amsTECHNOLOGIES
where technologies meet solutions

recirculating chillers

precise temperature control and high reliability

- active cooling below ambient
- thermoelectric (TEC) and compressor-based
- cooling capacities 160 W to 95 kW
- quiet operation
- ease of use

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THERMAL MANAGEMENT

AMS Technologies – where technologies meet solutions

AMS Technologies is a leading solution provider and distributor of high-tech, leading-edge components, systems and equipment, with more than 35 years of experience to date and currently serving more than 2000 European customers.

We are the specialists in both componentry and complete solutions for Optical Technology, Thermal Management and Power Technology fields, with access to and long standing relationships with the most advanced manufacturers in each of those fields. Drawing extensively on our experience in each of these differing technologies, and coupling this with our broad system-level competence, we are able to offer seamless and comprehensive solutions incorporating complementary aspects from all three key technology fields.

With an appropriate technical education, an element of entrepreneurial spirit and many years of design and consultancy expertise, our sales engineers can rapidly comprehend system requirements and provide you the customer with a solution that goes way beyond a simple understanding of our product datasheets. We take active involvement in the design cycle, defining and re-defining your specifications, and leading in many cases to highly specific, customized products and solutions. Helping you to effectively outsource your production line, we can even provide you with the necessary leading turnkey contract manufacturing services in our key competency fields.

AMS Technologies has been delivering solutions into a variety of high-tech markets, including renewable energies, medical, defence & aerospace, research & scientific and various other industrial segments. Our customer base consists of Europe's largest leading technology corporations, a network of universities and research institutes as well as the most promising start-ups.

We thrive by working in a 'customer first' environment. Our pan-European customers are serviced from a network of local offices in Germany, the UK, France, Italy, Spain, Poland and Sweden, with a focused operations and logistics centre located in Munich, Germany.

Our commitment: Identifying the best solution for your project enabling you to become your customers' first choice!
Your AMS Technologies team

- Optical Technologies
- Power Technologies
- Thermal Management

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recirculating chillers

Featuring precise temperature control, quiet operation and high reliability, our recirculating chillers range from compact thermoelectric chillers with a cooling capacity of 160 W to a multitude of stand-alone and rack-mount devices based on thermoelectric or compressor engines to very powerful chillers capable of dealing with heat loads up to 95 kW. Beyond the standard versions, a variety of options can be provided for different fluids, pumps, low temperatures below freezing, control and monitoring, additional heating and other aspects – all the way to fully customized solutions tailored to your requirements. Our recirculating chillers are used in applications like laser cooling, laboratory instrumentation, medical and analytical equipment, scanning electron microscopes, power supplies, printers or tooling machines.

mini recirculating chillers

No moving parts and high performance in a very compact size: With our mini thermoelectric recirculating liquid chillers UC160-190 and TCube mini 270 you get 160 W to 270 W cooling capacity with precise temperature control. Based on ultra-reliable thermoelectric modules, these compact chillers' lifetimes can easily exceed 200,000 hours. Both chillers are very space efficient and fit easily inside your equipment or on your table top – ideal for laboratory, lab automation, medical, lasers, CCD cameras and many other applications.

stand-alone recirculating chillers

Thermoelectric or compressor-based chillers for stand-alone use on your workbench or close to your device or machine. Our chillers offer precise temperature control for reliably cooling lasers and other sensitive equipment. Cooling capacities range from 200 W to 95 kW. In our broad portfolio you will find the performance and size you are looking for. Choose between standard chillers, double temperature and double pump versions and a variety of options like low / high temperature versions, wetted materials, pump type or additional heating.

rack mount recirculating chillers

Our rack mount thermoelectric or compressor-based recirculating chillers offer precise temperature control for sensitive equipment. Configurable and customizable rack mount chillers come in 4 to 18 unit high enclosurs and are available with cooling capacities from 315 W to 4,000 W. The coolant fluid circuit is designed for de-ionized water, ethylene glycol/water or propylene glycol/water. Different pumps deliver flow rates from 0.2 lpm to 13 lpm.

compressor-based stand-alone chillers

	CW-5000	Kodiak RC006	Kodiak RC009	Kodiak RC011	Kodiak RC022	
Cooling engine	Compressor	Compressor	Compressor	Compressor	Compressor	
Cooling capacity (at +20 °C in +20 °C ambient air)	627 W	825 W (60 Hz)	1,050 W (60 Hz)	1,650 W (60 Hz)	2,400 W (60 Hz)	
Coolant temperature range		+5 °C to +35 °C	+5 °C to +35 °C	+5 °C to +35 °C	+5 °C to +35 °C	
Temperature stability (constant load)	±0.3 °C	±0.1 °C (at +20 °C ambient and +20 °C setpoint)	±0.1 °C (at +20 °C ambient and +20 °C setpoint)	±0.1 °C (at +20 °C ambient and +20 °C setpoint)	±0.1 °C (at +20 °C ambient and +20 °C setpoint)	
Pump type		PDP, Centrifugal, Turbine	PDP, Centrifugal, Turbine	PDP, Centrifugal, Turbine	PDP, Centrifugal, Turbine	
Process fluid flow rate	10 lpm to 16 lpm	PDP: 4.9 lpm to 8.7 lpm	PDP: 4.9 lpm to 8.7 lpm	PDP: 4.9 lpm to 16.3 lpm	PDP: 4.9 lpm to 16.3 lpm	
Fluid connections	Ø 10 mm barbed/speedy connector	½" FNPT	½" FNPT	½" FNPT	½" FNPT	
Dimensions (w × d × h) mm	290 × 580 × 470	318 × 483 × 559	318 × 483 × 559	376 × 623 × 673	376 × 623 × 673	

stand-alone chillers for low / high temperature operation

	Kodiak RC31973G1	Kodiak RC50106G1	Kodiak RC50222G1	Kodiak RC50050G1	Kodiac RC29246G1	
Cooling engine	Compressor	Compressor	Compressor	Compressor	Compressor	
Cooling capacity	550 W at -80 °C	1,500 W at -80 °C	2,000 W at -40 °C	500 W at -40 °C	2,500 W at -20 °C	
Coolant temperature range	-80 °C to +50 °C	-80 °C to +40 °C – max. return temperature of coolant is +60 °C	-40 °C to +85 °C	-40 °C to +90 °C	-25 °C to +90 °C	
Temperature stability (constant load)	±0.5 °C	±0.5 °C from -80 °C to -5 °C, ±3 °C from -4.9 °C to +40 °C	±0.5 °C	±0.5 °C	±0.5 °C	
Pump type	Magnetically coupled gear pump with VFD and programmable pressure controller		Magnetically coupled turbine pump			
Fluid connections	½" Swagelok	Process ½" Swagelok, Facility ¾" FPT	Process ½" Swagelok, Facility ¾" FPT	½" FPT	½" FPT	
Dimensions (w × d × h) mm	508 × 1016 × 1346	508 × 1016 × 1626	490.2 × 736.6 × 1163	703.6 × 487.7 × 934.7	492.8 × 706.1 × 972.8	

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compressor-based stand-alone chillers

	Kodiak RC030	CW-6200	Kodiak RC045	CWFL-3000	Kodiak RC095	Kodiak RC115
Cooling engine	Compressor	Compressor	Compressor	Compressor	Compressor	Compressor
Cooling capacity (at +20 °C in +20 °C ambient air)	3,450 W (60 Hz)	4,385 W	5,900 W (60 Hz)	8,100 W	9,600 W (60 Hz)	11,000 W (60 Hz)
Coolant temperature range	+5 °C to +35 °C		+5 °C to +35 °C		+5 °C to +35 °C	+5 °C to +35 °C
Temperature stability (constant load)	±0.1 °C at +20 °C ambient and +20 °C setpoint	±0.5°C	±0.1 °C at +20 °C ambient and +20 °C setpoint	±1°C	±0.1 °C at +20 °C ambient and +20 °C setpoint	± 0.1 °C at +20 °C ambient and +20 °C setpoint
Pump type	PDP, Centrifugal, Turbine		PDP, Centrifugal, Turbine		Centrifugal, Turbine	Centrifugal, Turbine
Process fluid flow rate	PDP: 16.3 lpm	70 lpm	PDP: 16.3 lpm	50 lpm (high temp)/ 83 lpm (low temp)	dep. on pressure drop	
Fluid connections	½" FNPT	Rp ½"	½" FNPT	Rp ½" +Rp 1"	¾" FNPT	¾" FNPT
Dimensions (w × d × h) mm	543 × 705 × 810	470 × 780 × 890	543 × 705 × 810	650 × 1020 × 1170	813 × 1092 × 1143	813 × 1092 × 1143

stand-alone chillers for low / high temperature operation

	Kodiak RC50136G1	Kodiak RC31526G1	Kodiak RC50112G1
Cooling engine	Compressor	Compressor	Compressor
Cooling capacity	33,000 W at +20 °C	7,000 W at +20 °C	800 W at +20 °C
Coolant temperature range	+4 °C to +90 °C		+10 °C to +200 °C
Temperature stability (constant load)	±1 °C	±0.5 °C	±1 °C
Pump type	Turbine	Magnetically coupled turbine	
Fluid connections	1" FPT	½" FPT	Process ½" Swagelok, Facility ¾" FPT
Dimensions (w × d × h) mm	812.8 × 1524.0 × 1143	487.7 × 703.6 × 934.7	490.2 × 490.2 × 1163.0

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TEC-based stand-alone chillers

	Thermocube A	Thermocube	TCube edge	Thermocube PAO	T-Three	Thermocube L	Cleanstream 550-H1500
Cooling engine	Thermoelectric (TEC)	Thermoelectric (TEC)	Thermoelectric (TEC)	Thermoelectric (TEC)	Thermoelectric (TEC)	Thermoelectric (TEC)	Thermoelectric (TEC)
Cooling capacity (at +20 °C in +20 °C ambient air)	150 W to 250 W	200 W to 400 W	235 W to 285 W	275 W	275 W to 330 W	400 W to 600 W	550 W
Coolant temperature range	-10 °C to +65 °C	-5 °C to +65 °C	0 °C to +50 °C	0 °C to +65 °C	+5 °C to +50 °C	-10 °C to +65 °C	+10 °C to +90 °C
Temperature stability (constant load)	± 0.2 °C	± 0.05 °C	± 0.05 °C	± 0.1 °C	± 0.05 °C	± 0.05 °C	± 0.05 °C
Pump type	–	Diaphragm / Gear / Centrifugal	Centrifugal	Magnetically coupled gear	1C Centrifugal	Diaphragm / Gear / Centrifugal	–
Process fluid flow rate	–	1.5 lpm to 3.5 lpm @ 10 psig	2 lpm @ 10 psig	1 lpm tp 3 lpm @ 30 psig	3 lpm to 4.5 lpm @10 psig	1.5 lpm to 3.5 lpm @ 10 psig	2 lpm to 38 lpm
Fluid connections	1/4" John Guest std., CPC / Swagelok opt.	1/4" John Guest plus many options	1/4" valved CPC	1/4" CPC metal	3/8" brass female NPT or 1/4" CPC bulkhead	John Guest std., CPC or Swagelok opt.	¾" or 1" Flaretek, or Teflon tube stub
Wetted materials	–	Aluminium, stainless steel, polymers	Aluminium or stainless steel w. compatible materials	Aluminium, stainless steel, polymers	Copper, brass or Aluminium, stainless steel; polymers	Aluminium, stainless steel, polymers	–
Dimensions (w × d × h) mm	280 × 320 × 320	280 × 320 × 320	280 × 330 × 280	280 × 320 × 320	280 × 330 × 280	280 × 320 × 320	286 × 444 × 118

stand-alone chillers for high thermal loads

	Kodiak RC27969G1	CW-7900	Kodiak RC50077G1	Kodiak RC34944G1
Cooling engine	Compressor	Compressor	Compressor	Compressor
Cooling capacity (at +20 °C in +20 °C ambient air)	21,000 W (60 Hz)	25,200 W	50,000 W (60 Hz)	95,000 W (60 Hz)
Coolant temperature range	+5 °C to +30 °C		+5 °C to +30 °C	+4 °C to +30 °C
Temperature stability (constant load)	±0.5 °C	±1 °C	±1 °C	±1 °C
Pump type	Centrifugal		Turbine	Stainless steel centrifugal
Process fluid flow rate		70 lpm to 116 lpm		
Fluid connections	1" FPT	Rp 1"	1" FPT Process and Facility	Process 2" FPT
Dimensions (w × d × h) mm	795 × 1532 × 864	870 × 1660 × 1870	823 × 1646 × 1321	813 × 1549 × 1245

mini recirculating chillers

	UC160-190	TCube mini 270
Cooling engine	Thermoelectric (TEC)	Thermoelectric (TEC)
Cooling capacity (at +20 °C in +20 °C ambient air)	160 W to 190 W	270 W
Operating range (set point)	+ 2 °C to +45 °C	+2 °C to +45 °C
Temperature stability (constant load)	± 0.1 °C	± 0.1 °C
Pump type	Magnetically coupled gear (w. brushless DC motor)	Long life magnetic gear pump
Process fluid flow rate	0.45 lpm @ 10 psig	~0.75 lpm @ 10 psig
Fluid connections	1/8“ female CPC quick connect w. shut-off valve	1/8“ female CPC quick connect w. shut-off valve
Wetted materials	Aluminium, polymers	Aluminium (copper or stainless steel options planned)
Dimensions (w × d × h) mm	130 × 190 × 180	130 × 190 × 230

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rack-mount recirculating chillers

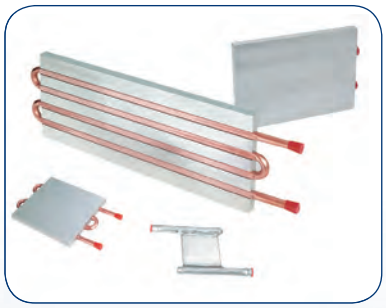
	Thermorack 401	Thermorack 800	Thermorack 1000	Kodiak RC26071G1	Kodiak RC29112G1
Cooling engine	Thermoelectric (TEC)	Thermoelectric (TEC)	Thermoelectric (TEC)	Compressor	Compressor
Cooling capacity (at +20 °C setpoint)	315 W to 420 W	700 W to 900 W	1000 W	600 W (at +20 °C ambient, 60 Hz)	4,000 W (at +30 °C ambient, 60 Hz)
Operating range (set point) / coolant temperature range	+5 °C to +45 °C	+5 °C to +50 °C	0 °C to +65 °C	+4 °C to +30 °C	
Temperature stability (constant load)	±0.05 °C	±0.05 °C	±0.1 °C	±0.5 °C	
Pump type	Centrifugal / Gear	Centrifugal	Magnetically-driven rotary vane	Magnetically coupled centrifugal	4 gpm Positive displacement
Process fluid flow rate	2 lpm @ 15 psig or 3 lpm configurable	3.5 lpm @ 30 psig	>12 lpm @ 30 psig		
Fluid connections	¼" CPC with shut off valves	⅜" female NPT	⅜" Swagelok	¼" FPT	½" FPT
Wetted materials	Al, stainless steel, polymers or Cu, stainless steel, brass, polymers	Al, stainless steel, polymers or Cu, stainless steel, brass, polymers	Aluminium, stainless steel, polymers		
Dimensions (w × d × h) mm	480 × 530 × 180	480 × 510 × 270	480 × 690 × 270	432 × 508 × 262	483 × 686 × 800

associated products

accessories, spares & consumables

Within our broad range of accessories, spares and consumables for the use with recirculating chillers, you can find readily confectioned insulating hoses, fittings and adapters for fluid handling, filters for air and water or temperature control plates, but also consumables like bottles of high performance liquid coolants.

cold plates

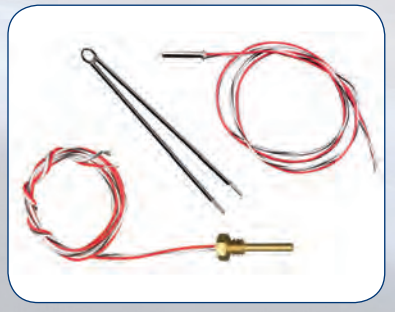


Our cold plate technologies range from tubed cold plates and flat tube cold plates to performance-fin cold plates and liquid-cooled chassis. In a world of compact designs with increasing power densities, cold plates are satisfying demanding contact cooling requirements in applications as diverse as high-powered electronics, lasers, power drives, medical equipment, and military and aerospace. For high watt densities, when air-cooled heat sinks are inadequate, liquid-cooled cold plates are the ideal high-performance heat transfer solution.

heat exchangers

AMS Technologies' heat exchanger portfolio includes tube-fin heat exchangers (copper or stainless steel tubes expanded into copper or aluminum fin for good and cost effective heat removal), oil cooler flat tube heat exchangers (aluminum flat tube fluid channels vacuum brazed with aluminum fin for optimum cooling with poor heat transfer fluids such as oil and EGW) and liquid-to-liquid brazed plate heat exchangers (herringbone construction for efficient maximum heat transfer in a compact and reliable package).

temperature sensors



Accurate and fast temperature sensors are essential for precision temperature control. Amongst the different types of temperature sensors, thermistors provide very high sensitivity, small size and appropriate speed. AMS Technologies' extensive range of NTC thermistor temperature sensor probes with base resistance values from 5 kΩ to 231.5 kΩ include various types from ultraminiature bare bead, epoxy coated and pipe versions (poly-imide, brass, brass nickel, stainless steel – threaded and unthreaded) to flange mount and plate models. Sizes range from 0.5 mm to 6.5 cm with Teflon coated lead lengths from 5 cm to 45 cm.

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from technology components to turnkey solutions

We want to accelerate your success, which is why AMS Technologies has invested in two design centers: in Krakow, Poland, and in the United Kingdom. Our goal is to augment your team's key competencies by providing engineering services that are not core to you or where you may struggle with available resources to finish your projects.

From design services to prototype development to complete turnkey solutions, our collaborative approach has already helped many customer projects to move from concept to production.

- Design, prototyping and "proof of concept"
- Development of turnkey solutions to the customer's order
- Design-in, systems integration, realization of entire design projects
- Development of customized specification sheets
- Effective project management of any product development
- Interdisciplinary system-level integrated design
- Appropriate subcontractor selection and production support
- Simulations and modeling of system-level designs
- Installation, training and servicing

custom laser chiller aboard an aircraft

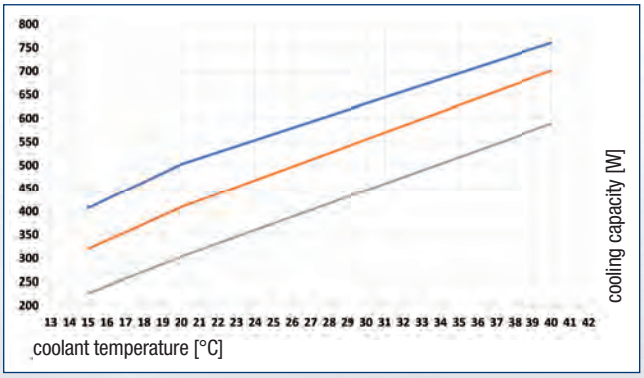
Too much drain on the battery: Our customer is operating a laser scanning system out of light airplanes for cartographic mapping and struggled with too high power consumption of the thermoelectric chiller used at that time. He turned to AMS Technologies to find a solution with a substantially reduced power consumption as well as dual output providing individual temperature control of pump diode and crystal cavity. AMS Technologies came up with two separate recirculating chiller circuits in a 19" rack with a common control board and DC/DC power supply. With this customized solution utilizing mini rotary compressors, small centrifugal pumps and small pressurized tanks, AMS Technologies was able to cut the power consumption by half. The solution has been certified to EMC and vibration resistance according to aviation standards.

mRC-C-450-100/240 – mini Recirculating Chiller – full chiller power in shoe box size

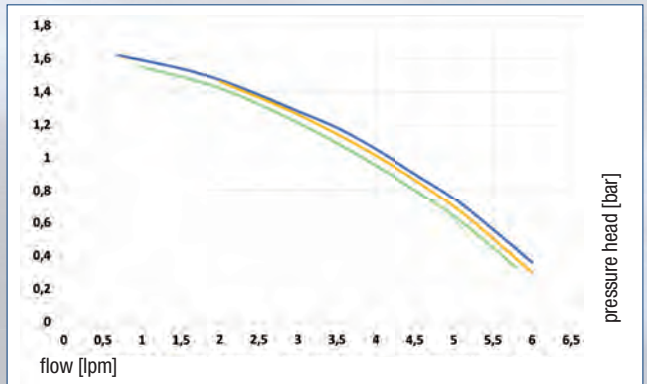
Our mRC-C-450-100/240 mini recirculating chiller features a vapor compression circuit and a closed, pressurized recirculating water circuit – like a conventional chiller five times the size. On the refrigeration side, a miniature rotary compressor, customized condenser and evaporator are utilized to reduce size. The twin pump compressor's BLDC motor is speed controlled by an inverter, offering efficient operation with high temperature stability as well as low vibration and low noise throughout the speed range. An integrated air pump applies overpressure on the coolant loop, allowing for a very small coolant tank and the compact centrifugal coolant pump operating smoothly and without cavitation – and also enabling automatic fill and drain. In addition, this overpressure prevents the ingress of bacteria and oxygen and thus extends the maintenance intervals. With its universal 90 to 264 VAC power supply, the mRC-C-450-100/240 can be plugged in anywhere in the world. 24 VDC and double mini recirculating chiller versions are also available on request. An integrated Ethernet interface renders the chiller "IoT ready", allowing access to system parameters as well as remote control of the cooling system via a web browser.

- up to 500 W cooling capacity in compact format
- temperature stability down to ±0.05 K
- 90 to 264 VAC universal power supply
- smooth, low-noise operation with low vibration
- automatic fill and drain
- IoT enabled – remote operation, monitoring and service via Ethernet interface

mRC-C-450-100/240 cooling capacity
(compressor 100 rps, fan 100%)



mRC-C-450-100/240 pressure head vs. flow



mRC-C-450-100/240 – unit main parameters	
weight	13 kg
dimensions (W×H×D)	350 mm × 280 mm × 230 mm, main body w/o filter
power supply	90 to 264 VAC
noise level	63 dBA (fan 40 %, compressor 100%)
control	local panel (optional), RS232
Interlock I/O alarms	liquid level, tank pressure, coolant feed temperature, coolant flow rate, condenser pressure

mRC-C-450-100/240 – specifications	
power supply consumption	< 300 W
cooling capacity (approximately)	300 W (T_{WATER} +20°C, $T_{AMBIENT}$ +40°C) to 500 W (+20°C/+20°C)
temperature stability	±0.05 K continuous operation, +2/-1.5 K over-/undershoot at 250 W heat load ON/OFF
hydraulic parameters	flow rate 4 lpm @ 2 bar (optionally 4 lpm @ 1 bar)

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mLC-KITs – mini Liquid Cooling Kits

If you have your own coolant loop design in mind, our mini Liquid Cooling development kits are what you are looking for, featuring a sealed vapor compression circuit with a speed-controlled miniature rotary BLDC compressor. Equipped with nickel brazed stainless steel plates, a heat exchanger serves as evaporator, is the interface to the customer liquid coolant circuit and suitable for a variety of coolant fluids, such as water, DI water and glycol-water mixtures. For smooth and precise temperature control the compressor speed can be set from the upper control system.

- ideal for bio reagents cooling
- ideal for mobile applications (mLC-C-450-24-KIT)
- kits to interface with OEM water circuit and electronics control
- utilizes low vibration, low noise mini rotary compressor
- components carefully designed to match each other
- ideal for compact laser cooling up to 500 W (mLC-C-450-24- KIT 500) or 1200 W (mLC-C-450-24-KIT)

mLC-C-450-24-KIT – specifications	
power supply consumption	< 150 W (6A @ 24VDC, 80 rps)
cooling capacity (approximately)	450 W (@ 100 rps, T_{WATER} = +25°C, $T_{AMBIENT}$ = +25°C)
temperature range (ambient, operating)	-10°C to +45°C
hydraulic parameters	pressure drop 30 kPa @ 4 lpm

mLC-1200-24-KIT – specifications	
power supply consumption	max 30 A @ 24 VDC
cooling capacity (approximately)	930 W (T_{WATER} = +20°C, $T_{AMBIENT}$ = +40°C, 2 lpm, 59 rps) to 1760 W (T_{WATER} = +20°C, $T_{AMBIENT}$ = +20°C, 4 lpm, 90 rps)
temperature range (ambient, operating)	+15°C to +45°C
hydraulic parameters	pressure drop 40 mbar @6 lpm, 100 mbar @9 lpm

mLC-C-450-24-KIT – unit main parameters	
weight	3.4 kg
dimensions (WxHxD)	200 mm × 172 mm × 180 mm
electrical connection	24 VDC
frame	stainless steel
control	inverter board

mLC-KIT 1600 – unit main parameters	
weight	10 kg
dimensions (WxHxD)	250 mm × 386 mm × 248 mm
electrical connection	24 VDC
frame	aluminium sheet
control	upper system to control inverter

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enabling your ideas.

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