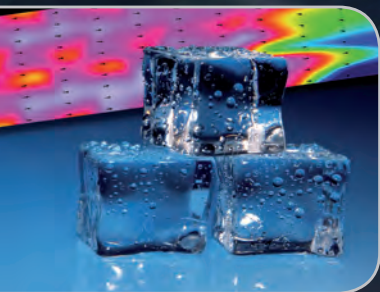


## mLC-KITs – mini Liquid Cooling Kits

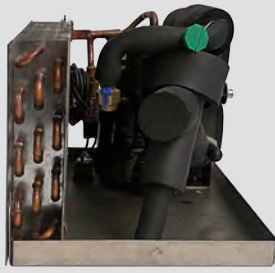
compact sealed compressor systems for water cooling



- ❄ up to 1200 W cooling capacity
- ❄ speed control for ease of temperature control
- ❄ lightweight, compact
- ❄ easy to integrate



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 40 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.

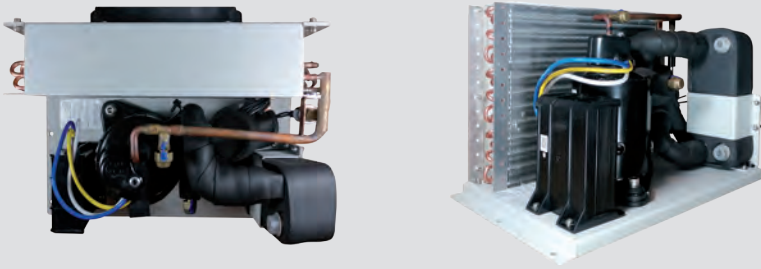
We thrive by working in a 'customer first' environment. Our pan-European customers are serviced from a network of local offices in Germany, the UK, France, Italy, Spain and Sweden, with a focused operations and logistics center located in Munich, Germany.

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



## new possibilities with miniature rotary and linear compressors

mLC-KITs are sealed vapor compression circuits with speed-controlled miniature rotary BLDC compressors. The evaporators are brazed plate heat exchangers, the interface to the customer liquid coolant circuit. The mLC-KITs come with inverter boards that require a 24 VDC power supply. The compressors' speed can be set from the upper control system by frequency or analog signal. The condenser is an aluminum finned copper tube heat exchanger coil. The mLC-KITs must be cooled by forced convection, i.e. 120 × 120 mm fan. The mLC-C-1200-24-KIT 1200 is already equipped with a fan.

The heat exchanger stainless steel plates are nickel brazed and suitable for a variety of coolant fluids, such as water, DI water and glycol-water mixtures. The plate heat exchanger has male R ¼" / R ⅜" connectors to connect the water circuit on the customer's side.

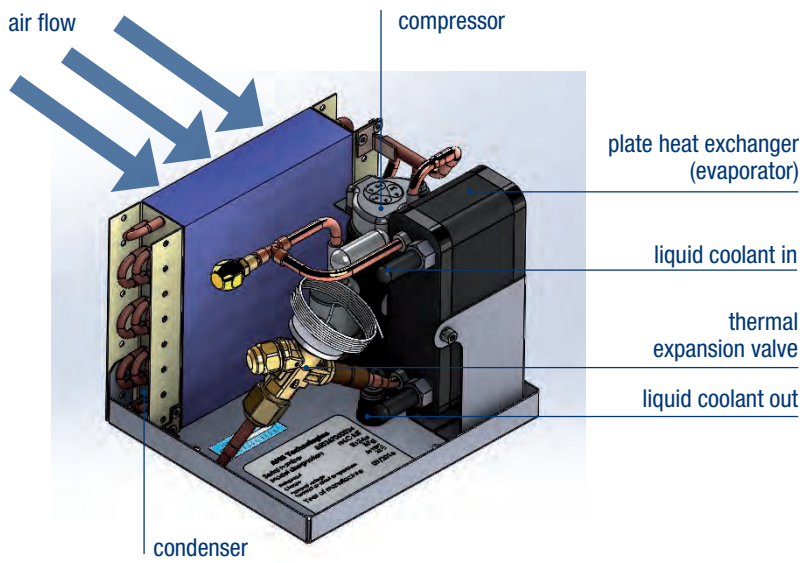
- ideal for compact laser cooling up to 500 W (mLC-C-450-24-KIT) or 1200 W (mLC-C-1200-24-KIT)
- ideal for bio reagents cooling
- ideal for mobile applications (mLC-C-450-24-KIT)

### key features

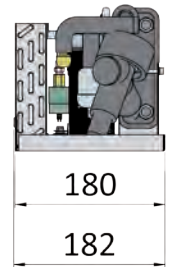
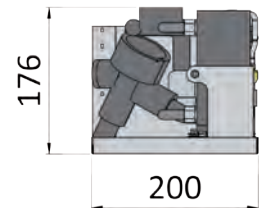
- kits to interface with OEM water circuit and electronics control
- mLC-KITs utilize low-vibration, low-noise rotary compressor
- components carefully designed to match each other



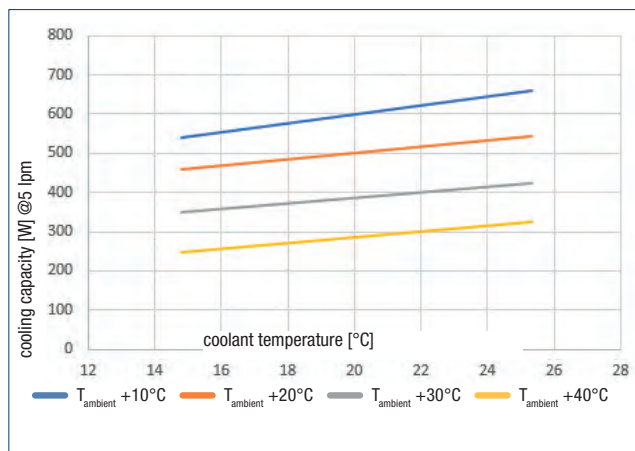
# mLC-C-450-24-KIT



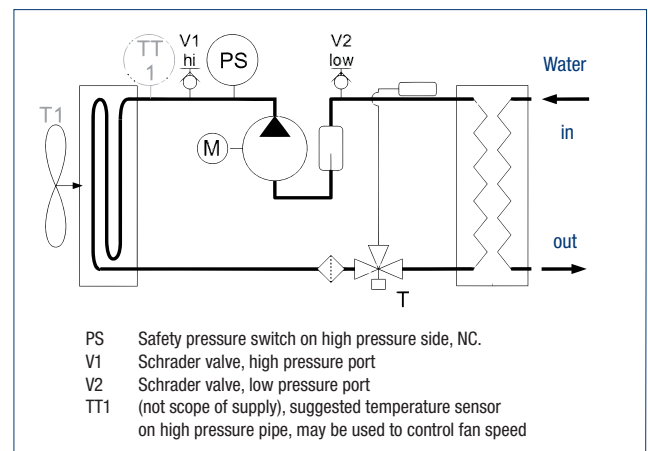
## dimensions [mm]



## cooling capacity



## process & instrumentation diagram



### mLC-C-450-24-KIT – specifications

power supply consumption	< 150 W (6A @ 24VDC, 80rps)
cooling capacity (approximately)	450 W (at 100 rps, T <sub>water</sub> = +25°C, T <sub>ambient</sub> = +25°C)
temperature range (ambient, operating)	-10°C to +45°C
hydraulic parameters	pressure drop 30 kPa @ 4 lpm

### mLC-C-450-24-KIT – unit main parameters

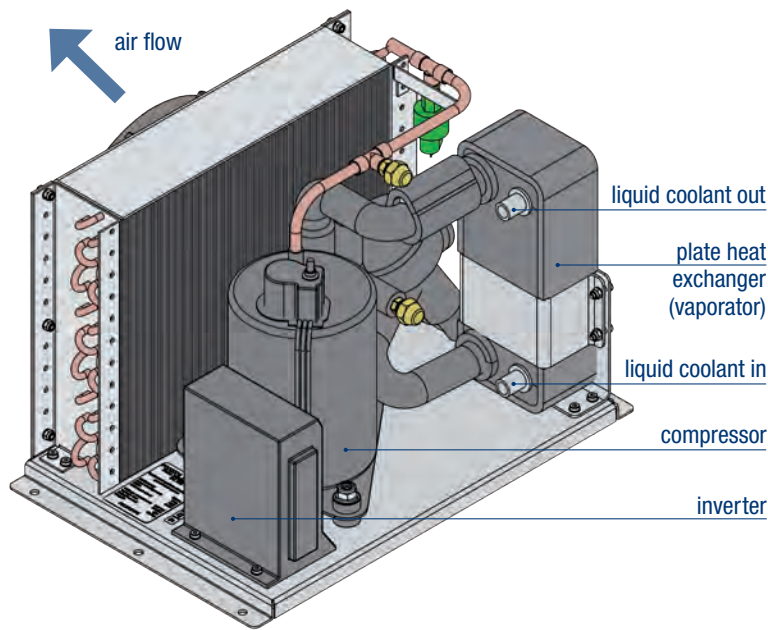
weight	3.4 kg
dimensions	200 × 176 × 182 mm (W × H × D)
electrical connection	24 VDC
frame	stainless steel
control	inverter board

### mLC-C-450-24-KIT – controller/inverter Board, DC model

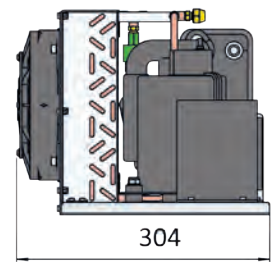
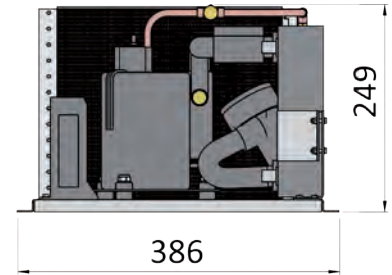
rated voltage	24 VDC
max current	12 A
max input power	250 W
operating range	20 to 100 rps
speed command	square wave pulse frequency: 40 Hz ~ 200 Hz, variable resistor input: 2 kΩ ~ 10 kΩ



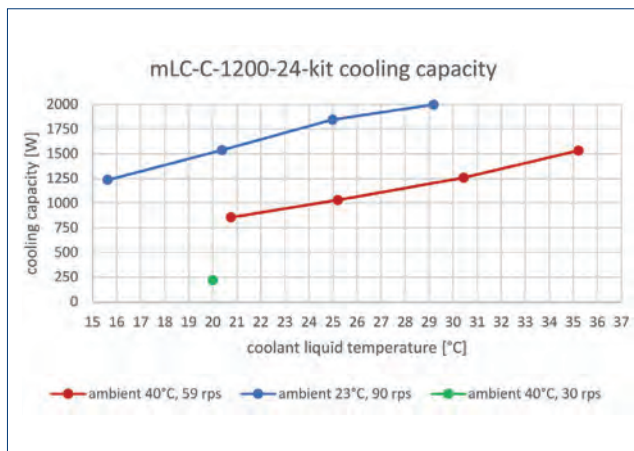
# mLC-C-1200-24-KIT



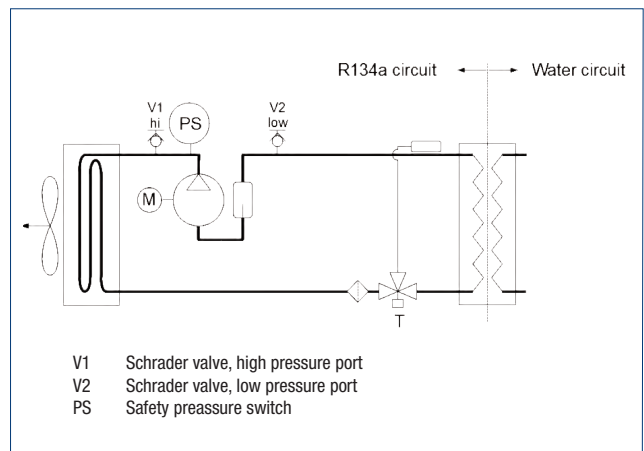
dimensions [mm]



## cooling capacity (nominal curves)



## process & instrumentation diagram



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

mLC-KIT 1200-24-KIT – unit main parameters	
weight	10 kg
dimensions	386 × 249 × 304 mm (W×H×D)
electrical connection	24 VDC
frame	aluminium sheet
control	upper system to control inverter

mLC-KIT 1200-24-KIT controller/inverter board 24 VDC	
rated voltage	24 VDC
max output power	620 W
operating range	28 to 100 rps
stroke command	square wave pulse frequency 56 Hz to 200 Hz, variable resistor input: 2,8 kΩ to 10 kΩ



## associated products

---

### compressors

---



Our miniature rotary compressors are the result of a breakthrough in compressor technology featuring low vibration and low noise operation. They can be utilized in many thermal management applica-

tions from compact recirculating chillers, cabinet coolers, direct cooling of electronic components and white goods to mobile refrigeration. For smooth and easy temperature adjustment, these miniature rotary BLDC compressors with cooling capacities up to 2000 W are continuously speed-controllable via the frequency of a square wave signal. The inverter board is included, a test function board for easy evaluation is also available as an option.

### heat exchangers

---

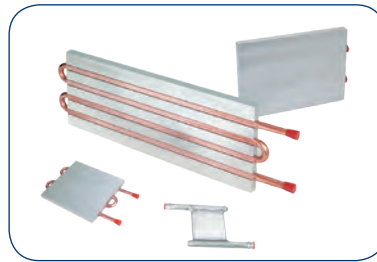


AMS Technologies' heat exchanger portfolio includes tube-fin heat exchangers (copper or stainless steel tubes expanded into copper or aluminum fin for good and cost effective heat removal), oil cooler flat

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).

### cold plates

---

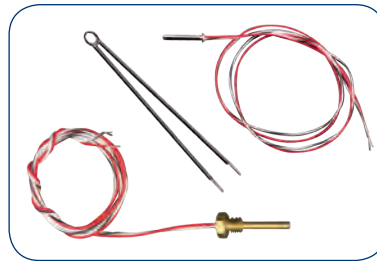


Our cold plate technologies range from tubed cold plates and flat tube cold plates to performance-fin cold plates and liquid-cooled chassis. In a world of compact designs with in-

creasing 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.

### 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 ap-

propriate speed. AMS Technologies' extensive range of NTC thermistor temperature sensor probes with base resistance values from 5 k $\Omega$  to 231.5 k $\Omega$  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.



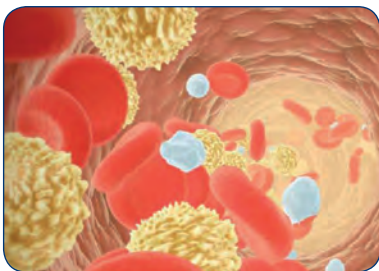
## from technology components to turnkey solutions

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

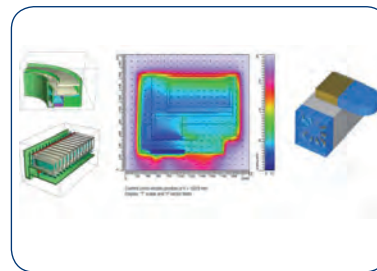
### custom cooling unit for biomedical reagents



A haemostasis analyzing instrument performs various tests to measure blood coagulation. In one area of the instrument the blood samples are kept at a constant temperature of +37°C. Right

next to the blood samples the reagents need to be conserved at constant +15 °C. The cooling of the reagents is done by forced air flow. For a redesign of the cooling system in their haemostasis analyzer, a French pharmaceutical laboratory turned to AMS Technologies. After careful empirical investigation and determination of the cooling capacity, AMS Technologies developed a customized cooling unit with a powerful 24 VDC mini compressor with linear speed control, small evaporator and condenser heat exchangers, fans and other components of a refrigeration cycle – and successfully placed all these components inside the given restricted space. During the development the AMS Technologies experts also optimized air flow rate and duct to achieve uniform temperatures across the reagents.

### directed air flow for precise temperature profile



In order to avoid condensation in plastic containers filled with reagents and mounted on a carousel, the customer had asked AMS Technologies to find a solution that would create the same tem-

perature profile of +4° C to +8° C bottom to top in every container's reagent.

With the help of computational fluid dynamic computations, the AMS Technologies experts showed that simply cooling the bottom disc of the carousel would not work, as insufficient thermal contact between plastic containers and cooled surface prevents effective cooling and does not allow to create the desired temperature profile. Instead, AMS Technologies developed an air conditioning system based on two peltier cooling units and fans, distributing the air flow evenly to all containers. The designed thermal insulation enabled to achieve a perfectly defined temperature profile.



**SOLUTIONS**



# enabling your ideas.

Optical, Power and Thermal Management Technologies

## ■ GERMANY

AMS Technologies AG  
Fraunhoferstr. 22  
82152 Martinsried, Germany  
Phone + 49 (0) 89 895 77 0

## ■ ITALY

AMS Technologies S.r.l.  
Via Copernico, 21  
20025 Legnano (MI), Italy  
Phone + 39 0331 596 693

## ■ SPAIN

AMS Technologies S.L.  
C/Filadors 35, 3º, 7ª  
08208 Sabadell, Spain  
Phone + 34 93 380 84 20

## ■ FRANCE

AMS Technologies S.A.R.L.  
Silic 649 – Bâtiment Magnolia  
16, avenue du Québec  
91945 Courtaboeuf Cedex  
Phone + 33 (0) 1 64 86 46 00

## ■ NORDICS

AMS Technologies Nordics  
Azpect Photonics AB  
Aminogatan 34  
431 53 Mölndal, Sweden  
Phone + 46 (0) 8 55 44 24 80

## ■ UNITED KINGDOM

AMS Technologies Ltd.  
Nene House, Drayton Way  
Daventry, Northamptonshire  
NN11 8EA, United Kingdom  
Phone + 44 (0)1455 556360

Download  
Brochure



Intertek

[info@amstechnologies.com](mailto:info@amstechnologies.com)  
[www.amstechnologies.com](http://www.amstechnologies.com)  
[www.amstechnologies-webshop.com](http://www.amstechnologies-webshop.com)