Comfort Flex®
Air Conditioning
a member of DAIKIN group

Installation, Operation and Maintenance Manual

IOM

Group: Chiller
Part Number: IOM CLIC STAND ALONE
Date: 13 July 2023

CLIC STAND ALONE Series
Air-Cooled Scroll Compressor Chiller
Water Generator Unit

Model

25 TR

Refrigerant HFC-410A

50/60 Hz

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Manufactured in an ISO 9001 certified facility

Pre-Start Checklist - Scroll Compressor Chillers

Must be completed, signed, and provided to Comfort Flex *at least 2 weeks prior to requested start date.*

Job Name	
Installation Location	
Customer Order Number	
Model Number(s)	
G.O. Number(s)	

Chilled Water and Condenser Water for Water-cooled Chiller	**Yes**	**No**	**N/A**	**Initials**
Piping Complete				
Water strainer(s) installed in piping per manual requirements				
Water System - flushed, filled, and vented; Water treatment in place				
Cooling tower flushed, filled, vented; Water treatment in place (if applicable)				
Pumps installed and operational (rotation checked, strainers cleaned)				
Controls operational (3-way valves, face/bypass dampers, bypass valves, etc.)				
Water system operated and tested; flow meets unit design requirements (Not all units include it)				
Flow switch(es) -installed, wired, and calibrated				
Vent installed on evaporator				
Electrical	**Yes**	**No**	**N/A**	**Initials**
Building controls operational				
*Power leads connected to power block or optional disconnect				
Power leads have been checked for proper phasing and voltage				
All interlock writing complete and compliant with unit specifications				
Power applied at least 12 hours before startup				
Oil heaters energized at least 12 hours before startup				
Chiller components (EXV Sensors Transducers) installed and wired properly				
*Wiring complies with National Electrical Code and local codes (See Notes)				
Miscellaneous	**Yes**	**No**	**N/A**	**Initials**
Unit control switches all off				
Remote Evaporator / Condenser Piping factory reviewed				
All refrigerant components/piping leak tested, evacuated and charged				
Thermometers, wells, gauges, control, etc., installed				
Minimum system load of 80% capacity available for testing/ adjusting controls				
Document Attached: Technical Breakdown from Selection Software				
Document Attached: Final Order Acknowledgement				
Document Attached: Remote piping approval				

Notes: The most common problems delaying start-up and affecting unit reliability are:
1. Field installed compressor motor power supply leads too small. Questions: Contact the local Comfort Flex sales representative*. State size, number and type of conductors and conduits installed:
a. From Power supply to chiller _____
* Refer to NFPA 70-2017, Article 440.35
2. Remote Evaporator piping incomplete or incorrect. Provide approved piping diagrams.
3. Items on this list incorrectly acknowledged resulting in delayed start and possible extra expenses incurred by return trips.

Contactor Representative

Singed
Name _____
Company _____
Date _____
Phone / Email _____

Comfort Flex Sales Representative

Signed
Name _____
Company _____
Date _____
Phone /Email _____

This manual contains safety instructions that must be followed during installation and maintenance of the unit. Read this manual before installing or operating this unit.

NOTE: Installation and maintenance should be performed only by qualified personnel who are familiar with local codes and regulations and who have experience with this type of equipment.

⚠ DANGER ⚠

LOCK OUT/LABEL all power sources before starting, pressurizing, depressurizing or shutting down the chiller.

Disconnect electrical power before servicing equipment. More than one disconnection may be required to deenergize the unit. Failure to follow this warning to the letter can result in serious injury or death. Be sure to read and understand the installation, operating and service instructions in this manual.

⚠ WARNING ⚠

Electric shock danger. Improper handling of this equipment can cause personal injury or equipment damage. This equipment must be properly grounded. Control panel connections and maintenance should be performed only by personnel knowledgeable in the operation of the equipment being controlled. Disconnect electrical power before servicing equipment. Be sure to install a earth leakage breaker. Failure to install a earth leakage breaker may result in electric shock or fire.

⚠ CAUTION ⚠

Static sensitive components. Static discharge during handling of the electronic circuit board can cause damage to components. Use a static strap before performing any service work. Never unplug any cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

⚠ CAUTION ⚠

When moving refrigerant to/from the cooler using an auxiliary tank, a grounding strap should be used. An electrical charge builds up when halo-carbon refrigerant travels in a rubber hose. A grounding strap should be used between the auxiliary refrigerant tank and the cooler end sheet (ground to ground), which will safely carry the charge to ground. Failure to follow this procedure may result in damage to sensitive electronic components.

⚠ WARNING ⚠

If refrigerant leaks from the unit, there is a potential choking danger as the refrigerant will displace air in the immediate area. Be sure to follow all applicable published industry-related standards and local, state, and federal statutes, regulations, and codes if refrigerant is produced. Avoid exposing refrigerant to an open flame or other ignition source.

⚠ WARNING ⚠

Polyolester oil, commonly referred to as POE oil, is a synthetic oil used in many refrigeration systems and may be present in this Comfort Flex product. POE oil, if it ever comes in contact with PCV/CPVC, will coat the inside wall of the PVC/CPVC pipe and cause environmental stress fractures. Although there is no PCV/CPCV pipe in this product, keep this in mind when selecting piping materials for your application, as system failure and property damage could occur. Consult the pipe manufacturer's recommendations to determine appropriate pipe applications.

DANGER IDENTIFICATION INFORMATION

⚠ DANGER ⚠

Danger indicates a dangerous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING ⚠

Warning indicates a potentially dangerous situation which may result in property damage, personal injury or death if not avoided

⚠ CAUTION ⚠

Caution indicates a potentially dangerous situation which may result in minor injury or equipment damage if not avoided.

Notes: Indicate important details or clarifying statements for the information presented.

General Description

Comfort Flex 's CLIC STAND ALONE Series air-cooled chilled water generators are self-contained, complete, automatic chillers designed for outdoor installation. The package units are fully assembled, factory wired, charged and tested.

The electrical control center includes all operating controls and equipment protection necessary for reliable automatic operation. Components housed in a weatherproof control panel.

NOMENCLATURE

CLIC-300-VL-C-1-A-N-D-F-M-M-N-N-0-2-S-N-D-N-4-C-0

FAMILY

CAPACITY (BTU)
300 - 300,000

AIR DISCHARGE
VL - Vertical Large

OPERATION
C - Cooling Only
H - Heat Pump

UNITS
1 - Stand alone
2 - 2 units
3 - 3 units
4 - 4 units
5 - 5 units
6 - 6 units
7 - 7 units
8 - 8 units
9 - units
10 - 10 units

CONDENSER FAN
A - Axial Fixed

ANTICORROSION
C - Coat in Condenser
I - Coat in Components
M - Total Coating
N - None

VOLTAGE
C - 208-230 / 3 / 60
D - 460 / 3 / 60

COMPRESSOR
F - Fixed
V - Inverter
T - Tandem

CONDENSER
M - Microchannel
C - Cu-Al

EXTRA
0 - TBD

CONTROL
P - Parametric
(Only standalone)
C - pCO / pGD

REFRIGERANT
4 - R410-A

SINGLE SKID
O - With base
N - N/A

PACKAGING
D - Domestic
I - Internacional

HIDRAULIC CONNECTION
N - Not included
Y - Yes included

ELECTRICAL CONNECTION
M - Multipoint
S - Single Point

PIPE
6 - 6”

GRILLS
1 - Painted Grill
0 - N/A

FREE COOLING
N - No

HEAT RECOVERY
N - N/A
R - Heat recovery

PROTOCOL
M - Modbus
B - BACnet IP

EFFICIENCY

Our units are designed to meet the needs of any project.
Our intelligent process controllers and smart temperature sensors provide maximum performance and energy savings.
The system automatically modifies the operating mode to maintain optimum system conditions, making it very easy to operate.

All temperature sensors are calibrated and adjusted at the factory prior to shipment. Start-up should be performed by a qualified technician, during initial start-up the unit will be adjusted to local conditions and all operating points will be checked.
Once the unit has been set up, operation is a matter of pressing the start/stop button until it is certain that the unit is operating properly.
After this the unit will operate automatically, turning itself on according to the demand of the refrigeration system and local conditions.

FLEXIBILITY

The units feature intelligent processors and sensors that automatically control the temperature at optimum operating conditions.

The units were designed to be coupled with each other and combined to meet different load variations (Tandem Installation). Up to 10 modules can be combined; these combinations can be made with Water Chiller Units of different capacities ranging from 25 to 250 tons. Capacities vary depending on the number and type of units.

SAFETY

All structures are made of galvanized sheet steel, coated with electrostatic baked-on paint to ensure long durability and freedom from corrosion under all weather conditions, such as direct sunlight, rain and wind.

All units are designed to fit into a small installation space, thus eliminating large installation areas. We use only high quality components to ensure durability and safety even in harsh environmental conditions.

NOTE: For applications in tropical climates our units are coated inside and out with corrosion protection (upon request).

Our products have AHRI efficiency certifications and ETL safety certifications, in addition to meeting all industry safety standards. We are members of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). To show our commitment to our customers and stakeholders; our equipment comes with a 1 year major warranty after start-up.

Our units use R410A refrigerant, which is harmless to the ozone layer and is non-toxic and non-flammable, even in case of leakage.

Finally, the efficiency of the heat exchanger and its modular design allow for quick and easy installation.

DESIGN

Research conducted by the Engineering Department has resulted in units with high design efficiency and optimum performance. The selection of the main components, our quality and control system guarantee high performance and safety.

All major components are rigorously tested and qualified before installation. Each designed unit has undergone long hours of rigorous testing to ensure the safety, durability and quality of the entire system.

COMMUNICATION

The units can be controlled in tandem mode and/or can be connected to a central control unit. Operation and user access will be through a 7” color touch screen.

Our units can be managed through different communication protocols; such as Modbus and BACnet, the most commonly used protocols in the Air Conditioning industry.

Our units keep track of all programmable variables in real time, such as performance monitoring, specific alarms of the refrigeration cycle and the electrical system; as well as detection of external factors such as fire or flood (optional sensors).

The control and monitoring system ensures the correct operation of the unit by monitoring in real time the condition of the major components (high or low refrigerant pressure, compressor and fan motor conditions, etc.).

In case of failure, the event will be recorded for later analysis, facilitating the localization of a possible failure and its solution.

INSTALLATION

The units have been designed for easy installation. Screw connections provide easy installation of the water piping, which are located on both sides of the unit, so that the piping can be connected to either side of the unit.

The individual assembly of the units reduces installation cost, the units have a rigid base that balances the weight of the unit and allows for easy installation.

MAINTENANCE

The simplicity in the design of each unit allows for maximum ease of maintenance. All major components are available to maintenance personnel by simply opening the service panel.

If an emergency shutdown occurs, the control section will indicate in detail the cause of the failure, helping to facilitate and accelerate troubleshooting.

TESTING

Each unit is pressure and vacuum tested and then charged with the refrigerant required for proper operation based on the customer's installation conditions.

The units are evaluated at full load operation with water flow, heat load and line voltage placed at actual operating conditions.

NOTE: The warranty policy requires that commissioning be performed by qualified personnel authorized by the company.

INSITUM ® CORROSION PROTECTION

SPRAY FOR COATING HVAC/R PRODUCTS

Coating is a flexible, water-based, water-reducible, synthetic polymer corrosion coating designed specifically for the protection of HVAC/R coils and components. Insitu® Spray Applied Coating contains ES2 (embedded stainless steel pigment) technology, an anti-corrosion coating specifically designed for the protection of coils mounted in corrosive areas.

HVAC/R coils, components and enclosures will have a permanent water-based synthetic coating with ES2 pigment applied to all areas of the coating surface with no bridging of material between fins. Therefore, ES2 pigments are suitable for even the most corrosive environments and will maintain their appearance after many years of exposure. UV degradation ES2 pigments form a multilayer structure throughout the paint film.

This creates a barrier layer that reflects sunlight away from the paint film preventing UV rays from penetrating. As a result, UV degradation of individual polymer molecules is eliminated, film integrity is maintained and the pigment particles remain well anchored to the substrate.

The resulting smooth, hard finish prevents dirt build-up. The multilayer structure of ES2 pigments delays the passage of water molecules into the film and acts as an effective moisture barrier.

Ideal applications for Insitu® spray-applied coatings.

- Mini-splits
- Packaged enclosures
- Condensing units
- Modular air handlers
- Air-cooled chillers
- Indoor and outdoor HVAC cabinets and copper tubing
- Heat exchange coils (water, condenser, evaporator, DX)

OPERATING AND STANDBY LIMITS

Table 1. Table unit CLIC

Maximum standby ambient temperature	130°F (54°C)
Maximum operating ambient temperature	105°F (41°C)
Minimum operating ambient temperature (standard control)	32°F(0°)
Outgoing chilled water temperature	40°F to 65°F (4°C to 18°C)
Outgoing chilled fluid temperatures (with antifreeze) - Note that in cases of high ambient temperature, the lowest outgoing water temperature settings may be outside the chiller's operating envelope; see the chiller's operating envelope. Outgoing water temperature settings may be outside the chiller's operating envelope; refer to the Comfort Flex Tools to make sure that the chiller is capable of the required elevation.	15°F to 65°F (-9°C to 18°C)
Maximum evaporator inlet fluid temperature	81°F (27°C)
Maximum non-operating evaporator inlet fluid temperature	100°F (38°C)

NAMEPLATES

The unit nameplate is located on the outside of the unit power panel. Both the model number and serial number are located on the unit nameplates; the serial number is unique to the unit.

These numbers should be used to identify the unit in case of service, parts or warranty questions. This nameplate also contains the unit's refrigerant charge and electrical ratings. The evaporator nameplate is under the insulation and contains the serial number. The compressor nameplate is located on each compressor and provides pertinent electrical information.

⚠ WARNING ⚠

Installation should be performed by qualified personnel who are familiar with local codes and regulations.

INSPECTION

Check all items carefully against the bill of lading. Inspect all units for damage upon arrival. Report shipping damage and file a claim with the carrier. Check the unit nameplate before unloading, making sure it matches the available power supply.

Comfort Flex is not responsible for physical damage that occurs after the unit leaves the factory.

HANDLING

Take care to avoid rough handling of the unit. Do not push or pull the unit from other than the base while seated on properly sized dollies.

To lift the unit, 2-1/2 (64 mm) diameter lifting eyes are provided at the base of the unit. Arrange the spreader bars and cables to prevent damage to the condenser coils or cabinet (see Figure 1).

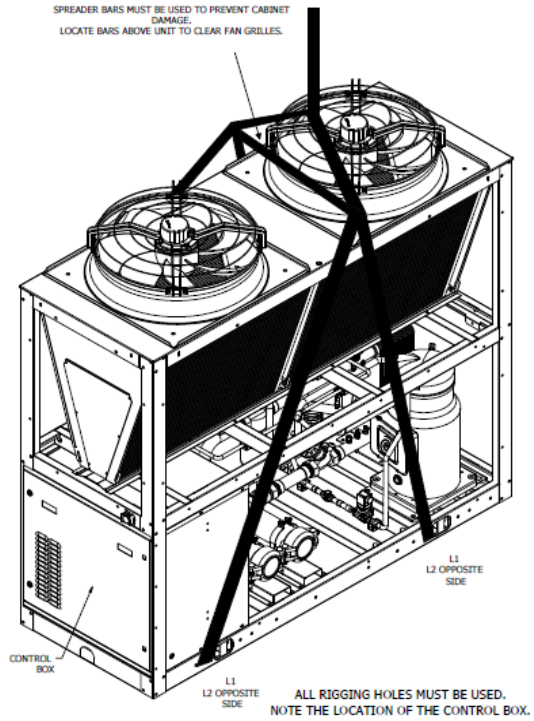
⚠ CAUTION ⚠

All lifting locations must be used to avoid damage to the unit.

⚠ DANGER ⚠

Improper rigging, lifting or moving of a unit can result in property damage, serious personal injury or death. Follow the rigging and moving instructions carefully. Do not stand under the unit while it is being lifted or installed.

Figure 1. Required elevation arrangement.



PLACEMENT OF THE UNIT

CLIC STAND ALONE series units are for outdoor applications and can be mounted on the roof or on the ground. For roof mounted applications, install the unit on a steel channel or I-beam frame to support the unit above the roof.

The use of spring isolators is recommended for roof applications. For ground level applications, install the unit on a solid base that will not settle.

Use a one-piece concrete slab with a foundation extended below the frost line.

Ensure that the foundation is level to within 13 mm over its entire length and width.

The foundation must be strong enough to support the weight of the unit (see “Dimension and Weight - Packaged Unit” on page 15.)

The addition of neoprene pads (customer supplied) under the unit allows water to drain from inside the frame, which can act as a dam. Installing optional spring or rubber isolators in the shear can also aid drainage, see page 19 for information.

MOUNTING

The inside of the base rail is open to allow access to secure mounting bolts, etc. Mounting location dimensions are indicated on the dimensional drawing on page 15 . All compressor bolts, rubber, grommets and fasteners should be left in place in the base. None of these fasteners are considered “temporary shipping bolts”.

CLEANING SERVICE

The control panels are located at the end of the chiller and require a minimum clearance of 1.2 meters in front of the panels. The compressor, filter-driers and line shutoff valves are accessible on each side or end of the unit. Do not block access to the sides or ends of the unit with piping or ductwork.

OPERATING SPACE REQUIREMENTS

Sufficient distance must be maintained between the unit and adjacent walls to allow the required airflow from the unit to reach the coils. Failure to do so will reduce capacity and increase energy consumption.

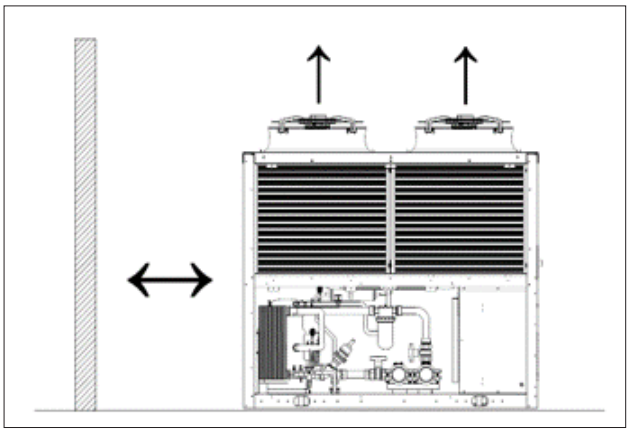
The clearance requirements shown are a general guide and cannot take into account all scenarios. Factors such as prevailing winds, additional equipment within the space, outside air temperature and many other factors may require more clearance than shown. Additional clearances may be required under certain circumstances.

The graphs on the following pages indicate the minimum clearance for different types of installations and also the reduction in capacity and increase in power if a smaller space is used. The graphs are based on individual cases and should not be combined with other scenarios.

⚠ CAUTION ⚠

The performance of the unit may be affected if the operating clearance is not sufficient.

Figure 2. Building or wall on one side of the unit.



Case 1. Open protection walls

Decorative walls are often used to help conceal a unit, either on the ground or on the roof. Whenever possible, design these walls so that the combination of their open area and distance to the unit does not require a performance adjustment.

If the percentage of wall openness is less than recommended for the distance to the unit, it should be considered a solid wall. The wall height is assumed to be equal to or less than the height of the unit when mounted on its base bracket.

If the wall height is greater than the unit height, (refer to Case 2: Pit Installation) for performance adjustment factors. The distance from the sides of the unit to the side walls must be sufficient for service, such as opening the control panel doors.

In the case of uneven wall separation, the distance from the unit to each wall can be averaged as long as no distance is less than 4 feet. Values are based on walls on all four sides.

Case 2. Pit installation

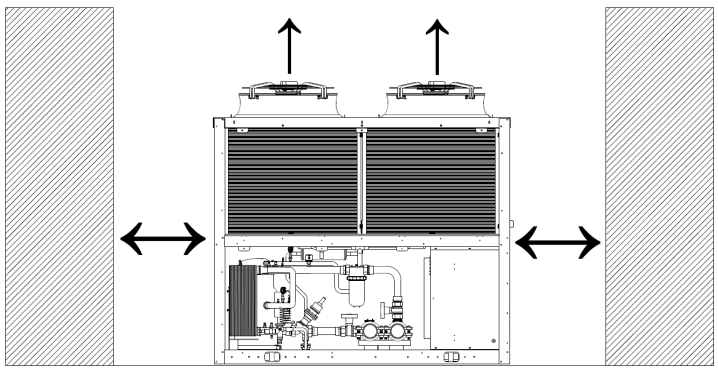
Pit installations can cause operating problems due to recirculation and air restriction and require that sufficient air separation be provided, safety requirements be met, and service access be provided.

A solid wall surrounding a unit is substantially a pit and this datum should be used. Sometimes a steel grating is used to cover a pit to prevent accidental falls or trips into the pit.

The grate material and installation design should be strong enough to prevent such accidents, but should provide plenty of open area to prevent recirculation problems.

Have the Comfort Flex sales representative review the installation of any pit prior to installation to ensure that it has sufficient airflow characteristics and is approved by the facility’s design engineer to avoid the risk of an accident.

Figure 3. Pit installation.



COLD WATER PIPES

⚠ CAUTION ⚠

To prevent damage to the evaporator and possible failure of the chiller, a supply filter is required in the inlet water piping that connects to this evaporator. This filter must be installed prior to operation of the chilled liquid pumps.

Field-installed water piping for the chiller should include:

A cleanable filter installed at the water inlet to the evaporator to remove debris and impurities before they reach the evaporator.

NOTE: Install the cleanable filter within 1,500 mm tubing length from the evaporator inlet connection and downstream of any solder connections (no solder connections between the filter and evaporator). CLICSTAND ALONE models require a filter with perforations no larger than 0.063" (1.6 mm) in diameter.

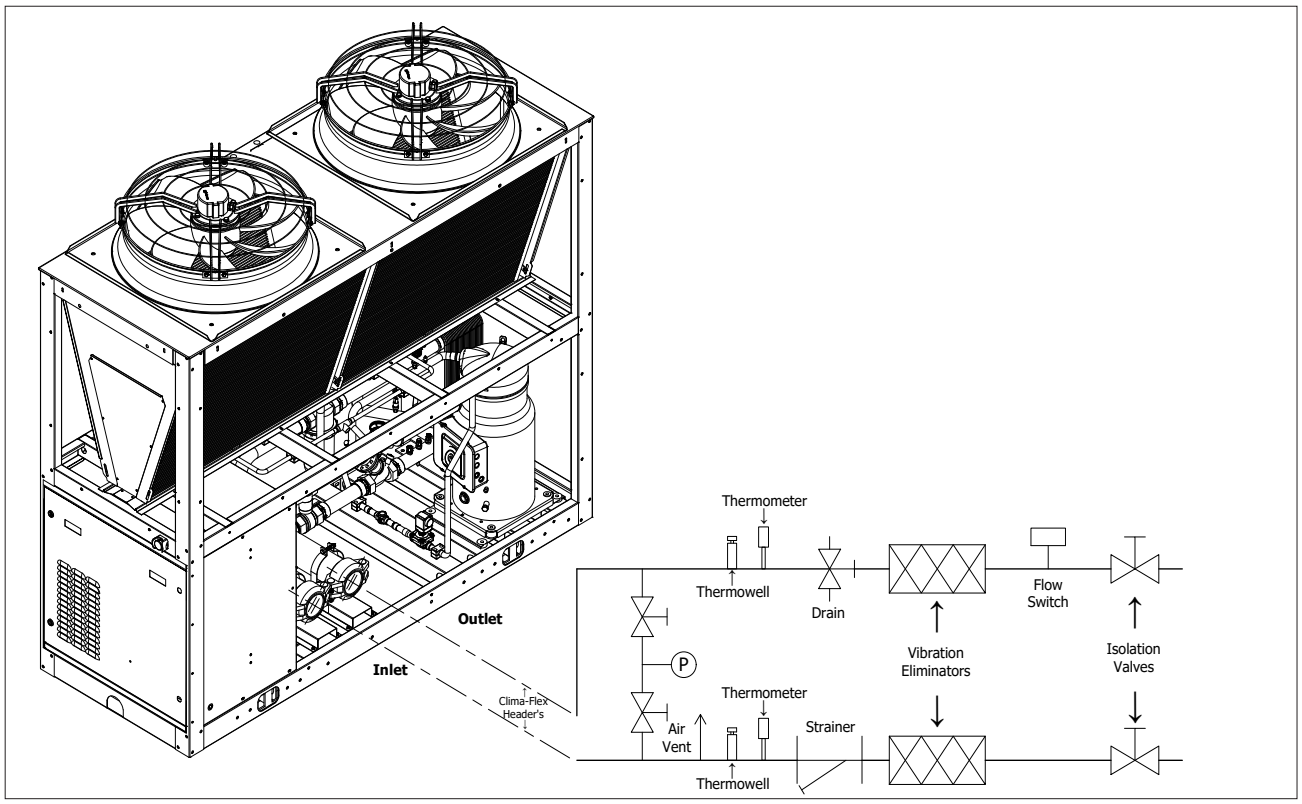
- A water flow switch must be installed in the horizontal piping of the supply water line (evaporator outlet) to prevent evaporator freezing under low or no flow conditions. The flow switch can be ordered as a factory-installed option, as a field-installed kit, or can be supplied and installed in the field.

- Piping for units with brazed plate evaporators should have a drain and vent connection at the bottom of the bottom connection piping and at the top of the top connection piping, respectively, (see Figure 4) These evaporators do not have drain or vent connections due to their construction. Purge air from the water system prior to unit start-up to provide adequate flow through the evaporator.
- A suitable support for piping, separate from the unit, to eliminate weight and stress on fittings and connections.
- An expansion tank and regulating valve to maintain water pressure.
- Suitable mechanical connections. All evaporators have.
- OGS type grooved water connections (adhering to AWWA C606) optionally with flanges. PVC piping should not be used.

⚠ WARNING ⚠

Polyolester oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems and is present in this Comfort Flex product. POE oil, if it ever comes in contact with PVC/CPVC, will coat the inside wall of the PVC/CPVC pipe causing environmental stress fractures. Although there is no PVC/CPVC pipe in this product, keep this in mind when selecting piping materials for your application as system failure and property damage could occur. Consult the pipe manufacturer's recommendations to determine suitable pipe applications.

Figure 4. Typical piping of a welded plate evaporator.



It is recommended that the field-installed water piping for the chiller include:

- Temperature sensors at evaporator inlet and outlet connections.
- Water pressure gauge connection taps and pressure gauges on evaporator inlet and outlet connections to measure water pressure drop.
- Shut-off valves to isolate the unit from piping during unit maintenance.
- Minimum elevation changes and bends to minimize pressure drop.
- Vibration eliminators on supply and return water lines to reduce transmissions to the building.
- Thorough flushing of system water piping prior to making connections to the unit evaporator.
- Insulation of the piping, including a vapor barrier, helps prevent condensation and reduces heat loss.

NOTE: Periodic water analysis and chemical treatment of the evaporator loop water is recommended immediately after unit start-up.

NOTE: Failure to comply with these measures may result in performance and reliability problems.

WATER FLOW LIMITATIONS

Constant evaporator flow

Maximum flow rate and pressure drop are based on a 6°F temperature drop. Flow rates above the maximum values will result in unacceptable pressure drops and may cause excessive erosion, which could lead to failure.

The minimum flow rate and pressure drop are based on a full load evaporator temperature drop of 16°F. Evaporator flow rates below the minimum values may result in laminar flow leading to low pressure alarms, fouling and poor temperature control (See pressure drop on page 16).

Variable evaporator flow

Reducing evaporator flow rate in proportion to load can reduce system energy consumption. The rate of flow change should be a maximum of 10 percent of the flow per minute. For example, if the maximum design flow rate is 200 gpm and is to be reduced to a flow rate of 140 gpm, the flow change is 60 gpm.

Ten percent of 200 gpm equals a change of 20 gpm per minute, or a minimum of three minutes to go from the maximum flow to the desired flow.

If the flow rate falls below the minimum allowable, large reductions in heat transfer can occur. If the flow rate exceeds the maximum, excessive pressure drop and tube erosion can occur.

System water considerations

All chilled water systems need adequate time to recognize a load change, respond to the change and stabilize to avoid undesirable compressor short cycling or loss of temperature control.

In air conditioning systems, the potential for short cycling often occurs when the building load drops below the minimum capacity of the chiller plant or in tightly coupled systems with very small water volumes. Some of the aspects that the designer should consider when studying water volume are the minimum cooling load, the minimum capacity of the chiller plant during the low-load period, and the desired cycle time for the compressors. Assuming there are no sudden loads and the chiller plant has a reasonable drawdown, the rule of thumb of "water volume in gallons equals two to three times the chilled water flow rate in gpm" is often used. A storage tank may have to be added to the system to achieve the recommended volume.

The quality of water supplied by the owner/occupant/operator/user to a cooling system should minimize corrosion, scale buildup, erosion, and biological growth to achieve optimum efficiency of HVAC equipment without creating a hazard to operating personnel or the environment. Filters should be used to protect cooling systems from waterborne debris. Comfort Flex is not responsible for damage caused by waterborne debris or damage to chiller heat exchangers due to improper water treatment.

Water systems should be cleaned and flushed prior to chiller installation. Testing and water treatment should be verified during initial chiller installation/commissioning and should be maintained on an ongoing basis by water treatment professionals.

⚠ CAUTION ⚠

Improper use of detergents, chemicals and additives in the cooling system water can adversely affect the performance of the chiller and potentially result in repair costs not covered under warranty. Any decision to use these products is at the discretion of the owner/occupant/operator/user, and the owner/occupant/operator/user assumes full responsibility for any damage that may occur due to their use.

Evaporator freeze protection

Evaporator freezing can be a problem in the application of air-cooled water chillers in sub-zero temperature areas. To protect against freezing, the evaporator comes with insulation.

Although the evaporator is equipped with freeze protection, it does not protect the water piping external to the unit or the evaporator itself if there is a power failure or heater burnout, or if the chiller cannot control the chilled water pumps.

Use one of the following recommendations for additional freeze protection:

1. If the unit will not operate during the winter, drain the evaporator and chilled water lines and flush them with glycol.
2. Add a glycol solution to the cold water system. Breakage protection should be approximately 10°F below the minimum design ambient temperature.
3. Insulate exposed piping.
4. Add thermostatically controlled heat by wrapping lines with heat tape.
5. When glycol is added to the water system for freeze protection, the refrigerant suction pressure will be lower, the cooling performance will be lower, and the water side pressure drop will be higher.

COLD WATER PUMP

It is important that the chilled water pumps are connected to and controlled by the chiller's microprocessor. The controller will activate the pump whenever at least one chiller circuit is enabled for operation.

This helps ensure proper start-up sequence of the unit. The pump will also turn on when the water temperature is below the freeze set point for longer than the specified time to help prevent evaporator freeze-up. Connection points are shown in the field wiring diagram beginning on page 34+.

⚠ CAUTION ⚠

Adding glycol or draining the system is the recommended method of freeze protection. If the chiller does not have the ability to control the pumps and the water system is not drained or does not have adequate glycol at subfreezing temperatures, catastrophic evaporator failure can occur.

If the chiller is not allowed to control the pump, the following problems may occur:

1. If the chiller attempts to start without first starting the pump, the chiller will lock up with the no flow alarm and require a manual restart.
2. If the chiller evaporator water temperature drops below the "freezing set point", the chiller will attempt to start the water pumps to prevent evaporator freezing.
3. If the chiller does not have the ability to start the pumps, the chiller will alarm for lack of water flow.
4. If the chiller does not have the ability to control the pumps and the water system must not be drained in freezing temperatures or contain glycol, the chiller may be subject to catastrophic evaporator failure due to freezing.

FLOW SWITCH

All chillers require a chilled water flow switch to verify that there is adequate water flow through the evaporator and to shut down the unit if necessary to prevent evaporator freeze-up under low or no flow conditions.

A factory-installed thermal dispersion flow switch will be installed on packaged models. On remote evaporator models, the flow switch can be supplied separately in the field, or optionally shipped loose for field installation. Terminals for field mounting

and wiring of the water flow switch are provided in the unit control center.

Wire from the Y and R terminals on the switch to the terminals on the unit control panel shown in the field wiring diagrams, page 19 through page 22. Mount the flow switch on the outlet water line to shut off the unit when water flow is interrupted. A flow switch is an equipment protection control and should never be used to cycle the unit.

Installation should be in accordance with the manufacturer's instructions included with the switch. Flow switches should be calibrated to shut the unit off when operating below the minimum flow rate.

There is also a set of paddle switch contacts on the switch that can be used for an indicator light or alarm to indicate when a "no flow" condition exists. Protect any flow switch that is installed outdoors from freezing. It is not recommended that differential pressure switches be installed outdoors. They may freeze and not indicate a no-flow condition.

GLYCOL SOLUTIONS

The use of glycol can affect system performance depending on its concentration and should be taken into account during initial system design. When glycol is added to the chilled water system to protect against freezing, it should be noted that the refrigerant suction pressure will be lower, the cooling performance will be lower and the water side pressure drop will be higher. The reduction in performance depends on the glycol concentration and temperature. Test the coolant with a clean and accurate glycol refractometer to determine the freezing point.

⚠ CAUTION ⚠

The installed glycol level must match the nominal glycol percentage indicated on the submitted chiller technical data sheet. Failure to meet the nominal glycol percentage may result in damage to the unit and loss of unit warranty.

⚠ CAUTION ⚠

Do not use automotive grade antifreeze. Industrial grade glycols should be used. Automotive antifreeze contains inhibitors that will cause plaque formation on the cooler evaporator copper tubes. The type and handling of the glycol used should be consistent with local codes.

HIGH TEMPERATURE OPERATION

CLIC STAND ALONE series units for high temperature operation (105°F to 125°F, 40°C to 52°C) require the addition of the optional high ambient package which includes a small fan with a filter on the air inlet to cool the control panel. All units with the optional VFD low ambient fan control automatically include the high ambient option.

Note that in cases of high ambient, the capacity may be reduced or the lower outlet water temperature settings may be outside the chiller's operating envelope; consult with a Comfort Flex sales representative to ensure that the chiller is capable of the required elevation.

CONDENSER COIL OPTIONS AND COATING

Considerations

The standard CLIC STAND ALONE Series chiller coils have an aluminum alloy microchannel design with a series of flat tubes containing multiple parallel flow microchannels placed between the coolant manifolds. The microchannel coils are designed to withstand the synthetic acidified seawater acidified (SWAAT) mist test of over 1000 hours (ASTM G85-02) at 120°F (49°C) with 0% loss and without developing leaks.

Epoxy coating: is an extremely flexible and durable water-based polymer coating that is uniformly applied to all coil surfaces by a multi-step electrostatic submerged coating process. Epoxy-coated coils offer ASTM B117-90 salt spray resistance of more than 10,000 hours applied to both the coil and the coil heads. Epoxy-coated coils also receive a UV-resistant urethane topcoat to provide superior resistance to degradation from direct sunlight.

Table 2. Coil and coating selection matrix

Coil Option	Non-corrosive[1]	Unpolluted marine[2]	Industrial[3]	Combined marine-industrial[4]
Standard	+++	-	-	-
Microchannel	+++	+++	+++	++

Notes:

1. **Non-corrosive environments can be estimated by the appearance of existing equipment in the immediate area where the chiller is to be placed.**
2. **Marine environments should take into account the proximity to the coast, as well as the prevailing wind direction.**
3. **Industrial contaminants can be general or localized, depending on the immediate source of contamination (e.g. diesel fumes due to proximity to a loading dock).**
4. **The marine-industrial combination is influenced by proximity to the coast, prevailing winds, and general and localized sources of pollution.**

Figure 5. Refrigerant schematics.

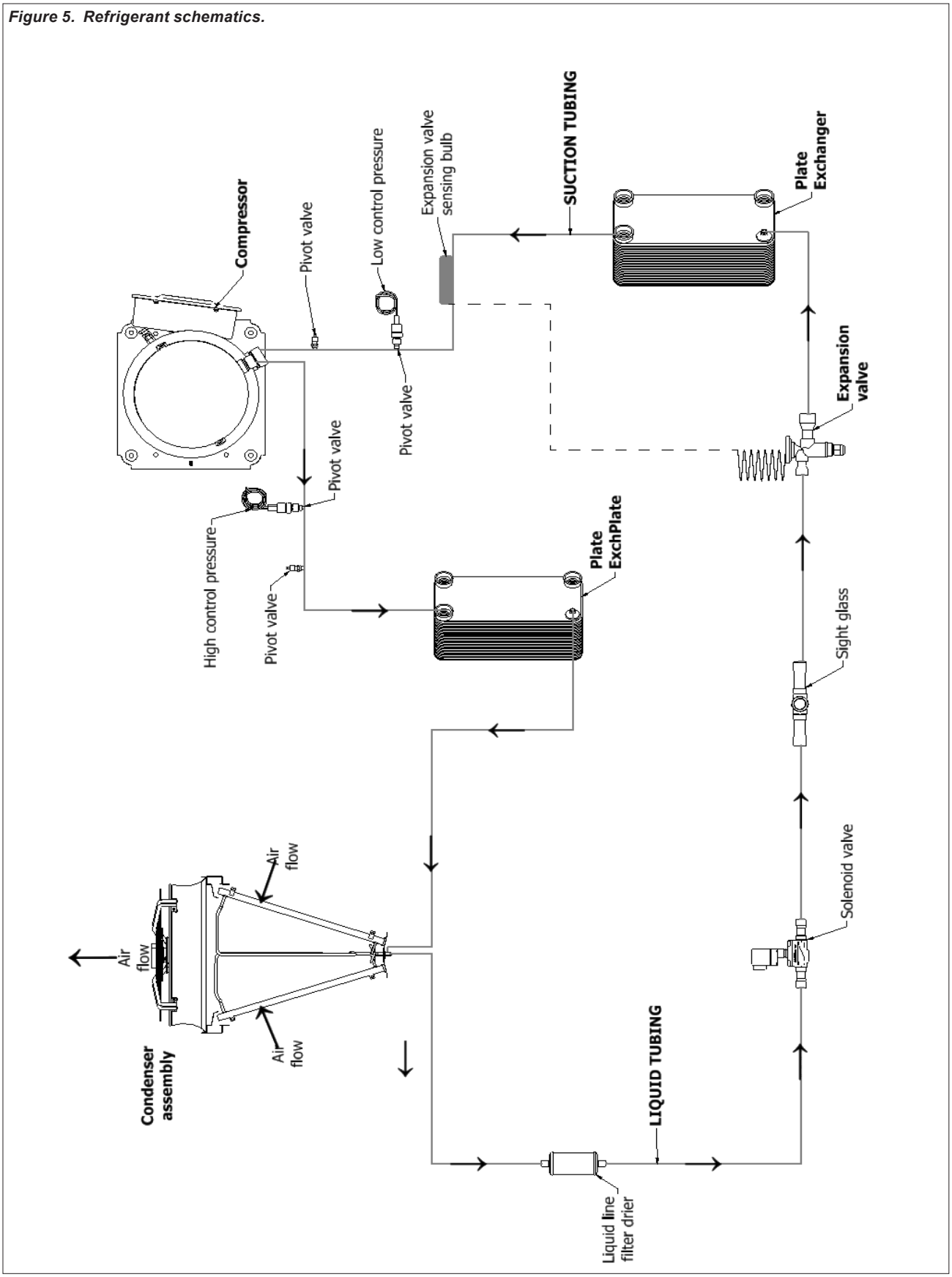


Figure 6. Dimensional configuration.

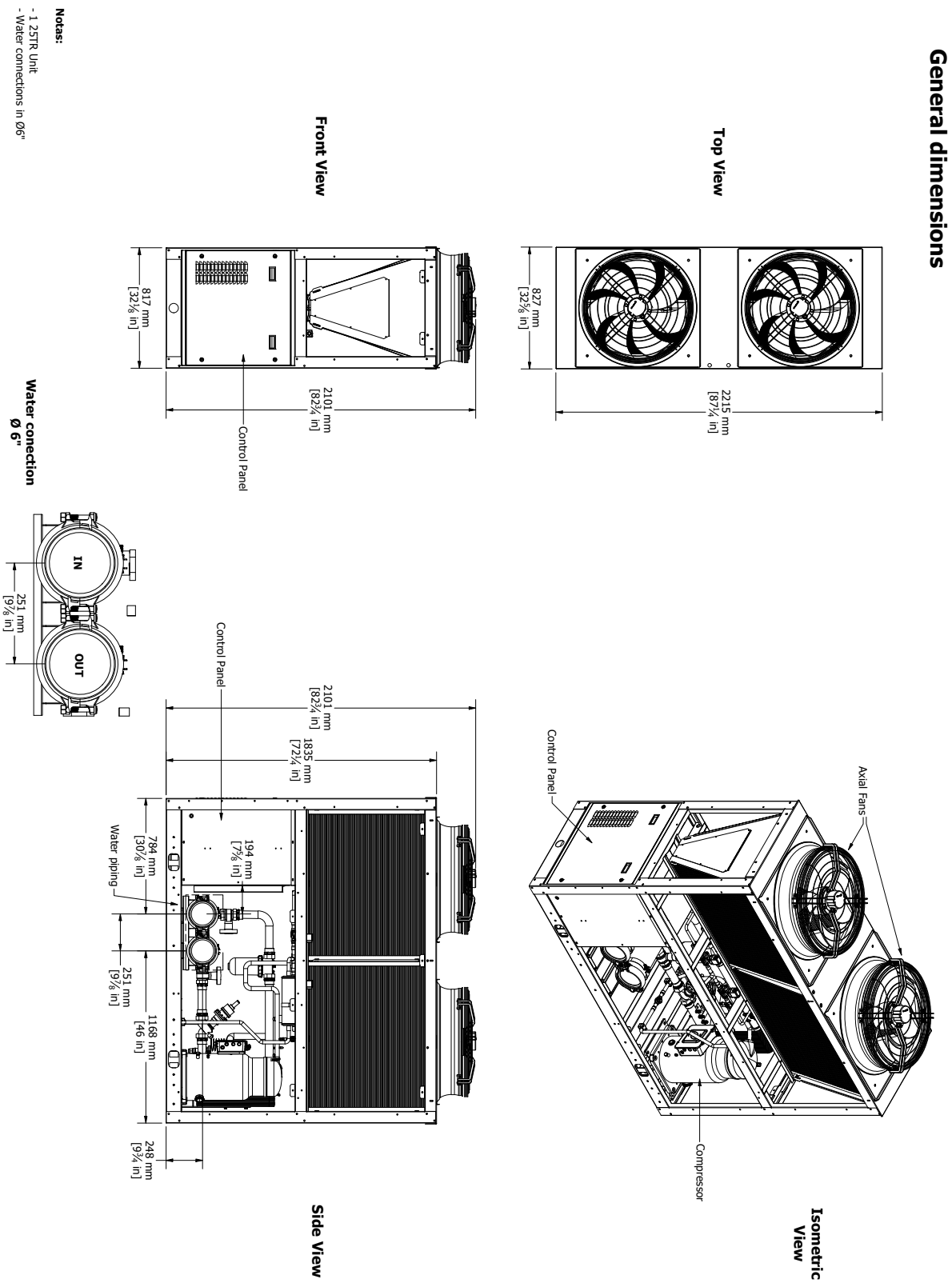
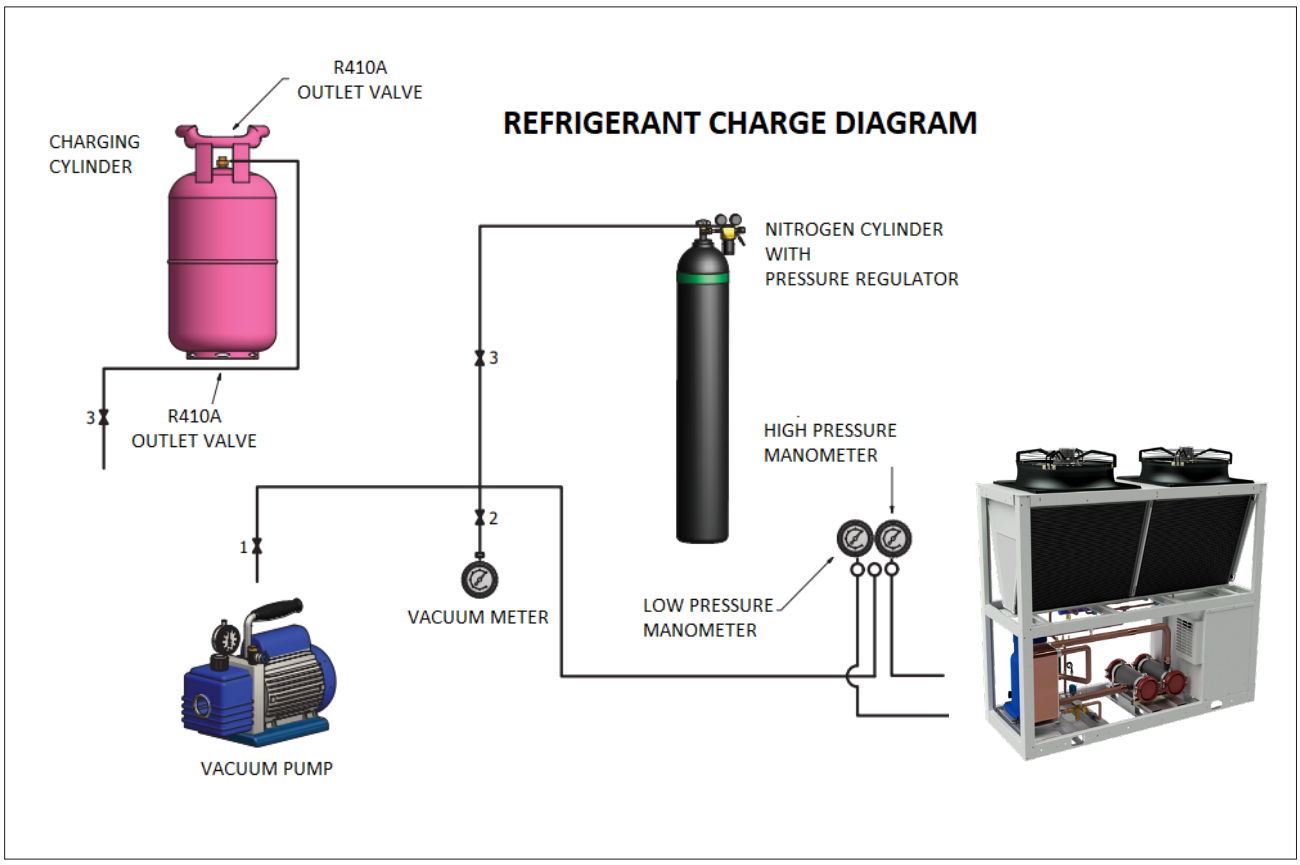


Table 3. Refrigerant charge and pressure drop in clic stand alone unit.

	REFRIGERANT CHARGE			EVAPORATOR PRESSURE DROP		
FAMILY	TR	R410A (LBS)	R410A (KG)	GPM	Φ PIPE SIZE	DP (FT WG)
CLIC	**25**	**1 X 21**	**1 X 9.5**	**60**	**6**	**34.01**

Figure 7. Diagram for obtaining vacuum and for refrigerant charge.



ELECTRICAL CONNECTION

CLIC STAND ALONE units can be ordered with standard multi-point power connections or with optional single-point connections and various disconnect and circuit breaker options. Wiring inside the unit is sized in accordance with the NEC®.

The required field wiring varies depending on the configuration of the unit. Refer to page 19-22 for wiring diagram information. Voltage limitations are:

1. Within 10 percent of nameplate rating.
2. Voltage unbalance must not exceed 2 percent. Since a voltage unbalance of 2% can cause a current unbalance of 6 to 10 times the voltage unbalance per NEMA MG-1, it is important that phase-to-phase unbalance be kept to a minimum.

⚠ DANGER ⚠

Qualified and licensed electricians must perform wiring. There is an electrical shock hazard that can cause serious injury or death.

⚠ DANGER ⚠

LOCK OUT / DISCONNECT all power sources before starting, pressurizing, depressurizing or shutting down the chiller. Disconnect electrical power before servicing equipment, including condenser fan motors or compressors. More than one disconnect may be required to deenergize the unit. Failure to comply with this warning can result in serious injury or death. Be sure to read and understand the installation, operating and service instructions in this manual.

Chiller electrical wiring connections may be made with either copper or aluminum wiring, provided the size and number of wires match the chiller terminals. All wiring must be in accordance with applicable local and national codes, including NECA/AA 10402012 for installation of aluminum wiring in buildings (ANSI).
Wiring inside the unit is sized in accordance with the NEC®. Refer to the unit nameplate and unit selection report for correct electrical ratings.

1. The control transformer is supplied and no separate 115V power is required. For single and multipoint power connections, the control transformer is on circuit #1 with control power wired from there to circuit #2. For multipoint power, disconnecting power from circuit #1 disconnects the control power from the unit.

2. The size of the wiring supplied to the control panel shall be in accordance with the field wiring diagram.

3. The single point power supply requires a single disconnect to supply electrical power to the unit. This power supply must have a fuse or use a circuit breaker.

4. All field wiring terminal range values listed in the unit selection report apply to 75°C cable per NEC.
5. It must be grounded per national and local electrical codes.

⚠ CAUTION ⚠

Static discharge during handling of the circuit boards can cause damage to the components. Use an antistatic strap before performing any main tenance work. Never unplug cables, circuit board terminal blocks or plugs while the panel is powered.

USE WITH ON-SITE GENERATORS

Switching from site mains to generator power and vice versa requires the chiller to be off or the power to be disconnected for more than five seconds to avoid sending out-of-phase voltage to the chiller.
A properly installed and fully synchronized automatic transfer switch must be used to transfer power if the chiller is operating under load.

Generator sizing

⚠ WARNING ⚠

The generator should be sized by an electrical engineer familiar with generator applications.

Transfer back to the grid

Proper transfer of power from the standby generator to the grid is essential to prevent damage to the chiller and must be used to ensure proper operation of the unit.

⚠ WARNING ⚠

Stop the chiller before transferring power from the generator to the mains. Transferring power while the chiller is running can cause serious damage to the chiller.

The procedure required to reconnect generator power to the mains is as follows:

1. Set the generator to always run five minutes longer than the unit start timer, which can be set from two to sixty minutes, while keeping the chiller powered by the generator until the fully synchronized Automatic Transfer Switch properly delivers chiller power from the site.

2. Set the transfer switch supplied with the generator to automatically shut down the chiller before the transfer is made. The automatic shutdown function can be accomplished through a BAS interface or with the “remote on/off” wiring connection shown in the field wiring diagrams. A start signal can be given at any time after the stop signal, as the three-minute start timer will be in effect.

⚠ WARNING ⚠

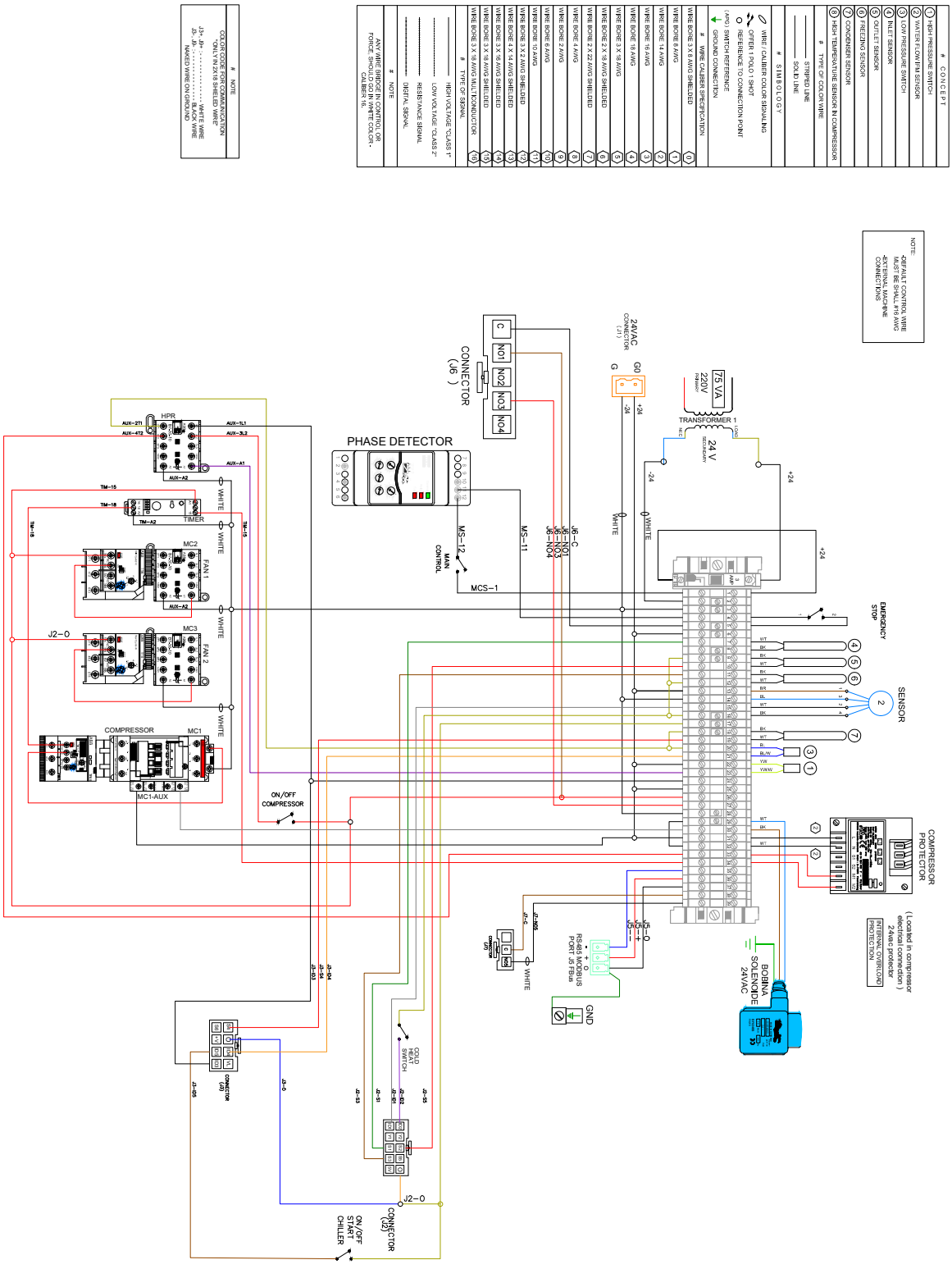
Electric shock danger. Improper handling of this equipment can cause personal injury or equipment damage. This equipment must be properly grounded. Control panel connections and maintenance should be performed only by personnel knowledgeable in the operation of the equipment being controlled. Disconnect electrical power before servicing equipment. Be sure to install a earth leakage breaker. Failure to install a earth leakage breaker may result in electric shock or fire.

⚠ WARNING ⚠

When installing the earth leakage protector make sure that it is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary opening of the earth leakage protector.ra.

NOTE: The electrical installer must provide a 12-gauge neutral wire.

Figure 8. Typical field wiring diagram of the 220V unit (single point connection with all options shown)



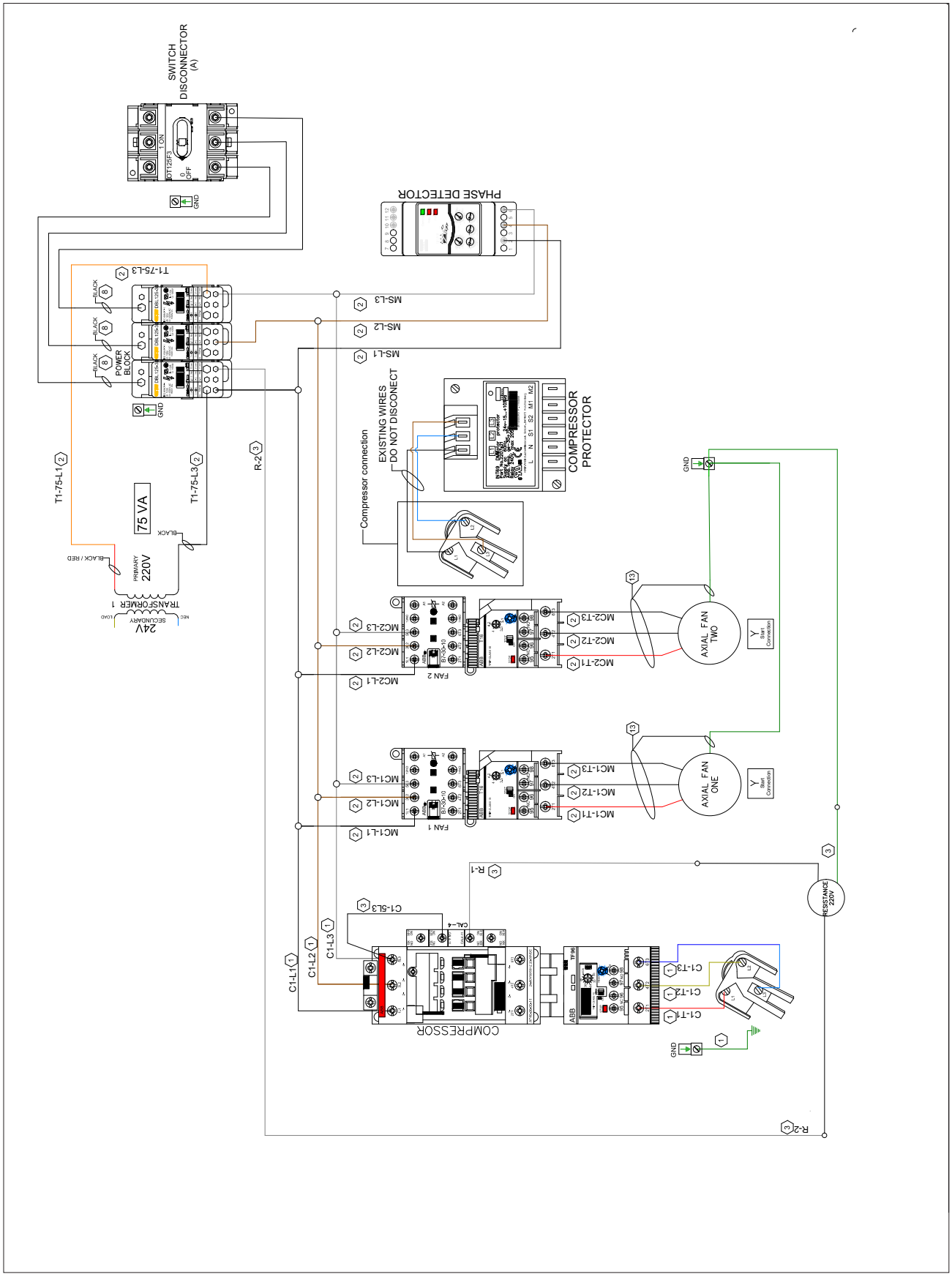
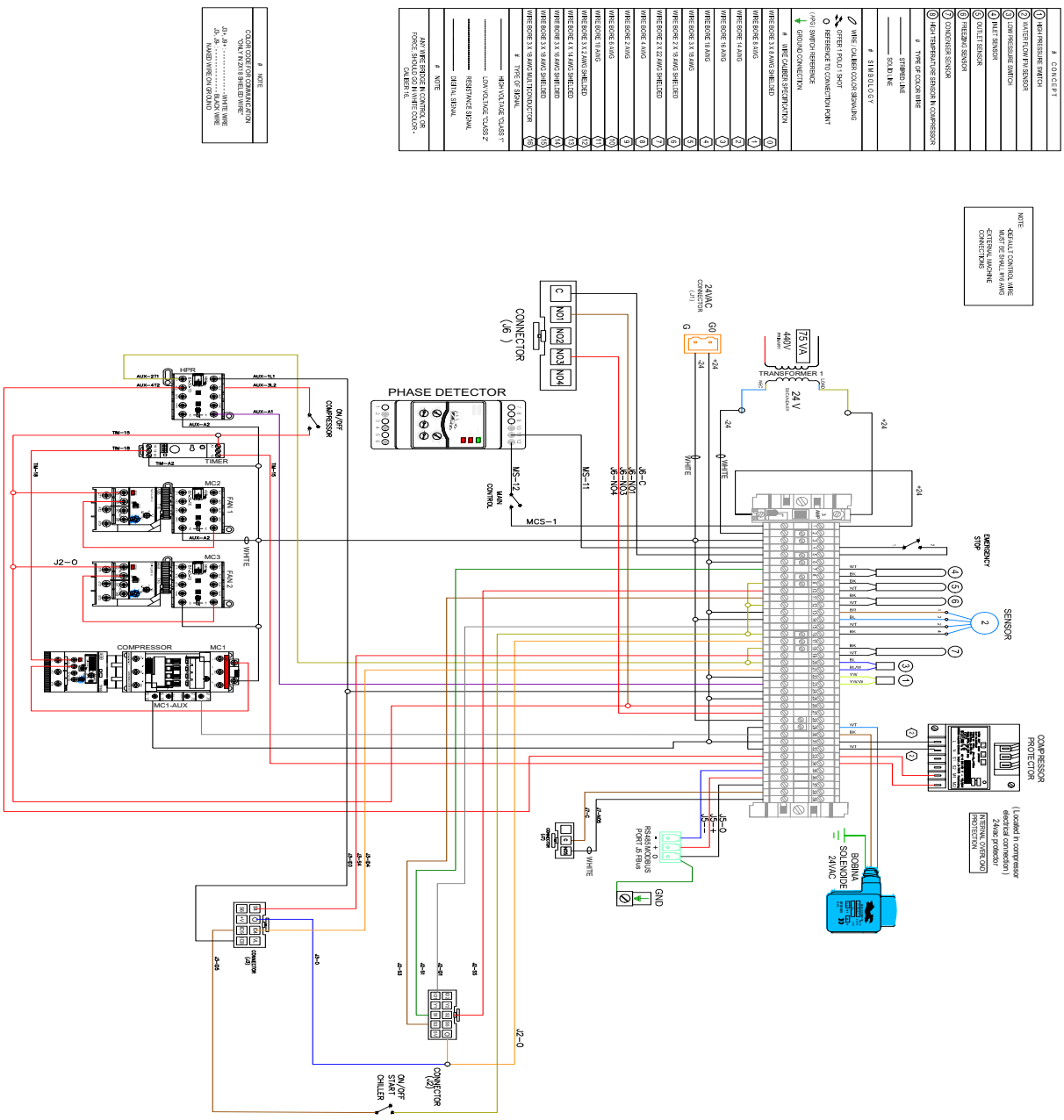
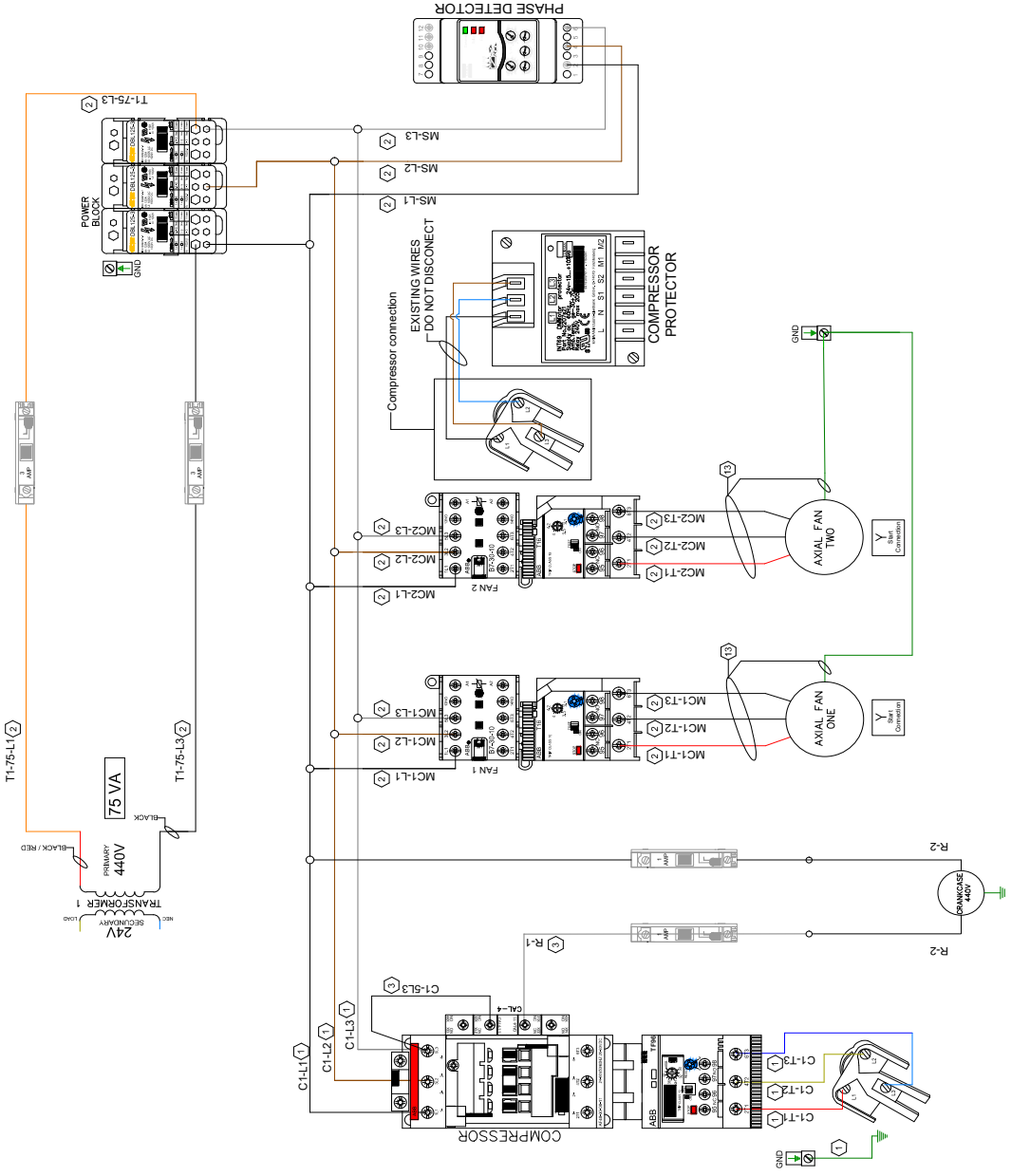

SWITCH DISCONNECTOR (A)
PHASE DETECTOR
POWER BLOCK
EXISTING WIRES DO NOT DISCONECT
Compressor connection
COMPRESSOR PROTECTOR
TRANSFORMER 1
75 VA
PRIMARY 220V
SECUNDARY 24V
AXIAL FAN TWO
AXIAL FAN ONE
FAN 2
FAN 1
COMPRESSOR
RESISTANCE 220V
GND
BLACK
T1-75-L1
T1-75-L3
R-2
R-1
MS-L1
MS-L2
MS-L3
MC2-L1
MC2-L2
MC2-L3
MC2-T1
MC2-T2
MC2-T3
MC1-L1
MC1-L2
MC1-L3
MC1-T1
MC1-T2
MC1-T3
C1-L1
C1-L2
C1-L3
C1-5L3
C1-T1
C1-T2
C1-T3

Figure 9. Typical field wiring diagram of the 440V unit (single point connection with all options shown)




PHASE DETECTOR
T1-75-L3
POWER BLOCK
GND
MS-L3
MS-L2
MS-L1
EXISTING WIRES DO NOT DISCONECT
Compressor connection
COMPRESSOR PROTECTOR
GND
MC2-L3
MC2-L2
MC2-L1
FAN 2
MC2-T3
MC2-T2
MC2-T1
AXIAL FAN TWO
MC1-L3
MC1-L2
MC1-L1
FAN 1
MC1-T3
MC1-T2
MC1-T1
AXIAL FAN ONE
T1-75-L1
T1-75-L3
75 VA
BLACK
BLACK / RED
PRIMARY
440V
TRANSFORMER 1
SECUNDARY
24V
R-2
CRANKCASE HEATER
R-1
C1-5L3
C1-L3
C1-L2
C1-L1
CAL-4
COMPRESSOR
C1-T3
C1-T2
C1-T1
GND

GENERAL DESCRIPTION

MICROCHILLER

µChiller is Carel's solution for the complete management of chillers and air/water and water/water heat pumps. The maximum configuration manages 2 compressors per circuit (On/Off or BLDC), up to a maximum of 2 circuits (using an expansion card for circuit 2).

The distinctive element of µChiller is the complete control of the high efficiency units through the integrated management of electronic expansion valves (ExV) and brushless BLDC compressors, thus ensuring increased compressor protection and reliability and a high efficiency unit.

The user terminal allows wireless connectivity with mobile devices and is integrated on panel-mounted models, or sold separately on DIN-rail mounted models. CAREL's "APPLICA" app, available on Google Play for the Android operating system, makes it easy to configure parameters and commission the unit in the field.

MICROCHILLER CONTROLLER INPUTS AND OUTPUTS

DIGITAL INPUTS	
PORT	DESCRIPTION
ID1	WATER FLOW SENSOR
ID2	HEAT-COLD SWITCH
ID3	LOW PRESSURE SWITCH
ID4	HIGH PRESSURE SWITCH

ANALOG INPUTS	
PORT	DESCRIPTION
S1	WATER INJECTION TEMPERATURE SENSOR
S2	WATER RETURN TEMPERATURE SENSOR
S3	CHILLED WATER TEMPERATURE SENSOR

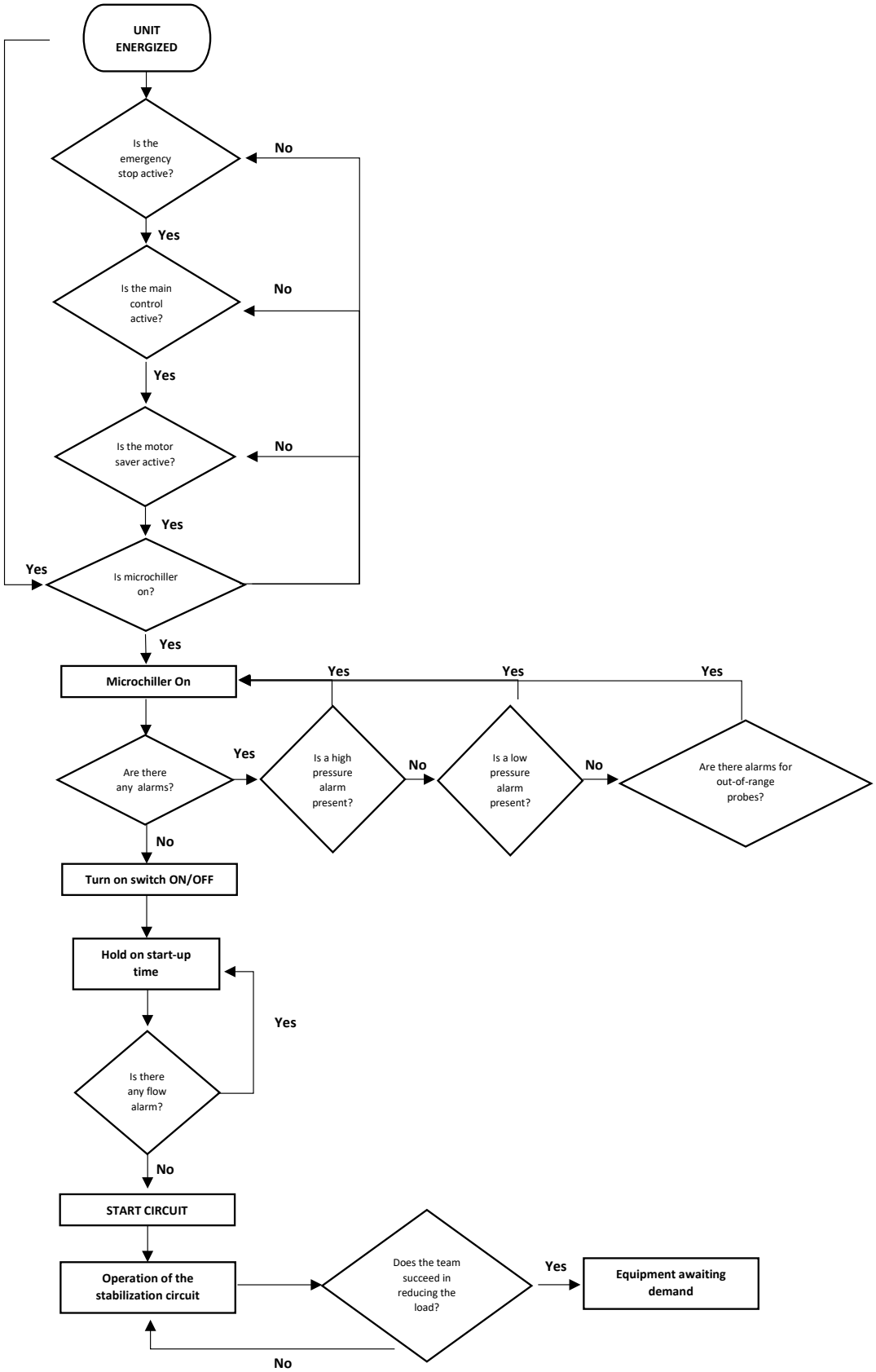
DIGITAL OUTPUTS	
PORT	DESCRIPTION
N01	DIGITAL OUTPUT OF SINGLE STAGE COMPRESSOR
N03	DIGITAL WATER PUMP OUTPUT

BASIC OPERATING PARAMETERS MICROCHILLER

The following parameters are intended for fast equipment startup and unit configuration.

Parameter	Value
U077	0
S068	0
U076	0
C046	1
C047	0
S065	0
S064	0
Hc31	7
Hc32	8
Hc14	1
Hc15	2
Hc06	9
Hc07	4
U006	5.0
U007	20.0
U008	30.0
U009	45.0
Hc013	1

Figure 10. Sequence of operation of the unit.



The calculations in this section are used in unit-level control logic or all-circuit control logic.

EVAPORATOR DELTA T

The Delta T of the evaporator water is calculated as the temperature of the water entering minus that leaving through all circuits.

PENDING LWT

The slope of LWT is calculated such that the slope represents the estimated change in LWT is immediately.

RATE OF DECLINE

The slope value calculated above will be a negative value as the water temperature is falling. The rate of decline is calculated by inverting the slope value and imitating it to a minimum value of 4°C/sec.

ERROR LWT

The LWT error is calculated as LWT - target LWT.

UNIT CAPACITY

Unit capacity is the Delta T of the unit operating for GPM of water.

CONTROLLER CALCULATIONS

Refrigerant saturation temperature

The saturated coolant temperature will be calculated from the pressure sensor readings for each circuit.

Evaporator approach

The evaporator approximation will be calculated for each circuit. The equation is as follows
Evaporator approximation = LWT - Evaporator saturated temperature.

Capacitor approach

The capacitor approximation will be calculated for each circuit. The equation is as follows
Capacitor approximation = Capacitor saturated temperature-OAT.

Suction reheating

The suction superheat shall be calculated for each circuit using the following equation:
Suction superheat = Suction temperature - Evaporator saturated temperature.

Pumping pressure

The pressure at which a circuit will pump down is based on the low pressure set point of the evaporator. The equation is as follows
Pump down pressure = Evaporator low pressure set point - 103KPA (15 PSI)

CIRCUIT LOGIC CONTROL

Circuit enablement

- A circuit must be enabled to start if the following conditions are met:
- The circuit breaker is closed
- No circuit alarms are active
- The circuit mode setpoint is set to Enable
- At least one compressor is enabled to start (according to the enable setpoints)

COMPRESSOR AVAILABILITY

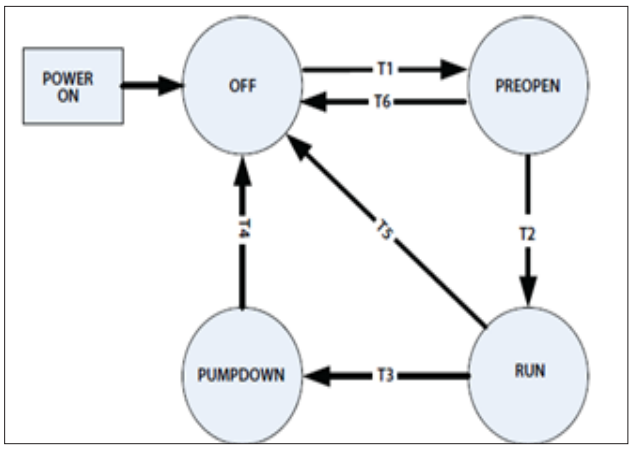
A compressor is considered to be available to start if all of the following are met:

- The corresponding circuit is enabled.
- The corresponding circuit is not in pump down.
- No cycle timers are active for the compressor.
- The corresponding circuit is not in pumping stop state -No cycle timers are active for the compressor.
- Compressor is enabled through the enable set points.
- Compressor is not running.

CIRCUIT STATES

The circuit will always be in one of four states:
Off - The circuit is not running.
Pre-open - The circuit is preparing to start up Running - The circuit is running
Pump off - The circuit is performing a normal shutdown.
The transitions between these states are shown in the diagram on the next page.

Figure 11. Circuit states.



T1 - A la pre-opening

- No compressor is running and any compressor in the circuit is commanded to start (see unit capacity control).

T2 - Pre-open to run

- 5 seconds have elapsed in pre-opening state.

T3 - Run to pump down

Any of the following is required:
- Last compressor in the circuit is commanded to stop.
- Unit status = Pump stopped
- Circuit breaker is open
- Circuit mode is disabled
- Circuit breaker is open -Circuit mode is disabled -Pump down alarm is active

T4 - Pumping down on Off

Any of the following is required:
- Evaporator pressure < Pump downstream pressure value.
- Unit status = Off
- Unit status = Off -Quick circuit shutdown alarm active.

T5 - Run to Off

Any of the following is required:
- Unit status = Off
- Fast circuit shutdown alarm is active
- Low temperature start attempt failed

T6 - Pre-open to Off

Any of the following is required:
- Unit status = Off
- Unit status = Pump off
- Circuit breaker is open
- Circuit mode is disabled
- Circuit quick stop alarm is active
- Pumping alarm is activated

COMPRESSOR CONTROL

Compressors should operate only when the circuit is in the operating or pumping state. They should not operate when the circuit is in any other state.

Compressor start-up

A compressor must start if it receives a start command from the unit capacity control logic.

Compressor shutdown

- A compressor must be shut down if any of the following situations occur:
- The unit's capacity control logic commands it to shut down.
- A discharge alarm occurs and sequencing requires this compressor to be the next compressor to shut down.
- The circuit status is pumping and sequencing requires this compressor to be the next compressor to shut down.

CONTROLLER CALCULATIONS

A minimum time between compressor starts and a minimum time between compressor stop and compressor start will apply. The time values are determined by the start timer and stop timer set points. These cycle timers should not be applied by power cycling the chiller. This means that if the power is cut off, the cycle timers should not be active. These timers can be cleared by a setting on the controller.

CONDENSER FAN CONTROL

The condenser fan control shall start the fans as required whenever the compressors are running in the circuit.
All fans and solenoid valves shall be off when the circuit is in the off and pre-open state.
The digital outputs of the condenser fans will turn on or off immediately for condenser stage changes. The outputs of the capacitor solenoid valves will turn on immediately when a step-up stage requires the output to turn on, but will have a delay to turn off during a step-down stage.
This delay is 20 seconds. If the circuit is turned off, the capacitor solenoid valve outputs will turn off without delay.

OVERHEATING CONTROL STATUS OPERATION

TXV Operation

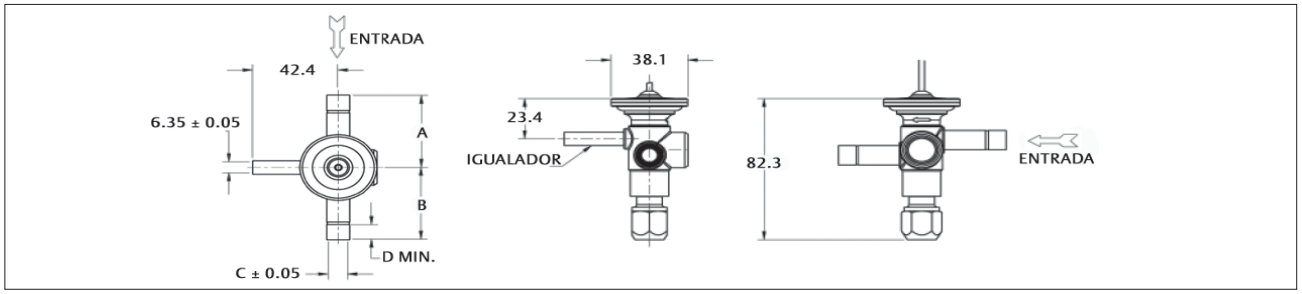
The measurement of refrigerant flow to the evaporator is the exclusive function of a TXV. It must measure this flow at precisely the same rate at which the refrigerant is evaporated by the heat charge.
The TXV does this by maintaining the coil with enough refrigerant to maintain the correct superheat of the suction gas leaving the evaporator coil.
The TXV regulates flow in response to charge superheat.

If it is suspected that a TXV is not operating properly, checking for overheating is the only way to be sure. Do this with precision instrumentation to obtain meaningful results.
Operating overheat of 8°F to 12°F are considered normal. Here are some “tips” to help in detecting and fixing performance failures in a TXV:

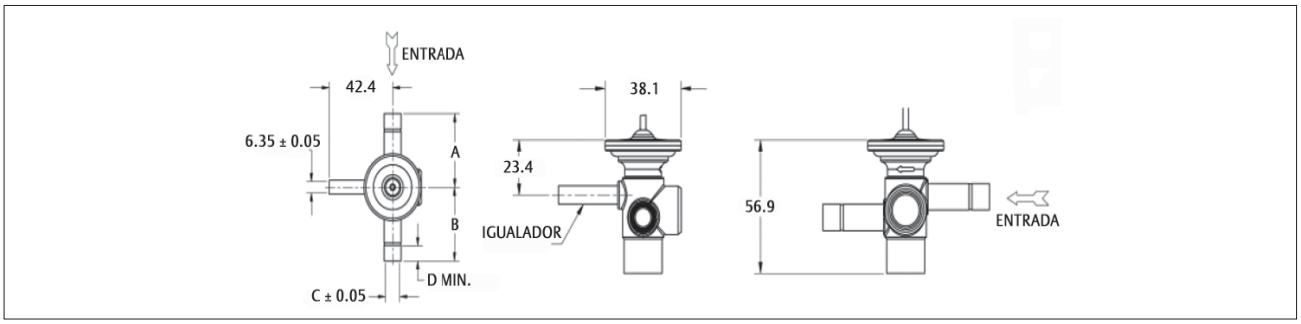
- Check the bulb to make sure it is properly connected to the suction line. If you can move the bulb manually, it is not properly secured.
- The bulb must be perfectly insulated to protect it against the effects of a draft.
- Check the equalizer line for restrictions (kinks) or signs of frost. A frosted equalizer line indicates internal leakage and will require valve replacement. Repair or replacement of a bent equalizer will be necessary for the valve to operate properly.

TXVs are designed to measure liquid refrigerant flow. If the refrigerant at the valve inlet contains flash gas, the valve capacity will be reduced. Make sure that the system is properly charged and that there is some subcooling at the valve inlet before discarding the TXV.

Dimensions (Mm)



Adjustable - ODF connections with 1/4” equalizer



Non-adjustable - Odf connections with 1/4” equalizer

Connections	Dimensions			
	A	B	C	D
3/8 ODF	41.9	41.9	9.6 (3/8)	8.6
1/2 ODF	41.9	41.9	12.8 (1/2)	12.2
5/8 ODF	54.6	54.6	16.0 (5/8)	19.0
7/8 ODF	54.6	54.6	22.3 (7/8)	19.0
1-1/8 ODF	61.0	61.0	28.7 (1-1/8)	23.1

MICROCHILLER CONTROL

Alarm	Description
A05	This alarm indicates when the water return sensor is damaged or broken.
A06	This alarm indicates when the water injection sensor is damaged or broken.
A10	This alarm indicates when there is a problem with or water flow problem.
A12	This alarm usually appears together with the A10 alarm as it depends on the configuration to which the pump was commissioned, otherwise the current equipment containing this controller simply has a pump configured in this case this alarm goes together with the current pump configuration.
A15	This alarm usually appears when the water temperature does not drop due to the current cooling process. This alarm is more of a warning than a serious alarm as it is simply an indicator that the equipment is not cooling and therefore the water temperature is not dropping.
A20	This alarm indicates when the condenser temperature probe is broken or disconnected.
A21	This alarm indicates when the suction temperature probe is broken or disconnected.
A25	This alarm indicates when the high pressure switch has suffered a change in its signal.
A29	This alarm indicates when the low pressure switch is active.

DESCRIPTION OF MICROCHILLER FORNTAL DISPLAY BUTTONS (Stand alone)

Button up

When this button is pressed, you can scroll to the previous parameter and in programming mode it is used to increment the parameter value.

Button down

When this button is pressed, you can scroll to the next parameter and in programming mode it is used to set the parameter value.

Main menu

Pressing this button briefly allows you to return to the main screen of the controller.
By pressing this button for 3 seconds you can access the Setpoint or unit on/off parameters.

Symbol and alarm button

This symbol means that an active alarm is present in the controller and will appear on the main screen with a red led and the alarm description. Briefly pressing this symbol will clear the sound alarm and pressing this button for 3 seconds will reset the alarm in case there is no major alarm or a continuous alarm present.

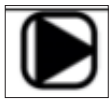
Programming mode access button

This button is used to access the programming mode.

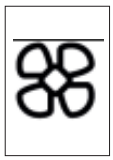
In Programming mode:

When in programming mode pressing this button briefly confirms the parameter value.
When in programming mode pressing this button for 3 seconds will return to the main menu.

ICON DESCRIPTION

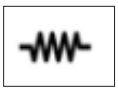


When this icon is present on the controller it means that the pump is active, if the icon is flashing it means that the pump is in a manual mode.

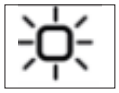


When this icon is present on the controller it means that the fan is active, if the icon is blinking it means that the fan is in manual mode. Currently the fan control of the equipment is electrically linked to the pump start which means that when the pump is turned on the fan is turned on, however this icon is currently represented on the controller as fan present.

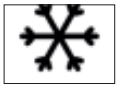
When this icon is present on the controller it means that the compressor is active, if the icon is blinking it means that it is in manual mode.



When this icon is present on the controller it means that the freeze protection process has started, however this symbol is also present when switching from cold to hot.



When this icon is present on the controller it means that the controller is operating in heat mode.



When this icon is present on the controller it means that the controller is operating in cold mode.

When this icon is present on the controller it means that it is in a major alarm, otherwise it may be a damage in the control or it may require some specialized service.

DIRECT ACCESS FUNCTIONS

In order to access the direct access functions without the need for users or passwords press the down button for 3 seconds and the following options will appear such as Setpoint change, This last option is disabled in some units because this option can be done directly from a button located inside the panel which has the purpose of being able to make the change from cold to heat from the unit or otherwise you can also make the change directly from the Carel application which controls the parameterization of the control from a mobile application.

Procedure:

- Press the down arrow button for 3 seconds for 3 seconds.
- To scroll press the keys with the up or down arrow button.
- The PRG or circle button allows you to change the value or save the changes.
- The PRG or circle button pressed for 3 seconds returns to the main screen.

- Go to the main screen.

- This parameter is the current setpoint in COOL mode but read only.

- Press the down arrow key and the SEtC parameter will appear. This parameter is the cooling Setpoint to change from here you can change the Setpoint in COOL mode.

- Press the PRG or circle key: the value on the display will change from static to flashing, at which point you can press the up or down keys to change the setpoint. Once the desired change has been made, momentarily press the PRG or circle key to confirm and save the change.

- Press the down key again and the SEtH menu will appear, this parameter is used to change the setpoint in HEAT mode only when the units have this option available otherwise it will not appear.

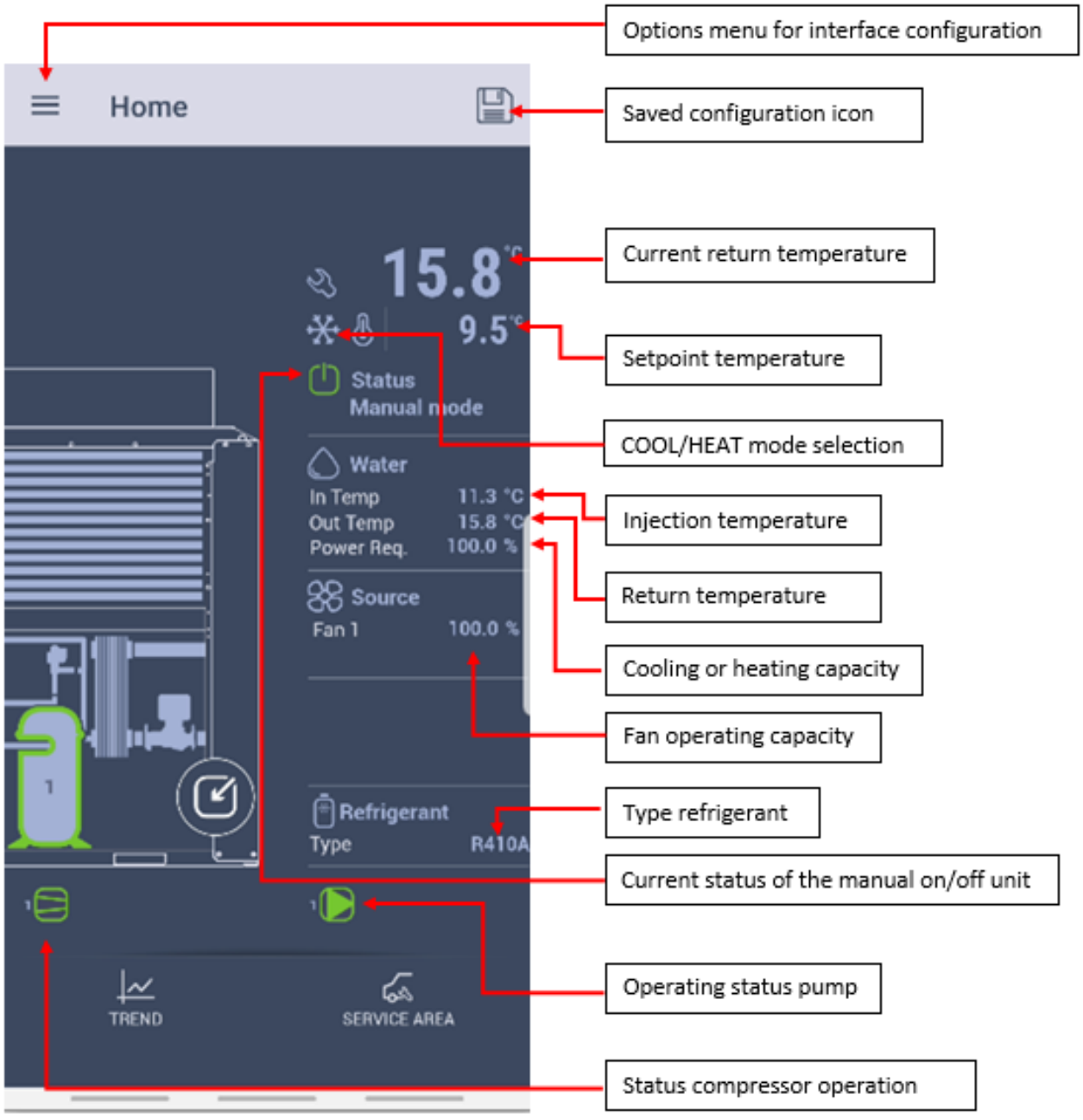
- Press the down key again and the UnST menu will appear, from here you can turn the unit on or off. In some units this parameter is not available because currently there is a switch on the panel to turn the unit on or off, otherwise, this parameter is also linked in the application from the cell phone to be able to turn on or off.

- Press the down key again and the UON menu will appear, from here you can change the units of measurement.

- After the parameters have been set, the output screen will appear on the main screen.

DESCRIPTION OF THE INTERFACE SCREEN OF THE CAREL APPLICATION VIA CELLULAR PHONE

The following image shows the interface of the carel application through Bluetooth communication and monitoring of equipment operation.



NOTE: The microchiller controller cannot be used in tandem units.

Coil Status

Index	Size	Acronym	Data Type	Min Value	Max Value	R/W	Init Value	UoM	Description
0	1	U001	BOOL			R/W	FALSE		U001 - User pump 1 reset hour counters
1	1	U004	BOOL			R/W	FALSE		U004 - User pump 2 reset hour counters
2	1	U010	BOOL			R/W	FALSE		U010 - Enable set point compensation (0=Disabled, 1=Enabled)
3	1	U017	BOOL			R/W	FALSE		U017 - Enable scheduler (0=Disabled, 1=Enabled)
4	1	U022	BOOL			R/W	FALSE		U022 - Type of scheduling (0=Switch OFF, 1=Change set point)
5	1	U034	BOOL			R/W	FALSE		U034 - Cool/heat changeover type (0=keypad, 1=DIn)
6	1	U036	BOOL			R/W	FALSE		U036 - Startup control probe (0=Return, 1=Delivery)
7	1	U038	BOOL			R/W	TRUE		U038 - Run control probe (0=Return, 1=Delivery)
8	1	U057	BOOL			R/W	FALSE		U057 - Remote alarm input logic (0=N.C., 1=N.O.)
9	1	U058	BOOL			R/W	TRUE		U058 - Cool/Heat input logic (0=N.O., 1=N.C.)
10	1	U059	BOOL			R/W	TRUE		U059 - Remote unit ON/OFF input logic (0=N.O., 1=N.C.)
11	1	U060	BOOL			R/W	FALSE		U060 - User pump flow input logic (0=N.C., 1=N.O.)
12	1	U061	BOOL			R/W	FALSE		U061 - User pump overload input logic (0=N.C., 1=N.O.)
13	1	U062	BOOL			R/W	TRUE		U062 - 2nd set point input logic (0=N.O., 1=N.C.)
14	1	U063	BOOL			R/W	FALSE		U063 - User pump output logic (0=N.O., 1=N.C.)
15	1	U064	BOOL			R/W	FALSE		U064 - Global alarm relay output logic (0=N.C., 1=N.O.)
16	1	U065	BOOL			R/W	FALSE		U065 - Free-Cooling valve output logic (0=N.O., 1=N.C.)
17	1	U066	BOOL			R/W	FALSE		U066 - Frost heater output logic (0=N.O., 1=N.C.)
18	1	U067	BOOL			R/W	FALSE		U067 - Alarm relay configuration (0=Control alarms, 1=All alarms)
19	1	U068	BOOL			R/W	FALSE		U068 - Enable Free-Cooling (0=Disabled, 1=Enabled)
20	1	E000	BOOL			R/W	FALSE		E000 - ExV circ.1 enable manual mode
21	1	E002	BOOL			R/W	FALSE		E002 - ExV circ.2 enable manual mode
22	1	Hd06	BOOL			R/W	FALSE		Hd06 - Enable capacity request from BMS (0=Disabled, 1=Enabled)
23	1	C001	BOOL			R/W	FALSE		C001 - Comp.1 circ.1 reset hour counters
24	1	C004	BOOL			R/W	FALSE		C004 - Comp.2 circ.1 reset hour counters
25	1	C007	BOOL			R/W	FALSE		C007 - Comp.1 circ.2 reset hour counters
26	1	C010	BOOL			R/W	FALSE		C010 - Comp.2 circ.2 reset hour counters
27	1	C034	BOOL			R/W	FALSE		C034 - High press. switch input logic (0=N.C., 1=N.O.)
28	1	C035	BOOL			R/W	FALSE		C035 - Comp. overload input logic (0=N.C., 1=N.O.)
29	1	C036	BOOL			R/W	FALSE		C036 - Comp. output logic (0=N.O., 1=N.C.)
30	1	C044	BOOL			R/W	FALSE		C044 - Enable circuit destabilisation (0=Disabled, 1=Enabled)
31	1	S001	BOOL			R/W	FALSE		S001 - Source pump 1 reset hour counters
33	1	S009	BOOL			R/W	FALSE		S009 - Source fan 1 circ.1 reset hour counters
34	1	S013	BOOL			R/W	FALSE		S013 - Source fan 1 circ.2 reset hour counters
35	1	S020	BOOL			R/W	FALSE		S020 - Enable low noise (0=Disabled, 1=Enabled)
37	1	S043	BOOL			R/W	FALSE		S043 - Enable sliding defrost (0=Disabled, 1=Enabled)
38	1	S055	BOOL			R/W	FALSE		S055 - Comp. behavior in post-defrost phase (0=Comp. is OFF, 1=Comp. is switched ON)
39	1	S061	BOOL			R/W	FALSE		S061 - Source fan output logic (0=N.O., 1=N.C.)
40	1	S062	BOOL			R/W	FALSE		S062 - Source pump output logic (0=N.O., 1=N.C.)
41	1	S063	BOOL			R/W	FALSE		S063 - Reverse valve output logic (0=N.O., 1=N.C.)
42	1	S064	BOOL			R/W	FALSE		S064 - Source flow type (0=Independent, 1=Common)
44	1	S065	BOOL			R/W	FALSE		S065 - Source fan type (0=Inverter, 1=ON/OFF)
45	1	rStr	BOOL			R/W	FALSE		rStr - Restore application to Carel settings (0=Disabled, 1=Enabled)
46	1	S068	BOOL			R/W	FALSE		S068 - Source type (0=Air, 1=Water)
47	1	UoM	BOOL			R/W	FALSE		UoM - Unit of measure used for Display 2-Row and BMS, not for Applica (0=°C/bar, 1=°F/PSI)
48	1	Hd07	BOOL			R/W	FALSE		Hd07 - BMS port database type (0= 32bit, 1= 16bit)
49	1	F027	BOOL			R/W	FALSE		F027 - Compressor with capacity control
50	1	Hc13	BOOL			R/W	TRUE		Hc13 - Enable buzzer (0=Disabled, 1=Enabled)
52	1	Ha02	BOOL			R/W	FALSE		Ha02 - Set controller internal clock (0=No set, 1=Set)
53	1	Hd03	BOOL			R/W	TRUE		#N/D
54	1	UnSt	BOOL			R/W	FALSE		UnSt - Unit ON/OFF command from keypad (0=OFF 1=ON)
55	1	ModE	BOOL			R/W	FALSE		ModE - Cool/Heat mode from keypad (0=Cool, 1=Heat)
56	1	RES	BOOL			R/W	FALSE		RES - Reset active alarms from BMS net (0=NO, 1=Reset)
57	1	DevRotReq_ Comp1Circ1	BOOL			R/W			Request comp.1 circ.1 by DeviceRotation

Index	Size	Acronym	Data Type	Min Value	Max Value	R/W	Init Value	UoM	Description
58	1	DevRotReq_ Comp2Circ1	BOOL			R/W			Request comp.2 circ.1 by DeviceRotation
59	1	ClrH	BOOL			R/W	FALSE		ClrH - Delete alarms log (0=No, 1=Yes)
60	1	UnitOn_Slv	BOOL			R/W			Unit ON/OFF status (0=OFF, 1=ON) sent to Secondary board
61	1	UsrPmp2_On_Slv	BOOL			R/W			Command to manage user pump 2 (Secondary board)
62	1	AFreezeHeat_Slv	BOOL			R/W			Command to manage the frost heater (Secondary board)
63	1	Hd05	BOOL			R/W	FALSE		Hd05 - Enable unit ON/OFF command by BMS net (0=Disabled, 1=Enabled)
64	1	BmsOnOff	BOOL			R/W			Unit On/Off command from BMS (0=OFF, 1=ON)
65	1	HeatCool_Slv	BOOL			R/W			Unit in cooling mode sent to secondary board (0=Heating, 1=Cooling)
66	1	P016	BOOL			R/W	FALSE		P016 - Oil equalisation solenoid valve circ.1 output logic (0=NC, 1=NO)
67	1	P017	BOOL			R/W	TRUE		P017 - Enable oil equalisation function (0=OFF, 1=ON)
68	1	P018	BOOL			R/W	FALSE		P018 - Enable oil recovery function (0=OFF, 1=ON)
69	1	P034	BOOL			R/W	FALSE		P034 - Enable cranckcase heater (0=OFF, 1=ON)
70	1	Al_SrsUnit_StopSlv	BOOL			R/W			Main sends Serious alarm to stop Secondary
71	1	CompCfg_BLDC. En_VaporInjection	BOOL			R/W	FALSE		#N/D
72	1	SlaveTyp_OnOff	BOOL			R/W	FALSE		Secondary type (0=Secondary connected to CORE-1 with Rotation, 1= Secondary connected to CORE-0 with EasyRot for ON/OFF)
73	1	ManInstDef_PWRP	BOOL			R/W			Request default installation of Power+ circ.1
74	1	MC_UnitTyp	BOOL			R/W	FALSE		MC unit(0= NO, 1= YES)
75	1	En_uC2SE	BOOL			R/W	FALSE		#N/D
76	1	C051	BOOL			R/W	FALSE		C051 - Low press. switch input logic (0=N.C., 1=N.O.)
77	1	F003	BOOL			R/W	FALSE		F003 - Evaporator number uC2SE (0=1, 1=2)
78	1	F020	BOOL			R/W	TRUE		F020 - Remote compressor command input logic (0=N.C., 1=N.O.)
79	1	F007	BOOL			R/W	FALSE		F007 - S4 probe fitted on source exchanger [uCH2SE] (0= NO, 1=YES: in CH read cond., in HP read evap.)
80	1	U078	BOOL			R/W	FALSE		U078 - Enable burst function (0=Disabled, 1=Enabled)
81	1	F016	BOOL			R/W	FALSE		F016 - Heaters active during defrost (0=OFF, 1=ON)
82	1	F017	BOOL			R/W	FALSE		F017 - User fan device activation mode (0=Always ON, 1=ON by control)
83	1	UsrHeater1	BOOL			R/W	FALSE		UsrHeater1 - User heater 1 status
84	1	F011	BOOL			R/W	FALSE		F011 - Heater output logic (0=N.O., 1=N.C.)
85	1	F023	BOOL			R/W	FALSE		F023 - Correspondence D.I. to D.O. compressors (for MC units only) (0=FALSE, 1=TRUE)
87	1	UsrFanON	BOOL			R/W	FALSE		UsrFanON - User fan ON
88	1	FC_Agree	BOOL			R/W			Free cooling condition exists (0=FC not possible; 1=FC possible)
89	1	En_SrcRetTempPrb	BOOL			R/W	FALSE		En_SrcRetTempPrb - Connected source return temperature probe
90	1	WaitOtherDevCirc1_ SmartOpnExV	BOOL			R/W			0
91	1	LowNoiseActive	BOOL			R/W	FALSE		Low noise function active
92	1	S073	BOOL			R/W	FALSE		S073 - Compressor status at defrost in (0 : Minimum speed, 1: OFF)
93	1	U082	BOOL			R/W	FALSE		U082 - Frost measurement type (0=ON EVAP., 1=ON WATER)
94	1	F028	BOOL			R/W	FALSE		F028 - Air heating: Control temp. probe for user heaters (0=ROOM, 1=DELIVERY)
95	1	AFreezeHeatUsr	BOOL			R/W			User frost heater status
97	1	AFreezeHeatSrc	BOOL			R/W			Source frost heater status
96	1	S066	BOOL			R/W	TRUE		S066 - Source water flow type (0=Independent, 1=Common)
117	1	S074	BOOL			R/W	FALSE		S074 - Source fan/pmp alarm input logic (0=N.C., 1=N.O.)
121	1	U093	BOOL			R/W	FALSE		U093 - Flow alarm management

Holding Register

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
0	2	Ha00	DATE_ AND_TIME			R/W	0		Ha00 - New date and time to set on the controller's internal clock
2	1	U000	UINT(0..999)			R/W	99	HOUR	U000 - User pump 1 maintenance hour threshold (x100)
3	1	U002	UINT(0..2)			R/W	0		U002 - User pump 1/fan manual mode (0=AUTO, 1=OFF, 2=ON)
4	1	U003	UINT(0..999)			R/W	0	HOUR	U003 - User pump 2 maintenance hour threshold (x100)
5	1	U005	UINT(0..2)			R/W	0		U005 - User pump 2 manual mode (0=AUTO, 1=OFF, 2=ON)
6	1	U083	USINT(0..3)			R/W	0		U083 - Automatic changeover type
7	2	U006	REAL			R/W	5	CELSIUS	U006 - Cool set point low limit
9	2	U007	REAL			R/W	20	CELSIUS	U007 - Cool set point high limit
11	2	U008	REAL			R/W	30	CELSIUS	U008 - Heat set point low limit
13	2	U009	REAL			R/W	45	CELSIUS	U009 - Heat set point high limit
15	2	U011	REAL			R/W	25	CELSIUS	U011 - Start temp. for cool set point compensation
17	2	U012	REAL			R/W	10	CELSIUS	U012 - End temp. for cool set point compensation
19	2	U013	REAL			R/W	5	DELTAKELVIN	U013 - Max compensation for cool set point
21	2	U014	REAL			R/W	5	CELSIUS	U014 - Start temp. for heat set point compensation
23	2	U015	REAL			R/W	-10	CELSIUS	U015 - Outside temp. diff. for heat set point compensation
25	2	U016	REAL			R/W	5	DELTAKELVIN	U016 - Max compensation for heat set point
27	1	U018	UINT			R/W	0	HOUR	Time band hours
28	1	U019	UINT			R/W	0	MINUTE	Time band minutes
29	1	U020	UINT			R/W	0	HOUR	Time band hours
30	1	U021	UINT			R/W	0	MINUTE	Time band minutes
31	2	U023	REAL			R/W	10	CELSIUS	U023 - 2nd cool set point
33	2	U024	REAL			R/W	35	CELSIUS	U024 - 2nd heat set point
35	1	U025	USINT(0..2)			R/W	0		U025 - Analogue set point input type (0=0-5V, 1=0-10V, 2=4-20mA)
36	1	F008	UINT(0..999)			R/W	10	SECOND	F008 - Antifrezee alarm delay
37	2	U026	REAL			R/W	5	CELSIUS	U026 - Remote set point min value
39	2	U027	REAL			R/W	35	CELSIUS	U027 - Remote set point max value
41	1	S023	UINT			R/W	0	HOUR	Time band hours
42	1	S024	UINT			R/W	0	MINUTE	Time band minutes

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
43	2	U028	REAL			R/W	0	DELTAKELVIN	U028 - Remote set point offset
48	1	E046	UINT	0	35	R/W	1		E046 - ExV valve type for EVD EVO (1=CAREL EXV, ...)
49	2	U031	REAL			R/W	10	DELTAKELVIN	U031 - High water temp. set point offset
51	1	U032	USINT(0..99)			R/W	15	MINUTE	U032 - High water temp. startup delay
52	1	U033	UINT(0..999)			R/W	180	SECOND	U033 - High water temp.run delay
53	1	U035	UINT(0..999)			R/W	1	MINUTE	U035 - Changeover delay time
54	1	U037	UINT(0..999)			R/W	180	SECOND	U037 - Delay time between Startup PID and Run PID
55	2	U039	REAL			R/W	8.3		U039 - Startup PID Kp
57	1	U040	UINT(0..999)			R/W	180	SECOND	U040 - Startup PID Ti
58	1	U041	UINT(0..99)			R/W	0	SECOND	U041 - Startup PID Td
59	2	U042	REAL			R/W	10		U042 - Run PID Kp
61	1	U043	UINT(0..999)			R/W	120	SECOND	U043 - Run PID Ti
62	1	U044	UINT(0..99)			R/W	0	SECOND	U044 - Run PID Td
63	1	U045	UINT(0..999)			R/W	10	SECOND	U045 - User pump flow alarm startup delay
64	1	U046	UINT(0..99)			R/W	3	SECOND	U046 - User pump flow alarm run delay
65	1	U047	UINT(0..999)			R/W	30	SECOND	U047 - Comp. ON delay after user pump ON
66	1	U048	UINT(0..999)			R/W	180	SECOND	U048 - User pump delay OFF from comp. OFF
67	1	U049	UINT(0..999)			R/W	5	HOUR	U049 - User pump rotation time
68	2	U050	REAL			R/W	-0.8	CELSIUS	U050 - User frost alarm threshold
70	2	U051	REAL			R/W	30	DELTAKELVIN	U051 - User frost alarm differential
72	1	U052	UINT(0..999)			R/W	30	SECOND	U052 - User frost alarm delay time at 1K below threshold
73	2	U053	REAL			R/W	4	CELSIUS	U053 - Frost (with unit OFF) set point
75	2	U054	REAL			R/W	2	DELTAKELVIN	U054 - Frost (with unit OFF) differential
78	1	DFr	USINT(0..3)			R/W	0		DFr - Force manual defrost (0= None, 1= Force defrost on circ. 1, 2= Force defrost on circ. 2, 3= Force defrost on all circuits)
79	2	U055	REAL			R/W	0	DELTAKELVIN	U055 - Probe offset for return water temp. from user
83	2	U056	REAL			R/W	0	DELTAKELVIN	U056 - Probe offset for delivery water temp. to user
85	2	U069	REAL			R/W	3	DELTAKELVIN	U069 - Delta temp. to activate Free Cooling
87	2	U070	REAL			R/W	1.5	DELTAKELVIN	U070 - Free-Cooling ON/OFF hysteresis
89	2	U071	REAL			R/W	8	DELTAKELVIN	U071 - Delta temp. Free-Cooling design (to reach unit nominal capacity)
91	2	U072	REAL			R/W	5	CELSIUS	U072 - Free Cooling limit threshold (used to close FC valve: because FC gives water with very low temp.)
93	2	U073	REAL			R/W	3	DELTAKELVIN	U073 - Free-Cooling limit differential
95	1	U074	USINT(0..2)			R/W	0		U074 - Free-Cooling type (0=Air, 1=Remote air coil, 2=Water)
96	1	U075	USINT(0..2)			R/W	2		U075 - Frost type (0=Heater, 1=Pump, 2=Heater-Pump)
97	1	U076	USINT(1..2)			R/W	1		U076 - User pump number
98	1	U077	USINT	0	2	R/W	0		U077 - Unit type (0=CH, 1=HP, 2=CH/HP, 3=MC CH, 4=MC CH/HP, 5=A/A CH, 6=A/A CH/HP, 7=W/W CH/HP with water reverse)
99	1	E001	UINT(0..65535)			R/W	0	STEPS	E001 - ExV circ.1 manual mode steps
100	1	E003	UINT(0..65535)			R/W	0	STEPS	E003 - ExV circ.2 manual mode steps
101	2	E004	REAL			R/W	6	DELTAKELVIN	E004 - ExV SH set point in cool
103	2	E005	REAL			R/W	15		E005 - ExV SH control Kp in cool
105	2	E006	REAL			R/W	150	SECOND	E006 - ExV SH control Ti in cool
107	2	E007	REAL			R/W	1	SECOND	E007 - ExV SH control Td in cool
109	2	E008	REAL			R/W	6	DELTAKELVIN	E008 - ExV SH set point in heat
111	2	E009	REAL			R/W	15		E009 - ExV SH control Kp in heat
113	2	E010	REAL			R/W	150	SECOND	E010 - ExV SH control Ti in heat
115	2	E011	REAL			R/W	1	SECOND	E011 - ExV SH control Td in heat
117	2	E012	REAL			R/W	1	DELTAKEL-VIN	E012 - ExV low SH threshold in cool
119	2	E013	REAL			R/W	10	SECOND	E013 - ExV low SH Ti in cool
121	2	E014	REAL			R/W	1	DELTAKELVIN	E014 - ExV low SH threshold in heat
123	2	E015	REAL			R/W	10	SECOND	E015 - ExV low SH Ti in heat
125	2	E016	REAL			R/W	-5	CELSIUS	E016 - ExV LOP control threshold in cool
127	2	E017	REAL			R/W	5	SECOND	E017 - ExV LOP control Ti in cool
129	2	E018	REAL			R/W	-50	CELSIUS	E018 - ExV LOP control threshold in heat
131	2	E019	REAL			R/W	5	SECOND	E019 - EEV LOP control Ti in heat
133	2	E020	REAL			R/W	30	CELSIUS	E020 - ExV MOP control threshold in cool
135	2	E021	REAL			R/W	15	SECOND	E021 - ExV MOP control Ti in cool
137	2	E022	REAL			R/W	20	CELSIUS	E022 - ExV MOP control threshold in heat
139	2	E023	REAL			R/W	15	SECOND	E023 - ExV MOP control Ti in heat
141	1	E024	UINT(0..18000)			R/W	300	SECOND	E024 - ExV low SH alarm delay time
142	1	E025	UINT(0..18000)			R/W	300	SECOND	E025 - ExV LOP alarm delay time
143	1	E026	UINT(0..18000)			R/W	300	SECOND	E026 - ExV MOP alarm delay time
144	1	E032	UINT(0..100)			R/W	100	PERCENT	E032 - ExV startup valve opening % (capacity ratio EVAP / EEV) in cool
145	1	E033	UINT(0..100)			R/W	100	PERCENT	E033 - ExV startup valve opening % (capacity ratio EVAP / EEV) in heat
146	1	E034	UINT(0..18000)			R/W	6	SECOND	E034 - ExV control delay after pre-positioning
147	1	Hd00	USINT(1..247)			R/W	1		Hd00 - BMS port serial address
148	1	Hd01	USINT(3..7)			R/W	4		Hd01 - BMS port baud rate (3=9600, 4=19200, 5=38400, 6=57600, 7=115200)
149	1	Hd02	USINT(0..5)			R/W	1		Hd02 - BMS port network settings (0=8-NONE-1, 1=8-NONE-2, 2=8-EVEN-1, 3=8-EVEN-2, 4=8-ODD-1, 5=8-ODD-2)
153	1	C000	UINT(0..999)			R/W	99	HOUR	C000 - Comp.1 circ.1 maintenance hour threshold (x100)
154	1	C002	USINT(0..2)			R/W	0		C002 - Comp.1 circ.1 manual mode (0=AUTO, 1=OFF, 2=ON)
155	1	C003	UINT(0..999)			R/W	99	HOUR	C003 - Comp.2 circ.1 maintenance hour threshold (x100)
156	1	C005	USINT(0..2)			R/W	0		C005 - Comp.2 circ.1 manual mode (0=AUTO, 1=OFF, 2=ON)
157	1	C006	UINT(0..999)			R/W	99	HOUR	C006 - Comp.1 circ.2 maintenance hour threshold (x100)
158	1	C008	USINT(0..2)			R/W	0		C008 - Comp.1 circ.2 manual mode (0=AUTO, 1=OFF, 2=ON)
159	1	C009	UINT(0..999)			R/W	99	HOUR	C009 - Comp.2 circ.2 maintenance hour threshold (x100)
160	1	C011	USINT(0..2)			R/W	0		C011 - Comp.2 circ.2 manual mode (0=AUTO, 1=OFF, 2=ON)
162	1	C012	UINT(0..999)			R/W	180	SECOND	C012 - Comp. min On time
163	1	C013	UINT(0..999)			R/W	60	SECOND	C013 - Comp. min Off time
164	1	C014	UINT(0..999)			R/W	360	SECOND	C014 - Min time between On of same comp.

Mapping Table

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
165	1	C015	UINT(5..999)			R/W	30	SECOND	C015 - Comp. load up time
166	1	C016	UINT(5..999)			R/W	10	SECOND	C016 - Comp. load down time
167	1	S021	UINT			R/W	0	HOUR	Time band hours
168	1	C020	UINT(5..999)			R/W	720	MINUTE	C020 - Circuit destabilisation max time with one or more comp. OFF
169	1	C021	USINT(0..1)			R/W	0		C021 - Circuit capacity distribution (0=Equalised, 1=Grouped)
170	2	C022	REAL			R/W	0	DELTAKELVIN	C022 - Discharge temp. probe offset for circ.1
172	2	C023	REAL			R/W	0	DELTAKELVIN	C023 - Suction temp. probe offset for circ.1
174	2	C024	REAL			R/W	0	DELTAKELVIN	C024 - Discharge temp. probe offset for circ.2
176	2	C025	REAL			R/W	0	DELTAKELVIN	C025 - Suction temp. probe offset for circ.2
178	2	C026	REAL			R/W	0	BAR	C026 - Discharge press. probe offset for circ.1
180	2	C027	REAL			R/W	0	BAR	C027 - Suction press. probe offset for circ.1
182	2	C028	REAL			R/W	0	DELTAKELVIN	C028 - Cond. temp. probe offset for circ.1
184	2	C029	REAL			R/W	0	DELTAKELVIN	C029 - Evap. temp. probe offset for circ.1
186	2	C030	REAL			R/W	0	BAR	C030 - Discharge press. probe offset for circ.2
188	2	C031	REAL			R/W	0	BAR	C031 - Suction press. probe offset for circ.2
190	2	C032	REAL			R/W	0	DELTAKELVIN	C032 - Cond. temp. probe offset for circ.2
192	2	C033	REAL			R/W	0	DELTAKELVIN	C033 - Evap. temp. probe offset for circ.2
194	1	C037	USINT(0..1)			R/W	0		C037 - Suction press. probe type (0=0..5V, 1=4..20mA)
195	2	C038	REAL			R/W	0	BAR	C038 - Suction press. probe min value
197	2	C039	REAL			R/W	17.3	BAR	C039 - Suction press. probe max value
199	1	C040	USINT(0..1)			R/W	0		C040 - Discharge press. probe type (0=0..5V, 1=4..20mA)
200	2	C041	REAL			R/W	0	BAR	C041 - Discharge press. probe min value
202	2	C042	REAL			R/W	45	BAR	C042 - Discharge press. probe max value
204	1	C043	USINT(0..1)			R/W	1		C043 - Discharge temp. probe type (0=NTC, 1=NTC-HT)
206	1	C046	USINT(1..2)			R/W	1		C046 - Number of circuit in the unit
207	1	C047	USINT	2	3	R/W	2		C047 - Type of compressors used (0=1 ON/OFF, 1=2 ON/OFF, 2=BLDC, 3=BLDC + ON/OFF)
208	1	C048	USINT(1..2)			R/W	1		C048 - Compressor rotation type (1=FIFO, 2=TIME)
209	1	S000	UINT(0..999)			R/W	99	HOUR	S000 - Source pump 1 maintenance hour threshold (x100)
210	1	S002	UINT(0..2)			R/W	0		S002 - Source pump 1 manual mode (0=AUTO, 1=OFF, 2=ON)
212	1	S022	UINT			R/W	0	MINUTE	Time band minutes
213	1	S072	USINT(0..2)			R/W	0		S072 - Source pump activation (0=always on, 1=on with compressor, 2=modulate on discharge)
214	1	S008	UINT(0..999)			R/W	99	HOUR	S008 - Source fan 1 circ.1 maintenance hour threshold (x100)
215	1	S010	USINT(0..2)			R/W	0		S010 - Source fan ON/OFFcirc.1 manual mode (0=AUTO, 1=OFF, 2=ON)
216	1	S011	USINT(0..101)			R/W	0	PERCENT	S011 - Source fan inverter circ.1 manual mode (0=AUTO, 1=0%, 2=1%, .. 101=100%)
217	1	S012	UINT(0..999)			R/W	0	HOUR	S012 - Source fan 1 circ.2 maintenance hour threshold (x100)
218	1	S014	USINT(0..2)			R/W	0		S014 - Source fan ON/OFF circ.2 manual mode (0=AUTO, 1=OFF, 2=ON)
219	1	S015	USINT(0..101)			R/W	0	PERCENT	S015 - Source fan inverter circ.2 manual mode (0=AUTO, 1=0%, 2=1%, .. 101=100%)
220	2	S016	REAL			R/W	-5	CELSIUS	S016 - Source fan temp. threshold for cold climates
222	2	S017	REAL			R/W	10	PERCENT	S017 - Source fan min speed for cold climates
224	2	S018	REAL			R/W	50	PERCENT	S018 - Source fan speed up speed for cold climates
226	1	S019	UINT(0..300)			R/W	5	SECOND	S019 - Source fan speed up time for cold climates
229	2	Sprb	REAL			R	0	CELSIUS	SPrb - Source external air temperature
231	2	S025	REAL			R/W	45	CELSIUS	S025 - Low noise source fan set point in cooling
233	1	S026	UINT(0..999)			R/W	30	SECOND	S026 - Comp. ON delay after source pump ON
234	1	S027	UINT(0..999)			R/W	10	SECOND	S027 - Source pump delay OFF from comp. OFF
235	2	S028	REAL			R/W	30	CELSIUS	S028 - Source device cool set point
237	2	S029	REAL			R/W	10	CELSIUS	S029 - Source device heat set point
239	1	U081	USINT(0..7)			R/W	0		U081 - Pressure alarm reset configuration
240	1	Hc71	USINT(0..3)			R/W	1		Hc71 - Analogue output 1 config. (0= Not used, 1=Source pump - Source fan on/off, 2=Source fan mod, 3=Free cooling valve)
241	2	S031	REAL			R/W	45	CELSIUS	S031 - Source fan cool set point at startup
243	1	S032	UINT(0..999)			R/W	240	SECOND	S032 - Source fan cool startup delay
244	1	Hc81	USINT(0..2)			R/W	1		Hc81 - Analogue output 1 secondary config. (0= Not used, 1=Source fan on/off, 2=Source fan mod)
245	1	Hc72	USINT(0..3)			R/W	1		Hc72 - Analogue output 2 config. (0= Not used, 1=Source pump - Source fan on/off, 2=Source fan mod, 3=Free cooling valve)
246	2	S034	REAL			R/W	15	DELTAKELVIN	S034 - Source device cool differential
248	2	S035	REAL			R/W	5	DELTAKELVIN	S035 - Source device heat differential
250	2	S036	REAL			R/W	20	PERCENT	S036 - Source fan inverter min speed
252	2	S037	REAL			R/W	80	PERCENT	S037 - Source fan inverter max speed
254	2	S039	REAL			R/W	-1	CELSIUS	S039 - Defrost start threshold
256	2	S040	REAL			R/W	1	CELSIUS	S040 - Defrost start threshold reset
258	1	S041	UINT(0..999)			R/W	30	MINUTE	S041 - Defrost start delay
259	2	S042	REAL			R/W	52	CELSIUS	S042 - Defrost end threshold
261	1	S044	UINT(0..999)			R/W	20	SECOND	S044 - Defrost begin delay before actuating the 4 way valve
262	1	S045	UINT(0..999)			R/W	30	SECOND	S045 - Defrost ending delay after actuating the 4 way valve
263	1	S046	UINT(0..99)			R/W	1	MINUTE	S046 - Defrost min duration
264	1	S047	UINT(0..99)			R/W	5	MINUTE	S047 - Defrost max duration
265	1	S048	UINT(0..999)			R/W	90	SECOND	S048 - Dripping duration
266	1	S049	UINT(0..999)			R/W	30	SECOND	S049 - Post dripping duration
267	1	S050	UINT(0..999)			R/W	20	MINUTE	S050 - Delay between defrosts
268	1	C049	UINT(0..999)			R/W	90	SECOND	C049 - Low pressure alarm start delay
269	1	C050	UINT(0..999)			R/W	15	SECOND	C050 - Low pressure alarm run delay
270	1	F024	USINT			R/W	0		F024 - Heater 1 manual mode (0=AUTO, 1=OFF, 2=ON)
271	1	F025	USINT			R/W	0		F025 - Heater 2 manual mode (0=AUTO, 1=OFF, 2=ON)
272	1	S053	USINT(0..2)			R/W	0		S053 - Defrost synchronisation type (0=Independent, 1=Separate, 2=Simultaneous)
274	2	S054	REAL			R/W	3	BAR	S054 - Delta press. to reverse the 4 way valve

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
276	1	Hc82	USINT(0..2)			R/W	1		Hc82 - Analogue output 2 secondary config. (0= Not used, 1=Source fan on/off, 2=Source fan mod)
277	1	AI_CfgLim-Max_Grp3	USINT			R/W	9		AI_CfgLimMax_Grp3 - Lim max probe group 3
278	1	S056	UINT(20..999)			R/W	20	SECOND	S056 - Duration of smart start function
279	2	S057	REAL			R/W	-0.8	CELSIUS	S057 - Source frost alarm threshold
281	2	S058	REAL			R/W	30	DELTAKEL-VIN	S058 - Source frost alarm differential
283	1	S059	UINT(0..999)			R/W	30	SECOND	S059 - Source frost alarm delay time at 1K below threshold
284	2	S060	REAL			R/W	0	DELTAKEL-VIN	S060 - Source external air temperature offset
286	1	Hc00	USINT	0	4	R/W	1		Hc00 - Analogue input 3 config. (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7= Return water temp. from user, 8= Delivery water temp. to user)
287	1	AI_CfgLim-Max_Grp3_Slv	USINT			R/W	11		AI_CfgLimMax_Grp3 - Lim max probe group 3 secondary
288	1	Hc03	USINT	0	2	R/W	0		Hc03 - Analogue input 6 config. (0= Not used, 1= Source water delivery temp., 2= Outside temp.,3= Remote set point, 4= Discharge temp., 5= Condensing. temp., 6= Suction temp., 7= Evaporation temp., 8= Condensing press., 9= Evaporating press., 10= Return water temp. from user, 11= Delivery water temp. to user, 12= Capacity request from AIN)
289	1	Hc04	USINT	0	1	R/W	0		Hc04 - Analogue input 7 config. (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7= Return water temp. from user, 8= Delivery water temp. to user)
290	1	Hc05	USINT	0	1	R/W	0		Hc05 - Analogue input 6 config. on Secondary board (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Remote set point, 4= Discharge temp., 5= Condensing. temp., 6= Suction temp., 7= Evaporation temp., 8= Condensing press., 9= Evaporating press., 10= Common delivery temp., 11= Delivery water evap.2 temp., 12= Capacity request from AIN)
291	1	Hc06	USINT	0	6	R/W	1		Hc06 - Digital input 4 config. (0=Not used, 1=User flow switch, 2=Comp.1 circ.1 overload, 3=Comp.2 circ.1 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 1, 12=Remote cmd 2, 13=Source alarm)
292	1	Hc07	USINT	0	6	R/W	5		Hc07 - Digital input 5 config. (0=Not used, 1=User flow switch, 2=Comp.1 circ.1 overload, 3=Comp.2 circ.1 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 1, 12=Remote cmd 2, 13=Source alarm)
293	1	Hc08	USINT	0	6	R/W	4		Hc08 - Digital input 6 config. (0=Not used, 1=User flow switch, 2=Comp.1 circ.1 overload, 3=Comp.2 circ.1 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 1, 12=Remote cmd 2, 13=Source alarm)
294	1	Hc09	USINT	0	5	R/W	0		Hc09 - Digital input 4 config. on Secondary board (0=Not used, 1=User flow switch, 2=Comp.1 circ.2 overload, 3=Comp.2 circ.2 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 3, 12=Remote cmd 4, 13=Source alarm)
295	1	Hc10	USINT	0	5	R/W	0		Hc10 - Digital input 5 config. on Secondary board (0=Not used, 1=User flow switch, 2=Comp.1 circ.2 overload, 3=Comp.2 circ.2 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 3, 12=Remote cmd 4, 13=Source alarm)
296	1	Hc11	USINT	0	5	R/W	0		Hc11 - Digital input 6 config. on Secondary board (0=Not used, 1=User flow switch, 2=Comp.1 circ.2 overload, 3=Comp.2 circ.2 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 3, 12=Remote cmd 4, 13=Source alarm)
297	1	Hc14	USINT			R/W	1		Hc14 - Digital input 1 config. (0=Not used, 1=User flow switch, 2=Comp.1 circ.1 overload, 3=Comp.2 circ.1 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 1, 12=Remote cmd 2, 13=Source alarm)
298	1	Hc15	USINT			R/W	2		Hc15 - Digital input 2 config. (0=Not used, 1=User flow switch, 2=Comp.1 circ.1 overload, 3=Comp.2 circ.1 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 1, 12=Remote

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
299	1	Hc16	USINT			R/W	0		Hc16 - Digital input 1 config. on Secondary board (0=Not used, 1=User flow switch, 2=Comp.1 circ.2 overload, 3=Comp.2 circ.2 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 3, 12=Remote cmd 4, 13=Source alarm)
300	1	Hc17	USINT			R/W	0		Hc17 - Digital input config. on Secondary board (0=Not used, 1=User flow switch, 2=Comp.1 circ.2 overload, 3=Comp.2 circ.2 overload, 4=Remote ON/OFF, 5=Cool/Heat, 6=2nd set point, 7=Remote alarm, 8=User pump 1 overload, 9=LP pressure switch, 10=User pump 2 overload, 11=Remote cmd 3, 12=Remote cmd 4, 13=Source alarm)
301	1	AI_CfgLim-Max_Grp2	USINT			R/W	8		AI_CfgLimMax_Grp2 - Lim max probe group 2
302	1	He00	UINT(0..9999)			R/W	1		He00 - USER profile password
303	1	He01	UINT(0..9999)			R/W	0		He01 - SERVICE profile password
304	1	He02	UINT(0..9999)			R/W	1234		He02 - MANUFACTURER profile password
305	2	Hd04	STRING[4]			R/W	0		Hd04 - NFC password
307	2	SEtC	REAL			R/W	7	CELSIUS	SEtC - Cool set point
309	2	SEtH	REAL			R/W	40	CELSIUS	SEtH - Heat set point
311	1	AI_CfgLim-Max_Grp1	USINT			R/W	8		AI_CfgLimMax_Grp1 - Lim max probe group 1
324	2	C017	REAL			R/W	65	CELSIUS	C017 - Threshold of max high pressure (HP)
326	2	C018	REAL			R/W	0.2	BAR	C018 - Threshold of min low pressure (LP)
328	1	E047	USINT(0..2)			R/W	0		E047 - Type of ExV driver (0= Disabled, 1= EVD embedded, 2=EVD EVO)
331	2	BMS_PwrReq	REAL					PERCENT	Capacity request using BMS net
335	2	P000	REAL			R/W	-25	CELSIUS	P000 - Evaporating min temp. custom envelope limit
337	2	P001	REAL			R/W	70	CELSIUS	P001 - Condensing max temp. custom envelope limit
339	1	P002	UINT(0..999)			R/W	15	SECOND	P002 - Prevent min duration
340	1	P003	UINT(0..999)			R/W	120	SECOND	P003 - Out of envelope alarm delay time
341	1	P004	UINT(0..999)			R/W	60	SECOND	P004 - Low pressure difference alarm delay
342	2	P005	REAL			R/W	35	RPS	P005 - Circuit destabilisation min BLDC speed threshold
344	2	P006	REAL			R/W	35	PERCENT	P006 - Oil recovery min request for activation
346	2	P007	REAL			R/W	35	RPS	P007 - Oil recovery min comp. speed for activation
348	1	P008	UINT(0..999)			R/W	15	MINUTE	P008 - Oil recovery time before activation in which the comp. can run at min speed
349	1	P009	UINT(0..999)			R/W	3	MINUTE	P009 - Oil recovery duration in which the comp. speed is forced
350	2	P010	REAL			R/W	50	RPS	P010 - Oil recovery comp. speed in which the comp. is forced
352	1	P011	UINT(0..999)			R/W	30	SECOND	P011- Oil equalisation startup time for solenoid valve on comp. starts
353	1	P012	UINT(0..999)			R/W	3	SECOND	P012 - Oil equalisation solenoid valve open time
354	1	P013	UINT(0..999)			R/W	1	MINUTE	P013 - Oil equalisation solenoid valve min off time
355	1	P014	UINT(0..999)			R/W	20	MINUTE	P014 - Oil equalisation solenoid valve max off time
356	1	P015	UINT(0..999)			R/W	20	MINUTE	P015 - Oil equalisation max time for management
357	1	P019	USINT(0..101)			R/W	0	PERCENT	P019 - Compressor 1 circuit 1 manual mode (0=AUTO, 1=0%, ... 101=100%)
358	1	P020	USINT(0..101)			R/W	0	PERCENT	P020 - Compressor 1 circuit 2 manual mode (0=AUTO, 1=0%, ... 101=100%)
359	2	P021	REAL			R/W	0	KILOPASCAL	P021 - Max permitted Delta P to start up
361	1	P022	UINT			R/W	0	SECOND	P022 - Max EVD pre-opening time to equalise pressure
362	1	P023	UINT			R/W	0	PERCENT	P023 - EVD pre-opening in case of pre-start to equalise pressure
363	2	P024	REAL			R/W	0	RPS	P024 - Start-up speed
365	2	P025	REAL			R/W	0	RPS	P025 - Max custom speed (rps)
367	2	P026	REAL			R/W	0	RPS	P026 - Min custom speed (rps)
369	2	P027	REAL			R/W	45	PERCENT	P027 - BLDC speed request threshold % to call on
371	2	P028	REAL			R/W	90	PERCENT	P028 - BLDC speed threshold to call on fixed speed compressor
373	2	P029	REAL			R/W	30	PERCENT	P029 - BLDC speed threshold to switch off fixed speed compressor
375	2	P030	REAL			R/W	0		P030 - Skip frequency: set 1 [010]
377	2	P031	REAL			R/W	0		P031 - Skip frequency: band 1 [011]
379	1	P032	UINT			R/W	0		P032 - Enable motor overtemperature alarm (PTC) (0=OFF, 1=ON) [027]
380	1	P033	UINT			R/W	0		P033 - Motor overtemperature alarm delay [028]
382	2	S051	REAL			R/W	80	RPS	S051 - BLDC defrost speed
384	2	S052	REAL			R/W	40	RPS	S052 - BLDC cycle reverse speed in defrost
386	40	Ha01	STRING			R/W	0		New time zone to set for the controller's internal clock
705	2	E048	REAL			R/W	1	DELTAKELVIN	E048 - RESERVED, Delta evap. temp. (Smart opening ExV)
707	2	E049	REAL			R/W	0.2	DELTAKELVIN	E049 - RESERVED, Delta suction temp. (Smart opening ExV)
709	1	U079	UINT(1..15)			R/W	3	MINUTE	U079 - Burst funct. time for unit pump on
710	1	U080	UINT(3..99)			R/W	15	MINUTE	U080 - Burst funct. time for unit pump off
711	2	F009	REAL			R/W	14	CELSIUS	F009 - Delivery air min. temp. threshold
713	2	F010	REAL			R/W	4	DELTAKELVIN	F010 - Delivery limit proportional band
715	1	ID_CfgLim-Max_Slv	USINT			R/W	0		ID_CfgLimMax_Slv - Lim digital input
716	2	F012	REAL			R/W	1	DELTAKELVIN	F012 - Heater offset in cool
718	2	F013	REAL			R/W	0.5	DELTAKELVIN	F013 - Heater differential in cool
720	2	F014	REAL			R/W	3	DELTAKELVIN	F014 - Heater offset in heat
722	2	F015	REAL			R/W	1	DELTAKELVIN	F015 - Heater differential in heat
724	2	F018	REAL			R/W	40	CELSIUS	F018 - Hot-Start set point
726	2	F019	REAL			R/W	5	DELTAKELVIN	F019 - Hot-Keep differential
728	2	F021	REAL			R/W	0	DELTAKELVIN	F021 - Common delivery user water temp. probe offset
730	2	F022	REAL			R/W	0	DELTAKELVIN	F022 - Evap.2 frost temp. probe offset

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
732	2	S070	REAL			R/W	0	DELTAKEL-VIN	S070 - Cond.1 frost temp. probe offset
734	2	S071	REAL			R/W	0	DELTAKEL-VIN	S071 - Cond.2 frost temp. probe offset
736	2	S069	REAL			R/W	0	CELSIUS	S069 - Temperature set point for fan-defrost function (0=Function disabled)
738	2	UsrDlvW-Temp_ FromMst	REAL					CELSIUS	Delivery water temperature to user received from Main (Single evaporator)
740	1	Hc51	USINT(0..11)			R/W	1		Hc51 - Digital output 1 config. (0= Not used, 1=Comp. 1 circ. 1, 2=Comp. 2 circ. 1, 3=User heater step 1, 4=User pump 1, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve, 9=Freecooling valve, 10=General alarm, 11=User pump 2
741	1	Hc52	USINT(0..11)			R/W	1		Hc52 - Digital output 2 config. (0= Not used, 1=Comp. 1 circ. 1, 2=Comp. 2 circ. 1, 3=User heater step 1, 4=User pump 1, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve, 9=Freecooling valve, 10=General alarm, 11=User pump 2
742	1	Hc53	USINT(0..11)			R/W	1		Hc53 - Digital output 3 config. (0= Not used, 1=Comp. 1 circ. 1, 2=Comp. 2 circ. 1, 3=User heater step 1, 4=User pump 1, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve, 9=Freecooling valve, 10=General alarm, 11=User pump 2
743	1	Hc54	USINT(0..11)			R/W	1		Hc54 - Digital output 4 config. (0= Not used, 1=Comp. 1 circ. 1, 2=Comp. 2 circ. 1, 3=User heater step 1, 4=User pump 1, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve, 9=Freecooling valve, 10=General alarm, 11=User pump 2
744	1	Hc55	USINT(0..11)			R/W	1		Hc55 - Digital output 5 config. (0= Not used, 1=Comp. 1 circ. 1, 2=Comp. 2 circ. 1, 3=User heater step 1, 4=User pump 1, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve, 9=Freecooling valve, 10=General alarm, 11=User pump 2
745	1	Hc56	USINT(0..11)			R/W	1		Hc56 - Digital output 6 config. (0= Not used, 1=Comp. 1 circ. 1, 2=Comp. 2 circ. 1, 3=User heater step 1, 4=User pump 1, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve, 9=Freecooling valve, 10=General alarm, 11=User pump 2
746	1	Hc61	USINT(0..8)			R/W	1		Hc61 - Digital output 1 secondary config. (0= Not used, 1=Comp. 1 circ. 2, 2=Comp. 2 circ. 2, 3=User heater step 2, 4=User pump 2, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve
747	1	Hc62	USINT(0..8)			R/W	1		Hc62 - Digital output 2 secondary config. (0= Not used, 1=Comp. 1 circ. 2, 2=Comp. 2 circ. 2, 3=User heater step 2, 4=User pump 2, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve
748	1	Hc63	USINT(0..8)			R/W	1		Hc63 - Digital output 3 secondary config. (0= Not used, 1=Comp. 1 circ. 2, 2=Comp. 2 circ. 2, 3=User heater step 2, 4=User pump 2, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve
749	1	Hc64	USINT(0..8)			R/W	1		Hc64 - Digital output 4 secondary config. (0= Not used, 1=Comp. 1 circ. 2, 2=Comp. 2 circ. 2, 3=User heater step 2, 4=User pump 2, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve
750	1	Hc65	USINT(0..8)			R/W	1		Hc65 - Digital output 5 secondary config. (0= Not used, 1=Comp. 1 circ. 2, 2=Comp. 2 circ. 2, 3=User heater step 2, 4=User pump 2, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve
751	1	Hc66	USINT(0..8)			R/W	1		Hc66 - Digital output 6 secondary config. (0= Not used, 1=Comp. 1 circ. 2, 2=Comp. 2 circ. 2, 3=User heater step 2, 4=User pump 2, 5=Source, 6=Frost heater, 7=4way valve, 8=Oil equal. valve
752	1	Hc31	USINT			R/W	0		Hc31 - Analogue input 1 config. (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7= Return water temp. from user, 8= Delivery water temp. to user)
753	1	Hc32	USINT			R/W	0		Hc32 - Analogue input 2 config. (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7= Return water temp. from user, 8= Delivery water temp. to user)
754	1	Hc34	USINT			R/W	0		Hc34 - Analogue input 4 config. (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing. temp., 5= Suction temp., 6= Evaporation temp., 7= Condensing press., 8= Evaporating press., 9= Return water temp. from user, 10= Delivery water temp. to user)
755	1	Hc35	USINT			R/W	0		Hc35 - Analogue input 5 config. (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing. temp., 5= Suction temp., 6= Evaporation temp., 7= Condensing press., 8= Evaporating press., 9= Return water temp. from user, 10= Delivery water temp. to user)
756	1	Hc41	USINT			R/W	0		Hc41 - Analogue input 1 config. on Secondary board (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7=Common delivery temp., 8= Delivery water evap.2 temp.)
757	1	Hc42	USINT			R/W	0		Hc42 - Analogue input 2 config. on Secondary board (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7=Common delivery temp., 8= Delivery water evap.2 temp.)

Mapping Table

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
758	1	Hc43	USINT			R/W	0		Hc43 - Analogue input 3 config. on Secondary board (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7=Common delivery temp., 8= Delivery water evap.2 temp.)
759	1	Hc44	USINT			R/W	0		Hc44 - Analogue input 4 config. on Secondary board (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing. temp., 5= Suction temp., 6= Evaporation temp., 7= Condensing press., 8= Evaporating press., 9= Common delivery temp., 10= Delivery water evap.2 temp.)
760	1	Hc45	USINT			R/W	0		Hc45 - Analogue input 5 config. on Secondary board (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing. temp., 5= Suction temp., 6= Evaporation temp., 7= Condensing press., 8= Evaporating press., 9= Common delivery temp., 10= Delivery water evap.2 temp.)
761	1	Hc47	USINT			R/W	0		Hc47 - Analogue input 7 config. on Secondary board (0= Not used, 1= Source water delivery temp., 2= Outside temp., 3= Discharge temp., 4= Condensing temp., 5= Suction temp., 6= Evaporation temp., 7=Common delivery temp., 8= Delivery water evap.2 temp.)
762	1	AI_CfgLim-Max_Grp2_Slv	USINT			R/W	10		AI_CfgLimMax_Grp2 - Lim max probe group 2 secondary
763	1	AI_CfgLim-Max_Grp1_Slv	USINT			R/W	8		AI_CfgLimMax_Grp1 - Lim max probe group 1 secondary
764	1	UnitTyp_Lim-Max	USINT			R/W	4		UnitTyp_LimMax - Lim max unit type
765	2	U084	REAL			R/W	23	CELSIUS	U084 - Automatic changever threshold (type 1) (°C)
767	2	SEtU	REAL			R/W	23	CELSIUS	SEtU - Automatic changeover set point (type 2,3) (°C)
769	1	U088	USINT(0..2)			R/W	0		U088 - Frost heater position
770	2	F026	REAL			R/W	-40	CELSIUS	F026 - Compressor cut-off by outside temperature
772	2	U085	REAL			R/W	2	DELTAKEL-VIN	U085 - Automatic changeover deadband (°C)
774	2	U086	REAL			R/W	5	CELSIUS	U086 - Automatic changeover set point low limit (°C)
776	2	U087	REAL			R/W	20	CELSIUS	U087 - Automatic changeover set point high limit (°C)
818	2	U090	REAL			R/W	0	PERCENT	U090 - Analogue capacity request offset
820	2	U091	REAL			R/W	0	PERCENT	U091 - Analogue capacity request min value
822	2	U092	REAL			R/W	100	PERCENT	U092 - Analogue capacity request max value
817	1	U089	USINT(0..2)			R/W	0		U089 - Analogue capacity request input type (0=0-5V, 1=0-10V, 2=4-20mA)
788	1	Hc90	USINT	0	8	R/W	0		HC90 - Display value selection - Large area
789	1	Hc91	USINT	0	8	R/W	0		Hc91 - Display value selection - Small area

Input Register

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
0	2	HuP1	UDINT			R	0	HOUR	HuP1 - User pump 1 operating hours
2	2	HuP2	UDINT			R	0	HOUR	HuP2 - User pump 2 operating hours
4	2	H1C1	UDINT			R	0	HOUR	H1C1 - Comp.1 circ.1 operating hours
6	2	H1C2	UDINT			R	0	HOUR	H1C2 - Comp.2 circ.1 operating hours
8	2	H2C1	UDINT			R	0	HOUR	H2C1 - Comp.1 circ.2 operating hours
10	2	H2C2	UDINT			R	0	HOUR	H2C2 - Comp.2 circ.2 operating hours
12	2	dSt1	REAL			R	0	CELSIUS	dSt1 - Discharge temp. probe on circ.1
14	2	Sct1	REAL			R	0	CELSIUS	Sct1 - Suction temp. on circ.1
16	2	dSt2	REAL			R	0	CELSIUS	dSt2- Discharge temp. probe on circ.2
18	2	Sct2	REAL			R	0	CELSIUS	Sct2 - Suction temp. on circ.2
20	2	dSP1	REAL			R	0	BAR	dSP1 - Discharge press. probe on circ.1
22	2	ScP1	REAL			R	0	BAR	ScP1 - Suction press. on circ.1
24	2	Cnd1	REAL			R	0	CELSIUS	Cnd1 - Cond. temp. probe (or press. probe converted value) on circ.1
26	2	EuP1	REAL			R	0	CELSIUS	EuP1 - Evap. temp. probe (or press. probe converted value) on circ.1
28	2	dSP2	REAL			R	0	BAR	dSP2 - Discharge press. probe on circ.2
30	2	ScP2	REAL			R	0	BAR	ScP2 - Suction press. on circ.2
32	2	Cnd2	REAL			R	0	CELSIUS	Cnd2 - Cond. temp. probe (or press. probe converted value) on circ.2
34	2	EuP2	REAL			R	0	CELSIUS	EuP2 - Evap. temp. probe (or press. probe converted value) on circ.2
36	2	HSP1	UDINT			R	0	HOUR	HSP1 - Source pump 1 operating hours
38	1	C045	UINT			R	0		C045 - Refrigerant type (3=R407C, 4=R410a, 6=R290, 10=R744, 22=R32)
39	1	UnitCompTyp_Lim-Max	USINT			R	0		UnitCompTyp_LimMax - Limit max of UnitCompTyp variable
40	2	HFn1	UDINT			R	0	HOUR	HFn1 - Source fan 1 circ.1 operating hours
42	2	HFn2	UDINT			R	0	HOUR	HFn2 - Source fan 1 circ.2 operating hours
46	2	SEtA	REAL			R	0	CELSIUS	SEtA - Actual set point used by temp. control
48	2	SSH1	REAL			R	0	DELTAKELVIN	SSH1 - Suction superheat on circ.1
50	1	Opn1	UINT			R	0	PERCENT	Opn1 - EEV position on circ.1
51	2	SSH2	REAL			R	0	DELTAKELVIN	SSH2 - Suction superheat on circ.2
53	1	Opn2	UINT			R	0	PERCENT	Opn2 - EEV position on circ.2
54	2	rUSr	REAL			R	0	CELSIUS	rUSr - Return water temp. from user
56	2	dUSr	REAL			R	0	CELSIUS	dUSr - Delivery water temperature to user

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
211	2	PwrRunCircs_Perc	REAL			R	0	PERCENT	PwrRunCircs_Perc - Circuit capacity percentage by compressors ON
213	2	AFC2	REAL			R	0	CELSIUS	AFC2 - Cond.2 frost temp
215	2	AFE1	REAL			R	0	CELSIUS	AFE1 - Evap.1 frost temp.
217	2	AFC1	REAL			R	0	CELSIUS	AFC1 - Cond.1 frost temp
219	1	IOprbCfgWrn	UINT			R	0		IOcfgPrbWrn - I/O probe configuration warnings
220	2	W_UsrTempRegPID	REAL			R	0	CELSIUS	W_UsrTempRegPID - Water temperature value used by control
226	1	DfrStatus_Circ1	UINT						Defrost status of circ 1
227	2	AIN_PwrReq_Circ1	REAL			R	0	PERCENT	Capacity request using analogue input on circuit 1
231	1	SWverEXP	UINT			R	0		Firmware B version on expansion board
232	1	SWverMAIN	UINT			R	0		Firmware B version on main board
233	1	PWRP_ErrCode_Circ1	UDINT	-	-	R	-	-	Power+ circuit 1 error code
234	1	PWRP_ErrCode_Circ2	UDINT	-	-	R	-	-	Power+ circuit 2 error code

Input Status

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	InitValue	UoM	Description
0	1	A01	BOOL			R	FALSE		Unit - Error in the number of retain memory writes
1	1	A02	BOOL			R	FALSE		Unit - Error in retain memory writes
2	1	A03	BOOL			R	FALSE		Unit - Remote alarm by digital input
3	1	A04	BOOL			R	FALSE		Unit - Remote set point out of range alarm
4	1	A05	BOOL			R	FALSE		Unit - User return water temperature probe broken or disconnected alarm
5	1	A06	BOOL			R	FALSE		Unit - User delivery water temperature probe broken or disconnected alarm
6	1	A07	BOOL			R	FALSE		Unit - Tank temperature probe broken or disconnected alarm
7	1	A08	BOOL			R	FALSE		Unit - User pump 1 overload
8	1	A09	BOOL			R	FALSE		Unit - User pump 2 overload
9	1	A10	BOOL			R	FALSE		Unit - Flow switch alarm, no flow present with user pump 1 active
10	1	A11	BOOL			R	FALSE		Unit - Flow switch alarm, no flow present with user pump 2 active
11	1	A12	BOOL			R	FALSE		Unit - User pump group alarm
12	1	A13	BOOL			R	FALSE		Unit - User 1 pump maintenance
13	1	A14	BOOL			R	FALSE		Unit - User 2 pump maintenance
14	1	A15	BOOL			R	FALSE		Unit - High chilled water temperature
15	1	A16	BOOL			R	FALSE		Unit - Source return water/air temperature probe broken or disconnected alarm
16	1	A17	BOOL			R	FALSE		Unit - Source 1 pump maintenance
17	1	A18	BOOL			R	FALSE		Unit - Free cooling fault
18	1	A19	BOOL			R	FALSE		Circuit 1 - Discharge pressure probe broken or disconnected alarm
19	1	A20	BOOL			R	FALSE		Circuit 1 - Condensing temperature probe broken or disconnected alarm
20	1	A21	BOOL			R	FALSE		Circuit 1 - Suction pressure probe broken or disconnected alarm
21	1	A22	BOOL			R	FALSE		Circuit 1 - Evaporation temperature probe broken or disconnected alarm
22	1	A23	BOOL			R	FALSE		Circuit 1 - Discharge temperature probe broken or disconnected alarm
23	1	A24	BOOL			R	FALSE		Circuit 1 - Suction temperature probe broken or disconnected alarm
24	1	A25	BOOL			R	FALSE		Circuit 1 - High pressure alarm from pressure switch
25	1	A26	BOOL			R	FALSE		Circuit 1 - High pressure alarm from transducer
26	1	A27	BOOL			R	FALSE		Circuit 1 - Low pressure alarm from transducer
27	1	A28	BOOL			R	FALSE		Circuit 1 or unit - Frost evaporation temperature alarm
28	1	A29	BOOL			R	FALSE		Circuit 1 - Low pressure alarm from pressure switch
29	1	A30	BOOL			R	FALSE		Circuit 1 - Overload compressor 1
30	1	A31	BOOL			R	FALSE		Circuit 1 - Overload compressor 2
31	1	A32	BOOL			R	FALSE		Circuit 1 - Compressor 1 maintenance
32	1	A33	BOOL			R	FALSE		Circuit 1 - Compressor 2 maintenance
33	1	A34	BOOL			R	FALSE		Circuit 1 - Source fan 1 maintenance
34	1	A35	BOOL			R	FALSE		Circuit 1 EVD - Low superheat (SH)
35	1	A36	BOOL			R	FALSE		Circuit 1 EVD - Low evaporation pressure (LOP)
36	1	A37	BOOL			R	FALSE		Circuit 1 EVD - Maximum evaporating pressure (MOP)
37	1	A38	BOOL			R	FALSE		Circuit 1 EVD - Valve motor error
38	1	A39	BOOL			R	FALSE		Circuit 1 EVD - Emergency closing
39	1	A40	BOOL			R	FALSE		Circuit 1 EVD - Incomplete valve closing
40	1	A41	BOOL			R	FALSE		Circuit 1 EVD - Offline
41	1	A42	BOOL			R	FALSE		Circuit 1 Envelope - General alarm + Zone alarm
42	1	A43	BOOL			R	FALSE		Circuit 1 BLDC - Delta pressure greater than the allowable at startup
43	1	A44	BOOL			R	FALSE		Circuit 1 BLDC - Starting failure
44	1	A45	BOOL			R	FALSE		Circuit 1 BLDC - Low differential pressure
45	1	A46	BOOL			R	FALSE		Circuit 1 BLDC - High discharge gas temperature
46	1	A47	BOOL			R	FALSE		Circuit 1 Inverter - Offline
47	1	A48	BOOL			R	FALSE		Circuit 1 Inverter - General alarm + Error code
48	1	A49	BOOL			R	FALSE		Unit - Secondary board is offline
49	1	A50	BOOL			R	FALSE		Unit - Error in the number of retain memory writes on Secondary board
50	1	A51	BOOL			R	FALSE		Unit - Error in retain memory writes on Secondary board

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	Init Value	UoM	Description
211	2	PwrRunCircs_Perc	REAL			R	0	PERCENT	PwrRunCircs_Perc - Circuit capacity percentage by compressors ON
213	2	AFC2	REAL			R	0	CELSIUS	AFC2 - Cond.2 frost temp
215	2	AFE1	REAL			R	0	CELSIUS	AFE1 - Evap.1 frost temp.
217	2	AFC1	REAL			R	0	CELSIUS	AFC1 - Cond.1 frost temp
219	1	IOprbCfgWrn	UINT			R	0		IOcfgPrbWrn - I/O probe configuration warnings
220	2	W_UsrTempRegPID	REAL			R	0	CELSIUS	W_UsrTempRegPID - Water temperature value used by control
226	1	DfrStatus_Circ1	UINT						Defrost status of circ 1
227	2	AIN_PwrReq_Circ1	REAL			R	0	PERCENT	Capacity request using analogue input on circuit 1
231	1	SWverEXP	UINT			R	0		Firmware B version on expansion board
232	1	SWverMAIN	UINT			R	0		Firmware B version on main board
233	1	PWRP_ErrCode_Circ1	UDINT	-	-	R	-	-	Power+ circuit 1 error code
234	1	PWRP_ErrCode_Circ2	UDINT	-	-	R	-	-	Power+ circuit 2 error code

Input Status

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	InitValue	UoM	Description
0	1	A01	BOOL			R	FALSE		Unit - Error in the number of retain memory writes
1	1	A02	BOOL			R	FALSE		Unit - Error in retain memory writes
2	1	A03	BOOL			R	FALSE		Unit - Remote alarm by digital input
3	1	A04	BOOL			R	FALSE		Unit - Remote set point out of range alarm
4	1	A05	BOOL			R	FALSE		Unit - User return water temperature probe broken or disconnected alarm
5	1	A06	BOOL			R	FALSE		Unit - User delivery water temperature probe broken or disconnected alarm
6	1	A07	BOOL			R	FALSE		Unit - Tank temperature probe broken or disconnected alarm
7	1	A08	BOOL			R	FALSE		Unit - User pump 1 overload
8	1	A09	BOOL			R	FALSE		Unit - User pump 2 overload
9	1	A10	BOOL			R	FALSE		Unit - Flow switch alarm, no flow present with user pump 1 active
10	1	A11	BOOL			R	FALSE		Unit - Flow switch alarm, no flow present with user pump 2 active
11	1	A12	BOOL			R	FALSE		Unit - User pump group alarm
12	1	A13	BOOL			R	FALSE		Unit - User 1 pump maintenance
13	1	A14	BOOL			R	FALSE		Unit - User 2 pump maintenance
14	1	A15	BOOL			R	FALSE		Unit - High chilled water temperature
15	1	A16	BOOL			R	FALSE		Unit - Source return water/air temperature probe broken or disconnected alarm
16	1	A17	BOOL			R	FALSE		Unit - Source 1 pump maintenance
17	1	A18	BOOL			R	FALSE		Unit - Free cooling fault
18	1	A19	BOOL			R	FALSE		Circuit 1 - Discharge pressure probe broken or disconnected alarm
19	1	A20	BOOL			R	FALSE		Circuit 1 - Condensing temperature probe broken or disconnected alarm
20	1	A21	BOOL			R	FALSE		Circuit 1 - Suction pressure probe broken or disconnected alarm
21	1	A22	BOOL			R	FALSE		Circuit 1 - Evaporation temperature probe broken or disconnected alarm
22	1	A23	BOOL			R	FALSE		Circuit 1 - Discharge temperature probe broken or disconnected alarm
23	1	A24	BOOL			R	FALSE		Circuit 1 - Suction temperature probe broken or disconnected alarm
24	1	A25	BOOL			R	FALSE		Circuit 1 - High pressure alarm from pressure switch
25	1	A26	BOOL			R	FALSE		Circuit 1 - High pressure alarm from transducer
26	1	A27	BOOL			R	FALSE		Circuit 1 - Low pressure alarm from transducer
27	1	A28	BOOL			R	FALSE		Circuit 1 or unit - Frost evaporation temperature alarm
28	1	A29	BOOL			R	FALSE		Circuit 1 - Low pressure alarm from pressure switch
29	1	A30	BOOL			R	FALSE		Circuit 1 - Overload compressor 1
30	1	A31	BOOL			R	FALSE		Circuit 1 - Overload compressor 2
31	1	A32	BOOL			R	FALSE		Circuit 1 - Compressor 1 maintenance
32	1	A33	BOOL			R	FALSE		Circuit 1 - Compressor 2 maintenance
33	1	A34	BOOL			R	FALSE		Circuit 1 - Source fan 1 maintenance
34	1	A35	BOOL			R	FALSE		Circuit 1 EVD - Low superheat (SH)
35	1	A36	BOOL			R	FALSE		Circuit 1 EVD - Low evaporation pressure (LOP)
36	1	A37	BOOL			R	FALSE		Circuit 1 EVD - Maximum evaporating pressure (MOP)
37	1	A38	BOOL			R	FALSE		Circuit 1 EVD - Valve motor error
38	1	A39	BOOL			R	FALSE		Circuit 1 EVD - Emergency closing
39	1	A40	BOOL			R	FALSE		Circuit 1 EVD - Incomplete valve closing
40	1	A41	BOOL			R	FALSE		Circuit 1 EVD - Offline
41	1	A42	BOOL			R	FALSE		Circuit 1 Envelope - General alarm + Zone alarm
42	1	A43	BOOL			R	FALSE		Circuit 1 BLDC - Delta pressure greater than the allowable at startup
43	1	A44	BOOL			R	FALSE		Circuit 1 BLDC - Starting failure
44	1	A45	BOOL			R	FALSE		Circuit 1 BLDC - Low differential pressure
45	1	A46	BOOL			R	FALSE		Circuit 1 BLDC - High discharge gas temperature
46	1	A47	BOOL			R	FALSE		Circuit 1 Inverter - Offline
47	1	A48	BOOL			R	FALSE		Circuit 1 Inverter - General alarm + Error code
48	1	A49	BOOL			R	FALSE		Unit - Secondary board is offline
49	1	A50	BOOL			R	FALSE		Unit - Error in the number of retain memory writes on Secondary board
50	1	A51	BOOL			R	FALSE		Unit - Error in retain memory writes on Secondary board

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	InitValue	UoM	Description
51	1	A52	BOOL			R	FALSE		Circuit 2 - Discharge pressure probe broken or disconnected alarm
52	1	A53	BOOL			R	FALSE		Circuit 2 - Condensing temperature probe broken or disconnected alarm
53	1	A54	BOOL			R	FALSE		Circuit 2 - Suction pressure probe broken or disconnected alarm
54	1	A55	BOOL			R	FALSE		Circuit 2 - Evaporation temperature probe broken or disconnected alarm
55	1	A56	BOOL			R	FALSE		Circuit 2 - Discharge temperature probe broken or disconnected alarm
56	1	A57	BOOL			R	FALSE		Circuit 2 - Suction temperature probe broken or disconnected alarm
57	1	A58	BOOL			R	FALSE		Circuit 2 - High pressure alarm from pressure switch
58	1	A59	BOOL			R	FALSE		Circuit 2 - High pressure alarm from transducer
59	1	A60	BOOL			R	FALSE		Circuit 2 - Low pressure alarm from transducer
60	1	A61	BOOL			R	FALSE		Circuit 2 - Frost evaporation temperature alarm
61	1	A62	BOOL			R	FALSE		Circuit 2 - Low pressure alarm from pressure switch
62	1	A63	BOOL			R	FALSE		Circuit 2 - Overload compressor 1
63	1	A64	BOOL			R	FALSE		Circuit 2 - Overload compressor 2
64	1	A65	BOOL			R	FALSE		Circuit 2 - Compressor 1 maintenance
65	1	A66	BOOL			R	FALSE		Circuit 2 - Compressor 2 maintenance
66	1	A67	BOOL			R	FALSE		Circuit 2 - Source fan 1 maintenance
67	1	A68	BOOL			R	FALSE		Circuit 2 EVD - Low superheat (SH)
68	1	A69	BOOL			R	FALSE		Circuit 2 EVD - Low evaporation pressure (LOP)
69	1	A70	BOOL			R	FALSE		Circuit 2 EVD - Maximum evaporating pressure (MOP)
70	1	A71	BOOL			R	FALSE		Circuit 2 EVD - Valve motor error
71	1	A72	BOOL			R	FALSE		Circuit 2 EVD - Emergency closing
72	1	A73	BOOL			R	FALSE		Circuit 2 EVD - Incomplete valve closing
73	1	A74	BOOL			R	FALSE		Circuit 2 EVD - Offline
74	1	A75	BOOL			R	FALSE		Circuit 2 Envelope - General alarm + Zone alarm
75	1	A76	BOOL			R	FALSE		Circuit 2 BLDC - Delta pressure greater than the allowable at startup
76	1	A77	BOOL			R	FALSE		Circuit 2 BLDC - Starting failure
77	1	A78	BOOL			R	FALSE		Circuit 2 BLDC - Low differential pressure
78	1	A79	BOOL			R	FALSE		Circuit 2 BLDC - High discharge gas temperature
79	1	A80	BOOL			R	FALSE		Circuit 2 Inverter - Offline
80	1	A81	BOOL			R	FALSE		Circuit 2 Inverter - General alarm + Error code
81	1	PrevAFreeze_C1	BOOL			R	FALSE		PrevAFreeze_C1 - Prevent request for frost condition active inside circ.1
82	1	PrevHP_C1	BOOL			R	FALSE		PrevHP_C1 - Prevent request for high pressure condition active inside circ.1
83	1	PrevAFreeze_C2	BOOL			R	FALSE		PrevAFreeze_C2 - Prevent request for frost condition active inside circ.2
84	1	PrevHP_C2	BOOL			R	FALSE		PrevHP_C2 - Prevent request for high pressure condition active inside circ.2
92	1	Comp1Circ1_DevAlrm	BOOL			R	FALSE		Comp1Circ1_DevAlrm - Comp.1 circ.1 in alarm condition
93	1	Comp1Circ1_AbleToOn	BOOL			R	FALSE		Comp.1 circ.1 enabled to start
94	1	Comp1Circ1_AbleToOff	BOOL			R	FALSE		Comp.1 circ.1 enabled to stop
95	1	Comp1Circ1_FrcdOnByT	BOOL			R	FALSE		Comp.1 circ.1 forced ON by timings (min comp. ON)
96	1	Comp1Circ1_FrcdOffByT	BOOL			R	FALSE		Comp1Circ1_FrcdOffByT - Comp.1 circ.1 forced OFF by timings (min comp. OFF)
97	1	Comp2Circ1_DevAlrm	BOOL			R	FALSE		Comp2Circ1_DevAlrm - Comp.2 circ.1 in alarm condition
98	1	Comp2Circ1_AbleToOn	BOOL			R	FALSE		Comp.2 circ.1 enabled to start
99	1	Comp2Circ1_AbleToOff	BOOL			R	FALSE		Comp.2 circ.1 enabled to stop
100	1	Comp2Circ1_FrcdOnByT	BOOL			R	FALSE		Comp.2 circ.1 forced ON by timings (min comp. ON)
101	1	Comp2Circ1_FrcdOffByT	BOOL			R	FALSE		Comp.2 circ.1 forced OFF by timings (min comp. OFF)
102	1	Comp1Circ1_On	BOOL			R	FALSE		Comp1Circ1_On - Comp.1 circ.1 status (0=OFF 1=ON)
103	1	Comp2Circ1_On	BOOL			R	FALSE		Comp2Circ1_On - Comp.2 circ.1 status (0=OFF, 1=ON)
104	1	Comp1Circ2_On	BOOL			R	FALSE		Comp1Circ2_On - Comp.1 circ.2 status (0=OFF, 1=ON)
105	1	Comp2Circ2_On	BOOL			R	FALSE		Comp2Circ2_On - Comp.2 circ.2 status (0=OFF, 1=ON)
106	1	RelayAlrm	BOOL			R	FALSE		RelayAlrm - Global alarm relay
107	1	CoolHeat	BOOL			R	FALSE		CoolHeat - Unit in heating mode (0=Cooling, 1=Heating)
108	1	FC_Status	BOOL			R	FALSE		FC_Status - Free cooling valve status (0=OFF, 1=ON)
109	1	AFreezeHeat	BOOL			R	FALSE		Frost heater status
110	1	SchedOnOff	BOOL			R	FALSE		Unit ON/OFF command by scheduler (0=On, 1=Off)
111	1	A83	BOOL			R	FALSE		Unit - User delivery water temp. probe common broken or disconnected alarm
112	1	A84	BOOL			R	FALSE		Circuit 2 - User delivery water temp. probe broken or disconnected alarm
113	1	A86	BOOL			R	FALSE		Circuit 2 - Source delivery water temp. probe broken or disconnected alarm
114	1	A85	BOOL			R	FALSE		Circuit 1 - Source delivery water temp. probe broken or disconnected alarm
115	1	Comp1Circ1_FrcOffDev	BOOL			R	FALSE		Comp1Circ1_FrcOffDev - Force OFF comp.1 circ.1
116	1	Comp2Circ1_FrcOffDev	BOOL			R	FALSE		Comp2Circ1_FrcOffDev - Force OFF comp.2 circ.1
117	1	Comp1Circ2_FrcOffDev	BOOL			R	FALSE		Comp1Circ2_FrcOffDev - Force OFF comp.1 circ.2
118	1	Comp2Circ2_FrcOffDev	BOOL			R	FALSE		Comp2Circ2_FrcOffDev - Force OFF comp.2 circ.2
119	1	A87	BOOL			R	FALSE		EVD - Incompatible HW alarm
120	1	SrcFanCirc1_On	BOOL			R	FALSE		SrcFanCirc1_On - Source fan circ.1 status (0=OFF, 1=ON)
121	1	SrcPmp1_On	BOOL			R	FALSE		SrcPmp1_On - Source pump 1 status (0=OFF, 1=ON)
122	1	UsrPmp1_On	BOOL			R	FALSE		UsrPmp1_On - User pump 1 status
123	1	RevVlv_Circ1	BOOL			R	FALSE		RevVlv_Circ1 - Reversing valve for refr. circ.1 (0=Cooling, 1=Heating)
124	1	OilEquVlv_Circ1	BOOL			R	FALSE		Oil equalisation solenoid valve circ.1
125	1	SrcFanCirc2_On	BOOL			R	FALSE		SrcFanCirc2_On - Source fan circ.2 status (0=OFF, 1=ON)
126	1	SrcPmp2_On	BOOL			R	FALSE		Source pump 2 on
127	1	UsrPmp2_On	BOOL			R	FALSE		UsrPmp2_On - User pump 2 status

Mapping Table

Index	Size	Acronym	DataType	Min Value	Max Value	R/W	InitValue	UoM	Description
128	1	RevVlv_Circ2	BOOL			R	FALSE		RevVlv_Circ2 - Reversing valve for refr. circ.2 (0=Cooling, 1=Heating)
129	1	OilEquVlv_Circ2	BOOL			R	FALSE		Oil equalisation solenoid valve circ.2
130	1	HeatCool	BOOL			R	TRUE		HeatCool - Unit in cooling mode (0=Heating, 1=Cooling)
131	1	DfrRun_Circ1	BOOL			R	FALSE		Defrost is running on circ.1
132	1	DfrRun_Circ2	BOOL			R	FALSE		Defrost is running on circ.2
133	1	DfrFrcCompDfrPwr_Circ1	BOOL			R	FALSE		Force circ.1 comp. to defrost capacity
134	1	UnitOn	BOOL			R	FALSE		Unit ON/OFF status (0=OFF, 1=ON)
140	1	EVD_CanGo	BOOL			R	FALSE		Enable EVD EVO driver to control superheat
141	1	ManPmpReqCirc1	BOOL			R	FALSE		Request user pump activation by manual-compressor control in circ.1
142	1	CompsManCirc1	BOOL			R	FALSE		Manual status of comp. in circ.1
143	1	FrcOn_Comp1Circ1_Oil-Migr	BOOL			R	FALSE		Force ON comp.1 circ.1 to avoid oil migration
144	1	FrcOn_Comp2Circ1_Oil-Migr	BOOL			R	FALSE		Force ON comp.2 circ.1 to avoid oil migration
145	1	FrcOn_Comp1Circ2_Oil-Migr	BOOL			R	FALSE		Force ON comp.1 circ.2 to avoid oil migration
146	1	FrcOn_Comp2Circ2_Oil-Migr	BOOL			R	FALSE		Force ON comp.2 circ.1 to avoid oil migration
148	1	UsrFlw_Absent	BOOL			R	FALSE		UsrFlw_Absent - User pump flow absent (0=Flow OK, 1=Flow absent)
149	1	En_DscgPPrb_Circ1	BOOL			R	FALSE		En_DscgTempPrb_Circ1 - Connected discharge temp. probe for circ.1
150	1	En_DscgTempPrb_Circ1	BOOL			R	FALSE		En_DscgTempPrb_Circ1 - Connected discharge temp. probe for circ.1
151	1	En_OvldComp1Circ1_Din	BOOL			R	FALSE		Enable comp.1 circ.1 overload input
152	1	UnitCh	BOOL			R	FALSE		Unit is chiller
153	1	UnitHp	BOOL			R	FALSE		Unit is heat pump
154	1	SrcFan1Circ1Status	BOOL			R	FALSE		Source fan circ.1 status (0=OFF, 1=ON)
155	1	SrcFan1Circ2Status	BOOL			R	FALSE		Source fan circ.2 status (0=OFF, 1=ON)
156	1	RegTypPrb	BOOL			R	FALSE		Control probe (0=Return; 1=Delivery)
157	1	En_SuctPPrb_Circ1	BOOL			R	FALSE		En_SuctPPrb_Circ1 - Connected suction press. probe for circ.1
159	1	ACU_PANEL	BOOL			R	FALSE		ACU panel
160	1	En_Circ2	BOOL			R	FALSE		Enable circ.2
161	1	En_Comp2Circ1	BOOL			R	FALSE		Enable compr.2 circ.1
162	1	En_Comp2Circ2	BOOL			R	FALSE		Enable compr.2 circ.2
163	1	En_CompsOnOffCirc1	BOOL			R	FALSE		Enable comp. ON/OFF for circ.1
164	1	En_CompsOnOffCirc2	BOOL			R	FALSE		Enable comp. ON/OFF for circ.2
165	1	En_CondTempPrb_Circ1	BOOL			R	FALSE		Connected cond. temp. probe for circ.1
166	1	En_SuctTempPrb_Circ1	BOOL			R	FALSE		En_SuctTempPrb_Circ1 - Connected suction temp. probe for circ.1
167	1	UsrHeater2	BOOL			R	FALSE		UsrHeater2 - User heater 2 status
168	1	Al_RegulationAlrms	BOOL			R	FALSE		Al_RegulationAlrms - Control alarms
169	1	Al_MiscAlrms	BOOL			R	FALSE		Al_MiscAlrms - Miscellaneous alarms
170	1	Al_SrsCirc1	BOOL			R	FALSE		Al_SrsCirc1 - Serious alarm circ.1
171	1	Al_SrsCirc2	BOOL			R	FALSE		Al_SrsCirc2 - Serious alarm circ.2
172	1	Al_SrsCircs	BOOL			R	FALSE		Al_SrsCircs - Serious alarm circ.1 and circ.2
173	1	RemCmdComp1Circ1	BOOL			R	FALSE		RemCmdComp1Circ1 - Remote comand comp.1 circ.1
174	1	RemCmdComp2Circ1	BOOL			R	FALSE		RemCmdComp2Circ1 - Remote comand comp.2 circ.1
175	1	RemCmdComp1Circ2	BOOL			R	FALSE		RemCmdComp1Circ2 - Remote comand comp.1 circ.2
176	1	RemCmdComp2Circ2	BOOL			R	FALSE		RemCmdComp2Circ2 - Remote comand comp.2 circ.2
178	1	En_RemCmdComp-1Circ1_Din	BOOL			R	FALSE		Enable remote command comp.1 circ.1 input
179	1	En_RemCmdComp-2Circ1_Din	BOOL			R	FALSE		Enable remote command comp.2 circ.1 input
180	1	En_UsrRetWTempPrb	BOOL			R	FALSE		En_UsrRetWTempPrb - Connected user return water temperature probe
181	1	En_UsrDlvWTempPrb	BOOL			R	FALSE		En_UsrDlvWTempPrb - Connected user delivery water temperature probe
183	1	AFreezeHeatUsr_Circ2	BOOL			R	FALSE		Circuit 2 user frost heater status
190	1	Active2ndSetPDin	BOOL			R	FALSE		Second set point input
191	1	CoolHeatDin	BOOL			R	FALSE		Cool/Heat input status (0=Cooling, 1=Heating)
192	1	HiP_Pstat_Circ1	BOOL			R	FALSE		High pressure switch on circ.1
193	1	OvldComp1Circ1	BOOL			R	FALSE		Comp.1 circ.1 overload
194	1	OvldComp2Circ1	BOOL			R	FALSE		Comp.2 circ.1 overload
195	1	RemAlrmDin	BOOL			R	FALSE		Remote alarm
196	1	RemOnOffDin	BOOL			R	FALSE		Remote unit ON/OFF command from digital input (0= OFF, 1=ON)
198	1	UsrPmp1Ovld	BOOL			R	FALSE		User pump 1 overload input logic
199	1	UsrPmp2Ovld	BOOL			R	FALSE		User pump 2 overload input logic
200	1	UnitChOnly	BOOL			R	FALSE		Unit is chiller only
197	1	UnitWW	BOOL			R	FALSE		Unit is WW - FALSE: Unit is not WW, TRUE: Unit is WW
201	1	UnitChHp	BOOL			R	FALSE		Unit is Chiller/Heat pump with reversal of refrigeration cycle
205	1	UnitHpOnly	BOOL			R	FALSE		Unit is heat pump only
202	1	UnitChHp_NotAA	BOOL			R	FALSE		Unit is reverse-cycle but not AA
203	1	UnitChHp_WR	BOOL			R	FALSE		UnitChHp_WR - WW Chiller/Heat pump with reversal on water circuit
206	1	Rev4WayValve_Circ2_Out-STATUS	BOOL			R	FALSE		4WayValve reverse output command for circ 2
204	1	En_AIN_PwrReqPrb_Circ1	BOOL			R	FALSE		Connected analogue capacity request probe on circuit 1
207	1	A88	BOOL			R	FALSE		Circuit 1 - Source fan/pump alarm
209	1	LP_Pstat_Circ1	BOOL			R	FALSE		Low pressure switch on circ.1
210	1	A90	BOOL			R	FALSE		Unit - Power failure

CONTROL PANEL

The following instructions apply to the graphical LCP (LCP 102):
The control panel is divided into four functional groups:

1. Graphical display with status lines. All data is displayed on a graphical LCP display, which can show up to five items of operating data while displaying the [Status].
2. Menu keys and indicator lights - change parameters and switch between display functions.
3. Navigation keys and indicator lights (LEDs).
4. Operation keys and indicator lights (LEDs).

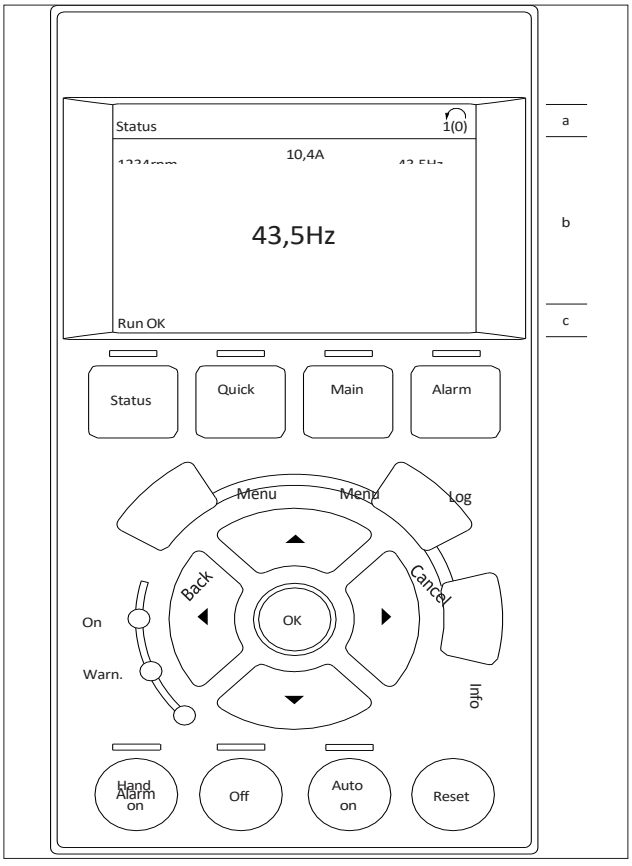
DISPLAY LINES

A.Status line: Status messages showing icons and graphic.
B.Line 1-2: Operator data lines showing user-defined or user-selected data. By pressing the [Status] key, up to one additional line can be added.
C.Status line: Status messages displaying text.

ADJUSTING THE DISPLAY CONTRAST

Press [Status] and [▼] to make the display darker.
Press [Status] and [▲] to make the display brighter.

Figure 12. LCP Overview

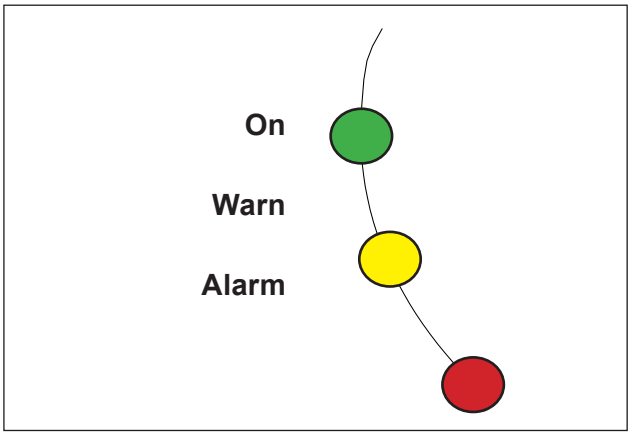


INDICATOR LIGHTS

If certain threshold values are exceeded, the alarm LED lights up and/or the alarm LED lights up. An alarm status and alarm text are displayed on the control panel.
The control panel. The power LED is activated when the frequency inverter is supplied with mains voltage.

- Green LED/on: The control section is running.
- Yellow LED/Warning: Indicates a warning.
- Red LED flashing/Alarm: Indicates an alarm.

Figure 13. Indicator lights



LCP KEYS

The control keys are divided into functions. The keys below the display and the indicator lights are used for parameter settings, including the choice of display indication during normal operation.

Figure 14. Function keys

The [Status] indicates the status of the frequency converter and/or compressor motor.
Choose between 3 different readouts by pressing the [Status] key: 5-line readout, 4-line readout or Smart Logic Control by pressing [Status] twice.
Press [Status] to select the display mode or to return to the display mode from the quick menu mode, main menu mode or alarm mode. Also press [Status] to toggle single or dual readout mode.

The [Quick Menu] allows quick access to different quick menus such as:

- Q1 - My personal menu
- Q2 - Quick Setup
- Q3 - PID Process Loop
- Q4 - Compressor functions
- Q5 - Changes made
- Q6 - Records
- Q7 - Load profile

Use [Quick Menu] to program the parameters belonging to the Quick Menu. It is possible to switch directly between the Quick Menu mode and the Main Menu mode.

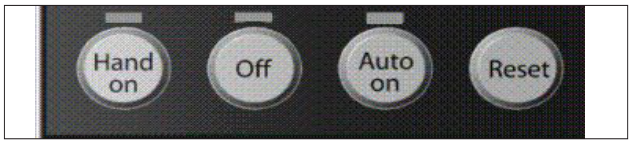
NAVIGATION KEYS

The 4 navigation keys are used to navigate between the different options available in [Quick Menu], [Main Menu] and [Alarm Log].
Press the keys to move the cursor.
The [OK] key is used to select a parameter marked by the cursor and to enable changing a parameter and logs from the Quick Menu.

Local control keys

The keys for local control are located at the bottom of the control panel.

Figure 15. Local control keys



The [Hand On] option allows the frequency converter to be controlled by the LCP. The [Hand on] option also starts the motor compressor and it is possible to enter the speed data of the motor compressor using the arrow keys.
The key can be selected as [1]
Activate or [0] Deactivate via the [Hand on] key 0-40 on the LCP.
External stop signals activated via control signals or a serial bus will override a “start” command via the LCP.
The following control signals will remain active when.[Hand on] is activated:

- [Hand On] - [Off] - [Auto On].
- Reset
- Reverse coasting stop
- Reverse
- Select lsb (least significant bit) - [Off] - [Auto On] - [Auto On
- msb (most significant bit) select msb (most significant bit) select msb (most significant bit)
- Stop command from serial communication
- Fast stop
- DC brake

The [Off] key stops the connected motor compressor. The key can be selected as [1] Enable or [0] Disable via the 0-41 [Off] key in LCP. If no external stop function is selected and the [Off] key is inactive, the motor compressor can be stopped by disconnecting the voltage.

[Auto On] allows the frequency converter to be controlled via the control terminals and/or serial communication. When a start signal is applied to the control control terminals and/or the bus, the frequency converter will start. The key can be selected as [1] Enable or [0] Disable via the 0-42 [Auto on] key on the LCP.

NOTE: An active HAND-OFF-AUTO signal via the digital inputs has higher priority than the [Hand on] and [Auto on] control keys.

The [Reset] key is used to reset the frequency converter after an alarm (trip). It can be selected as [1] Enable or [0] Disable using the 0-43 [Reset] key on the LCP.
Direct access to the parameters can be made by holding down the [Main Menu] key for 3 seconds. Direct parameter access allows direct access to any parameter.

QUICK TRANSFER OF PARAMETER SETTINGS

Once the configuration of a frequency converter has been completed, store the data in the LCP or on a PC using the MCT 10 Set-up Software.

DATA STORAGE IN LCP

1. Go to 0-50 LCP Copy in the main menu.
2. Press [OK].
3. Select [1] All to LCP.
4. Press [OK].
5. All parameter settings are now stored in the LCP indicated by the progress bar. When 100% is reached, press [OK].

NOTE: Stop the motor compressor before performing this operation. The LCP can now be connected to another frequency converter and copy the parameter settings to this frequency converter as well.

INITIALIZATION TO DEFAULT CONFIGURATION

Initialize the frequency converter to default settings in two ways:

A.Recommended initialization (via operating mode 14-22)

- Select operating mode 14-22.
- Press [OK].
- Select [2] Initialization.
- Press [OK].
- Disconnect the mains power and wait until the display turns off.
- Reconnect the mains power.
- A80] (Alarm 80) appears - the frequency converter has been reset.

14-22 Operating mode Initializes everything except:

- 8-30 Protocol
- 8-31 Address
- 8-32 FC port baud rate
- 8-33 Parity / Stop Bits
- 8-34 Estimated cycle time
- 8-35 Minimum Response Delay
- 8-36 Maximum Response Delay
- 8-37 Maximum Inter-Carriage Delay 8-38 Maximum Inter-Carriage Delay
- 14-50 RFI filter
- 8-30 Protocol
- 8-31 Address
- 8-32 FC port baud rate
- 8-33 Parity / Stop bits 8-34 Estimated cycle time
- 8-34 Estimated Cycle Time
- 8-35 Minimum Response Delay
- 8-36 Maximum Response Delay

- 8-37 Maximum Inter-Carriage Delay 8-38 Maximum Inter-Carriage Delay
- 14-50 RFI Filter
- 15-00 Operating Hours
- 15-01 Operating Hours
- 15-02 kWh counter
- 15-03 Ignitions
- 15-04 Over temperature
- 15-05 Over voltage
- 15-20 History Log: Event
- 15-21 History Log: Value
- 15-22 History Log: Time
- 15-30 Fault Log: Error Code
- 15-31 Fault Log: Value
- 15-32 Fault log: Time

B.Manual initialization

- Disconnect from the mains and wait until the display turns off.
- Press [Status] - [Main menu] - [OK] at the same time while the LCP 102 graphic is switched on.
- Release the keys after 5 s.
- The frequency converter is now programmed according to the default settings.

This procedure initializes everything except:

- 15-00 Operating hours
- 15-03 Power on
- 15-04 Over temperature
- 15-05 Over voltage

DATA TRANSFER FROM THE LCP TO THE FREQUENCY CONVERTER

NOTE: Stop the motor compressor before performing this operation.

1. Go to 0-50 LCP Copy.
2. Press [OK].
3. Select [2] All from LCP.
4. Press [OK] again.
5. The parameter settings stored in the LCP are transferred to the frequency converter indicated by the progress bar. When 100% is reached, press [OK].

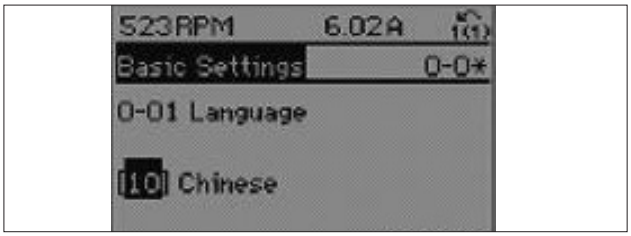
PARAMETER SELECTION

In the main menu mode, the parameters are divided into groups. Use the navigation keys to select a parameter group.
The following parameter groups can be accessed:

- - 0-** Operation/Display
- - 1-** Load/Motor
- - 3-** Reference/Ramps
- - 4-** Limits/Warnings
- - 5-** Digital input/output
- - 6-** Analog input/output
- - 7-** Controls
- - 8-** Communication and options
- - 13-** Intelligent logic
- - 14-** Special functions
- - 15-** Drive information
- - 16-** Data readouts
- - 25-** Cascade controller
- - 28-** Compressor functions

After selecting a parameter group, select a parameter with the navigation keys. The middle section of the display shows the number and name of the parameter as well as the value of the selected parameter.

Figure 16. Screen example - Parameter selection



DATA CHANGE

The procedure for changing the data is the same in both the Quick Menu and the Main Menu mode.
Quick menu and in the main menu mode.
Press [OK] to change the selected parameter. The procedure for changing the data depends on whether the selected parameter represents a numerical data value or a text value.

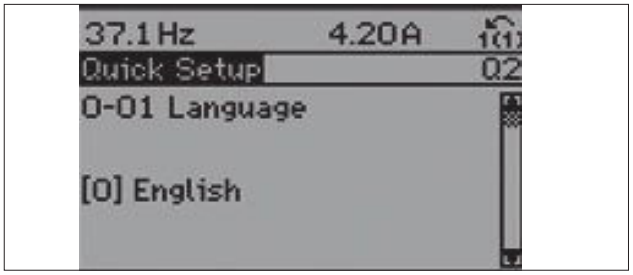
MODIFICATION OF A TEXT VALUE

If the selected parameter is a text value, change the value by pressing the [▲]/[▼] navigation keys. The [▲] key increases the value and [▼] decreases the value. Place the cursor on the value and press the [OK] key to save.

CHANGE A GROUP OF NUMERICAL VALUES

If the selected parameter represents a numerical data value, change it by pressing the navigation keys. Press [<]/[>] to move the cursor horizontally. Press the [▲]/[▼] key to change the data value. The [▲] key increases the data value and the [▼] key decreases the data value. Place the cursor on the value and press [OK] to save.

Figure 17. Screen example



⚠ WARNING ⚠
The installer must take these procedures into account; his personnel must be qualified and certified to perform the i nstallation in order to comply with all specifications and good practices to ensure proper operation of the unit.

PRE-START-UP CHECKLIST

The following data should be checked before putting the unit into operation.

Date:	
Place of Work:	
Location:	
Installing Contractor:	
Technician/Company:	
Unit Commissioning:	
Unit model:	
Serial number:	

PHYSICAL INSPECTION (BEFORE ELECTRICAL CONNECTION)

Check that the unit has not been damaged by handling or transport.	
Visually check for refrigerant leaks.	
Open the unit for hydraulic installation only. Do not remove the connection guards until the hydraulic circuit is closed.	
Check for foreign objects in the fan discharge.	
Check that the air inlet is not obstructed and has the suggested clearance.	

NOTE: Accessories such as thermometers, pressure gauges, measuring ports, etc., Are recommended but not necessary for the operation of the unit

INSPECTION OF THE HYDRAULIC CIRCUIT

Date:	
Place of Work:	
Location:	
Installing Contractor:	
Technician/Company:	
Unit Commissioning:	
Unit model:	
Serial number:	

It is necessary to install a water filter in all hydraulic circuits to prevent the entry of solid particles, these must be installed on the return side of the circuit and must be cleaned once the initial system load is finished.

Check that the water filter is clean.	
Check that all service valves are open.	
Check the correct structure of the water supply.	
Check that all pipes are filled with water and that air has been evacuated.	
Check thermometers (not included from factory).	
Check the pressure gauges (not included in the delivery).	

⚠ WARNING ⚠
If the hydraulic circuit contains air, it may compromise the operation of the unit.

CHECKING THE ELECTRICAL SUPPLY

The units require grounded, three-phase electrical power.

Verify that the circuit breaker is of the correct rating for the unit.	
Check that all electrical connections are secure.	
Check for false ground contacts as well as all wiring.	
Check internal control and power connections.	
Measure voltage on all units, ground, neutral and 3-phase line.	
Check that the motor overload protection conforms to design requirements and is in automatic mode.	
Check voltage (*Motor save), which is set to supply the correct supply voltage for the unit.	

* The percentage of unbalance of the power supply must be calculated with the following formula, and adjusted with the UNBALANCE command.

UNBALANCE PERCENTAGE = [(MAXIMUM AVERAGE DEVIATION) / (AVERAGE)] X (100)

DIAGNOSTIC LIGHT INDICATORS (LED STATUS)	
Regular operation	Evergreen
Delayed start	Flashing green
Reverse phase	Flashing red
Phase unbalance	Red in lapses
High/low voltage	Constant red

NOTE: The units are factory set, however the power supply may vary in each installation and due to this imbalance must be adjusted prior to start-up in order to protect the motors and electrical components of all units.

INSPECTION OF THE CONTROL PANEL

Check that the control panel is free of foreign objects.	
Power supply unit with three-phase electrical current.	
The unbalance phase should be less than 2% of the average.	
Turn on each fan to ensure proper rotation.	
Turn on the water pump (if applicable) to make sure it is running.	

After completing the inspection of the above installation points and ensuring that all elements of the unit are correct, the unit can be powered up. Turn the switch on the CONTROL UNIT to the ON position to power the control unit with 24 volts.

START-UP

After powering up the controller, wait 5 minutes for the unit to be ready to operate.

The operating sequence will begin by checking all pre-programmed safety points on the unit. If all required conditions are correct, the unit will be ready to start operations.

UNIT CONTROL

To start operations, turn the ON/OFF switch to the ON position.
After 6 seconds, the control will command the pump to start.
If water flow is detected in the piping, the internal sequence of the unit will start.

NOTE : After completing the inspection of the above installation points and making sure that all elements of the unit are correct, the unit can be turned on. Place the switch on the CONTROL UNIT in the ON position to power the control panel with 24 volts.

MAINTENANCE

Service or maintenance of these units should be performed by experienced personnel with specific refrigeration training. Check Repeated safety devices and cycle control components should be analyzed and corrected before initiating a restart.

The simplified design of the refrigeration circuit completely eliminates potential problems during regular operation of the unit. No maintenance is required on the refrigeration circuit as long as the unit operates regularly.

Ease of maintenance has been taken into account during the design phase; thus, the unit is easily accessible for service and maintenance. By accessing through the panel on the front of the unit, service and maintenance of the unit can be easily performed.

The electrical components are located in the terminal box at the top of the front panel, allowing easy access to them.

Under normal circumstances, this water chiller unit requires only a check and cleaning of the air inlet through the coil surface. This can be done monthly or quarterly, depending on the environment in which the units are installed.

When the environment is constantly invaded with grease or dust particles, the coils should be cleaned by an air conditioning service technician on a regular basis to ensure adequate cooling capacity and therefore efficient operation of the Unit. The regular life of the unit may be shortened if proper service is not performed.

For continued durability and performance of the unit, proper maintenance should always be performed on a regular basis.

Over long periods of operation, the heat exchanger will become fouled, impairing efficiency and reducing the units performance. Consult your local supplier about cleaning the heat exchanger The internal water circuit requires no further maintenance or service, except in the event of a water pump failure. It is recommended that the water filter be checked periodically and replaced if it is dirty or clogged.

Always check the water level in the system to protect the moving parts of the hydraulic kit from overheating and excessive wear.

NOTE: The company is not responsible for the malfunction of the unit if the main cause is lack of maintenance or the operating conditions of the unit do not correspond to those recommended in this manual.

GENERAL

Routine checks and maintenance should be performed during initial operation as well as periodically during start-up. These include checking the liquid lines, condensing and suction pressure measurements, and checking the unit for normal overheating and undercooling. A maintenance schedule is recommended at the end of this section.

COMPRESSOR MAINTENANCE

Internal pressure and surface temperature are dangerous and could cause permanent injury. Maintenance operators and installers must have the proper tools and knowledge.

Tube temperatures can exceed 100°C and could cause severe burns. Ensure that regular maintenance inspections are carried out to ensure reliability and compliance with local regulations. To avoid system-related compressor problems, perform the following recommended periodic maintenance tasks:

- Check that safety devices are operational and properly adjusted.
- Make sure that the system is not leaking.
- Check the compressor current level.
- Confirm that the system is operating in a manner consistent with previous maintenance records and ambient conditions.
- Check that all electrical connections are securely fastened.
- Keep the compressor clean and check for rust and rust on electrical connections, tubing and compressor housing.

ELECTRICAL TERMINALS

Electrical connections should be inspected and tightened if necessary. Heat and vibration can cause connections to loosen and fall out, thus causing arcing stress.

For servicing electrical components:

- Disconnect main electrical lines before repairing or replacing any components or cables.
- Tighten all wire connections attached to the terminal block and/or components.
- Check connectors, cables and/or components for burn marks, frayed wires, etc. If any of them present these conditions, they should be repaired. or replaced.
- The voltage on the equipment should be checked with a meter periodically to ensure adequate power supply.

NOTE: Each unit comes with complete wiring. Have the diagrams handy when making connections. Electrical connections required at the time of installation are: Power line to power inlet and control wiring for the remote control. Do not wire the remote control with high voltage wires. High voltage may interfere with the control signals and/or may cause erratic or poor operation.

⚠ WARNING ⚠

Risk of electric shock, can cause injury and death.

Disconnect all power sources before inspecting the fan.

Disconnect all electrical power sources when working inside the unit. Potentially lethal voltages exist within the equipment during operation.

Review all cautions and warnings contained in this manual. Only qualified personnel should service this unit.

CONDENSER

Maintenance consists mainly of removing dirt and debris from the outer surface of the fins and repairing any damage to the fins. For units installed in corrosive environments, cleaning of the fins should be part of the regular maintenance program.

In this type of installation, dust and debris should be removed promptly to avoid build-up that will interfere with the regular operation of the unit.

⚠ WARNING ⚠

Risk of electric shock, may cause injury and death.

Risk of serious injury. Fan may start up and cause injury. Disconnect all power sources before inspecting the fan.

FILTER DRIER

Any particles from the condenser piping, compressor or various components are swept by the refrigerant into the liquid line and trapped by the filter drier.

It is recommended that the filter drier be replaced each time a refrigerant line repair is performed.

EXPANSION VALVE

The function of the expansion valve is to maintain adequate supply of refrigerant to the evaporator. This is in order to satisfy the charge conditions.

Before adjusting the superheat, verify that the unit charge is correct and that the liquid line is completely full and free of bubbles, and that the circuit is operating under stable load conditions The superheat suction for the evaporator suction discharge is factory set for 10°F.

⚠ WARNING ⚠

Risk of explosive discharge of refrigerant at high pressure. This can cause personal injury or equipment damage. Never loosen refrigerant or electrical line connections until the compressor has been depressurized on both sides.

ANNUAL MAINTENANCE SCHEDULE

Before performing any work on the unit, make sure you have the proper Personal Safety Equipment (EPS), and that the unit is turned off and idle. It is also recommended that the unit be turned on 24 hours prior to first start-up to begin warming up the compressor crankcase.

HYDRAULIC MAINTENANCE

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cleaning of the hydronic circuit filter, if present.	Plan	x	x	x	x	x	x	x	x	x	x	x	x
	Real												
Visual inspection of all water pipes for leaks.	Plan	x	x	x	x	x	x	x	x	x	x	x	x
	Real												
Replacing the water in the hydronic circuit.	Plan	x	x	x	x	x	x	x	x	x	x	x	x
	Real												

ELECTRICAL MAINTENANCE

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Re-tighten electrical panel connectors and terminals, control parts, power and junction boxes (quarterly)	Plan	x			x			x			x		
	Real												
Physical inspection of all electrical panel connectors and relays (monthly)	Plan	x	x	x	x	x	x	x	x	x	x	x	x
	Real												
Check amperage of all electric motors, compare them according to the nameplate for anomalies (quarterly)	Plan	x			x			x			x		
	Real												
Physically check for false contacts (Twice a month)	Plan	x	x	x	x	x	x	x	x	x	x	x	x
	Real												
Cleaning of the electrical panel (monthly)	Plan	x	x	x	x	x	x	x	x	x	x	x	x
	Real												

PHYSICAL INSPECTION													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cleaning of the condenser with pressurized water (twice a month)	Plan	x		x		x		x		x		x	
	Real												
Refrigerant pressure check (quarterly)	Plan	x			x			x			x		
	Real												
Inspection of fan blades, cleaning of fan blades (Quarterly)	Plan	x			x			x			x		
	Real												
Compressor power consumption check to determine refrigerant loss (quarterly)	Plan	x		x		x		x		x		x	
	Real												
Compressor oil inspection (monthly)	Plan	x	x	x	x	x	x	x	x	x	x	x	x
	Real												
Review and cleaning of the inside of the equipment (Bimonthly)	Plan	x		x		x		x		x		x	
	Real												
Review of condensate drain line, must not be clogged (Quarterly)	Plan	x			x			x			x		
	Real												
Review of alarm history (monthly)	Plan	x	x	x	x	x	x	x	x	x	x	x	x

TROUBLESHOOTING CHART

Problem	Possible causes	Possible corrective actions
Compressor does not run.	Main or compressor disconnect switch open.	Circuit breaker closed.
	Fuse damaged, circuit breakers open.	Check the electrical circuit and possible short circuit, line to ground, loss of connections or motor windings causing the failure. Replace the fuse and reset the compressor brakes, only after detecting and correcting the cause of the fault.
	Thermal overloads have tripped.	Overloads are self-resetting. Check supply voltage, operating amps, cycle times and mechanical operations. Allow time for automatic reset.
	Faulty contactor or coil.	Replace.
	System shutdown by equipment protection devices.	Determine the type and cause of the shutdown and correct it before restarting the equipment. For example, low or high pressure, water freezing, etc.
	No cooling required.	Wait until the unit calls for cooling.
	Liquid line solenoid does not open.	Repair or replace the solenoid. Check wiring.
	Motor electrical problems.	Check for open, shorted or bubbled motor.
	Loose wiring.	Check all wire connections and tighten all terminal screws.
Compressor makes noise or vibrates	Compressor running in reverse.	Check that the unit and compressor are on the correct phase of the line voltage.
	Improper piping or supports on suction or discharge.	Reposition, add or remove hangers.
	Compressor insulator bushing worn.	Replace.
	Compressor mechanical failure.	Check for possible problem in compressor failure and replace.
	Low oil level.	Check the possible problem before it damages the compressor.
High discharge pressure.	Dirty condenser coil.	Clean the coil.
	Fan failure.	Check electrical circuit and fan motor.
		Check the electrical circuit and possible problems before changing the motor fan.
	Coolant overcharge.	Remove excess coolant and check the liquid subcooling.
	Fan motor running in reverse.	Check that the unit and fan motor are correctly supplanted by the line voltage.
	No or failed condenser caps.	Check or replace condenser caps on front and rear of unit.
	No condensables in the system.	Remove the non-condensables in the system and replace the charge.

Problem	Possible causes	Possible corrective actions
Low suction pressure.	Dirty evaporator.	Backwashing or chemical cleaning.
	Lack of refrigerant.	Check for leaks, repair and add the necessary charge. Check liquid sight glass.
	Low water flow.	Adjust the water flow required for the equipment.
	Expansion valve malfunction or failure.	Check or replace (if necessary) the valve and adjust the proper superheat.
	Solenoid value not open.	Check circuit and possible problem of solenoid valve not opening, if necessary replace.
	Liquid line filter drier fouled.	Check pressure drop or temperature for diagnostics.
	Condensing temperature too low.	Check means of regulating condenser temperature.
	Excess oil used.	If the system has excess oil, recover and adjust by observing the sight glass on the compressor.
Motor overload relays or circuit breakers open.	Voltage unbalance or out of range.	Correct power supply.
	Faulty or grounded wiring on motor.	Check electrical circuit for possible problem. Then replace compressor.
	Loose power wiring or faulty contactors.	Check all connections and tighten, if necessary replace contactors.
	High condenser temperature.	See corrective steps for high discharge pressure.
Compressor thermal protection switch open.	Operation beyond design conditions.	Correct to bring conditions within allowable limits.
	Voltage range or unbalance.	Check and correct.
	High overheating.	Set correct superheat. Check for possible problem. Then replace the compressor.
	Short cycling.	Check and stabilize load or correct control settings for the application.

Troubleshooting Chart

Problem	Possible causes	Possible corrective actions
Compressor oil level too high or too low.	Low oil level.	Adjust the water flow required for the equipment.
	Insufficient water flow - level too high.	Check or replace (if necessary) the valve and adjust the proper superheat.
	Solenoid valve return oil not open.	Check circuit and possible problem of solenoid valve not opening, if necessary replace.
	Short cycling.	Check pressure drop or temperature for diagnostics.
	Excess liquid in crankcase - level too high.	Check means of regulating condenser temperature.
	Level too high with compressor operation.	If the system has excess oil, recover and adjust by observing the sight glass on the compressor.
	Operation or selection of expansion value.	Correct power supply.
	Compressor mechanical problems.	Check electrical circuit for possible problem. Then replace compressor.
	Incorrect oil for application.	Check all connections and tighten, if necessary replace contactors.
	Oil collapse in remote piping.	See corrective steps for high discharge pressure.
	Loose fitting in oil line	Correct to bring conditions within allowable limits.
Compressor staging intervals too short.	Control band not properly adjusted.	Check and correct.
	Water temperature sensor failure.	Set correct superheat.
	Insufficient water flow.	Check for possible problem. Then replace the compressor.
	Rapid temperature or flow changes.	Check and stabilize load or correct control settings for the application.
	Oversized equipment.	Evaluate equipment selection.
	Light loads.	Checking and adjusting the load.
Equipment will not run.	Inadequate voltage.	Check voltage and correct it.
	Reset switch is off.	Power up.
	No water flow in the system.	Flush the system.
	Water flow is reversed.	Check water direction.
Unit runs, but does not cool sufficiently.	Set temperature value is an incorrect setting.	Set values.
		Check data sheet and check system for leaks.
	High condensing temperature.	Check condenser and repair.
	Equipment does not have sufficient water flow.	Check technical data, check filter in water line and adjust flow if necessary.
The fan does not work.	No supply voltage.	Check electrical circuit (line down).
	Motor defective.	Contact the manufacturer.
	Motor thermal protection switch open.	Check operating conditions, if necessary contact the manufacturer.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