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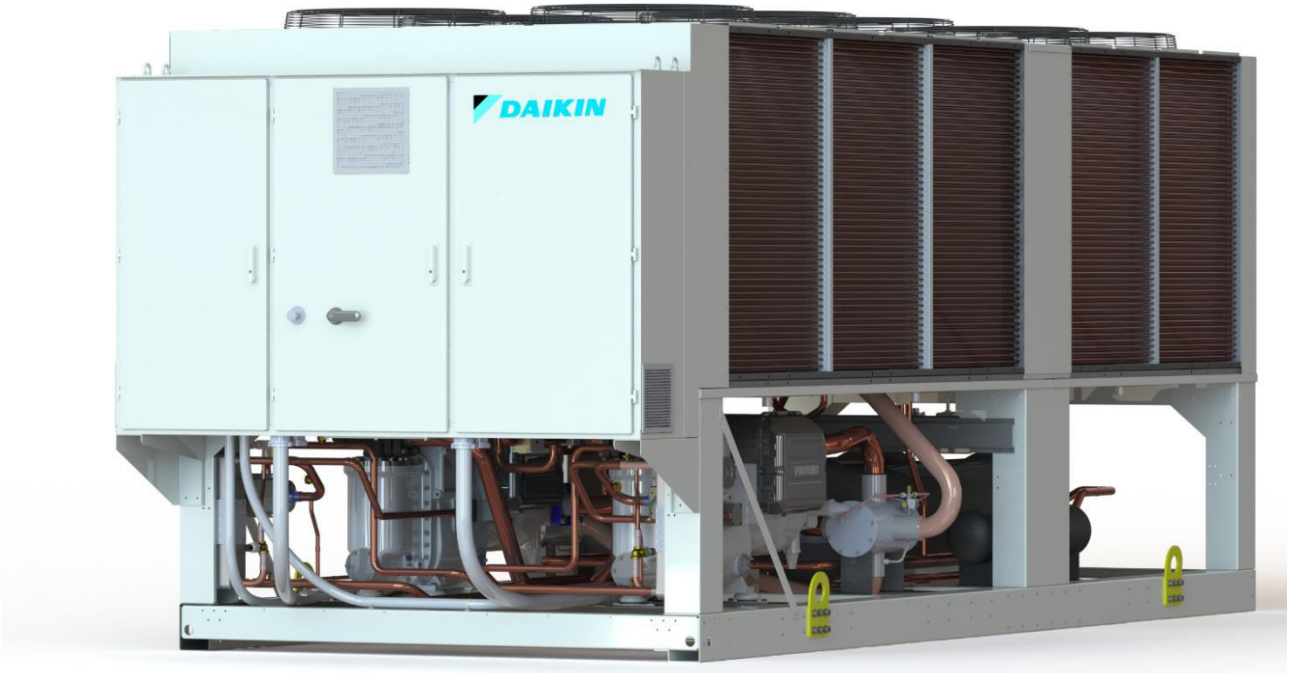
| REV | 00 |
| Data | June 2020 |
| Supersedes | N/A |

# Service Manual

## Startup Guide – EWYD_4Z



# Contents



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## 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)
- ☑ Filled Pre-Commissioning Sheet (*Table D*)
- ☑ Commissioning Sheet (*Table C*)
- ☑ Chiller Technical Data, Selection Sheet, and Certified Submittal Drawings
- ☑ Manuals:

  *Note: Be sure that all manuals are the current revision appropriate for this unit.*
  - o This Manual: Startup Guide – EWYD_4Z
  - o Installation, Operation and Maintenance Manual (D–EIMHP01201-18_04EN)
  - o Operating Manual: EWYD4Z - Multipurpose Unit (D-EOMZC00204-18_01EN)
  - o 4Z-P&ID (last revision)
  - o Wiring Diagram

- ☑ Other technical reference material as necessary
- ☑ Current operating software version downloaded and ready to install if needed
- ☑ Miscellaneous gauges and hand tools, including:

  - o Electronic Leak Detector
  - o Differential Pressure Gauge (*adequate for system pressures*)
  - o Phase Rotation Meter
  - o Digital Refrigeration Gauge Manifold (*Range: 50bar, Accuracy: ±0.5% of Final Value, Resolution: 0.01bar/0.1psi/1kPa*)
  - o Digital thermometer (*Range: -50°C/+150°C, Accuracy: ±0.1°C, Resolution: 0.1°C*)
  - o Amprobe
  - o Voltmeters
  - o Recover refrigerant cylinder (*for eventual charge adjustments*)
  - o Full refrigerant cylinder (*for eventual charge adjustments*)
  - o 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 (*Table D*) received from the Installer/Customer 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;
- Verify that chiller is adequately located and level mounted as per the IOM (***Paragraph 3.3***) according to the minimum space requirements as per IOM (***Paragraph 3.4***)
- 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 and surrounding area, removing any debris from the 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 3.6***)
- Verify if proper glycol percentage for the application in accordance with Daikin specifications is present as per IOM (***Paragraph 3.8***)
- 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 and condenser water 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
- Check eventual cooling tower for debris and/or obstructions before running pumps or fans.
- Confirm that all piping specialties (expansion tank, make-up, relief, vents, etc), cooling coil connections, 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 evaporator and condenser to measure the pressure drop across the 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.***

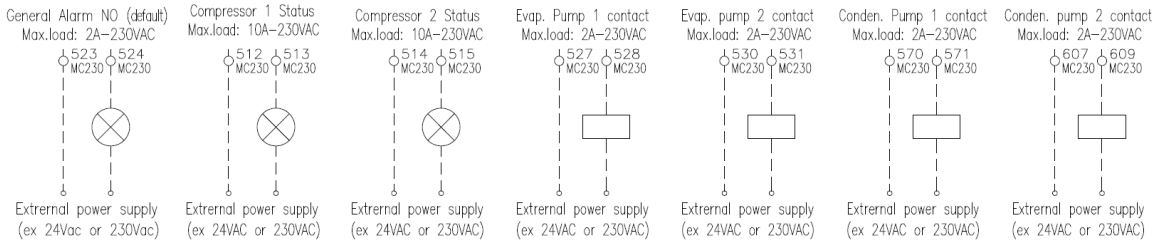
If flow is outside of acceptable margins, corrective action is required. If flow is too high, valves may be adjusted to trim flow. If flow is too low, notify Installing Contractor, and note on the Commissioning Form. If flow is different from the selection data, notify Service Supervisor and Sales Rep. Correction may be required prior to startup.

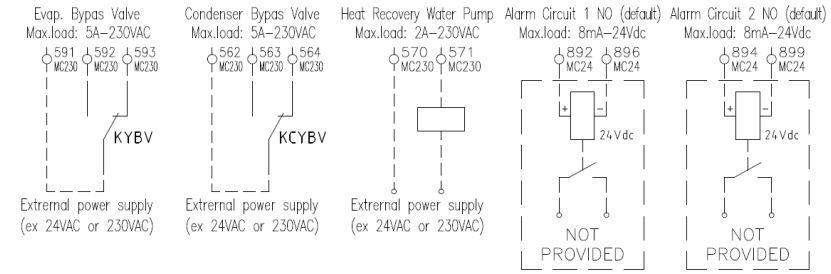
Note any issues in the Commissioning Form (***Pre-Startup Comments***)

## 6.5 Electric Connections Check

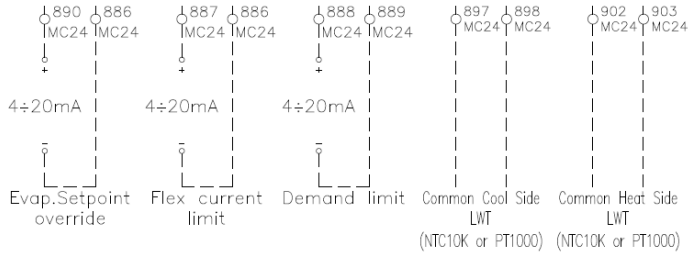
- Verify the Electric connections, Cable requirements, Interconnection cables and Phase unbalance as per IOM (***Paragraph 3.11***)
- Verify the proper electrical phasing U-V-W of the loads (fans, compressors, pumps) for L1, L2, & L3 respectively.
- Verify Field wiring correctness according to the unit wiring diagram

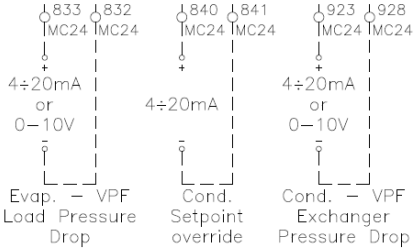
Digital output terminals

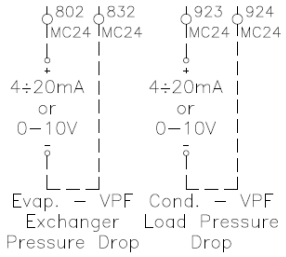



Analog input terminals



***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 have to be performed according to the ***Pre-Startup Checklist*** of the Commissioning Sheet by following the instruction below shown.

***Make sure that unit switch (Q0) and both circuit switches are set in 0 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 Flow Switches

- Check the water flow safety switches: verify that field-installed flow switches are installed as per the manufacturer's instructions and IOM (***Paragraph 3.9***)
- 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 fall below 50% of nominal operating flow rate.

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

### 7.2 Voltage Check

- Verify the electric main voltage and frequency
- Verify all on-board auxiliary transformer voltages
- Check Heaters current

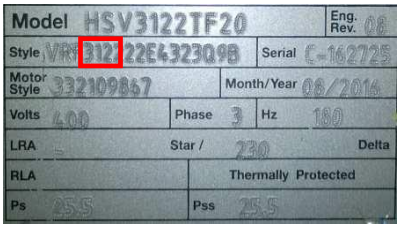
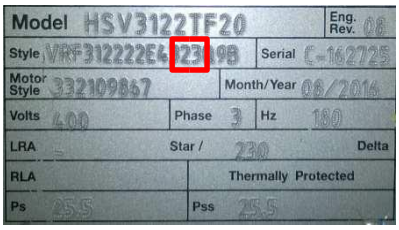
Note any issues in the Commissioning Form (***Pre-Startup Comments***)

## 7.3 Control Settings

- Check all MicroTech III 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 menu.

| Setpoint | Default | Range | Description |
|---|---|---|---|
| Apply Changes | No | No<br>Yes | Use this command to reset the controller to confirm the configuration made. |
| Unit Type | EWYD 4Z | EWYD 4Z | - |
| Size | | | Set the size of the machine according to the unit’s label |
| Noise Class | S | S, L, R | Set the noise level of the machine according to the unit’s label.<br>S – Standard<br>L – Low<br>R – Reduced |
| Compressor | None | Not Set<br>3120<br>3122<br>F3AL<br>F3AS | Set the compressor model based on the compressor’s label, referring to the unit composition tables.<br>  |
| Inverter Size | 90kW | 90kW<br>120kW<br>200kW | Define the type of compressor inverter referring to the compressor’s label.<br>The type of inverter can be obtained by reading the motor current shown in the style field of the compressor label (these are the 2 digits starting from the fifth last).<br>  <br>The inverter model can be obtained as follows:<br>• 18 = 90kW<br>• 19 = 90kW<br>• 23 = 120kW<br>• 25 = 120kW<br>• 41 = 200kW |
| Motor Type | AC | AC | - |
| Fan Control | VFD | VFD | - |
| Fan Type | AC900 | AC900<br>AC900L<br>AC700<br>EC900<br>EC900L<br>EC700<br>EC700L<br>EC1000L | Set the type of fan based on the machine model, referring to the fan composition tables. |

| | | | |
|---|---|---|---|
| Eco EXV Type | Sporlan | Sporlan<br>Danfoss<br>Colibri | Set the economizer electronic expansion valve model. The model can be read directly on the motor body of the valve.<br><br>Note: Danfoss and Colibri are not used in EWYD-4Z units |
| Evap Pump | On-Off | On-Off<br>Fixed Speed<br>VPF | Select if the evaporator pump(s) are direct start or if they are controlled by an inverter.<br>• On-Off = direct start.<br>• Fixed Speed = the pumps are controlled by an inverter.<br>• VPF = this option is left to the customer. |
| Cond Pump | On-Off | On-Off<br>Fixed Speed<br>VPF | Select if the condenser pump(s) are direct start or if they are controlled by an inverter.<br>• On-Off = direct start.<br>• Fixed Speed = the pumps are controlled by an inverter.<br>• VPF = this option is left to the customer. |
| Power Supply | 400V/50-60Hz | 400V/50-60Hz<br>415V/50Hz<br>440V/60Hz<br>460V/60Hz<br>380V/50-60Hz | Define the type of power supply for the unit. |
| Energy Meter | None | None<br>Nemo<br>D4-L<br>Nemo D4-Le | Set the model of energy meter installed on the unit.<br>Nemo D4-L  Nemo D4-Le  |
| Leak Detector | None | None<br>Digital | Set whether or not the leak detector is present. |
| Comm Module 1<br>Comm Module 2<br>Comm Module 3 | None | None<br>IP<br>LON<br>MSTP<br>Modbus<br>AWM | Select if there is the communication module connected on the left side of the controller.<br>• Modbus = POL902.00<br>• IP = POL908.00<br>• MSTP = POL904.00<br>• LON = POL906.00<br>• AWM = POL909 .00 |
| Fan Alarm | No | No<br>Yes | Select this option if relays KQ1 and KQ2 are present in the electrical panel |
| Switch Box Temp | No | No<br>Yes | Select if the electrical panel temperature probe is present |
| Rapid Restart | No | No<br>Yes | Enabling of the Rapid Restart function.<br>This option must be enabled if it has been ordered. |
| Loc Net Switch | No | No<br>Yes | This setting must be made by the customer |
| M/S Address | None | None<br>Master<br>Slave 1<br>Slave 2<br>Slave 3 | Enabling of the Master & Slave feature |
| M/S Num Of Units | 2 | 2<br>3<br>4 | Number of units in Master & Slave system |
| M/S Sns Type | NTC10K | NTC10K<br>PT1000<br>None | Master & Slave common water sensor type |
| Display Units | Metric | Metric<br>English | Unit of measure displayed |

***At the end of the Unit Configuration, a restart of the controller ("Apply Changes") is required BEFORE carrying out the Circuit Configuration***

#### 7.3.2 Circuit Configuration

On the unit controller, enter the "Technician Password" and check the circuit configuration in the following menu:

*Main Menu → Commission Unit → Configuration → Circuit #X*

| Setpoint | Range | Description |
|---|---|---|
| Apply Changes | Yes<br>No | Use this command to reset the controller to confirm the configuration made. |
| Speed Cool | 840 ÷ 5400 | Compressor Speed in Cool mode [Refer to Table A] |
| Speed Heat | 840 ÷ 5400 | Compressor Speed in Heat mode [Refer to Table A] |
| Speed Water | 840 ÷ 5400 | Compressor Speed in Water mode [Refer to Table A] |

***At the end of the Unit Configuration, a restart of the controller ("Apply Changes") is required BEFORE to proceed to the Alarm Limits setting***

### 7.4 Alarm Limits

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

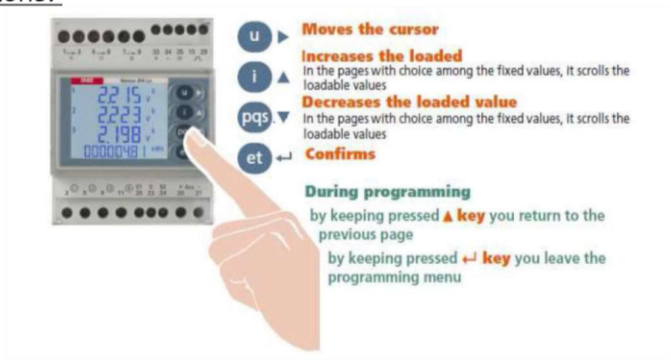
*Main Menu → Commission Unit → Alarm Limits*

***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.***

## 7.5 Energy Meter

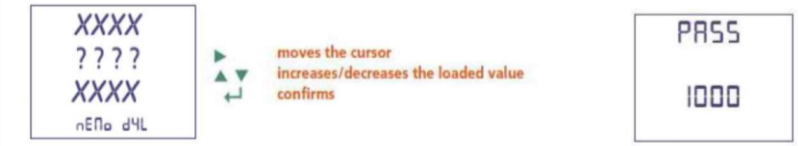
If the unit is provided with Opt.16/16a, proceed with the energy meter settings check.

*Function of the buttons:*




*Acces the setup menu*

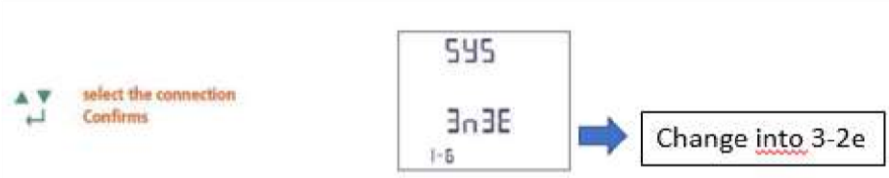
1) press "et " repeatedly until the page is displayed: "nEMo D4L "
2) Press and hold the "et " button until you see the page: "PASS "
3) Enter the password “1000” and confirm with the "et " key.




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.

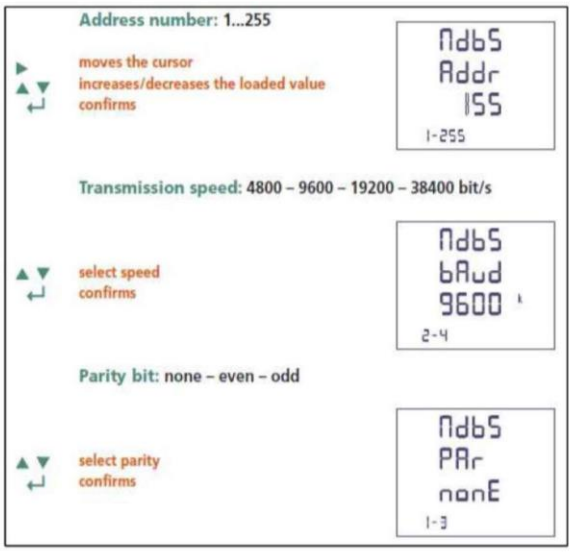
Depending on the wiring configuration, the respective programming scheme must be selected

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!

## 7.6 Pre-Running Adjustments

Pre-Running Adjustments have to be separately performed for each circuit

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

### 7.6.1 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 five temperature sensors to be calibrated (for each circuit):

- Cool LWT sensor
- Cool EWT sensor
- Heat LWT sensor
- Heat EWT sensor
- Outside Air sensor

#### 7.6.1.1 Cool LWT

- Place the sample and Cool LWT sensors in a container with ice
- Enter in *Commission Unit* → *Calibrate Sensors* → *Unit* menu and then compare the *Cool 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.***

#### 7.6.1.2 Cool EWT

- Place the sample and Cool EWT sensors in a container with ice
- Enter in *Commission Unit* → *Calibrate Sensors* → *Unit* menu and then compare the *Cool 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.***

#### 7.6.1.3 Heat LWT

- Place the sample and suction temperature sensors in ambient temperature
- Enter in *Commission Unit* → *Calibrate Sensors* → *Unit* menu and then compare the *Heat 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 stable air conditions and wait until read unit and sample temperatures are stabilized respect to air ambient temperature before to proceed with the calibration.***

#### 7.6.1.4 Heat EWT

- Place the sample and suction temperature sensors in ambient temperature
- Enter in *Commission Unit* → *Calibrate Sensors* → *Unit* menu and then compare the *Heat 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 stable air conditions and wait until read unit and sample temperatures are stabilized respect to air ambient temperature before to proceed with the calibration.***

#### 7.6.1.5 Outside Air

- Place the sample and suction temperature sensors in ambient temperature
- Enter in *Commission Unit* → *Calibrate Sensors* → *Unit* menu and then compare the *Outside Air* 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 stable air conditions and wait until read unit and sample temperatures are stabilized respect to air ambient temperature before to proceed with the calibration.***

### 7.6.2 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 four temperature sensors to be calibrated (for each circuit):

1. The suction temperature sensor
2. The liquid temperature sensor
3. The discharge temperature sensor
4. The economizer temperature sensor

#### 7.6.2.1 Suction Temperature

- Place the sample and suction temperature sensors in a container with ice
- Enter in *Commission Unit* → *Calibrate Sensors* → *Circuit #1/2* menu and then compare the *Suction 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 *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***

#### 7.6.2.2 Liquid Temperature

- Place the sample and liquid 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 pressure value measured by the unit sensor is different from the sample one, set the difference in the *Liquid 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.***

#### 7.6.2.3 Discharge temperature

- Place the sample and discharge temperature sensors in ambient temperature
- Enter in *Commission Unit* → *Calibrate Sensors* → *Circuit #1/2* menu and then compare the *Discharge 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 *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.***

#### 7.6.2.4 Economizer temperature

- Place the sample and Economizer temperature sensors in ambient temperature
- Enter in *Commission Unit* → *Calibrate Sensors* → *Circuit #1/2* menu and then compare the *Econ 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 *Eco Tmp 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 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*
3. Set *Test*

All the dry tests are performable through the following menu:

*Main Menu → Commission Unit → Manual Control*

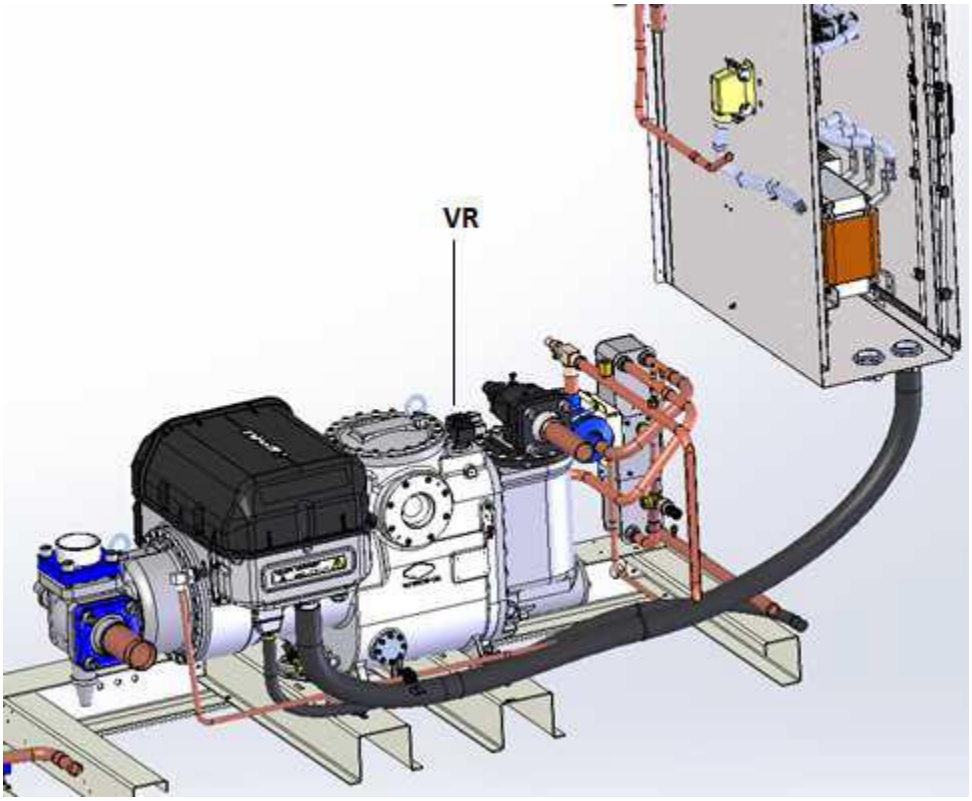
Refer to *Table B* for the complete overview of the components positioning.

### 7.7.1 VR Slides

Check the correct activation of the compressor VR slides:

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

***On 3100 style compressors: VR2 & VR3***
***On FR3A/FR3B style compressors: VR1.8, VR2.4 and VR3.1***




### 7.7.2 Oil/VFD resistance

Check the correct activation of oil and VFD resistances:

*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Oil Heater (KC-1/KC-2)*

*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → VFD Heater (KC-1/KC-2)*

### 7.7.3 Compressor addressing

Electrically disconnect the pressure transducer on the compressor (high or low) and check the activation of the related alarm on the correct circuit.

### 7.7.4 Cooling EXVs

Verify the correct operation of the cooling EXV valves (C.EXV-1 & C.EXV-2):
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Cool-Heat EXV = Off (Off=Cool)*

And set the opening percentage:

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

### 7.7.5 Heating EXVs

Verify the correct operation of the cooling EXV valves (H.EXV-1 & H.EXV-2):
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Cool-Heat EXV = On (On=Heat)*

And set the opening percentage:
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → EXV*

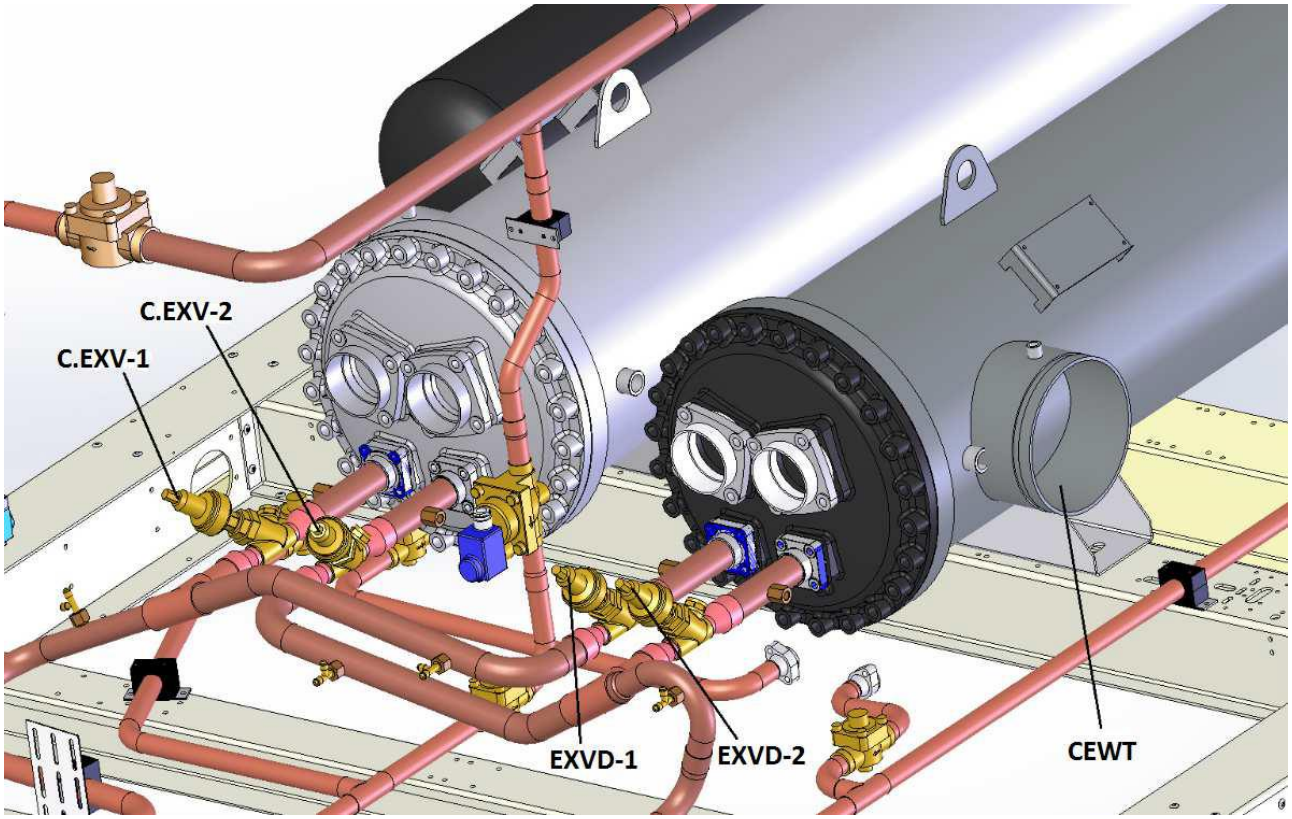
### 7.7.6 Defrost EXVs

Verify the correct operation of the cooling EXV valves (EXVD-1 & EXVD-2):
*Main Menu → Commission Unit → Manual Control → Unit → Defrost EXV Switch*

*Off = EXVD-1*

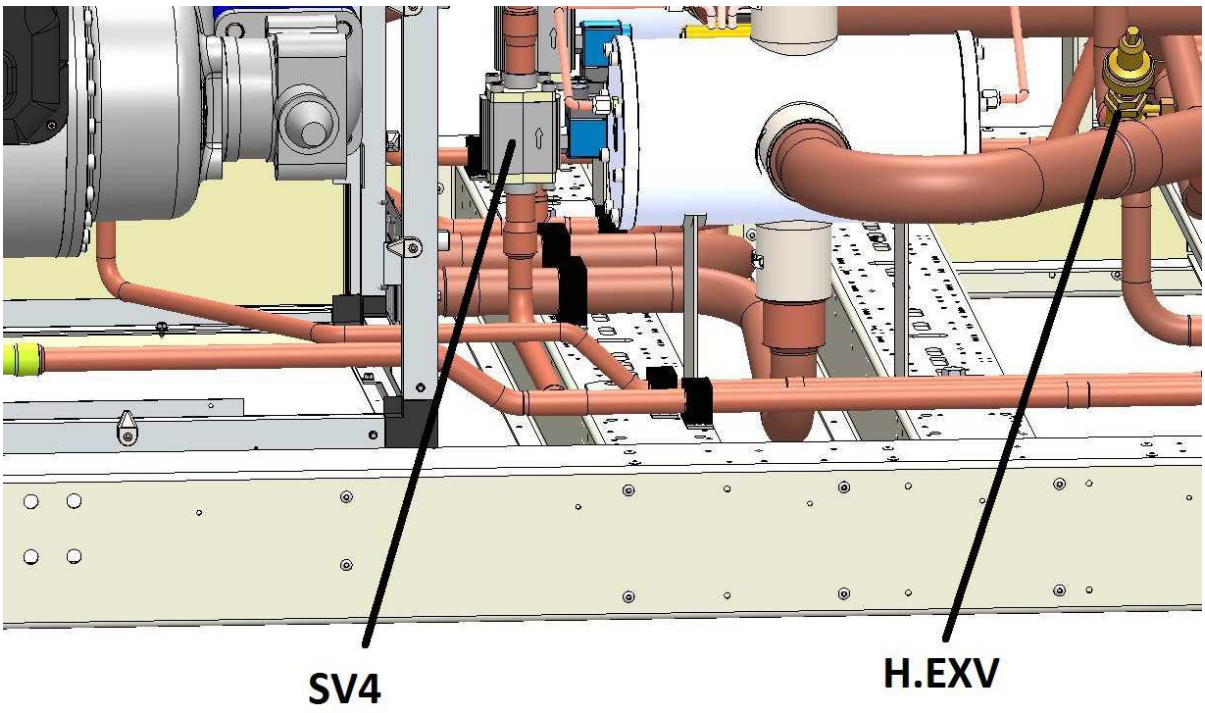
*On = EXVD-2*

And set the opening percentage:
*Main Menu → Commission Unit → Manual Control → Unit → Defrost EXV Pos*




### 7.7.7 SubCooler Solenoid

Verify the correct operation of the SubCooler solenoid valves (SV4-1 & SV4-2):
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → SubCooler = On*



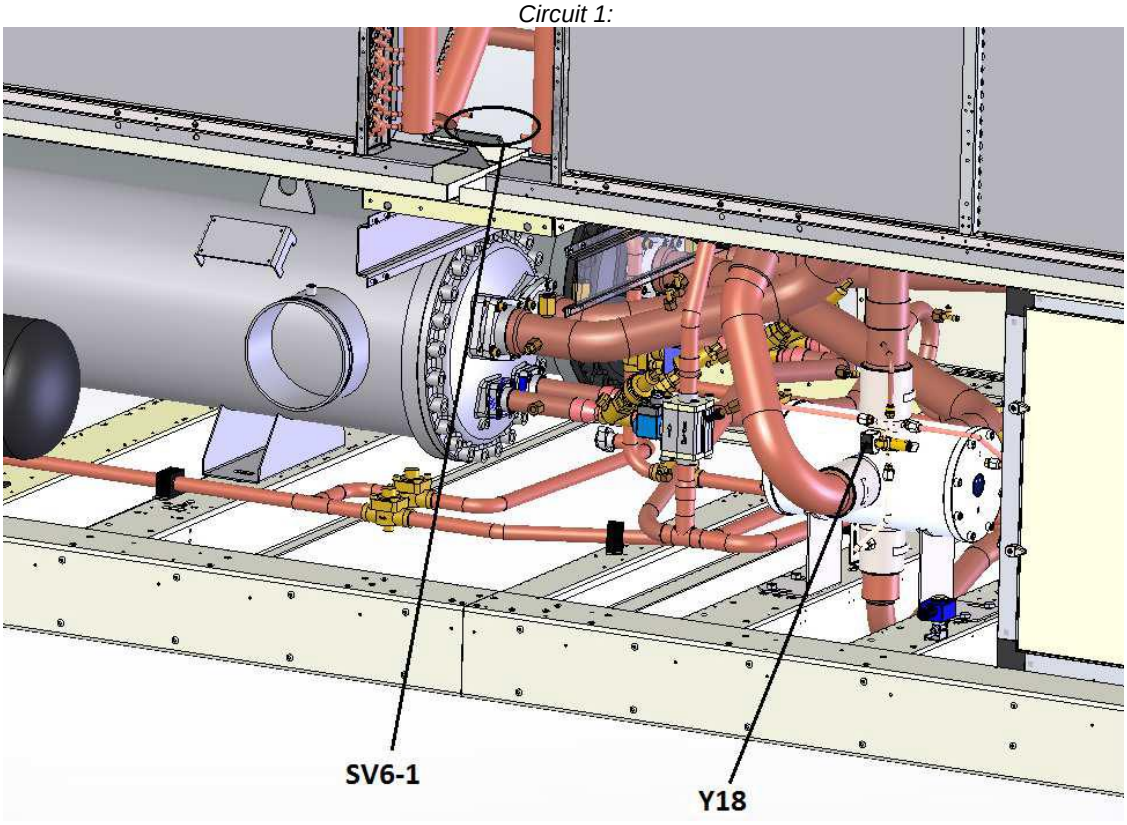

### 7.7.8 4 Way Valve

Verify the correct operation of the 4 Way Valve (Y18 & Y28):
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → 4 Way Valve = On*

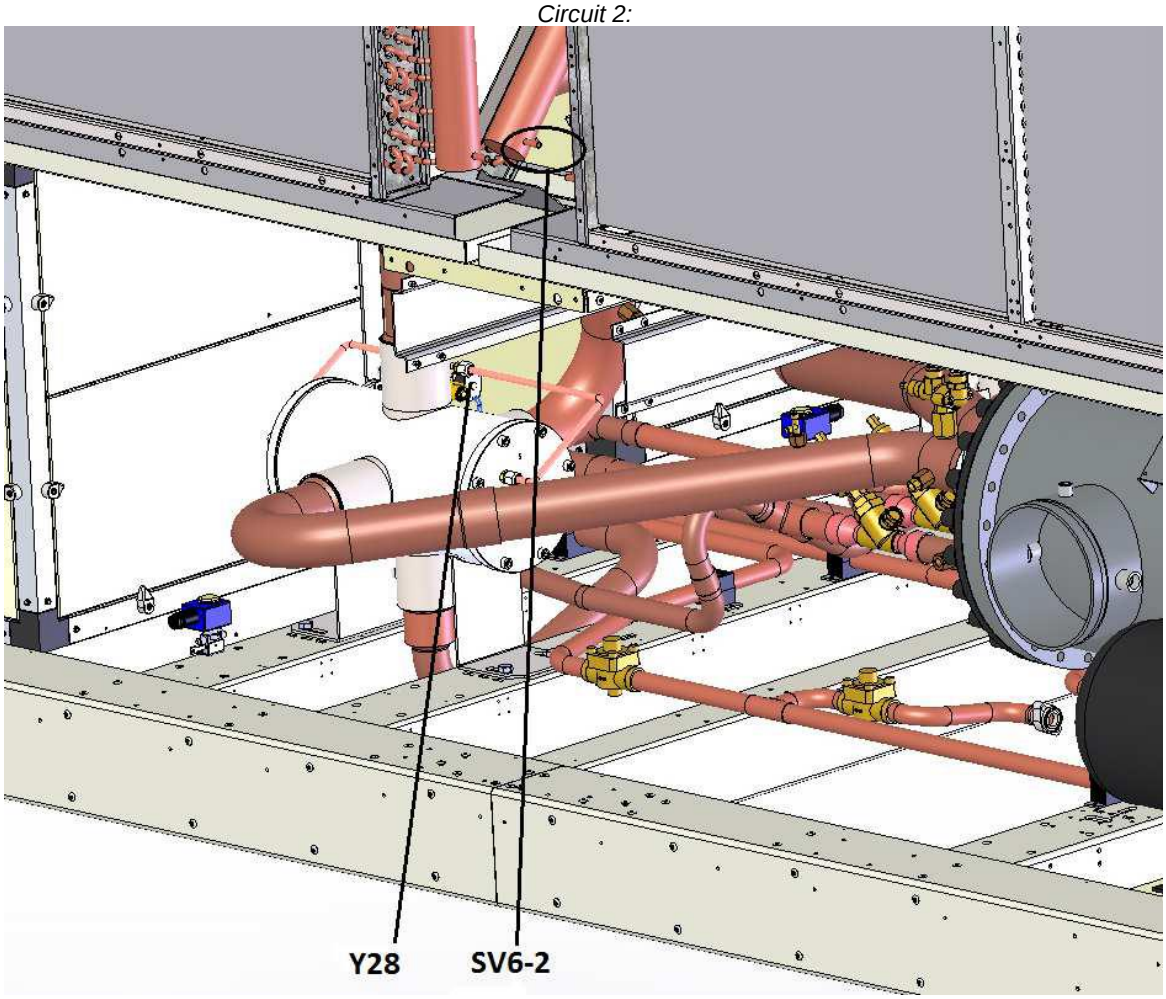
### 7.7.9 Oil Drain Solenoid

Verify the correct operation of the Oil Drain Solenoid (SV6-1 & SV6-2):
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Oil Drain = On*

*Circuit 1:*



*Circuit 2:*



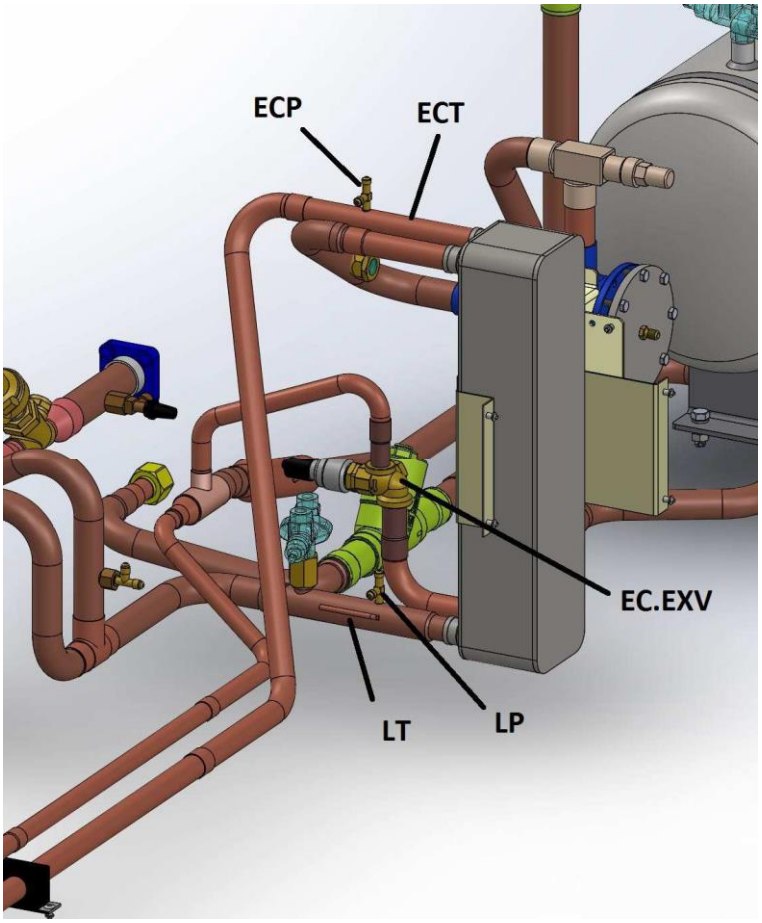

#### 7.7.10 ecoEXVs

Verify the correct operation of the ecoEXVs (EC.EXV-1 & EC.EXV-2) by setting the opening percentage:
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Economizer EXV*

#### 7.7.11 Economizer/Subcooler sensors and transducers

Verify the correct installation and reading of:

- Pressure transducers (ECP-1 & ECP-2)
- Temperature sensors (ECT-1 & ECT-2)
- Liquid pressure transducers (LP-1 & LP-2)
- Liquid temperature sensors (LT-1 & LT-2)




#### 7.7.12 Suction/Discharge temperature sensors

Verify the correct installation and reading of:

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

#### 7.7.13 Fans

Verify the correct operation and rotation of the fans:

Set the fan speed:
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Fan Speed*

Test the first fan set:
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Fan Out 1 = On*

Test the second fan set:
*Main Menu → Commission Unit → Manual Control → Circuit #1/2 → Fan Out 2 = On*

#### 7.7.14 High Pressure Switches Test

Test the high pressure swtiches by physically disconnecting them from the unit and by testing them until the intervention pressure by connecting them to a pressurized nitrogen cylinder

## 8 Start-Up

The first data acquisition for each circuit has to be performed in “Water Mode”, in order to also check the correctness of the refrigerant charge by measuring the subcooling at the filter dryer (refer to *D2.10* item of the *Commissioning Sheet*)
The unit is shutdown in “Chiller Mode” after the factory test and this means that most of the refrigerant amount is stored in the coil.
To start up the circuit in “Water Mode” it’s recommended to initially run it in “Heat Pump Mode” (for, at least, 10 minutes) to be sure to recover all the refrigerant from the coil: in this way, after the pumpdown phase, the refrigerant will be stored into the water condenser in order to make the circuit ready to be started up in “Water Mode” without the risk of having residual refrigerant in the coil (that would be anyway recovered during the normal unit working).

***Make sure to open all the service valves before to perform the first unit StartUp:***

- ***Liquid line***
- ***Compressor Discharge line***
- ***Compressor Suction line***

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

4. Enter the “Technician Password” on the controller
5. Go in *Main Menu* → *Unit Mode*
6. Set *MultiP* or *MultiP w/Glycol* (if Glycol application)
7. Go in *Main Menu”* → *Unit Operation* menu
8. Set *Switch Mode = Manual*
9. Set *CX Manual = Heat Pump*
10. Enable the unit from *Main Menu* → *Unit Enable*
11. Enable the Circuit from *Main Menu* → *Unit Enable*
12. Switch On the Unit Switch
13. Switch On the Circuit Switch
14. Run the circuit for 10 minutes
15. Go in *Main Menu* → *Unit Operation* menu
16. Set *CX Manual = Water* (the circuit will perform the mode transition)
17. The circuit is now ready for the Running Adjustment *(paragraph 12)*

### 8.1 Running Adjustments

Running Adjustments have to be separately performed for each circuit while it is running in “Water Mode” near the rating conditions.

***Make sure that the circuit is working in water 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 five pressure sensors to be calibrated (for each circuit):

1. The suction pressure transducers
2. The discharge pressure transducers
3. The oil pressure transducers
4. The liquid pressure transducers
5. The economizer pressure transducers

#### 8.1.1.1 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.

***If this difference is greater than ± 20 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.***

#### 8.1.1.2 Condenser Pressure

- Connect the sample 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 *Cnd Pr Offset* parameter.

***If this difference is greater than ± 90 kPa replace the transducer and repeat the operation.***

#### 8.1.1.3 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 ± 90 kPa replace the transducer and repeat the operation.***

#### 8.1.1.4 Economizer Pressure

- Connect the sample transducer to the “T shape” pressure port on which the liquid pressure transducer is installed.
- With the unit on, enter in *Commission Unit → Calibrate Sensors → Circuit #1/2* menu and then compare the *Econ 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 *Eco Pr Offset* parameter.

***Perform Economizer Pressure calibration with Economizer= and ESH=ESH target SH control:***
***View/Set Circuit → Circui #1/2 → Economizer/Subcooler → State = ESH***
***View/Set Circuit → Circui #1/2 → Economizer/Subcooler → ESH near the ESH Target***

#### 8.1.2 Subcooling measurement point

The calculation of the subcooling at the filter dryier (in addition to the visual inspection of any flash gas on the liquid sight glass) is the main parameter by which the need for a charge adjustment is established. This quantity must be quantified with the least possible margin of error.

What's needed:

- Additional pressure transducer
- Additional temperature sensor

Proceed to the installation as follows:

- The pressure sensor must be installed on one of the two pressure points on the corner tap, close to the dryer filter.
- The temperature sensor must be installed on a smooth pipe section (not on a weld, for example), as close as possible to the pressure sensor mentioned above.

***Temperature measurements are among the most difficult to perform. Install the temperature probes with a correct quantity of thermal paste, tighten the probes firmly to the pipe and abundantly insulate the probes so that external agents cannot affect the measurement.***

The optimal refrigerant charge is attested by the following conditions, while the circuit is working in **Water** mode and with the **Economizer=ON** state:

- Subcooling (at the filter dryer) = 5°C ± 1°C
- Both full sight glass on the liquid reciever
- Full liquid sight glass

If the Subcooling value is out of range, then proceed with the charge adjustment by using the recovery pump connected on the condenser outlet (before filter dryier).

The charge adjustment has to be performed step-by-step:

- For 50÷100kg circuits, proceed by adding/removing ±1kg of refrigerant at every step
- For 100÷500kg circuits, proceed by adding/removing ±2kg of refrigerant at every step

***After every charge step, wait 5 minutes after the liquid temperature stabilizing before to proceed with the next eventual adjustment step.***

### 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 in order to don't affect the Data Acquisition***

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

  *Main Menu → Unit Operation → CX Manual*

- 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).
- It is recommended to let the circuit reach stable operating conditions before to proceed with the data acquisition.
  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***

## EWYD-4Z-XS-A2

| MODEL | COMP-RESSOR | VFD | MOTOR TYPE | SPEED COOL C1 | SPEED HEAT C1 | SPEED WATER C1 | SPEED COOL C2 | SPEED HEAT C2 | SPEED WATER C2 | FAN TYPE | FAN TYPE BRINE (opt-08) | FAN TYPE HA (opt-142) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EWYD4004ZXSA2 | 3122 | 90 | AC | 3000 | 3000 | 2400 | 3600 | 3000 | 2400 | AC900 | AC900 | EC1000 |
| EWYD4504ZXSA2 | 3122 | 120 | AC | 3600 | 3000 | 2700 | 3900 | 3600 | 2700 | AC900 | AC900 | EC1000 |
| EWYD5004ZXSA2 | 3122 | 120 | AC | 3900 | 3600 | 3000 | 3900 | 3900 | 3000 | AC900 | AC900 | EC1000 |
| EWYD5504ZXSA2 | 3122 | 120 | AC | 4500 | 3900 | 3300 | 4500 | 4200 | 3300 | AC900 | AC900 | EC1000 |
| EWYD6004ZXSA2 | 3122 | 120 | AC | 4500 | 4200 | 3600 | 4800 | 4500 | 3600 | AC900 | AC900 | EC1000 |
| EWYD6504ZXSA2 | 3122 | 120 | AC | 5100 | 4800 | 3900 | 5100 | 4800 | 3900 | AC900 | AC900 | EC1000 |
| EWYD7004ZXSA2 | F3AS | 200 | AC | 3900 | 3600 | 3300 | 3900 | 3900 | 3300 | AC900 | AC900 | EC1000 |
| EWYD8004ZXSA2 | F3AS | 200 | AC | 4500 | 4200 | 3600 | 4500 | 4500 | 3600 | AC900 | AC900 | EC1000 |

## EWYD-4Z-XL-A2

| MODEL | COMP-RESSOR | VFD | MOTOR TYPE | SPEED COOL C1 | SPEED HEAT C1 | SPEED WATER C1 | SPEED COOL C2 | SPEED HEAT C2 | SPEED WATER C2 | FAN TYPE | FAN TYPE BRINE (opt-08) | FAN TYPE HA (opt142) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EWYD4004ZXLA2 | 3122 | 90 | AC | 3000 | 3000 | 2400 | 3600 | 3000 | 2400 | AC900L | AC900L | EC1000L |
| EWYD4504ZXLA2 | 3122 | 120 | AC | 3600 | 3000 | 2700 | 3900 | 3600 | 2700 | AC900L | AC900L | EC1000L |
| EWYD5004ZXLA2 | 3122 | 120 | AC | 3900 | 3600 | 3000 | 3900 | 3900 | 3000 | AC900L | AC900L | EC1000L |
| EWYD5504ZXLA2 | 3122 | 120 | AC | 4500 | 3900 | 3300 | 4500 | 4200 | 3300 | AC900L | AC900L | EC1000L |
| EWYD6004ZXLA2 | 3122 | 120 | AC | 4500 | 4200 | 3600 | 4800 | 4500 | 3600 | AC900L | AC900L | EC1000L |
| EWYD6504ZXLA2 | 3122 | 120 | AC | 5100 | 4800 | 3900 | 5100 | 4800 | 3900 | AC900L | AC900L | EC1000L |
| EWYD7004ZXLA2 | F3AS | 200 | AC | 3900 | 3600 | 3300 | 3900 | 3900 | 3300 | AC900L | AC900L | EC1000L |
| EWYD8004ZXLA2 | F3AS | 200 | AC | 4500 | 4200 | 3600 | 4500 | 4500 | 3600 | AC900L | AC900L | EC1000L |

## EWYD-4Z-XR-A2

| MODEL | COMP-RESSOR | VFD | MOTOR TYPE | SPEED COOL C1 | SPEED HEAT C1 | SPEED WATER C1 | SPEED COOL C2 | SPEED HEAT C2 | SPEED WATER C2 | FAN TYPE | FAN TYPE BRINE (opt-08) | FAN TYPE HA (opt-142) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EWYD4004ZXRA2 | 3122 | 90 | AC | 2700 | 2700 | 2400 | 3000 | 2700 | 2400 | AC900L | AC900L | EC1000L |
| EWYD4504ZXRA2 | 3122 | 120 | AC | 3000 | 2700 | 2400 | 3300 | 3300 | 2400 | AC900L | AC900L | EC1000L |
| EWYD5004ZXRA2 | 3122 | 120 | AC | 3300 | 3300 | 2700 | 3600 | 3300 | 2700 | AC900L | AC900L | EC1000L |
| EWYD5504ZXRA2 | 3122 | 120 | AC | 3900 | 3600 | 3000 | 4200 | 3900 | 3000 | AC900L | AC900L | EC1000L |
| EWYD6004ZXRA2 | 3122 | 120 | AC | 4200 | 3900 | 3000 | 4200 | 4200 | 3300 | AC900L | AC900L | EC1000L |
| EWYD6504ZXRA2 | 3122 | 120 | AC | 4500 | 4500 | 3300 | 4500 | 4500 | 3600 | AC900L | AC900L | EC1000L |
| EWYD7004ZXRA2 | F3AS | 200 | AC | 3600 | 3600 | 3000 | 3600 | 3600 | 3000 | AC900L | AC900L | EC1000L |
| EWYD8004ZXRA2 | F3AS | 200 | AC | 3900 | 3900 | 3000 | 3900 | 3900 | 3000 | AC900L | AC900L | EC1000L |

***Table A - Circuit Settings***

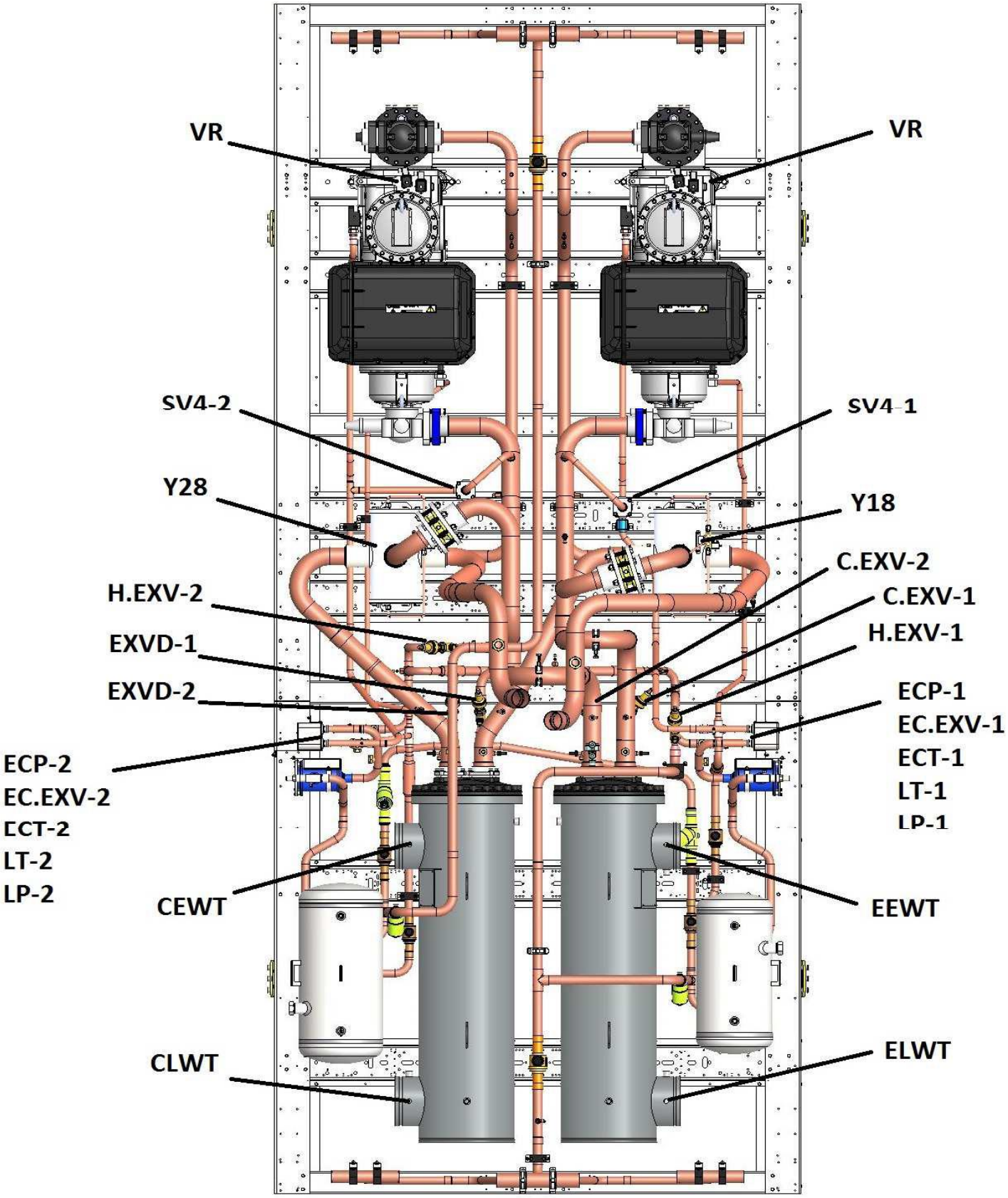



***Table B - Unit Layout***

# 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

| | | Chiller | | Water | | Heat pump | |
|---|---|---|---|---|---|---|---|
| | Mode: | | | | | | |
| | Percentage of Load: | | | | | | |
| | Circuit: | C1 | C2 | C1 | C2 | 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 | **REFRIGERANT SYSTEM** | | | | | | |
| D2.1 | Evaporator Pressure (kPa) | | | | | | |
| D2.2 | Condenser Pressure (kPa) | | | | | | |
| D2.3 | Suction Temperature (°C) | | | | | | |
| D2.4 | Condenser Pressure (kPa) | | | | | | |
| D2.5 | Suction Temperature (°C) | | | | | | |
| D2.6 | Discharge Superheat (°C) | | | | | | |
| D2.7 | Liquid Temperature (°C) | | | | | | |
| D2.8 | Liquid Pressure (kPa) | | | | | | |
| D2.9 | Subcooling (°C) | | | | | | |
| D2.10 | Subcooling at dryer filter (°C) | | | | | | |
| D2.11 | Evaporator Approach (°C) | | | | | | |
| D2.12 | Condenser Approach (°C) | | | | | | |
| D2.13 | Oil Pressure (kPa) | | | | | | |
| D2.14 | Oil Pressure Differential (kPa) | | | | | | |
| D2.15 | EXV Position (%) | | | | | | |
| D2.16 | Fans (%) | | | | | | |
| D2.17 | Economizer/Subcooler Status | | | | | | |
| D2.18 | Economizer EXV Position (%) | | | | | | |
| D3 | **EVAPORATOR (WATER)** | | | | | | |
| D3.1 | Entering Water Temperature (°C) | | | | | | |
| D3.2 | Leaving Water Temperature (°C) | | | | | | |
| D3.3 | Evaporator Pressure Drop (kPa) | | | | | | |
| D3.4 | Design Evaporator Pressure Drop (kPa) | | | | | | |
| D3.5 | Flow Rate (l/s) | | | | | | |
| D3.6 | Design Flow rate (l/s) | | | | | | |
| D3.7 | Check Flow Swich status | | | | | | |
| D4 | **CONDENSER (WATER)** | | | | | | |
| D4.1 | Entering Water Temperature (°C) | | | | | | |
| D4.2 | Leaving Water Temperature (°C) | | | | | | |
| D4.3 | Condensor Pressure drop Kpa | | | | | | |
| D4.4 | Design pressure Drop Kpa | | | | | | |
| D4.5 | Flow Rate (l/s) | | | | | | |
| D4.6 | Design Flow rate (l/s) | | | | | | |
| D4.7 | Check Flow Swich status | | | | | | |
| D5 | **CONDENSER (AIR)** | | | | | | |
| D5.1 | UNIT IN Air Temperature (°C) | | | | | | |

## 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:** | **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 C - Commissioning Sheet***

## 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***