HECU - sistema requirements

CAREL

Hecu sistema is the CAREL solution for integrated control of condensing units with DC inverter compressor technology and the related refrigerating units.

	Hecu sistema Requir.	Mandatory for Hecu sistema HFC	Mandatory for Hecu sistema CO2	Disclaimer / Additional info
Condensing unit	Controller	ECU50SM0C0	ECU70TS0C0 ECU70TS0D0 ECU80TS0C0 24V ECU80TS0D0 24V	-
	Compressor	BLDC technology (ref.+050001835)	BLDC technology (ref.+050001835)	The Hecu solution is only compatible with the compressors specified in the document ref. +050001835. The unit will not start with different compressors.
	Inverter	Carel DC power+ (ref.+050001835)	Carel DC power+ (ref.+050001835)	The document ref.+ 050001835 specifies the right model of Carel power+ inverter for each compressor. Using 3rd part inverters may cause serious unit malfunctions.
	Probes	Suction pressure Discharge pressure Suction temperature Discharge temperature Vapour injection pressure (only LT) Vapour injection temp. (only LT)	Suction pressure Gas Cooler pressure Receiver Pressure Suction temperature Discharge temperature Gas Cooler temp. LT Suction pressure LT Suction temp. LT Discharge temp. LT Discharge pressure (if supp. by SW)	The probes listed here are essential to manage the compressor inside its envelope. The unit will not start if one or more of these is missing.
	Check Valve	Prevent liquid return from condenser	Prevent liquid return from gas cooler and receiver (LT units only)	We recommend to install a check valve at the oil separator gas outlet or at the compressor discharge (CO2 units without oil separator). This avoids refrigerant liquid migration from the condenser/gas cooler or receiver back to the compressor.
	Equalization	By DELTA PRESSURE or by TIME with: • Oil injection valve • Equalization solenoid	By DELTA PRESSURE or by TIME with: • Oil injection valve • Equalization solenoid • HPVv • RPRV	Equalization by DELTA PRESSURE is highly recommended in order to limit at the minimum the compressor's start failures. In order to have a faster equalization, with a lower increase of pressure on the suction line, is suggested to use a dedicated solenoid valve.
	Oil separator	Suitable oil separator on discharge (see disclaimer)	Suitable oil separator on discharge (see disclaimer)	Carel recommends against using oil separators with mechanical float valves in variable cooling capacity systems, due to known cases of malfunctions.
	Oil injection valve	Chosen from the following opt.: • Carel ExV (best option) • Capillary	Chosen from the following options: • Carel ExV (best option, external driver required) • Capillary	Carel ExV valves are suggested in order to achieve good calibration of the oil flow-rate required by the compressor. Sub-optimum or no calibration will reduce reliability and increase energy consumption.
	Liquid injection valve (only MT)	Chosen from the following opt.: • Carel ExV (best option) • Solenoid valve	-	If no liquid injection valve is installed, high discharge temperatures can be reached, with a consequent reduction in cooling capacity and frequent compressor's shutdown due to the maximum threshold being exceeded.
	Vapour injection valve (only LT)	Carel ExV	-	The vapour injection valve is required for some models of compressors in specific applications. The unit will not start without the valve.
	Suction accumulator	Required for LT line Recommended for MT line	-	Carel always recommend installation of a suction accumulator on the suction line. Without the accumulator, at low temperature, there may be liquid return to the compressor and possible damages to the unit.
	Suction and Liquid lines service valves	Dedicated service valves for each pipe	Dedicated service valves for each pipe	Carel suggests the use of separate service valves on the suction and liquid lines. For the suction lines, Hecu sistema requires an installation referred to in literature as "multisplit".
Refriger. units	Controller	Carel MPXPRO or Carel Ultracella	Carel MPXPRO (recommended) or Carel Ultracella (recommended)	The MPX PRO controller and Carel ExV electronic expansion valve are two essential components in the Hecu sistema, as they ensure important functions, without which the reliability, energy efficiency and food quality would be compromised. The Hecu HFC controller can operate without one of these two components for a limited time of around 10 hours, to allow system commissioning.
	Valves	Carel ExV	Carel ExV (recommended)	
Installation	Suction line design	Multisplit	Multisplit	For the suction lines, Hecu sistema requires an installation referred to in literature as "multisplit". At low cooling capacities and with incorrect piping design, oil may not return to the compressor, causing it to break. Carel suggests the use of pre-insulated pipes in rolls, already commonly used in multisplit air-conditioning systems. The use of these pipes reduces installation costs and times, as well as avoiding the need for welding in the field.
	Discharge line design	Multisplit (recommended)	Multisplit (recommended)	For the discharge lines, an installation similar to what is referred to in literature as "multisplit" should be evaluated. This allows faster and more economical installation (no welding), as well as the possibility to reduce refrigerant charge. Oversizing the lines may cause problems of oil return to the compressor and consequently damage the compressor.
	Pipe sizing	Suction pipe sizing tables (ref.+050001890)	Suction pipe sizing tables (ref.+050001890)	Undersizing the lines may cause excessive pressure drop and low efficiency. Carel provides sizing tables based on the cooling capacity of the connected units.
	Serial line between condensing unit and refrigeration units	Modbus RS485	Modbus RS485 (only if utilities are Carel devices)	The serial connection between the refrigeration units and the condensing unit is required in order to guarantee correct implementation of the oil return function. The Hecu controller can operate without serial communication for a limited time of around 10 hours.
System functions	Oil return	Oil recovery washing Oil speed boost	Oil speed boost Oil recovery washing (if utilities are Carel devices)	Hecu sistema features two software functions for managing oil return to the compressor, and these must be enabled at all times.
	Energy efficiency	Floating suction Smooth Lines Floating condensing	Floating condensing Floating suction (if utilities are Carel devices) Smooth Lines (if utilities are Carel devices)	Carel always recommends the configuration of these advanced control algorithms in order to maximise system energy efficiency.