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Commissioning Guide – EWW(L)(H)T-Q

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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 proper safety equipment safe practices.

Be sure before starting any work, that 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 Checklist
- ☒ 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 document: Commissioning guide
- Installation, Operation and Maintenance Manual (D-EIMHP01702-23)
- Operating Manual: EWW(L)(H)T-Q (D-EOMHP01702-23)
- EWW(L)(H)T-Q P&I Diagram (last revision)
- Wiring Diagram

- ☒ Other technical reference material as necessary
- ☒ Current operating software version downloaded and ready to install if needed:
 - Proxima – ([DAE Software Repository - Official](#))

Note: Before to go on site, get the last software version from MyDaikin.eu portal or from DAE Software repository sharepoint (only for Daikin Affiliates)

- ☒ Miscellaneous gauges and hand tools, including:
 - Tool to find leaking (Soap and spray or Electronic leak detector)
 - Differential Pressure Gauge (*adequate for system pressures*)
 - Phase Rotation Meter
 - Refrigeration Gauge Manifold for R32 (*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 presence of leakage)
 - Full refrigerant cylinder (for eventual charge adjustments)
 - Recovery pump (for eventual charge adjustments)
 - Water flow meter

- HMI Service tool (Siemens POL 895)
- Laptop + Scope Light + Service cable



Commissioning procedure can be completed totally with HMI Service tool (Siemens POL 895) and partially with EVCO HMI.

The procedure is advised to be carried out with HMI Service tool (Siemens POL 895)

In case the procedure is carried out without HMI Service tool (Siemens POL 895), some alarms could occurred due to missing checks (example: Flow loss alarm due to pump settings not set/checked)

3 Collaboration and Responsibilities

Refer to the latest Chiller Startup Procedure for breakdown of Sales Rep and Service Office 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-Commissioning On Check \(Paragraph 6\)](#) 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-Start Up 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 Installation Operation and Maintenance Manual, 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 Installation Checklist 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 Commissioning Guide and Commissioning Checklist.
- Review Installation Operation and Maintenance Manual.
- Review Operating 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, pumps, BAS integration, etc...

6 Pre-Commissioning Checks

Initial Chiller Inspection has to be performed according to the **Pre-Commissioning 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-Commissioning 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 4.3**) according to the minimum space requirements (**Paragraph 4.3**)
- Visually inspect for oil and refrigerant leaks.
- Verify the proper shut-off valve actuator as per IOM (**Paragraph 7.3.1**)
- Record component model and serial numbers as appropriate on Commissioning Checklist.
- Verify the proper Stacked installation, if equipped, as per IOM (**Paragraph 7.4**)
- 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 or soap and spray, leak check entire unit. Be sure to note any leaks found and repairs performed on the EWW(L)(H)T-Q Commissioning Checklist. 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 Installation Operation and Maintenance Manual (**Paragraph 4.5**)
- 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 (if used)
- Confirm that all piping specialties (expansion tank, make-up, relief, vents, etc), water pumps are properly installed.

Note: In case the Manifold Module (Accessory) is included, be sure to follow the Installation Operation and Maintenance Manual, to proper installed the module.

Note any issues in the EWW(L)(H)T-Q Commissioning Checklist (**Pre-Startup Comments**)

6.4 Electric Connections Check

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

Field Wiring Connection

Type	Signal description	Function	Page / column		Symbol
Digital Output	EVAP. WATER PUMP.1	Max Load 2A-230Vac External power supply	13	5	
Digital Output	EVAP. WATER PUMP.1	Max Load 2A-230Vac External power supply	13	6	
Digital Output	COND. WATER PUMP.1	Max Load 2A-230Vac External power supply	13	7	
Digital Output	UNIT ALARM	Max Load 2A-230Vac External power supply	13	9	
Digital Output	COND. WATER PUMP 2	Max Load 2A-230Vac External power supply	16	1	
Digital Output	EVAP. WATER PUMP 2	Max Load 2A-230Vac External power supply	16	2	
Digital input	UNIT ON/OFF SWITCH		11	6	
Digital input	EVAPORATOR FLOW SWITCH	Obligatory	11	7	
Digital input	EVAPORATOR FLOW SWITCH	Obligatory	11	9	
Digital input	COOL/HEAT SWITCH		11	8	



Analog Inputs must be generated through external auxiliary voltage

Unit On/Off switch must be connected: to run the unit, it must be enabled both from physical switch (supplied by customer) and from User HMI/External HMI service tool

Evaporator Flow switch must be electrically connected

Note: In case of multiple units (modular application), be sure to follow the Installation Operation and Maintenance Manual to properly install the power bar system.

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

6.4.1 Valve actuator and limit switch installation

Verify the proper installation of the valve actuator and Limit Switch as per IOM (**Paragraph 7.3.2**).

6.5 Pump Module

Verify the proper installation of the Pump module, if equipped, as per IOM (**Paragraph 7.6**)

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** EWW(L)(H)T-Q Commissioning Checklist 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: check the phase-to-phase voltage and Phase unbalance as per IOM (**Paragraph 6.3**)
- Verify all on-board auxiliary transformer voltages

Note any issues in the EWW(L)(H)T-Q Commissioning Checklist (**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 unit controller settings to verify they are optimized for application conditions.
- Verify that last software version is installed. If not, install it.
- Verify settings of all safety and operating controls.

7.3.1 Unit and Option Configuration



Procedure of this paragraph can be completed totally with HMI Service tool (Siemens POL 895) and partially with EVCO HMI
The procedure is advised to be carried out with HMI Service tool (Siemens POL 895)

To activate the SIEMENS HMI:

- Insert Installer/technician password
- Go to menu 15.03 and set "0"
- Go to menu 20.00 and set "On" (Application Save)
- Go to menu 20.01 and set "On" (Apply Changes: the controller reboots)
- Connect HMI Service tool (Siemens POL 895) to HMI port on controller



Unit is pre-configured from factory
Changing of parameters should not be required

Check unit and option configuration according to unit selection (refer to unit label)
 On the HMI Service tool (Siemens POL 895), enter the "Installer/Technician Password" and go into Main Menu:

Commission Unit → Configure Unit → Unit menu and after, Option menu.

HMI Service tool (Siemens POL 895) Menu			User HMI (EVCO) Menu		Description
Setpoint	Default	Range	[XX.YY]	Range	
Type	Not Cfg	- EWWT100XS EWWT125XS EWWT160XS EWLT100XS EWLT125XS EWLT160XS EWHT100XS EWWT100XR EWWT125XR EWWT160XR EWLT100XR EWLT125XR EWLT160XR EWHT100XR	[14.00]	- 0) Not Configured 1) Water Inversion - 15+15 HP 2) Water Inversion - 15+25 HP 3) Water Inversion - 25+25 HP 4) Water Inversion - 15+15 HP - Condenserless 5) Water Inversion - 15+25 HP - Condenserless 6) Water Inversion - 25+25 HP - Condenserless 7) Refr. Inversion - 15+15 HP	Set the model type of the unit according to the unit label
IO Exp	No	- Yes No	[14.01]	- Off On	Set if the I/O expansion is included or not*
M/S Address	None	None MU1 MU2 MU3 MU4 MU1+MUSE	[14.02]	0 = None 1 = MU1 2 = MU2 3 = MU3 4 = MU4 5 = MU1+MUSE	Set the correct Master And Slave address for the specific Module.
Number of Units	0	0 1 2 3 4	[14.03]	0 1 2 3 4	Set the number of unit in case of modular units.
Term Resistor	No	No Yes	N/A	N/A	
Pump Skid En	N/Cfg	N/Cfg Cfg	[14.04]	Off On	Set if the Pump skid is included*
Cond Ctrl Var	No	No Pressure Cond In Cond Out	[14.05]	0=None 1=Pressure 2=Cond EWT 3=Cond LWT	Set the proper condensation control type

Cond Ctrl Dev	None	None Valve VFD	[14.06]	0=None 1=Valve 2=VFD	Set the proper condensation control device
DoubleSetP	No	No Yes	[15.00]	FALSE= No TRUE= Yes	Set if the Double SP feature is available
Limit/Override	None	None StepOvrr	[15.01]	0=None 1=Setpoint 2=Demand Limit	Set if the Limit/Override feature is available
BAS Protocol	-	- ModBus BacNet	[15.02]	0=None 1=Modbus 2=Bacnet	Set the proper BAS protocol, if equipped
HMI Type	EvCO	EvCO Siemens	[15.03]	0= Siemens 1= EVCO	Set the proper HMI type, as included*
External Alarm	No	No Event Alarm	[15.04]	0=No 1=Event 2=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
Leak Detector	No Yes**	No Yes	[15.05]	0=No 1=Yes	Select enable only in case this option is included in the unit* <i>**Leak detector is provided as standard with reduced sound version</i>
Liquid Tmp	No	No Yes	[15.06]	0= No 1= Yes	Set the Liquid Tmp sensor enabling
PVM	No	No Yes	[15.07]	0= No 1= Yes	Set the PVM if available.
Evap Diff Prs	No	No Yes	[15.08]	0= No 1= Yes	Enable the Evap Diff pressure transducer
Cond Diff Prs	No	No Yes	[15.09]	0= No 1= Yes	Enable the Cond Diff pressure transducer
Evap ShOff fdbk	No	No Yes	[15.10]	0= No 1= Yes	Enable the Evap Shut off valve feedback, if included*
Cond ShOff fdbk	No	Yes No	[15.11]	0= No 1= Yes	Enable the Cond Shut off valve feedback, if included*
ModemType	None	None MachineLink Teltonika	N/A	N/A	Set the proper Modem included*
Display Units	Metric	Metric English	N/A	N/A	Set the desired Units set

*Optional components and accessories must be configured in the commissioning menu only if the relevant option/accessory is actually included in the order and installed on the unit in the field.

As a reference, the following list includes all additional accessories that can be ordered with the unit at the time of publication of this manual.

Table 1- Accessories list

No.	Description	Reference
1	Daikin on Site Modem without M2M card	EKDOSMWO
2	Connectivity for external BMS communication	EKCBMS
3	Access Point for mobile App HMI	EKMDDMAP
4	Control Extension pack	EKCTRLPACK
6	Temperature sensor for master/slave configuration	EKTSMS
7	Local/remote display HMI	EKRUPCS
8	Kit Water In/Out	EKWIO
9	Kit for Variable Primary Flow systems on one loop only (for multiple units)	EKVPFKIT
10	Stacked assembly kit	EKSTCK
11	Modular assembly kit	EKSBSM
12	Motor for throttle valve drive on collector	EKACTV
13	Single Power Supply Kit	EKSPELT2-EKSPELT3-EKSPELT4
14	iCM gateway (Multi Master Controller)	EKICMGW
15	Pump module VFD high lift and low lift	EKPUMPLL1/2/3/4/5 EKPUMPHL1/2/3/4
16	Manifold module	EKMFKIT3 EKMFKIT5
17	Victaulic caps	EKCAPS3-EKCAPS5
18	Connection kit	EKWCONNKIT3-EKWCONNKIT5- EKHCONNKIT3-EKHCONNKIT5
19	Water filter	EKWTRFLTR3 - EKWTRFLTR5
20	Smart grid ready box	EKCMSGW
21	Anti vibration mounts for manifold	EKRUBAVMC - EKSPRAVMC
22	Anti vibration mounts for pump module	EKRUBAVMP - EKSPRAVMP

For further details on each accessory, including descriptions and installation instructions, please refer to the Unit Databook and to the accessory manual (***D-EIOOC03212-24_01EN***).

7.4 Alarm Limits



Procedure of this paragraph can be completed totally with HMI Service tool (Siemens POL 895) and partially with EVCO HMI

The procedure is advised to be carried out with HMI Service tool (Siemens POL 895)



- **At the end of the Alarm limits settings, the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.**
Note: Application Save command in EVCO HMI is in menu [23.00]. Set “On” to apply the command.
- **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.**
Note: Apply Changes command in EVCO HMI is in menu [23.01]. Set “On” to apply the command.

On the HMI Service tool (Siemens POL 895), enter the “Installer/Technician password” and set the alarm limits in the following menu:

Main Menu → Commission Unit → Alarm Limits

HMI Service tool (Siemens POL 895) Menu			Description
Setpoint	Default	Range	
Low Press Alm	200.0 kPa	[200-640] kPa	Set the proper low pressure Alarm limit
Low Press Hold	690.0 kPa	Depends on unit mode if Unit mode = 1 or 3 170÷800 [kPa] if Unit mode = 0 or 2 630÷800 [kPa]	Minimum pressure before compressor starts unload action to increase evaporating pressure
Low Press Unld	660.0 kPa	Depends on unit mode if Unit mode = 1 or 3 170÷800 [kPa] if Unit mode = 0 or 2 600÷800 [kPa]	Minimum pressure before compressor starts unload action in order to increase evaporating pressure
Evap Water Freeze	2.0 °C	Depends on unit mode	Defines the minimum water temperature before the unit alarm for evaporator freezing in triggered
Cond Water Frz	2.0 °C	Depends on unit mode	Defines the minimum water temperature before the unit alarm for condenser freezing in triggered
Evap Flow Proof	31 s	From 31 s to 301 s	Limit for flow alarm protection
Cond Flow Proof	31 s	From 31 s to 301 s	Limit for flow alarm protection
Evap Rec Timeout	3 min	From 1 min to 10 min	Set the evaporator water recirculation timeout
Hi DischT Stop	130 °C	[0-170] °C	Set the High Discharge T Stop value
Low Env Lim	4.0 °C	[2 ; 6] °C ***[-15 ; -6] °C ***with glycol enabled	In Heat Mode, capacity is limited when the evaporator water temperature is below the threshold. ***With glycol, the limit must be adjusted due to the extended operating envelope.
High Env Lim	63 °C	[60-65]	In Cool Mode, if the condenser water temperature rises above

			the threshold, the unit capacity is limited
--	--	--	---



- **High Pressure unload is dynamically calculated (not possible to modify it)**
- **Low pressure unload**
 - **For Cool – Heat/Cool mode application, the limit is dynamically calculated (not possible to modify it)**
 - **For Cool with glycol – Heat/Cool with glycol (Brine Application) refer to paragraph 7.3.1**

7.5 Water Flow

7.5.1 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)

7.5.2 Pump Skid module

Pump Speed Control: management of Variable speed driver pumps according to specific controlled sensor:

- Constant Flow
- Variable flow:
 - Fixed Speed
 - VPF (Variable Primary Only flow)
 - VarDT

The pump Skid Module has a dedicated controller which interacts with the unit controller.
In this paragraph will be described the configuration of the dedicated pump module controller.
To proceed with the configuration go to:

Main Overview → Main Menu → configuration

Description	Default	Range and function
Supervisor	MU	It sets type of Supervisor: - MU: Modular Unit - MUSE: Modular Unit Sequencer (MMU) - iCMgtw: iCM Gateway (External Panel)
Unit Type	Water-Ch	It sets the unit type of the connected unit: - Water-Ch (Chiller only unit) - Water HP (Heat pump with water conversion) - Refr-HP (Heat pump unit with refrigerant conversion)
Pump Driver	CSD	It sets type of Pump driver: - CSD (On/Off pump) - VFD
Pump IO	MB	It sets type of Pump Input/Output

		- MB (ModBus Communication)
EVAPORATOR DEVICE		
Evap Speed Ctrl	None	It sets type of Evaporator Pump Speed Control: - None - Fixed - VPF: Control based on Diff.Prs. - VarDT: Control based on DT - iCMGtw: Speed calculation performed by iCM and communicated to Pump Skid
Evap Max Pres Ctrl	No	It sets the Evaporator Absolute Pressure protection - No - Yes
Evap BypValve En	N7Cfg	It configure the Evaporator Bypass valve: - N/Cfg - Cfg Note: According to unit type and selected Evaporator speed Ctrl, bypass valve control is automatically set or limited selection is available. Moreover, in case of heat pump unit, according to Unit Operating Mode (Cool/Heat), BypValve Ctrl can switch from a type to another.
Evap BypValve Ctrl	None	It shows the Evaporator Bypass Valve Control (auto-configured) - None (Forced if bypass valve is not configured) - Close/Ewt (Closed / Based on Entering water temperature protection; only if Unit is Heat Pump and Pump Speed Ctrl is Fixed) - MinDP (based on request from unit for minimum differential pressure con exchanger; only if Pump Speed Ctrl is VPF) - MinDP/Ewt (based on request from unit / Based on Entering water temperature protection; only if Unit is Heat Pump and Pump Speed Ctrl is VPF) - Open (only if Pump Speed Ctrl is VarDT) - Open/Ewt (Closed / Based on Entering water temperature protection; only if Unit is Heat pump and Pump Speed Ctrl is VarDT) - Close/Ewt (Closed/ Based on Entering water temperature; only if Unit is Heat pump and Pump Speed Ctrl is decided by iCMGtw)
CONDENSER DEVICE		
Cond Speed Ctrl	None	It sets type of Condenser Pump Speed Control: - None - Fixed - VPF - VarDT - iCMGtw
Cond Max Pres Ctrl	No	It sets the Condenser Maximum Absolute Pressure control: - No - Yes
Cond BypValve EN	N/Cfg	It sets the Condenser Bypass Valve: - N/Cfg (valve not configured) - Cfgd (valve configured)

		Note: According to Unit Type and selected Condenser Speed Ctrl, bypass valve control is automatically set or limited selection is available. Moreover, in case of heat pump unit and according to Unit Operating Mode (Cool/Heat), BypValve Ctrl can switch from a type to another.
Cond BypValve Ctrl	None	It shows the Condenser Bypass Valve Control (auto configured) <i>None (Forced if bypass valve is not configured)</i> <i>Ewt (Based on Entering water temperature; only if Unit is chiller and Pump Speed Ctrl is Fixed)</i> <i>Close/Ewt (Closed / Based on Entering water temperature protection; only if Unit is Heat Pump and Pump Speed Ctrl is Fixed)</i> <i>MinEwt/MaxEwt(based on EWT protection in heat rejection / Based on EWT protection in cool rejection; only if Units is Heat-pump with refrigerant conversion and Pump Speed Ctrl is Fixed)</i> <i>MinDP (based on request from unit for minimum differential pressure con exchanger; only if Pump Speed Ctrl is VPF)</i> <i>MinDP/Ewt (based on request from unit / Based on Entering water temperature protection; only if Unit is Hea Pump and Pump Speed Ctrl is VPF)</i> <i>Open (only if Pump Speed Ctrl is VarDT)</i> <i>Open/Ewt (Closed / Based on Entering water temperature protection; only if Unit is Heat pump and Pump Speed Ctrl is VarDT)</i> <i>Close/Ewt (Closed/ Based on Entering water temperature; only if Unit is Heat pump and Pump Speed Ctrl is decided by iCMGtw)</i>
Reset Ctrl	No	Controller Reset No Yes

Settings can be found and adjusted in:

Main Overview → Main Menu → Settings

Hare Several sub-menus are available:

Settings → Common settings

Description	Default	Range and functions
Heater DT Sp	1 °C 0...5 °C	Delta Temperature setpoint for Heater activation
Pump Alarm Dly	1s 0...15s	Time delay for Pumps feedback alarm
MU Comm Dly	15s 0...30s	Communication Delay with Modular unit

Settings → Evaporator/Condenser Speed Setting

Description	Default	Range and functions
Max Speed	100% MinSpeed...100%	Maximum Evaporator Pump Speed
Min Speed	20% 0...MaxSpeed%	Minimum Evaporator Pump Speed

Backup Speed	40% MinSpeed...MaxSpeed%	Back-up Evaporator Pump Speed (applied in case of communication error)
Fix Speed 1	50% MinSpeed...MaxSpeed%	Evaporator Fixed Speed 1
Fix Speed 2	50% MinSpeed...MaxSpeed%	Evaporator Fixed Speed 2
PID DP PBand	200kPa 0...2000 kPa	Evaporator Speed control PID: Delta Pressure Proportional Band
PID DT PBand	10.0°C 1...20°C	Evaporator Speed control PID: Delta Temperature Proportional Band
PID Ti_Intgr	60s 0...3600s	Evaporator Speed Control PID: Integral Time
PID Ti_Deriv	10s 0...3600s	Evaporator Speed control PID: Derivative Time
PID MaxAP PBand	200kPa 0...2000kPa	Evaporator Maximum Absolute Pressure PID: Proportional Band
PID MaxAP Ti_Intgr	60s 0...3600s	Evaporator Maximum Absolute Pressure PID: Integral Time
PID MaxAP Ti_Deriv	10s 0...3600s	Evaporator Maximum Absolute Pressure PID: Derivative Time

Settings → Evaporator/Condenser Bypass Valve Control

Description	Default	Range and functions
Min Opening	0% 0...95%	Minimum Evaporator Bypass Valve Opening
Bckup Opening	0% 0...100%	Backup Evaporator Bypass Valve Opening
PID EWT PropBand	10.0°C 0...50°C	Evaporator Bypass Valve PID: Proportional Band
PID Ti_Intgr	60s 0...3600s	Evaporator Bypass Valve PID: Integral Time
PID Ti_Deriv 10s 0...3600s	PID Ti_Deriv 10s 0...3600s	PID Ti_Deriv 10s 0...3600s

7.6 Pre-Running Adjustments



NOTE: Procedure of this paragraph can be completed only with HMI Service tool (Siemens POL 895)
Test mode function can be used only with HMI Service tool (Siemens POL 895)
The procedure is advised to be carried out with HMI Service tool (Siemens POL 895)

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

7.6.1 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 three-unit temperature sensors to be calibrated (for each circuit):

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

7.6.1.1 Evaporator Leaving Water Temperature

- Place the sample and Evap LWT sensors in a container with ice;
- Enter in *Commission Unit* → *Calibrate Sensor* 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.



At the end of the Calibrate Sensor setting the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.



***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 Evaporator Entering Water Temperature

- Place the sample and Evap EWT sensors in a container with ice
- Enter in *Commission Unit* → *Calibrate Sensor* 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.



At the end of the Calibrate Sensor setting the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.



***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 Condenser Leaving Water Temperature

- Place the sample and Cond *LWT* sensors in a container with ice
- Enter in *Commission Unit* → *Calibrate Sensor* 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.***

7.6.1.4 Condenser Entering Water Temperature

- Place the sample and Cond EWT sensors in a container with ice
- Enter in *Commission Unit* → *Calibrate Sensor* 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



At the end of the Calibrate Sensor setting the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.



Make sure to have a stable air condition 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 two temperature sensors to be calibrated (for each circuit):

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

7.6.2.1 Suction Temperature sensor

- Place the sample and suction temperature sensors in a container with ice
- Enter in *Commission Unit* → *Calibrate Sensor* 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.



At the end of the Calibrate Sensor setting the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.



***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 Discharge temperature sensor

- Place the sample and discharge temperature sensors in ambient temperature
- Enter in *Commission Unit* → *Calibrate Sensor* 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.



At the end of the Calibrate Sensor setting the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.



Make sure to have a stable air condition 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 Liquid temperature

- Place the sample and Subcooling temperature sensors in ambient temperature
- *Commission Unit* → *Calibrate Sensor* 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.

7.7 Dry Tests



- ***NOTE: Procedure of this paragraph can be completed totally with HMI Service tool (Siemens POL 895) and partially with EVCO HMI.
Test mode function can be used only with HMI Service tool (Siemens POL 895)
The procedure is advised to be carried out with HMI Service tool (Siemens POL 895)***
 - ***Every time that a function is used, revert to default value.***
 - ***All the Manual Control functionalities must be disabled before to run the unit***
-

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*

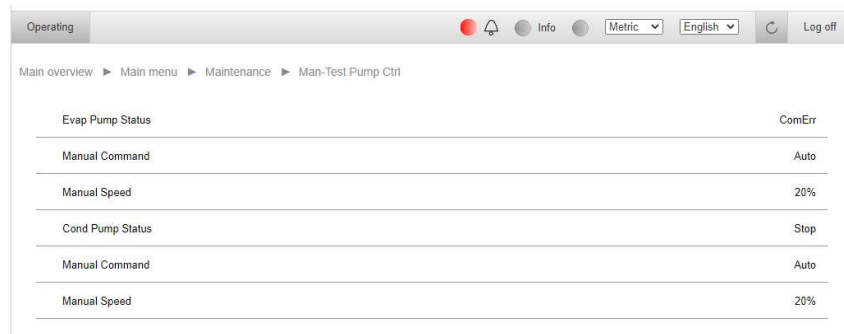
All the dry tests are performable through the following menu:

Main Menu → Commission Unit → Manual Control

7.7.1 Evap/Cond Pump Module

→ Main Overview (Pump skid Controller) → Main Menu → Maintenance → Manual/ Test Mode of The pump

And set the Pump in Test Mode.



Operating		Info	Metric	English	Log off
Main overview ► Main menu ► Maintenance ► Man-Test Pump Ctrl					
Evap Pump Status	ComErr				
Manual Command	Auto				
Manual Speed	20%				
Cond Pump Status	Stop				
Manual Command	Auto				
Manual Speed	20%				

7.7.2 Expansion Valve

Verify the correct operation of the EXV valves:

Main Menu → Commission Unit → Circuit 1 Manual Control → EXV Position

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



After this dry test revert command to default value: 0%

7.7.3 Compressor

To verify the correct operation of the compressors some operations are needed:



The unit is equipped with two compressors, carry out the procedure separately

Connect pressure gauges on high- and low-pressure side to check the pressure

Turn on the water pumps to guarantee the correct flow rate.

Open manually electronic expansion valve:

Manual Control → Circuit 1 Manual Control → Test Exv Position → 20%



Verify to carry out all the activity reported upon before proceeding with the compressor test

Now is possible verify the correct operation of each compressor:

Main Menu → Commission Unit → Manual Control → Circuit 1 Manual Control → Compressor 1 → Set On

After the start of the compressor check on the gauges the pressure lift.



If the compressor doesn't make a lift in pressure, it is not running. Verify electrical connection according to wiring diagram.

Is possible check directly in the Compressor 1/2 menu the upon pressure.



During this check pay attention to the evaporating pressure: if it drops below the pump down setpoint, open in a controlled way the expansion valve in order to reestablish the pressure inside the evaporator

8 Start-Up



Before to proceed with start-up, ensure that all the commands in manual mode have been reverted to default values, unit mode is not set on "Test" and application save command has been used

8.1 Running Adjustments



**NOTE: Procedure of this paragraph can be completed only with HMI Service tool (Siemens POL 895)
Test mode function can be used only with HMI Service tool (Siemens POL 895)
The procedure is advised to be carried out with HMI Service tool (Siemens POL 895)**

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



For EWW(L)(H)T-Q unit: Make sure that the pump is running

1. Enter the "Installer/Technician Password"
2. Go in Main Menu → Unit Mode → Mode and set Cool (or Heat/Cool)



In case of application with Set Point less than 4°C select the Unit Mode: Cool with Glycol

3. Go in Main Menu → Unit Enable
4. Set Unit → Enable
5. Set View/Set Unit → Network Control → Control source → Local

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



Make sure that Unit/Off switch is closed



Make sure that pump is running

Connect the pressure gauges to the high-pressure port and low-pressure port.

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 two pressure sensors to be calibrated (for each circuit):

- The low-pressure transducer
- The high-pressure transducer



Make sure that the circuit is working in stable conditions at 100% capacity to don't affect the following operations result



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

8.1.1.1 Evaporator Pressure (Low pressure transducer)

- Enter the Commission Unit → Calibrate Sensors → Circuit #1/2 menu and then compare the Evap Pressure value with that detected by sample transducer or pressure gauge. If the pressure value measured by the unit transducer is different from the sample one, set the difference in the Evp Pr Offset parameter.



At the end of the Calibrate Sensor setting the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.



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.

8.1.1.2 Condenser Pressure

- Enter *Commission Unit* → *Calibrate Sensors* → *Circuit #1/2* menu and then compare the *Cond Pressure* value with the one detected by the sample transducer/pressure gauge.
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.



At the end of the Calibrate Sensor setting the saving of the modified parameter (Main Menu > Application Save > Yes) is required BEFORE to proceed with the startup of the unit.



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

8.2 User HMI (EVCO) restoring

User HMI must be restored

To activate the User HMI:

- Insert Installer/technician password
- Set EVCO HMI in menu:
Commission Unit → *Configuration* → *HMI Selection* → *EvCO*
- Reboot the controller with Apply Changes command:
Commission Unit → *Options* → *Apply Changes* → *Yes*
- Controller is rebooted and the unit is ready to be run



CLIMATIX Scope Light data recording during commissioning is strongly suggested.

For all material required for the recording and remote support get in contact with FQS.TECHNICALSERVICES@DAIKINEUROPE.COM (DENV Affiliates) or servicesupport@daikinapplied.eu (DAE affiliates)

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 must be performed according the Data Acquisition section of the Commissioning Sheet.
- 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.
- 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:

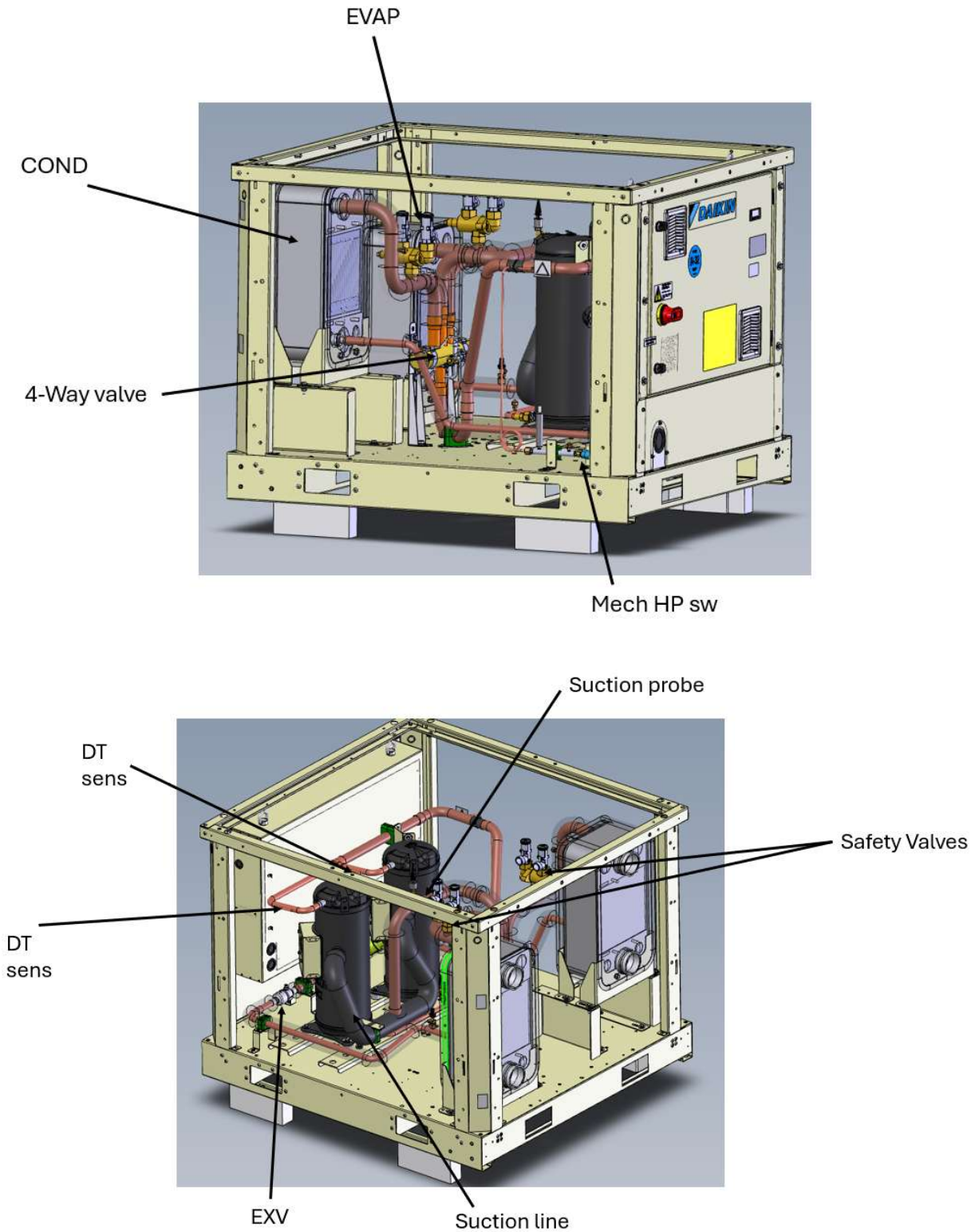
- Circuit Status equal to "Run=Normal"
- ELWT and/or CLWT is as near as possible to the relative setpoint
- EXV is working in Superheat mode:

- Main Menu → View/Set Circuit → Circuit → EXV → State = Pressure
- SSH is equal to the SSH target for 5 minutes continuously:
 - Main Menu → View/Set Circuit → Circuit# → EXV → Pressure 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

9.1 Layout



9.2 Pre-Commissioning Sheet



Pre-Commissioning Sheet

Job Name: _____

Unit Model No.(s): _____

Daikin Serial Unit No.: _____

	Yes	No	N/A
Chilled Water			
-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: _____

9.3 Commissioning Sheet

		CHILLER COMMISSIONING SHEET - EW(W)(H)(L)T-Q-									
End user :				Date:							
Site:				Model nr:							
Distributor:				Serial nr:							
A PRE-POWER ON CHECK LIST				D STARTUP CHECK LIST							
A1 Any shipping damage?				D1 Running Adjustments performed (calibrations)?							
A2 Is the chiller adequately level mounted?				D1 Safety tests performed?							
A3 Are minum space requirements met?				DATA ACQUISITION Mode: Percentage of Load: Circuit: Compressor WATER C1 C2							
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]				D1 ELECTRICAL SYSTEM							
A9 Are electrical connections correct?				D1.1 Comp running Amps L1 (A)							
A10 Compressor model C1				D1.2 Comp running Amps L2 (A)							
A11 Compressor serial C1				D1.3 Comp running Amps L3 (A)							
A12 Compressor model C2				D2 REFRIGERANT SYSTEM							
A13 Compressor serial C2											
B PRE-STARTUP CHECK LIST				D2.1 Evaporator Pressure (kPa)							
B1 Evaporator Flow Switch Check				D2.2 Condenser Pressure (kPa)							
B2 Condenser Flow Switch Check				D2.3 Suction Temperature (°C)							
B3 Main VOLTAGE L1-L2 (V)				D2.4 Condenser Pressure (kPa)							
B4 Main VOLTAGE L2-L3 (V)				D2.5 Suction Temperature (°C)							
B5 Main VOLTAGE L1-L3 (V)				D2.6 Discharge Superheat (°C)							
B6 Frequency (Hz)				D2.7 Liquid Temperature (°C)							
B7 Control voltage Tx IN / OUT (V)		/ /		D2.9 Subcooling (°C)							
B8 Control voltage AL1 (V)				D2.11 Evaporator Approach (°C)							
B9 Oil Heaters were on before start up?				D2.12 Condenser Approach (°C)							
B10 Check Heaters (A) (measure current)		C1 C2		D2.13 Oil Pressure (kPa)							
				D2.14 Oil Pressure Differential (kPa)							
				D2.15 EXV Position (%)							
B11 Unit Software Version				D2 EVAPORATOR (WATER)							
B12 Unit Water Temp Set Point Cool/Heat (°C)											
B13 Unit settings checked?				D2.1 Entering Water Temperature (°C)							
B14 Circuit settings checked?				D2.2 Leaving Water Temperature (°C)							
B15 Alarm Limits set?				D2.3 Evaporator Pressure Drop (kPa)							
B16 Evap Water Frz Alarm Setpoint (°C)				D2.4 Design Evaporator Pressure Drop (kPa)							
B17 Dry Test performed?				D2.5 Flow Rate (l/s)							
B18 Can be the chiller put into operation?				D2.6 Design Flow rate (l/s)							
C PRE-STARTUP COMMENTS				D2.7 Check Flow Switch status							
				D3 CONDENSER (WATER)							
E POST-STARTUP COMMENTS				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 Switch status							
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											