg Place =	Not Selected	Not Selected Europe USA	Use this command to choose were the unit was assembled
Unit Type	NotCfg	NotCfg Std HT	Select the type of chiller. Std = standard unit HT = High condensing temperature unit CLWT up to 65°C

Refrigerant	R134A	R134A R1234ZE R513A	Select the type of refrigerant
Marine	No	No Yes	Define if unit for Marine application or not.
Number of Ckts=	2	1 2	Define the number of circuits
Twin Valve	No	No Circ1 Circ2 Both	No = each circuit has 1 EXP Valve Circ1 = Circuit 1 has 2 EXP valves and Circ 2 has only 1 EXP Valve Circ2 = Circuit 2 has 2 EXP valves and Circ 1 has only 1 EXP Valve Both= Both circuits have 2 EXP Valve each.
3 Way Valve	Off	Off On	Off= 3 way Valve is not used. On= 3 way valve used.
Comp1 Type=	F3AL	F3AL F3BL F4AL	Select the compressor model according to the machine model, referring to the unit configuration tables. Also check the compressor nameplate F3AL = HSA204 F3BL = HAS232 F4AL = HAS263
Cmp 1 Max Freq	60 HZ	60 HZ 63 HZ 65 HZ 70 HZ 75 HZ 78 HZ Cust	Chose the maximum compressor frequency. Refer to Annex 2. In case of special request for a custom compressor frequency refer to ***7.3.2 Custom compressor settings*** and to the special material request form
Comp2 Type=	F3AL	F3AL F3BL F4AL	Select the compressor model according to the machine model, referring to the unit configuration tables. Also check the compressor nameplate F3AL = HSA204 F3BL = HAS232 F4AL = HAS263
Cmp 2 Max Freq	60 HZ	60 HZ 63 HZ 65 HZ 70 HZ 75 HZ 78 HZ Cust	Chose the maximum compressor frequency. Refer to Annex 2. In case of special request for a custom compressor frequency refer to ***7.3.2 Custom compressor settings*** and to the special material request form
Brine Mode =	STD	STD Low	Select brine mode
Power Supply	400 V	380 V 400 V 460 V	Select the actual power supply for the unit after checking it with a mustimeter
Limit Type	None	None Current Demand	Select Curent on Demand depending on the option available. If no option is available leave default value None
Energy Mtr =	None	None Nemo	Select Nemo in case energy meter is present
Leak Detektor	Disable	Disable Enable	Select enable in case this option is available on the unit
Rapid Restart	Disable	Disable Enable	Select enable in case this option is available on the unit
Alm Out Type	Solid	Solid Blinking	Status of the General Alarm relay Solid= the alarm output will be continuous Blinking= the alarm output will blink
Modem Type	None	MachineLink Teltonika None	Select Modem Type
Ext Fault Cfg	None	None Event Alarm	Definition of the unit behaviour after switching of external alarm contact Event= the ext alarm will trigger an event on the unit Alarm= the ext alarm will trigger an alarm on the unit
Comm Module 1=	None	None IP LON MSTP Modbus AWM	Select whether a connected communication module is present on the left side of the controller. IP → POL908 LON → POL906 MSTP → POL904 Modbus → POL902 AWM → POL909
Comm Module 2=	None	None IP LON MSTP Modbus AWM	Select whether a second communication module is present on the left side of the controller. IP → POL908 LON → POL906 MSTP → POL904 Modbus → POL902

			AWM → POL909
Comm Module 3=	None	None IP LON MSTP Modbus AWM	Select whether a third communication module is present on the left side of the controller. IP → POL908 LON → POL906 MSTP → POL904 Modbus → POL902 AWM → POL909
M/S Address =	None	None Master Slave 1 Slave 2 Slave 3	Defines if the unit is Master or Slave in the M/S system or leave to none in case of standalone unit.
M/S Num Of Units =	2	2 3 4	Defines the number of units in the M/S system
M/S Sns Type	NTC10K	None NTC10K PT1000	Select the type of common LWT temperature sensor used in the M/S system
Display Units	Metric	Metric English	Select the display unit system (metric or imperial)

After termination of the Unit configuration, it's necessary to restart the controller to activate the settings made through the "Apply changes" command.

The control part of Micro-channel EWWD/H/S VZ is composed of the controller POL688 + 1 or 2 modules POL965 and POL94U (depending on whether the machine is Mono or Dual). Once the **unit** has been **configured,** after the controller has been restarted, a part of the program will be automatically be transferred on the POL965U modules. Be careful not to remove the power supply if the BSP and BUS LEDs of both POL94U modules have become green.

7.3.2 Custom compressor setting

The compressors of VZ series have the option of being programmed at a frequency other than that normally established for the relevant model of unit. If requested as a special on the material request, the inverter must be set with the normal parameters provided for the unit model and then modify the following parameters:

3 - 03 Maximum reference = Frequency requested by the customer
4 - 14 High speed limit = Frequency requested by the customer
4 - 19 Max Output Frequency = (Customer requested frequency) + 2 Hz

The rest of the parameters remain unchanged from the standard unit.

Furthermore, the operating frequency of the compressor must also be set on the controller, as described below:

1) Select "Commission Unit" and then "Configuration"
2) Choose the compressor model and instead of its maximum frequency select "Cust" (Custom)
3) Now set the frequency ap per customer request.

After termination of the Unit configuration, it's necessary to restart the controller to activate the settings made through the "Apply changes" command.

The control part of Micro-channel EWWD/H/S VZ is composed of the controller POL688 + 1 or 2 modules POL965 and POL94U (depending on whether the machine is Mono or Dual). Once the **unit** has been **configured,** after the controller has been restarted, a part of the program will be automatically be transferred on the POL965U modules. Be careful not to remove the power supply if the BSP and BUS LEDs of both POL94U modules have become green.

7.3.3 690 V Application

For 690 V application, some settings need to be changed respect to standard application:

- Inverter settings
- Controller Settings (Compressor 1 and/or 2 max Frequency)

Before to go on site to carry out the unit commissioning, contact servicesupport@daikinapplied.eu to get the specific inverter and controller settings.

After termination of the Unit configuration, it's necessary to restart the controller to activate the settings made through the "Apply changes" command.

The control part of Micro-channel EWWD/H/S VZ is composed of the controller POL688 + 1 or 2 modules POL965 and POL94U (depending on whether the machine is Mono or Dual). Once the **unit** has been **configured,** after the controller has been restarted, a part of the program will be automatically be transferred on the POL965U modules. Be careful not to remove the power supply if the BSP and BUS LEDs of both POL94U modules have become green.

7.3.4 Software Options

Software Options (Only for Microtech 4)

The possibility to employ a set of software options has been added to the functionality of the chiller, in according with the new Microtech 4 installed on the Unit. The Software Options do not require any additional hardware and regard communication channels and the new energy functionalities.

During the commissioning the machine is delivered with the Option Set chosen by the customer; the Password inserted is permanent and depends on the Serial Machine Number and the Option Set selected.

The available options are:

1. Modbus Slave MSTP for settings refer to BAS integration guide Doc. Name: D-EIGOC00203-21EN_TZ
2. BACNet MSTP for settings refer to BAS integration guide Doc. Name: D-EIGOC00103-21EN-TZ
3. BACNet IP for settings refer to BAS integration guide Doc. Name: D-EIGOC00103-21EN-TZ
4. Performance Monitoring. The Energy Monitoring is a software option not requiring any additional hardware. It can be activated to achieve an estimation (5% accuracy) of the instantaneous performances of the chiller in terms of:
   • Cooling Capacity
   • Power Input
   • Efficiency-COP
   An integrated estimation of these quantities is provided
5. iCM Standard for settings and configuration contact servicesupport@daikinapplied.eu
6. iCM Advanced for settings and configuration contact servicesupport@daikinapplied.eu

After termination of the Software Options configuration it's necessary to restart the controller to activate the settings made through the "Apply changes" command.

7.4 Twin evaporator pump setting

In the case of twin evaporator pumps, set the automatic start-up management pumps.

1. Enter technician password in the controller
2. Open the menu:

Main Menu → View / Set Unit → Pumps → Evp Pmp Ctrl → Auto

7.5 Alarm Limits

On the unit controller, enter the “Technician password” and set the alarm limits in the following menu:

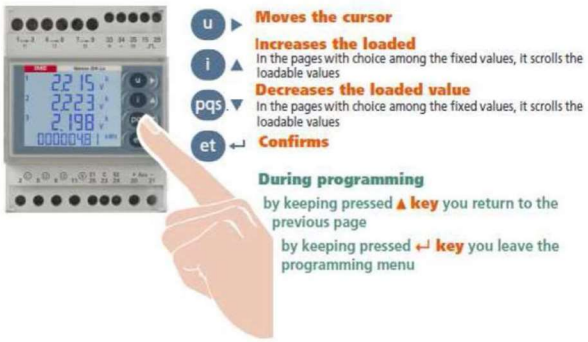
Main Menu → Commission Unit → Alarm Limits

At the end of the Alarm Limits setting a restart of the controller ("Apply Changes") is required BEFORE to proceed with the startup of the unit.

7.6 Energy Meter

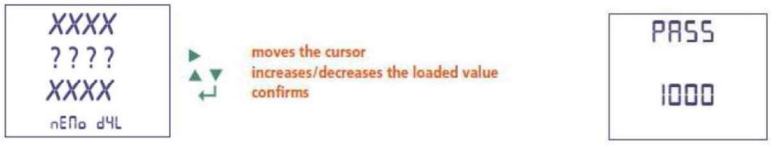
If the unit is provided with Opt.16/16a, proceed with the energy meter settings check.

Function of the buttons:



Acces the setup menu

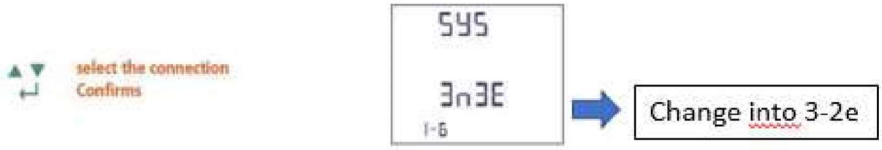
1) press "et " repeatedly until the page is displayed: "nEMo D4L "
2) Press and hold the "et " button until you see the page: "PASS "
3) Enter the password “1000” and confirm with the "et " key.



The “arrow” ▸ is used to move between the various digits, while ▲ ▼ is used to increment or decrement the numerical value of each digit. The ENTER key is used to confirm the password.

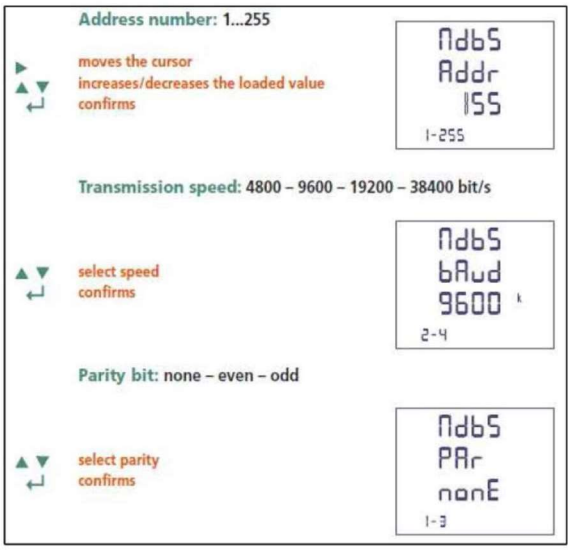
Depending on the wiring configuration, the respective programming scheme must be selected

1) log in with the password "1000 "
2) press the "et " button repeatedly until the page is displayed: "SYS "
3) Select the desired configuration: **3-2e** if the number of current transformers is 2, which is the standard configuration.



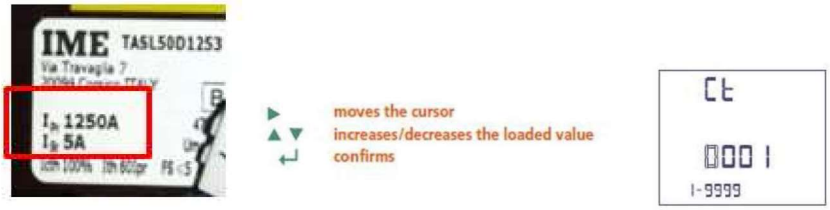
In case the energy meter is integrated in the modbus communication network of the POL687 controller of the chiller unit , the modbus parameters of the Nemo energy meter needs to be updated. It will be necessary to configure the address, transmission speed and parity bit on the energy meter corresponding to those on the chiller controller (POL 687).

1) log in with the password "**1000** "
2) press "et " repeatedly until the page is displayed: "MDB Addr "
3) Select Address **20**
4) press "et " repeatedly until the page is displayed: "MDB BAud "
5) Select the baud rate **19200**
6) press "et " repeatedly until the page is displayed: "MDB par "
7) Select **None** Parity bit



Set the transformation ratio of the current transformers (CT ratio)

On the label of the CT it's indicated what the maximum primary and secondary currents are. For example max primary current 1250A / max secondary current 5A gives an CT ratio of 250 (1250/5)



Warning: the nominal current value at the Ime Nemo Energy meter input terminals should be between 1A~5A. Do not use CT's exceed this range in order to avoid damage to the energy meter!

7.7 Pre-Running Adjustments

Pre-Running Adjustments must be separately performed for each circuit

It is highly recommended to use a double sample sensor for the calibration of temperature sensors

7.7.1 Check and calibration of unit temperature sensors

Calibration of unit temperature sensors is a fundamental step for the correct operation of the unit.
There are three temperature sensors to be calibrated (for each circuit):

- Evaporator LWT
- Evaporator EWT
- Condenser LWT
- Condenser EWT

7.7.1.1 Evaporator Leaving Water Temperature

- Place the sample and Evap LWT sensors in a container with ice
- Enter in *Commission Unit → Sensors Calibration → Unit* menu and then compare the Evap *LWT* value with that detected by the sample sensor
- If the temperature value measured by the unit sensor is different from the sample one, set the difference in the *Offset* parameter.

Make sure to have a good water/ice mix and wait for the water/ice system temperature to stabilize before to proceed with the calibration.
Place both sensors (sample and unit) in the middle of the container in order to not affect the readings.

7.7.1.2 Evaporator Entering Water Temperature

- Place the sample and Evap EWT sensors in a container with ice
- Enter in *Commission Unit → Calibrate Sensors → Unit* menu and then compare the Evap *EWT* value with that detected by the sample sensor
- If the temperature value measured by the unit sensor is different from the sample one, set the difference in the *Offset* parameter.

Make sure to have a good water/ice mix and wait for the water/ice system temperature to stabilize before to proceed with the calibration.
Place both sensors (sample and unit) in the middle of the container in order to not affect the readings.

7.7.1.3 Condenser Leaving Water Temperature

- Place the sample and Cond LWT sensors in a container with ice
- Enter in *Commission Unit → Sensors Calibration → Unit* menu and then compare the Cond LWT value with that detected by the sample sensor
- If the temperature value measured by the unit sensor is different from the sample one, set the difference in the *Offset* parameter.

Make sure to have a good water/ice mix and wait for the water/ice system temperature to stabilize before to proceed with the calibration.
Place both sensors (sample and unit) in the middle of the container in order to not affect the readings.

7.7.1.4 Condenser Entering Water Temperature

- Place the sample and Cond EWT sensors in a container with ice
- Enter in *Commission Unit → Sensors Calibration → Unit* menu and then compare the Cond EWT value with that detected by the sample sensor
- If the temperature value measured by the unit sensor is different from the sample one, set the difference in the *Offset* parameter.

Make sure to have a good water/ice mix and wait for the water/ice system temperature to stabilize before to proceed with the calibration.
Place both sensors (sample and unit) in the middle of the container in order to not affect the readings.

7.7.2 Check and calibration of circuit temperature sensors

Calibration of circuit temperature sensors is a fundamental step for the correct operation of the unit.
There are three temperature sensors to be calibrated (for each circuit):

- The Suction temperature sensor (ST-1 & ST-2)
- The Discharge temperature sensor (DT-1 & DT-2)
- The Liquid temperature sensor.

7.7.2.1 Suction Temperature sensor

- Place the sample and suction temperature sensors in a container with ice
- Enter in *Commission Unit → Sensors Calibration → Circuit #1/2* menu and then compare the *Suction Tmp* value with that detected by the sample sensor
- If the temperature value measured by the unit sensor is different from the sample one, set the difference in the *Suction Offset* parameter.

Make sure to have a good water/ice mix and wait for the water/ice system temperature to stabilize before to proceed with the calibration.
Place both sensors (sample and unit) in the middle of the container in order to not affect the readings.

Suction temperature sensor is the most crucial of chiller's sensors as will guarantee the correct working of the EXV and consequent safe compressor running

7.7.2.2 Discharge temperature sensor

- Place the sample and discharge temperature sensors in ambient temperature
- Enter in *Commission Unit → Sensors Calibration → Circuit #1/2* menu and then compare the *Discharge Tmp* value with that detected by the sample sensor
- If the temperature value measured by the unit sensor is different from the sample one, set the difference in the *Disch Offset* parameter.

Make sure to have a stable air conditions and wait until read unit and sample temperatures are stabilized respect to air ambient temperature before to proceed with the calibration.

7.7.2.3 Liquid temperature

- Place the sample and Subcooling temperature sensors in ambient temperature
- Enter in *Commission Unit → Calibrate Sensors → Circuit #1/2* menu and then compare the *Liquid Temp* value with that detected by the sample sensor
- If the temperature value measured by the unit sensor is different from the sample one, set the difference in the *Liquid Offset* parameter.

Refer to Table A for the complete overview of the components positioning.

7.8 Dry Tests

Perform the Dry Tests by setting the unit in "test mode":

1. Enter the "Technician Password" on the controller
2. Go in *Main Menu → Unit Mode → Mode*
3. Set *Test*

All the dry tests are performable through the following menu:

Main Menu → Commission Unit → Manual Control

7.8.1 Unit Alarm

Check the correct activation of the software general alarm:

Main Menu → Commission Unit → Manual Control → Unit → Unit Alarm

7.8.2 Circuit Alarm

Check the correct activation of the software general alarm:

Main Menu → Commission Unit → Manual Control → Unit → Circuit #1/#2 Alarm

7.8.3 Evap Pump #1/#2

Check the correct activation of the water pump (if it is controlled by the unit):

Main Menu → Commission Unit → Manual Control → Unit → Pump #1/#2 → set Pump Speed in %.

7.8.4 Cond Pump #1/#2

Check the correct activation of the water pump (if it is controlled by the unit):

Main Menu → Commission Unit → Manual Control → Unit → Pump #1/#2 → set Pump Speed in %.

7.8.5 Tower Fan Step

Check the correct activation of the cooling tower fan steps (if it is controlled by the unit):

Main Menu → Commission Unit → Manual Control → Unit → Tower Step X

7.8.6 Tower VFD

Check the correct modulation of the cooling tower fan VFD (if it is controlled by the unit):

Main Menu → Commission Unit → Manual Control → Unit → Tower VFD → set Fan Speed in %.

7.8.7 3 Way Valve

Check the correct modulation of the 3 Way Valve (if it is controlled by the unit):

Main Menu → Commission Unit → Manual Control → Unit → 3 Way Valve → set % opening.

7.8.8 VR Slides

Check the correct activation of the compressor VR slides:

Main Menu → Commission Unit → Manual Control → Circuit #1/2 → VRX

7.8.9 Expansion Valve

Verify the correct operation of the EXV valves:

Main Menu → Commission Unit → Manual Control → Circuit #1/2 →EXV Position

And set the opening percentage, it is possible to verify the movement of the piston inside the expansion valve through the glass port on it.

8 Start-Up

The first data acquisition for each circuit must be performed in “Cooling mode”, in order to also check the correctness of the refrigerant charge by measuring the subcooling.

Make sure to open all the service valves before to perform the first unit Start-Up:

- Liquid line
- Jet pump
- Oil Filter
- Discharge line (if present)
- Suction line (if present)
- Turn on the water pumps

To do that, follow these steps, referring to the “Circuit #X”:

1. Enter the “Technician Password” on the controller
2. Go in Main Menu→Unit Mode → Mode and set Cool
3. Go in *Main Menu → Unit Enable*
4. Set *Circuit #1→ Enable, Circuit #2→Disable*
5. Set *Unit→ Enable*
6. *Set on Local the switch Q0*

The circuit is now ready for the Running Adjustment *(paragraph 8.1)*

8.1 Running Adjustments

Running Adjustments must be separately performed for each circuit while it is running near the rating conditions.

Make sure that the circuit is working in cooling mode in stable conditions in order to don’t affect the following operations result

Make sure that the circuit status is “Run: Normal” before to proceed with the Running Adjustments

8.1.1 Check and calibration of pressure transducers

Calibration of pressure transducers is a fundamental step for the correct operation of the unit.
There are three pressure sensors to be calibrated (for each circuit):

- The suction pressure transducers
- The discharge pressure transducers
- The oil pressure transducers

8.1.2 Evaporator Pressure

- Connect the sample transducer to the “T shape” pressure port on which the suction pressure transducer is installed.
- With the unit on, with the *Suction Temperature* of 7°C ± 1°C and before making gas charge adjustments, enter the *Commission Unit → Calibrate Sensors → Circuit #1/2* menu and then compare the *Evap Pressure* value with that detected by sample transducer
- If the pressure value measured by the unit transducer is different from the sample one, set the difference in the *Evp Pr Offset* parameter.

Sample transducer is the measuring device has been calibrated and it must be very accurate.

If this difference is greater than ± 100 kPa replace the transducer and repeat the operation.

Evaporator pressure transducer is the most crucial of chiller's transducer as will guarantee the correct working of the EXV with consequent safe compressor running and since all low-pressure safeties are based on its readings.

8.1.3 Condenser Pressure

- Connect the transducer to the "T shape" pressure port on which the discharge pressure transducer is installed.
- With the unit on, enter in *Commission Unit* → *Calibrate Sensors* → *Circuit #1/2* menu and then compare the *Cond Pressure* value with the one detected by the sample transducer. If the value of the pressure measured by the unit transducer is different from the sample one, set the difference in the *Cond Pr Offset* parameter.

If this difference is greater than ± 100 kPa replace the transducer and repeat the operation.

8.1.4 Oil Pressure

- Connect the sample transducer to the "T shape" pressure port on which the oil pressure transducer is installed.
- With the unit on, enter in *Commission Unit* → *Calibrate Sensors* → *Circuit #1/2* menu and then compare *Oil Pressure* value with *Condenser Pressure*.
- If the value of the pressure measured by the *Oil Pressure* transducer is different from the *Condenser Pressure*, set the difference in the *Oil PR Offset* parameter.

If this difference is greater than ± 100 kPa replace the transducer and repeat the operation.

8.2 Running Safeties Test

8.2.1 Flow Switches

With the running unit, disable the water pumps and check if "Water Flow Loss" alarm appears after 30sec.
If not, check proceed with the check of correct flow switch installation and calibration.

8.3 Data acquisition

Make sure that the circuit is working in stable conditions to don't affect the Data Acquisition

- Data acquisition must be performed according the ***Data Acquisition*** section of the Commissioning Sheet.
- Data acquisition must be separately performed for each circuit in Chiller and Heat Pump mode.
  To select the circuit working mode refer to the following setting:

  Start in Cool Mode:

  Main Menu → *Unit Mode* → *Cool*

Enable this setpoint for testing the unit in Mechanical mode and through Unit Enable to select which Circuit to test.

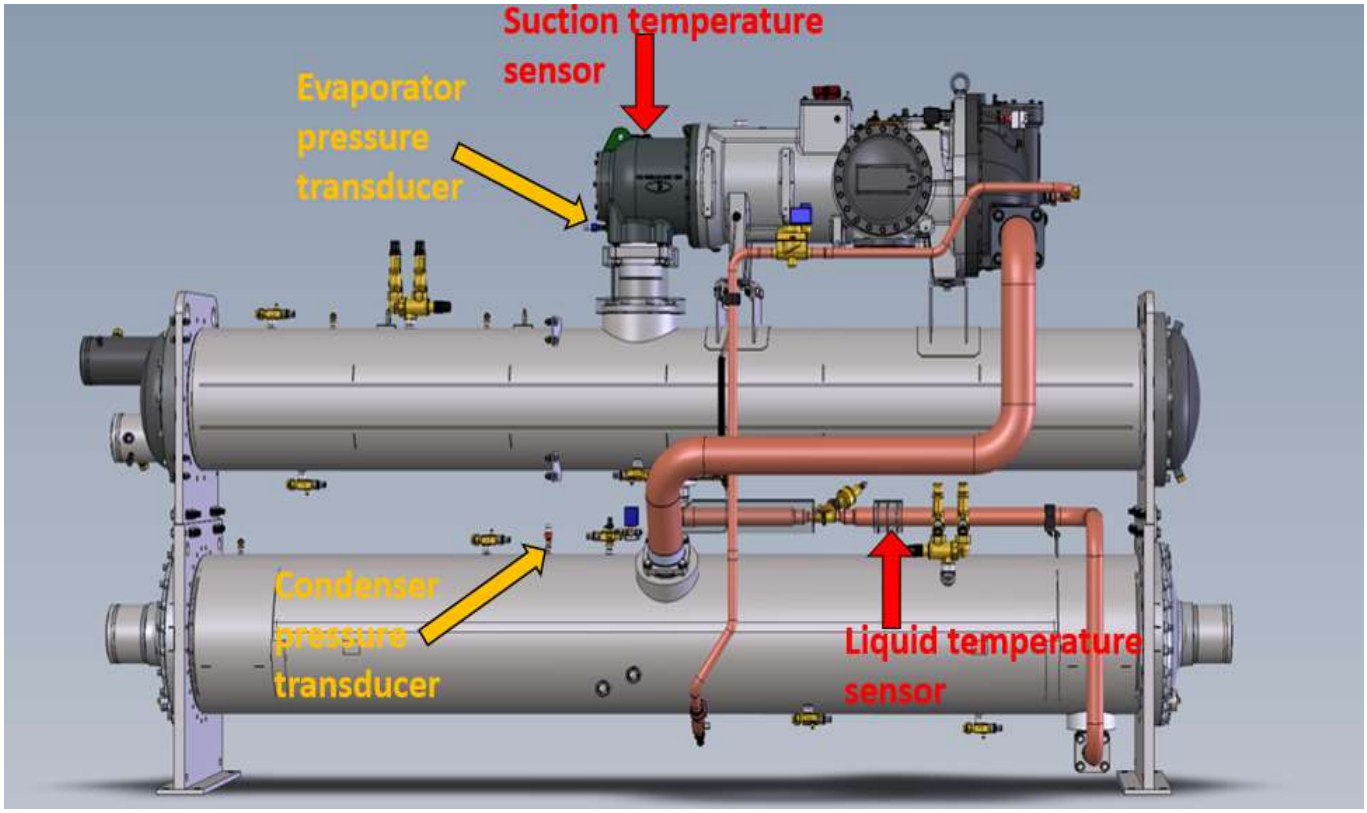
- It is recommended to let the circuit reach the 100% of capacity before to proceed with the data acquisition (according to the plant load conditions).
  To evaluate the stable operation of the unit check, following conditions must be satisfied:
  - Circuit Status equal to “Run=Normal”
  - ELWT and/or CLWT is as near as possible to the relative setpoint
  - EXV is working in Superheat mode:
    - Main Menu → View/Set Circuit → EXV Cool/Heat → State = SSH
  - SSH is equal to the SSH target for 5 minutes continuously:
    - Main Menu → View/Set Circuit → EXV Cool/Heat → SSH Target

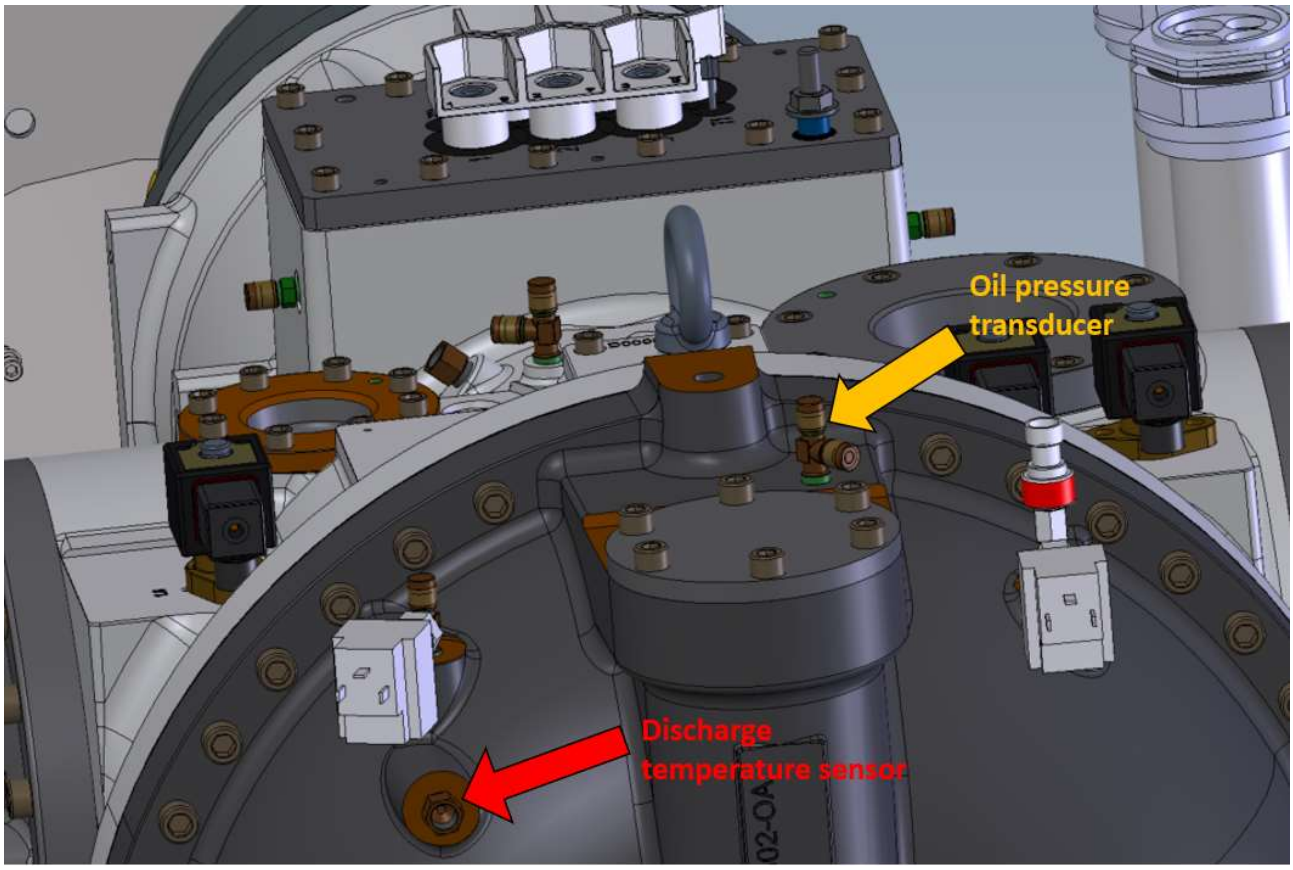
CLIMATIX Scope Light data recording during commissioning is strongly suggested.
For all material required for the recording get in contact with servicesupport@daikinapplied.eu

9 TABLES

9.1 Unit Layout (Table A)

9.1.1 EWWD/H/S VZ





Sensor positioning is identical for all compressor models.

9.2 Unit configuration (Table B)

9.2.1 EWWD VZ, EWWH VZ, EWWS VZ

Unit Configuration Settings (default Pwr Supply - 400V/50-60Hz)

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Speed #1	Max Comp Speed #2	No.Circ
EWWH445VZSSA1	FR3BL VVR		60 Hz		1
EWWH515VZSSA1	FR3BL VVR		70 Hz		1
EWWH550VZSSA1	FR3BL VVR		75 Hz		1
EWWH660VZSSA1	FR4AL VVR		60 Hz		1
EWWH770VZSSA1	FR4AL VVR		70 Hz		1
EWWH860VZSSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWH940VZSSA2	FR3BL VVR	FR3BL VVR	65 Hz	65 Hz	2
EWWHC10VZSSA2	FR3BL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWHC12VZSSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWHC13VZSSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2
EWWHC14VZSSA2	FR4AL VVR	FR4AL VVR	65 Hz	65 Hz	2
EWWHC15VZSSA2	FR4AL VVR	FR4AL VVR	70 Hz	70 Hz	2

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Speed #1	Max Comp Speed #2	No.Circ
EWWH335VZXSA1	FR3AL VVR		63 Hz		1
EWWH365VZXSA1	FR3AL VVR		70 Hz		1
EWWH450VZXSA1	FR3BL VVR		60 Hz		1
EWWH525VZXSA1	FR3BL VVR		70 Hz		1
EWWH580VZXSA1	FR3BL VVR		78 Hz		1
EWWH670VZXSA1	FR4AL VVR		60 Hz		1
EWWH800VZXSA1	FR4AL VVR		70 Hz		1
EWWH875VZXSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWH950VZXSA2	FR3BL VVR	FR3BL VVR	65 Hz	65 Hz	2
EWWHC11VZXSA2	FR3BL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWHC12VZXSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWHC13VZXSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2
EWWHC14VZXSA2	FR4AL VVR	FR4AL VVR	65 Hz	65 Hz	2
EWWHC15VZXSA2	FR4AL VVR	FR4AL VVR	70 Hz	70 Hz	2

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Speed #1	Max Comp Speed #2	No.Circ
EWWH370VZPSA1	FR3AL VVR		70 Hz		1
EWWH530VZPSA1	FR3BL VVR		70 Hz		1
EWWH680VZPSA1	FR4AL VVR		60 Hz		1
EWWH880VZPSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWHC12VZPSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWHC13VZPSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2

Unit Configuration Settings (default Pwr Supply - 400V/50-60Hz)

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Freq #1	Max Comp Freq #2	No.Circ
EWWD600VZSSA1	FR3BL VVR		60 Hz		1
EWWD700VZSSA1	FR3BL VVR		70 Hz		1
EWWD760VZSSA1	FR3BL VVR		75 Hz		1
EWWD890VZSSA1	FR4AL VVR		60 Hz		1
EWWDC10VZSSA1	FR4AL VVR		70 Hz		1
EWWDC12VZSSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWDC13VZSSA2	FR3BL VVR	FR3BL VVR	65 Hz	65 Hz	2
EWWDC14VZSSA2	FR3BL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWDC16VZSSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWDC17VZSSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2
EWWDC19VZSSA2	FR4AL VVR	FR4AL VVR	65 Hz	65 Hz	2
EWWDC21VZSSA2	FR4AL VVR	FR4AL VVR	70 Hz	70 Hz	2

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Freq #1	Max Comp Freq #2	No.Circ
EWWD450VZXSA1	FR3AL VVR		63 Hz		1
EWWD500VZXSA1	FR3AL VVR		70 Hz		1
EWWD610VZXSA1	FR3BL VVR		60 Hz		1
EWWD710VZXSA1	FR3BL VVR		70 Hz		1
EWWD800VZXSA1	FR3BL VVR		78 Hz		1
EWWD900VZXSA1	FR4AL VVR		60 Hz		1
EWWDC11VZXSA1	FR4AL VVR		70 Hz		1
EWWDC12VZXSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWDC13VZXSA2	FR3BL VVR	FR3BL VVR	65 Hz	65 Hz	2
EWWDC14VZXSA2	FR3BL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWDC16VZXSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWDC17VZXSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2
EWWDC19VZXSA2	FR4AL VVR	FR4AL VVR	65 Hz	65 Hz	2
EWWDC21VZXSA2	FR4AL VVR	FR4AL VVR	70 Hz	70 Hz	2

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Freq #1	Max Comp Freq #2	No.Circ
EWWD505VZPSA1	FR3AL VVR		70 Hz		1
EWWD715VZPSA1	FR3BL VVR		70 Hz		1
EWWD910VZPSA1	FR4AL VVR		60 Hz		1
EWWDC12VZPSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWDC16VZPSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWDC18VZPSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2

Unit Configuration Settings (default Pwr Supply - 400V/50-60Hz)

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Freq #1	Max Comp Freq #2	No. Circ
EWWS600VZSSA1	FR3BL VVR		60 Hz		1
EWWS700VZSSA1	FR3BL VVR		70 Hz		1
EWWS740VZSSA1	FR3BL VVR		75 Hz		1
EWWS880VZSSA1	FR4AL VVR		60 Hz		1
EWWSC10VZSSA1	FR4AL VVR		70 Hz		1
EWWSC12VZSSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWSC13VZSSA2	FR3BL VVR	FR3BL VVR	65 Hz	65 Hz	2
EWWSC14VZSSA2	FR3BL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWSC15VZSSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWSC17VZSSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2
EWWSC18VZSSA2	FR4AL VVR	FR4AL VVR	65 Hz	65 Hz	2
EWWSC20VZSSA2	FR4AL VVR	FR4AL VVR	70 Hz	70 Hz	2

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Freq #1	Max Comp Freq #2	No. Circ
EWWS450VZXSA1	FR3AL VVR		63 Hz		1
EWWS490VZXSA1	FR3AL VVR		70 Hz		1
EWWS600VZXSA1	FR3BL VVR		60 Hz		1
EWWS700VZXSA1	FR3BL VVR		70 Hz		1
EWWS780VZXSA1	FR3BL VVR		78 Hz		1
EWWS890VZXSA1	FR4AL VVR		60 Hz		1
EWWSC10VZXSA1	FR4AL VVR		70 Hz		1
EWWSC12VZXSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWSC13VZXSA2	FR3BL VVR	FR3BL VVR	65 Hz	65 Hz	2
EWWSC14VZXSA2	FR3BL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWSC16VZXSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWSC17VZXSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2
EWWSC19VZXSA2	FR4AL VVR	FR4AL VVR	65 Hz	65 Hz	2
EWWSC20VZXSA2	FR4AL VVR	FR4AL VVR	70 Hz	70 Hz	2

Daikin Model	Comp Type #1	Comp Type #2	Max Comp Freq #1	Max Comp Freq #2	No. Circ
EWWS500VZPSA1	FR3AL VVR		70 Hz		1
EWWS710VZPSA1	FR3BL VVR		70 Hz		1
EWWS900VZPSA1	FR4AL VVR		60 Hz		1
EWWSC12VZPSA2	FR3AL VVR	FR3BL VVR	70 Hz	70 Hz	2
EWWSC16VZPSA2	FR3BL VVR	FR4AL VVR	70 Hz	60 Hz	2
EWWSC17VZPSA2	FR3BL VVR	FR4AL VVR	70 Hz	70 Hz	2

9.3 Pump Inverter Settings (Table C)

Impostazioni Parametri Inverter Danfoss per Pompe				
Start-up Wizard for Open Loop Applications				
Parametro	**Descrizione**	**Settings**	**Default**	**NOTE**
0-03	Regional Settings	default	*[0] International*	
0-06	Grid Type	**[12] 380-440V/50Hz**	*[12] 380-440V/50Hz*	*Verificare Tensione di alimentazione su R.M.*
1-10	Motor Construction	default	*[0] Asynchron*	
1-20	Motor Power	default	*Size related*	*Verificare Targa Motore*
1-22	Motor Voltage	**400 V**	*Size related*	*Verificare Targa Motore*
1-23	Motor Frequency	**50 Hz**	*Size related*	*Verificare Targa Motore*
1-24	Motor Nominal Current	default	*Size related*	*Verificare Targa Motore*
1-25	Motor Nominal Speed	**See Pump Motor Label**	*Size related*	*Verificare Targa Motore*
1-73	Flying Start	default	*[0] Disabled*	
3-02	Minimum Reference	-	*0*	*Con velocità comandata dal cliente, impostare a 40Hz.*
3-03	Maximum Reference	**50**	*50*	*Come 1-23 a meno che non sia riportata su R.M. una velocità inferiore*
3-41	Ramp-Up Time	**10 s**	*Size related*	*Tempo per arrivare a 1-23 frequency*
3-42	Ramp-Down Time	**10 s**	*Size related*	*Tempo per fermarsi da 1-23 frequency*
4-12	Motor Speed Low Limit [Hz]	default	*0*	
4-14	Motor Speed High Limit [Hz]	default	*65*	
4-19	Max Output Frequency	default	*Size related*	
5-40	Function Relay [0]	default	*Alarm*	
5-40	Function Relay [1]	default	*Drive running*	
6-10	Terminal 53 Low Voltage	default	*0.07 V*	
6-11	Terminal 53 High Voltage	default	*10 V*	
6-12	Terminal 53 Low Current	default	*4 mA*	
6-13	Terminal 53 Low Voltage	default	*20 mA*	
6-19	Terminal 53 mode	default	*1*	*Voltage input - [0] commuta all'ingresso in corrente*

Table C – Pump inverter settings

Pre-Commissioning Sheet

Job Name: _____

Unit Model No.(s): _____

Daikin Serial Unit No.: _____

Chilled Water	Yes	No	N/A
-Piping complete	❑	❑	❑
-Water System filled and vented	❑	❑	❑
-Pumps installed & operational (rotation checked)	❑	❑	❑
-Strainers installed and clean	❑	❑	❑
-Controls (3-way valves, bypass valves, etc.) operable	❑	❑	❑
-Flow switch installed.	❑	❑	❑
-Water system operated and flow balanced to meet unit design requirements	❑	❑	❑
-Proper glycol percentage for the application in accordance with Daikin specifications	❑	❑	❑
Condenser Water			
-Cooling tower flushed, filled and piping vented	❑	❑	❑
-Pumps installed & operational (rotation checked)	❑	❑	❑
-Strainers installed and clean	❑	❑	❑
-Controls (3-way valves, bypass valves, etc.) operable	❑	❑	❑
-Water system operated and flow balanced to meet unit design requirements	❑	❑	❑
-Proper glycol percentage for the application in accordance with Daikin specifications	❑	❑	❑
Electrical			
-Power leads connected to unit main terminal block	❑	❑	❑
-Power leads have been checked for proper electrical phasing U-V-W for L1, L2, & L3 respectively.	❑	❑	❑
-All interlock wiring complete and complies with Daikin specifications	❑	❑	❑
-Pump starter and interlocks wired	❑	❑	❑
-Cooling tower fans and controls wired	❑	❑	❑
-Wiring complies with National Electrical Code and local codes	❑	❑	❑
Miscellaneous			
-Unit installed in accordance with Daikin IOM specifications (leveling, space requirements, …)	❑	❑	❑
-Thermometer wells, thermometers, gauges, control wells, controls, etc., installed	❑	❑	❑
-A minimum system load of 60% of machine capacity is available for testing and adjusting controls	❑	❑	❑

Warning: Under no condition should these units be started prior to the authorized start-up by Daikin Applied. Failure to follow this warning may result in serious equipment damage and will negate the warranty.
All installation work has been completed as checked above; the system has been inspected and the unit is ready for start-up

Site Engineer

Name: _____

Date: _____

Signature: _____

Table D – Pre-Commissioning Sheet

CHILLER COMMISSIONING SHEET - EWYD-4Z

End user :		Date:	
Site:		Model nr:	
Distributor:		Serial nr:	

A PRE-POWER ON CHECK LIST

A1	Any shipping damage?	
A2	Is the chiller adequately level mounted?	
A3	Are mimum space requirements met?	
A4	Anti vibration pads installed?	
A5	Full Leak Test performed?	
A6	Water piping system checked?	
A7	Water Flows checked?	
A8	Glycol type / percentage [Evap/Cond]	
A9	Are electrical connections correct?	
A10	Compressor model C1	
A11	Compressor serial C1	
A12	Compressor model C2	
A13	Compressor serial C2	

B PRE-STARTUP CHECK LIST

B1	Evaporator Flow Switch Check					
B2	Condenser Flow Switch Check					
B3	Main VOLTAGE L1-L2 (V)					
B4	Main VOLTAGE L2-L3 (V)					
B5	Main VOLTAGE L1-L3 (V)					
B6	Frequency (Hz)					
B7	Control voltage Tx IN / OUT (V)	/		/		
B8	Control voltage AL1 (V)					
B9	Oil Heaters were on before start up?					
B10	Check Heaters (A) (measure current)	C1	C2	VFD1	VFD2	
B11	Unit Software Version					
B12	Unit Water Temp Set Point Cool/Heat (°C)					
B13	Unit settings checked?					
B14	Circuit settings checked?					
B15	Alarm Limits set?					
B16	Evap Water Frz Alarm Setpoint (°C)					
B17	Dry Test performed?					
B18	Can be the chiller put into operation?					

C PRE-STARTUP COMMENTS

D STARTUP CHECK LIST

D1	Running Adjustments performed (calibrations)?	
D1	Safety tests performed?	

DATA ACQUISITION

Mode:	WATER	
Percentage of Load:		
Circuit:	C1	C2

D1	ELECTRICAL SYSTEM		
D1.1	Comp running Amps L1 (A)		
D1.2	Comp running Amps L2 (A)		
D1.3	Comp running Amps L3 (A)		
D2	EVAPORATOR (WATER)		
D2.1	Entering Water Temperature (°C)		
D2.2	Leaving Water Temperature (°C)		
D2.3	Evaporator Pressure Drop (kPa)		
D2.4	Design Evaporator Pressure Drop (kPa)		
D2.5	Flow Rate (l/s)		
D2.6	Design Flow rate (l/s)		
D2.7	Check Flow Swich status		
D3	CONDENSER (WATER)		
D3.1	Entering Water Temperature (°C)		
D3.2	Leaving Water Temperature (°C)		
D3.3	Condensor Pressure drop (kPa)		
D3.4	Design pressure Drop (kPa)		
D3.5	Flow Rate (l/s)		
D3.6	Design Flow rate (l/s)		
D3.7	Check Flow Swich status		

E POST-STARTUP COMMENTS

F Defective items found at commissioning?

1	Parts subject to ECHC?
2	Parts requested to be directly supplied by factory?

Please mention under which conditions parts are directly requested to the factory (ie. Urgent matter, Extra Europe affiliate or others):

G Present during commissioning

Name :	***Company:***
Name :	***Company:***
Name :	***Company:***
Author:	**Installer:**
Signature:	**Signature:**
Title: Service Engineer	**Title:**

As Commissioning is a technical process performed - before the Chiller is put into definitive operation - by an "Authorised Engineer".
As Commissioning is done and is intended to achieve the following specific limited objectives:
- verify and document (via checklist) that the Chiller is installed according to the manufacturers installation manual and operation manual.
- configure the Chiller to a set of manufacturers defined parameters in order to secure the correct performance of the Chiller in the specific site related operating conditions.
Therefore the Commissioning process does not take away from or reduce the responsibility of the System Designers and/or Installers to provide a finished and fully functioning system.

Table E – Commissioning Sheet