

mRC-KITs – mini Recirculating Chiller Kits

universal water cooling solutions



- ❄️ 450 W, 900 W and 1000 W cooling capacity
($T_{\text{water}} +25^{\circ}\text{C}$, $T_{\text{ambient}} +25^{\circ}\text{C}$)
- ❄️ high cooling capacity in compact format
- ❄️ single/twin versions available
- ❄️ 24 VDC and 100 to 240 VAC derivatives
- ❄️ temperature stability down to ± 0.05 K
- ❄️ centrifugal / gear pump options
- ❄️ low vibration
- ❄️ some models with automatic fill & drain
- ❄️ IoT enabled



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mini Recirculating Chiller Development Kits – mRC-KITs

The mRC-KITs (mini Recirculating Chiller development kits) feature precise control of ± 0.05 K. They are all equipped with speed-controlled 24 V BLDC mini rotary compressors. Within the mRC KIT portfolio, models for direct 24 VDC supply as well as with wide range input 100-240 VAC power supply are available.

The 450 W version (mRC-C-450-24-KIT) and 900 W version (DmRC-C-900-24-KIT) are particularly compact. They come with a small air pump to automatically pressurize the tank and drive an automatic fill and drain

process. The system performs a leakage test at start-up. Since the water circuit is pressurized, positive suction pressure and smooth cavitation-free operation of the pump is guaranteed. Overpressure on the cooling system also prevents the ingress of bacteria and oxygen and thus extends maintenance intervals.

The rackmount 900 W version has two circuits of 450 W each which can operate independently or connected in series. This mini recirculating chiller kit is also available in a 28 VDC version certified for light aircrafts.

mRC recirculating chillers

In addition to our mRC-KITs, AMS Technologies provides two recirculating chillers that are CE certified and available from stock. mRC-C-450-100/240 provides up to 500 W cooling capacity, while

mRC-C-1000-100/240 features a more powerful compressor, capable of cooling capacities up to 1000 W. Both systems come with an integrated 90 to 264 VAC wide-input-range power supply.

your customized mRC-KIT

For customer requirements that cannot be covered by the available kits and products, our thermal management specialists at AMS Technologies are happy to develop a completely tailor-made solution and offer all

services from development and proof-of-concept all the way to series production.

key features

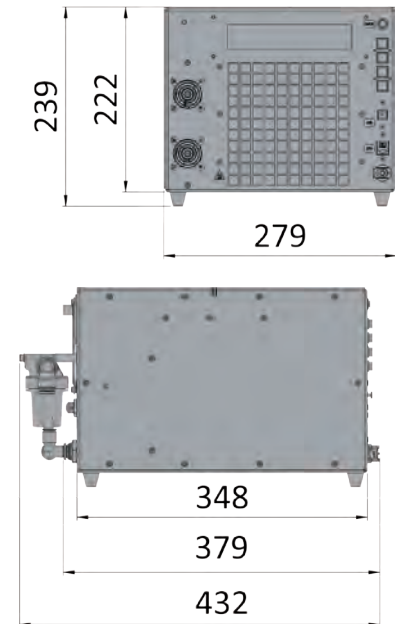
- models for 450 W, 900 W and 1000 W
($T_{\text{ambient}} + 25^{\circ}\text{C} / T_{\text{coolant}} + 25^{\circ}\text{C}$)
- coolants: water, glycol water, deionized water
- 24 VDC or universal 100-240 VAC power supply
- precise temperature control: ± 0.05 K
- refrigerant: R134a, R290 in preparation



mRC-C-450-100/240



dimensions [mm]



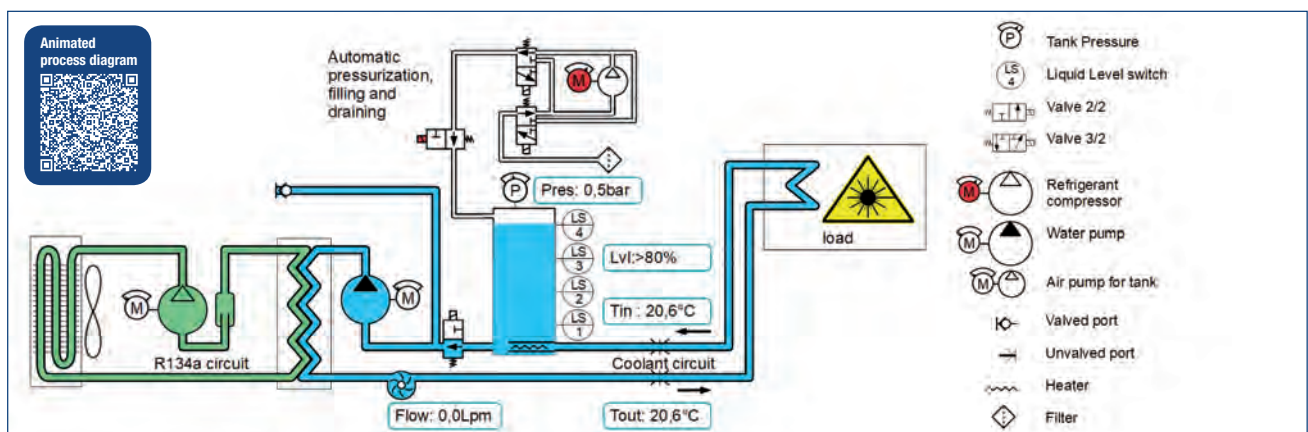
The mRC-C-450-100/240 features full chiller power and up to 450 W cooling capacity in a shoe box form factor. Its universal 90 to 264 VAC power supply allows it to be plugged in anywhere in the world.

key features

- recirculating water chiller
- ideal for water cooling tasks up to 450 W
- compact size, easy to be integrated in customer application
- 90 to 264 VAC power supply
- IoT enabled

specifications	mRC-C-450-100/240
model	mRC-C-450-100/240
power supply	90 to 264 VAC
power consumption	< 300 W
cooling capacity	300 W ($T_{\text{water}} = +20^{\circ}\text{C}, T_{\text{ambient}} = +40^{\circ}\text{C}$) to 500 W ($T_{\text{water}} = +20^{\circ}\text{C}, T_{\text{ambient}} = +20^{\circ}\text{C}$)
ambient temperature range	+10°C to +45°C
set coolant temperature range	+10°C to +30°C
temperature stability	±0.05 K continuous operation, +2/-1.5 K over-/undershoot @250 W heat load ON/OFF
available pressure head	1.5 bar @1 lpm, 0.5 bar @5.5 lpm
cabinet	bench-top
weight	13 kg
dimensions	279 × 239 × 432 mm (W×H×D), main body without filter
noise level	63 dBA (fan 40%, compressor 100%)
control	local, USB/serial, internet (web browser) via Ethernet
interlock I/O alarms	liquid level, tank pressure, coolant feed temperature, coolant flow rate, condenser pressure
approval	CE

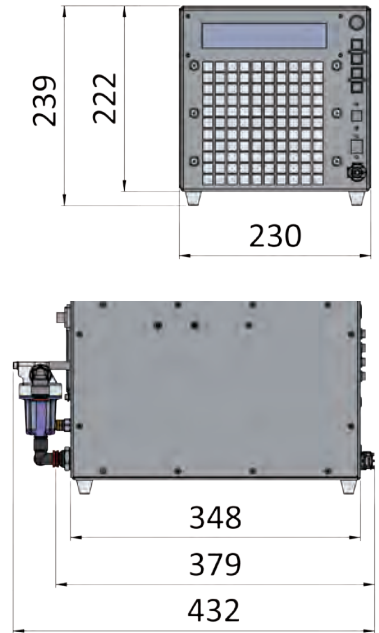
mRC-C-450-100/240 – process & instrumentation diagram



mRC-C-450-24-KIT



dimensions [mm]

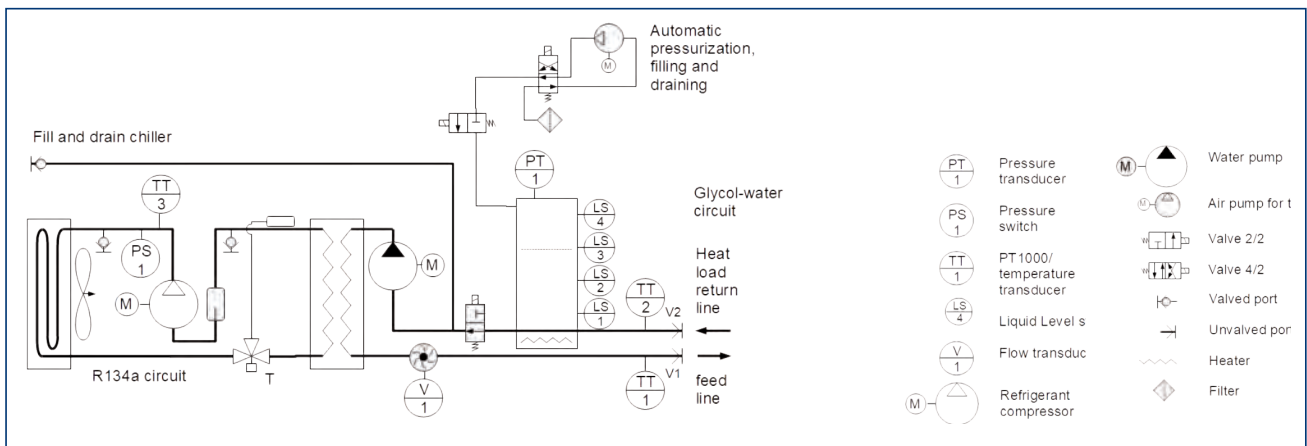


key features

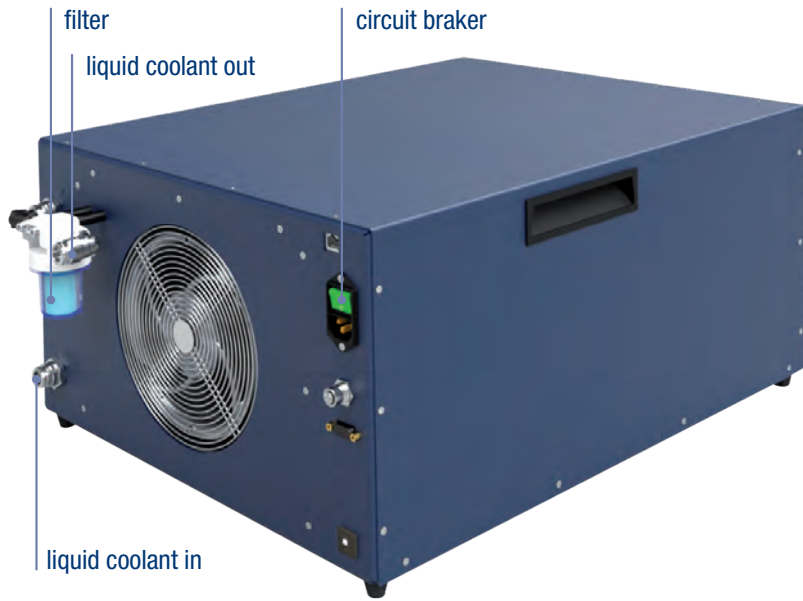
- recirculating water chiller
- ideal for water cooling tasks up to 450 W
- compact size, easy to be integrated in customer application
- 24 VDC power supply

specifications	mRC-C-450-24-KIT
model	mRC-C-450-24-KIT
power supply	24 VDC
power consumption	<290 W (≤ 12 A)
cooling capacity	300 W ($T_{\text{water}} = +20^{\circ}\text{C}, T_{\text{ambient}} = +40^{\circ}\text{C}$) to 500 W ($T_{\text{water}} = +20^{\circ}\text{C}, T_{\text{ambient}} = +20^{\circ}\text{C}$)
ambient temperature range	+10°C to +45°C
set coolant temperature range	+10°C to +30°C
temperature stability	± 0.05 K continuous operation, +2/-1.5 K over-/undershoot @250 W heat load ON/OFF
hydraulic parameters	available pressure head 1.5 bar @1 lpm, 0.5 bar @5.5 lpm
cabinet	bench-top
weight	13 kg
dimensions	230 × 239 × 432 mm (W×H×D), main body without filter
noise level	63 dBA (fan 40%, compressor 100%)
control	local, USB/serial, internet (web browser) via Ethernet
interlock I/O alarms	liquid level, tank pressure, coolant feed temperature, coolant flow rate, condenser pressure

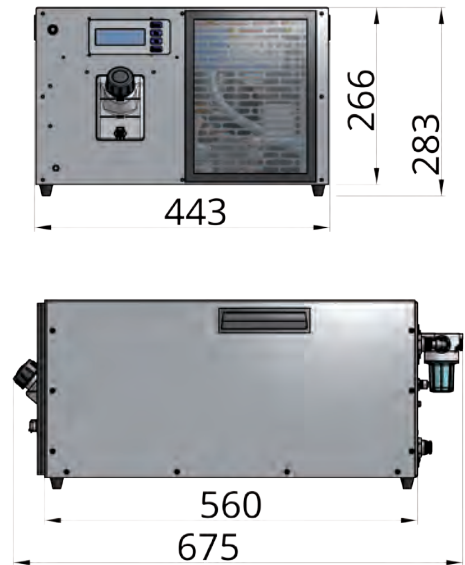
mRC-C-450-24-KIT – process & instrumentation diagram



mRC-C-1000-100/240



dimensions [mm]



The mRC-C-1000-100/240 features full chiller power and up to 1000 W cooling capacity in a compact form factor.

key features

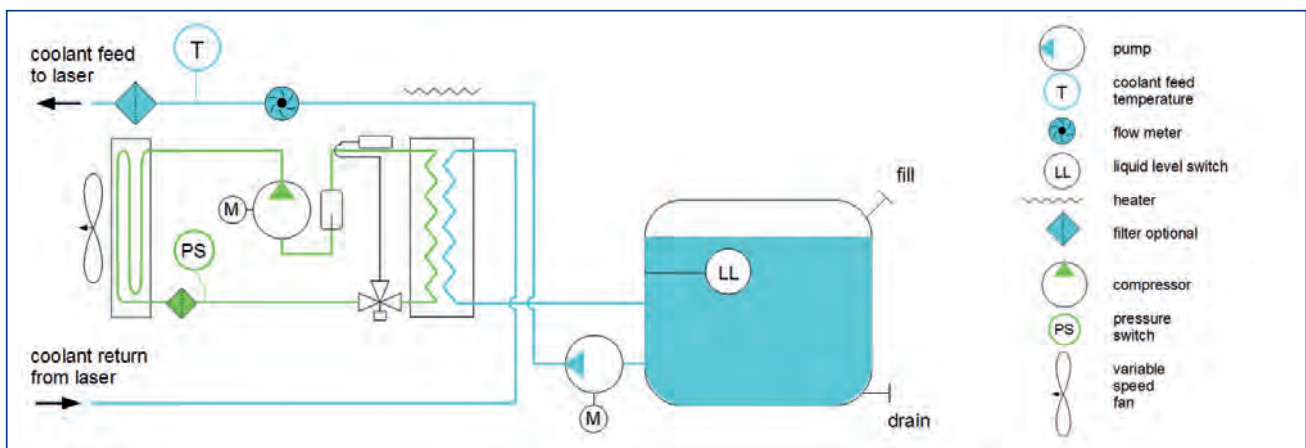
- precise temperature control: $\pm 0.05^{\circ}\text{C}$
- low noise
- “green” version available based on Propane (R290) as refrigerant
- optional Ethernet interface for “IoT ready” capabilities
- wide range input power supply (96 to 264 VAC)

options

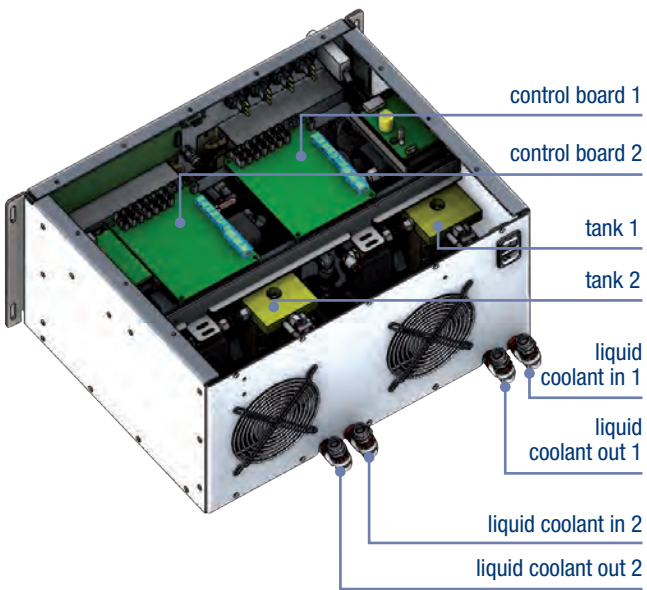
- 19” rack mount, 6U
- optional pumps
- CPC inlet/outlet fittings
- external coolant filters
- external dust filters
- Ethernet / IoT

specifications	
model	mRC-C-1000-100/240
cooling capacity	nominal 1 kW ($T_{\text{water}} = +25^{\circ}\text{C}$, $T_{\text{ambient}} = +35^{\circ}\text{C}$)
refrigerant	R134a
coolant	water, glycol water, deionized water
coolant flow	0.5 bar @ 5.5 lpm (standard), 5 bar @ 5 lpm (optional)
coolant tank volume	2 l
wide range power input	96 to 264 VAC, max. 750 W
ambient temperature range	+10°C to +40°C
coolant temperature range	+15°C to +30°C
dimensions	443 × 283 × 675 mm (W×H×D), main body without filter
temperature stability	$\pm 0.05^{\circ}\text{C}$ at constant load
inlet/outlet	push-in, 12 mm OD
communication interface	RS232, interlock, optional Ethernet
noise control	adaptive fan and compressor speed

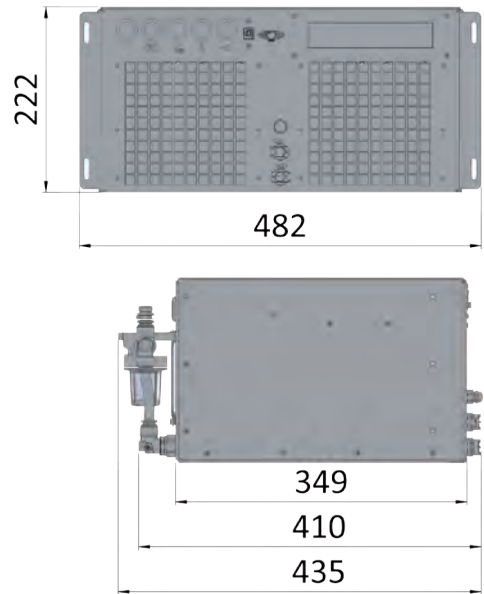
mRC-C-1000-100/240 – process & instrumentation diagram



DmRC-C-900-100/240-KIT



dimensions [mm]

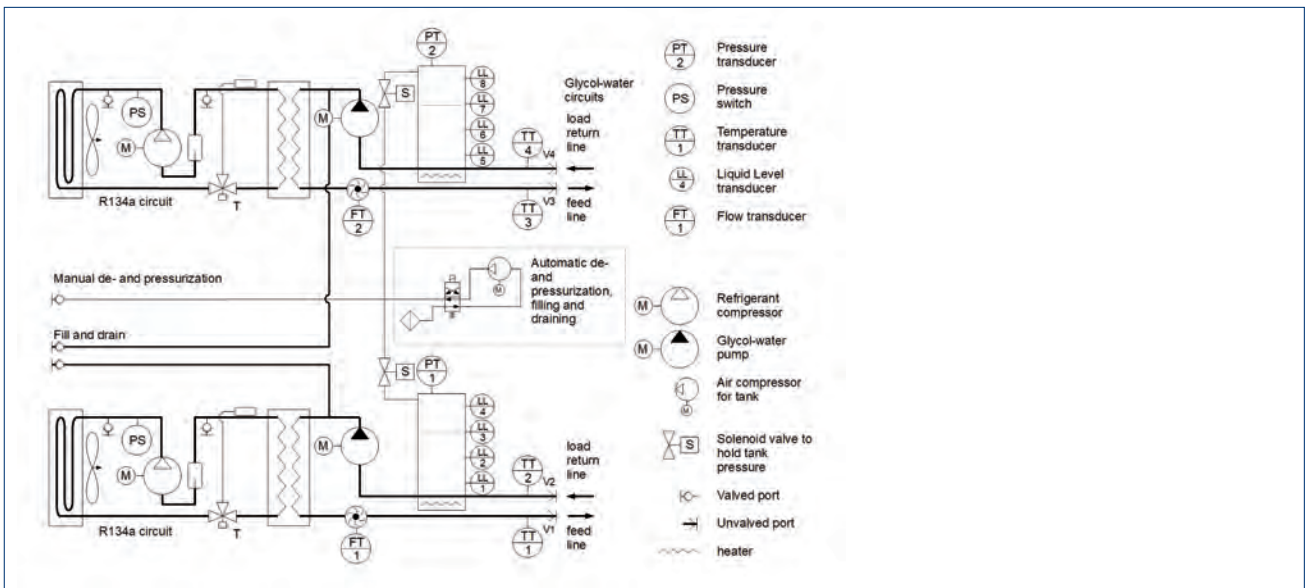


key features

- recirculating water chiller
- double (twin) cooling circuits, operable independently or in series
- ideal for water cooling tasks up to 900 W
- 24 VDC power supply
- 28 VDC version available certified for light aircrafts

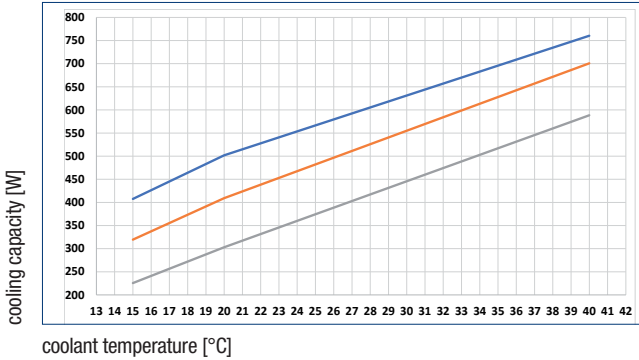
specifications	
model	DmRC-C-900-100/240-KIT
power supply	90 to 264 VAC
power consumption	<700 W
cooling capacity	900 W (2 × 450 W, $T_{water} = +25\text{ }^{\circ}\text{C}$, $T_{ambient} = +25\text{ }^{\circ}\text{C}$)
temperature range	+2/-1.5 K over-/undershoot at 250 W heat load ON/OFF, down to $\pm 0.05\text{ K}$ continuous operation
hydraulic parameters	pressure drop 1 bar to 0.2 bar @ 1 lpm to 5.5 lpm
cabinet	rack-mount, 19"/5U, aluminium housing
weight	20 kg (dry weight 19 kg)
dimensions	482 × 222 × 435 mm (W×H×D), main body without flanges
control	local, USB/serial, internet (web browser) via Ethernet
interlock I/O alarms	liquid level, tank pressure, coolant feed temperature, coolant flow rate, condenser pressure

DmRC-C-900-100/240-KIT – process & instrumentation diagram



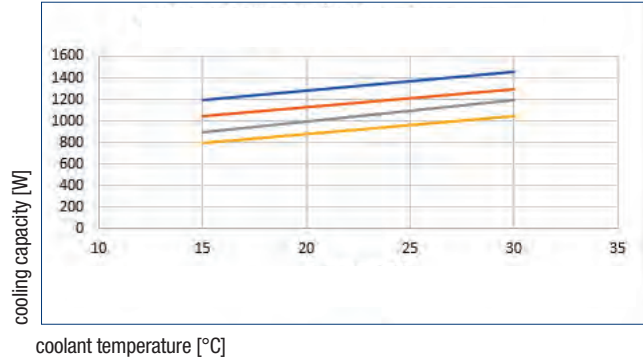
cooling performance / pressure head

mRC-C-450 KIT cooling capacity (compr.100 rps, fan 100%)



coolant temperature [°C]
 mRC-C-450-24-KIT / mRC-C-450-100/240
 — Tamb: +20°C — Tamb: +30°C — Tamb: +40°C

mRC-C-1000-100/240 KIT cooling capacity



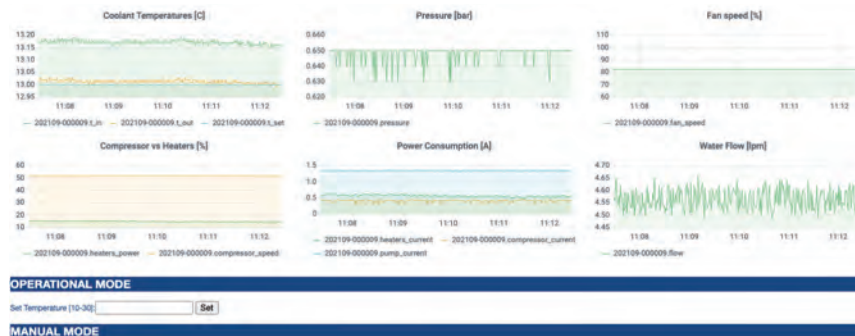
coolant temperature [°C]
 mRC-C-1000-100/240
 — Tamb: +25°C — Tamb: +30°C — Tamb: +35°C — Tamb: +40°C

automatic fill & drain for mRC-C-450 & DmRC-C-900

Using automatic air and water pump technology integrated into the unit, the cooling water in the tank and pipe system of the mRC-KIT can be automatically filled and drained at the push of a button – without the need for time-consuming tilting or removing the unit or the tank from the system and avoiding annoying spills or leaks.



IoT ready



An integrated Ethernet interface (mRC-C-450-100/240, optional for mRC-C-1000-100/240) allows access to system parameters of the chiller as well as remote control of the cooling system via a web browser.

remote operation:

- switch on/off
- set regulation temperature
- set fan speed

remote monitoring:

- water loop: temperature setpoint, inlet temperature, outlet temperature, cooling water flow, pressure, cooling water level in tank
- coolant loop: compressor speed setpoint, condenser temperature, heater power, fan speed
- current and voltage: supply voltage, control board current, compressor current, heater current, pump current, fan current, valves current

- alarms: liquid level low, cooling loop over-pressure, outlet temperature out of range, flow out of range, supply voltage out of range
- other: system internal temperature, time & date
- all data can be kept on memory card or/and in real-time database

remote service:

- switch on/off components individually: compressor, heaters, fan, pump, coolant and pressure valves
- setting of alarms thresholds
- setting of filling and draining timeout
- clear alarms
- PID settings
- filling and draining procedure (not recommended, remote hands needed)
- power-on-test on/off

remote update of firmware



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