



| Powertrain



| Assembly



| OEM



| System Integrator



| Service

Automotive

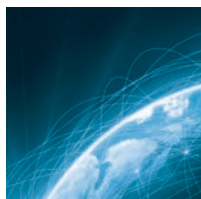
—
We keep industry
on the move.

Modern thermal management and signaling technology
for high availability and energy efficiency.

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Everything but downtime.

Our global services ensure high availability, safety and efficiency along the entire process chain.



The Pfannenberg Group

Fully committed to the automotive industry - worldwide.

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Whenever you need us, we
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The Pfannenberg Group

Fully committed to the automotive industry - worldwide.

The demands placed on modern production lines have increased. Significantly longer life cycles mean that greater machine and component availability is required whilst achieving cost and energy efficiency at the same time. We support automotive manufacturers and suppliers with energy-efficient thermal management solutions and signaling devices along the whole process chain from the pressing plant to quality control.

We know what drives you.

Apart from production safety and speed, these days, sustainability and energy efficiency are more and more in the focus of attention. Given the energy efficiency, flexibility and long working life of our thermal management solutions for electrical enclosures as well as of our process cooling and signaling technology, we are addressing exactly the topics relevant to vehicle manufacturers, today and tomorrow.

We offer exactly what you need.

The cooling solutions of our **ECOOL** series can nearly halve energy consumption for the cooling of your electronic equipment used in manufacturing.

And our signaling devices ensure a maximum signaling range, which significantly reduces the number of converters you need. Finally, our ten-year warranty offers OEMs, end users and service departments an extra safety-plus.

Apart from components, our global range also includes complete system solutions. Extensive releases enable the use of our devices which are backed by CE, UL, GOST and EAC certifications and represent top quality 'German engineering' standards.

Our comprehensive service offering satisfies your needs in terms of safety and cost efficiency along the whole process chain – from project planning through maintenance to replacement and service – even at the other end of the world. We know

your requirements and are happy to advise you.



Signaling

- Visual and audible signaling devices.
- Signal towers.
- Explosion-proof signaling devices.
- Performance Level (PL) and Safety Integrity Level (SIL).
- Special solutions.



Thermal management

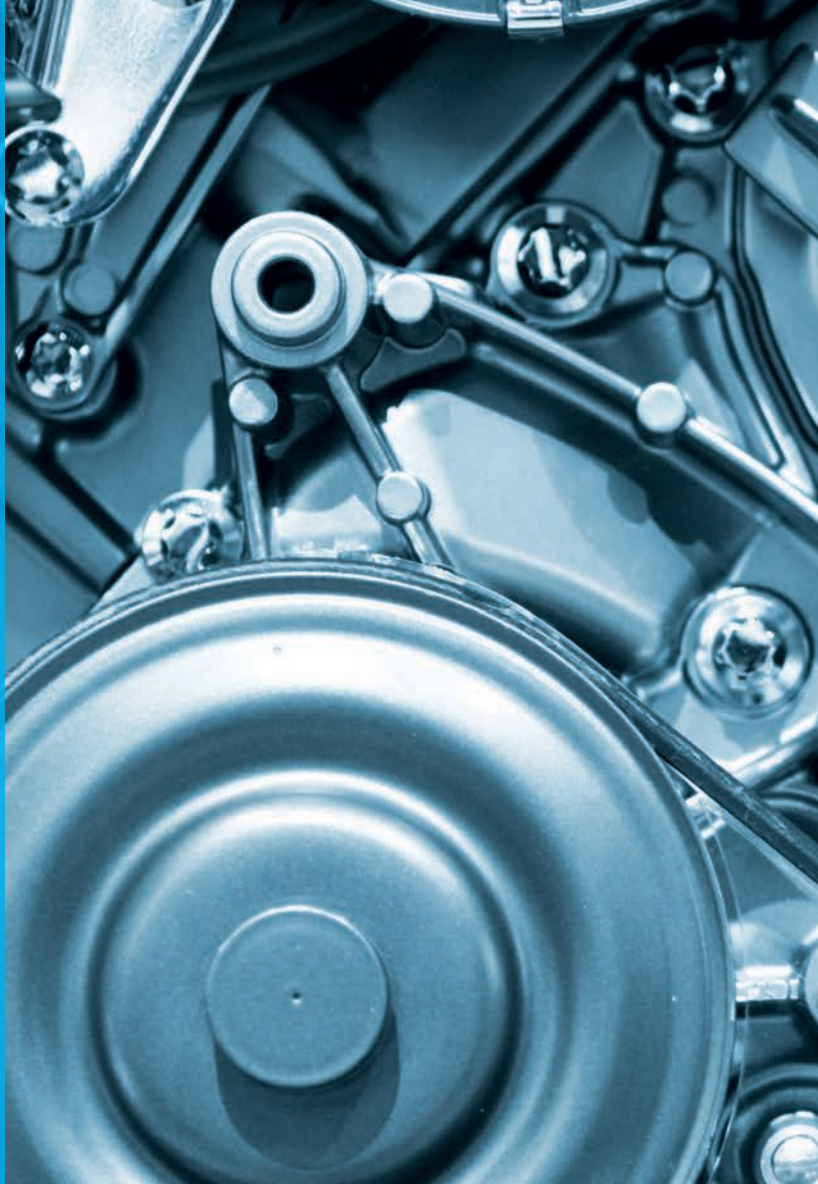
- Cooling units.
- Air/air heat exchangers.
- Air/water heat exchangers.
- Chillers.
- Filterfans.
- Heaters, thermostats, hygrometers.



Powertrain

Staying cool. Even when the heat is on.

Systems producing engines, gearboxes, axles or drive shafts are exposed to extreme stress, which is why we have developed components specially designed for this environment.



Green light for production safety.

Whether the **ambient conditions involve high temperatures** or **oily air**, we ensure that nothing compromises your production safety. The distinctive features of our **ECOOL cooling solutions** include high **energy efficiency** and **easy servicing** in particular. Because even in harsh ambient conditions, it is important that cooling units do their job reliably around the clock.

For this reason, ECOOL devices are designed in such a way that:

- They have extremely **low maintenance requirements**.
- **Filters can be changed without tools** within just a **few seconds**.
- Because it takes just a **short time to dismantle and reassemble**

a unit a speedy resumption of production is guaranteed.

- Operability is guaranteed even at high temperatures or in air laden with oil vapours.

Used in combination with our chillers, our cut-out compatible ECOOL air/water heat exchangers represent an economic system solution.

This delivers clear benefits to any machine tool and plant manufacturer as well as to the end user:

- A coordinated cooling concept for the respective application from a single source.
- Air/water heat exchangers are **maintenance-free** and **do not disperse heat to the environment**.
- When used with heavily contami-

nated cooling water, the stainless steel variants in V4A prevent abrasion, washouts and leaks in the pipes and heat exchanger bends.

- The optional top-fitted water connection line ensures shorter conducting routes and reduces the risk of trip hazards.

To obtain our known high product quality, we exclusively use components from globally renowned manufacturers such as EBM-Papst, Grundfos or Ziehl Abegg.

The SIL/PIL compliant alarm devices from Pfannenberg give machine and system builders more planning security and increase machine availability.



**Pfannenberg products ensure
your production availability 24/7**



All-round flashing light PMF



Sounder DS series

All-round flashing light PMF

- IP 55 protection for oil-contaminated ambient conditions in processing plants.
- 14 joule with light reflexes in large-scale assembly halls.
- SIL/PL certification for personal protection conforming to standards.

Sounder DS series

- Die-cast aluminium housing, suitable for industrial transmission gear manufacture.
- 110 dB, audible even in halls with loud milling machines.
- 32 tones for different alarms in axle manufacture.



Air/water heat exchanger



Chiller CC series

Air/water heat exchangers

- Engine block casting cooling independent of the ambient temperature.
- Maintenance-free even in industrial environments.
- Top-mounted water connection, space-saving for compact machine tools.

Chillers CC series

- Compact design, low space requirement in confined factory halls.
- Large tank opening for rapid maintenance in engine manufacture.
- Steel housing with thick powder coating for harsh industrial environments.



Assembly

Every job is different.
And each one needs
perfect cooling.

Wherever the temperature has to be right, we are there for you. Our devices provide perfect cooling for numerous electronic components in production – for example, when doors or tailgates are formed in the steel press or when robots carry out delicate painting or assembly jobs.



Custom solutions are standard for us.

We have the perfect response to the requirements posed by each environment. Our space-saving top-mounted cooling units are **ideally suited for use** in vehicle construction and with their **patented condensate management** they guarantee 100% condensate protection.

By using top-mounted cooling units, you not only benefit from ideal and safe thermal management for the installed components but also gain valuable floor space, for example for escape routes.

Generally installed in an environment with stable temperatures, air/air heat exchangers are frequently used as an alternative to filter fans. They use

ambient air to help significantly optimise energy costs. The **cut-out compatibility** of our **ECOOL family** gives plant builders maximum **flexibility** in the selection of thermal management solutions with a consistent electrical enclosure cut-out.

Other example applications:

- Final inspection / leak test: Our heaters prevent condensate from forming and keep the process safe.
- Paint shop: Explosion-proof flashing lights and audible alarms ensure safety for both people and the environment.



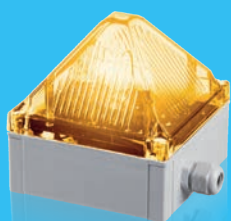
Top-mounted cooling units save space



DTT series top-mounted cooling unit



Air/air heat exchanger



Quadro SIL-/PL compliant and as ATEX version

Quadro series flashing lights

- SIL/PL compliant signaling devices are used for personal protection in press construction.
- ATEX version.
- Integrated self-monitoring.

DTT series top-mounted cooling units

- Space-saving installation and therefore high level of freedom in the design of complex enclosure rows.
- Expensive storage space is saved.
- Escape routes are kept clear.
- 100% condensate protection thanks to patented condensate management.

Air/air heat exchangers

- Energy efficient cooling solution for final vehicle inspection.
- Six versions from 20 W/K to 100 W/K in three construction sizes.
- Long air ducting for safe airflow through the electrical enclosure.
- Integrated thermostat for temperature regulation.



OEM

Thermal management technology which protects the climate.

Machines and plants are only of any value when available. And that is precisely what our **ECOOL** series cooling solutions ensure – safely, easy to service and energy efficient. They protect the environment and lower your operating costs.



A solution where everything has been taken into consideration.

Our chillers are the recommended solution for the reliable cooling of spindles, engines, hydraulic systems and cooling lubricants. In combination with our air/water heat exchangers, they provide perfectly matched **system solutions**.

Benefits of our cooling solutions:

- Integrated condensate management.
- Long air ducting to eliminate hot spots.
- 3 different cooling solutions fit one device cut-out – active cooling units, air/air heat exchangers and air/water heat exchangers.

- Robust industrial design.
- Multi-voltage units.
- Simple colour adaptation to suit the look of the machines/systems.
- Standard Controllers (SC) are available as a cost-effective alternative to Multi Controllers (MC).

Efficient thermal management technology offering particular benefits:

- Reliable airflow through the electrical enclosure.
- Long working life of the electronic components.
- High level of planning and investment security thanks to our unique cut-out compatibility.
- Rapid and cost-effective system adaptation to meet changing requirements.
- **Tool-free one-man assembly**

ensures easy and fast installation and modification.

- **Low maintenance requirements.**
- Environmentally friendly and energy efficient – energy consumption is reduced by up to 43%.

Practical aids for project planning.

The **Pfannenberg Sizing Software (PSS)** provides designers and planners with a proven tool for the optimal dimensioning of thermal management and signaling solutions. When it comes to the operation and control of machines, our **ECOOL-Plant** software gives service technicians a tool for easily and rapidly retrieving detailed information on the particular cooling unit.



Cooling units reduce the energy consumption by up to 43%



Signal tower BR 50

Signal tower BR 50

- All machine / system states are displayed to the operator.
- Modular construction: Suitable for all end customer requirements/specifications.



Chiller EB series



Air/water heat exchangers

Chillers EB series

- A big range of options makes it easy to adapt the chillers to your requirements.
- Maximum hysteresis accuracy up to ± 0.1 K ensures maximum precision, e.g. in grinding processes.
- 1 housing – several performance classes – your benefit in layout planning.
- Energy efficient chillers with inverter technology significantly reduce energy consumption.

Air/water heat exchangers

- An ideal system in combination with the chillers.
- Because of the V4A option, they can also be used for open cooling tower systems.
- Long air ducting for safe airflow through the electrical enclosure.
- Integrated thermostat for temperature regulation.



System Integrator

When looking at the whole picture, every detail counts.

You bear the responsibility for large-scale projects – we support you by enabling you to implement these with significant cost savings. Benefit from our many years of expertise in differentially considering complex plant architectures and production lines as well as in the manufacture of high-quality thermal management components for industrial applications.



Our experience is your gain.

Acting as a link between car manufacturers and system integrators, we know what is important in the configuration of specific solutions every single time: Flexibility and compatibility. This is why our **ECOOL** cooling devices, air/air heat exchangers and air/water heat exchangers and active cooling units are **designed for optimum cut-out compatibility** and offer many options even at planning stage.

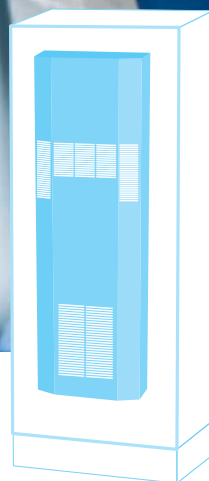
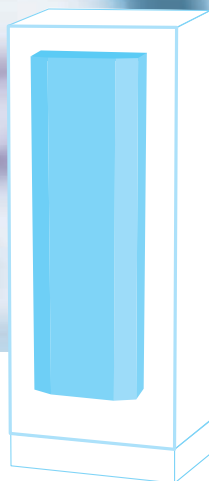
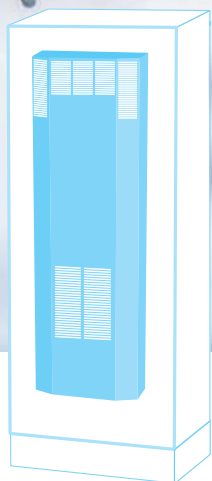
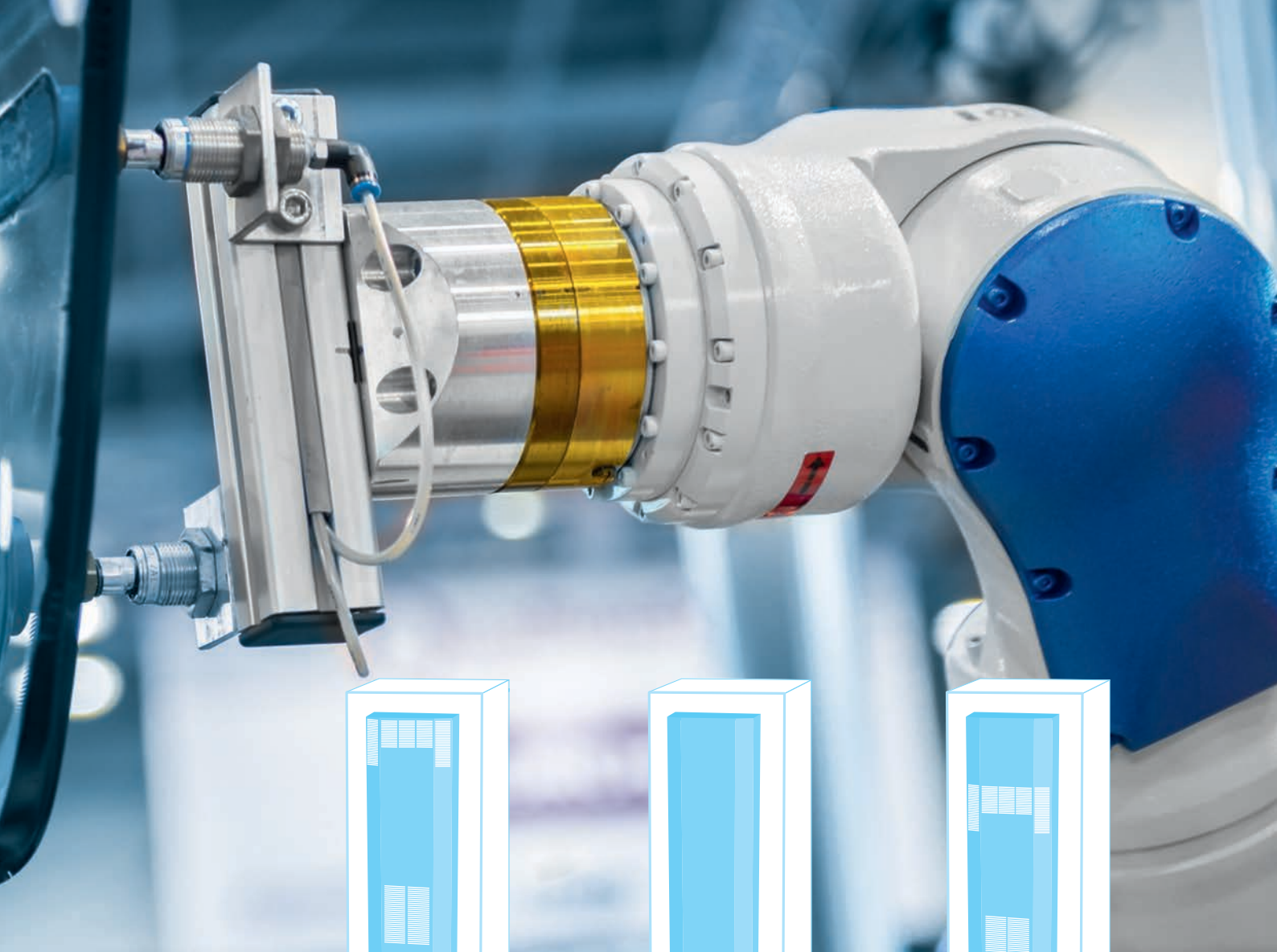
At project planning stage, thermal losses of the electronic components and the required cooling power are often still not known completely. Thanks to the various models within the **ECOOL** series, there is complete planning freedom so that the ideal unit can be selected.

The same applies to the different thermal management requirements at different production sites. A further bonus: our units match the cut-outs of all housings available on the market.

Our free Pfannenberger Sizing Software (PSS) supports you at design and project planning stage. After entering the parameters of the electrical enclosure and of the operating environment, the ideal thermal management solution for your application is calculated and documented.

Additionally, we offer **makros for E-Plan and Zuken** for a simple and free integration of our products. You can find these in our download area at www.pfannenberger.com.

- Available in special colours and easy to integrate into an existing machine design.
- Comes with all the international certifications such as CE, UL, GOST and EAC.
- All units are either available as models for door or side mounting or for partially recessed door or side mounting.



Cut-out	Cooling unit 300–4000 Watt	Air/water heat exchanger 500–5000 Watt	Air/air heat exchanger 20–100 W/K
Size 1	DTx 6801 DTx 6501 DTx 6401 DTx 6301 DTx 6201 DTx 6X2E DTx 6X1E	PWx 6502 PWx 6302	PAX 6203 PAX 6173
Size 2	DTx 9341C DTx 9141 DTx 6301C DTx 6201C	PWx 6302C PWx 6152	PAX 6133 PAX 6103 PAX 6073
Size 3	DTx 9041	PWx 6105 PWx 6052	PAX 6043



Service

To ensure everything runs smoothly.
At all times.

In order to allow for smooth production processes, we have designed our devices for minimum maintenance and servicing effort. This saves you time and money. In addition, our global service including maintenance contracts and hotline support ensures high machine and plant availability at all times.



Rapid solutions instead of long breaks.

No production process is immune to faults. It is all the more important that these can be eliminated as rapidly as possible. This is why we regard ease of servicing as all important in our products. All our solutions allow for quick replacement of either complete units or components. Additionally, they facilitate upcoming service and maintenance work because of:

- **Tool-free filter changes** in only a few seconds.
- Short dismantle and reassemble times for a **speedy resumption of production**.
- Total functionality even at high temperatures or exposed to oily air.

With our chillers, easily removable side parts facilitate access and enable main components to be reached quickly.

Even with our compact chillers, we have been able to make maintenance more comfortable. Optimised cross-section allows for fitting the control system in a separate switch-gear cabinet. This creates maximum freedom of movement for servicing.

As much service as you want.

Whatever solution you choose: **Customised service packages** and spare part kits ease commissioning and ensure the reliable and long-term operation of our products. Should you need sup-

port from our technical staff, our **worldwide service network** is available to you at all times.



One-man assembly and ease of servicing.

The plug & play system enables one-man assembly within minutes.



Few screws and easy access to the components make the units particularly easy to service.

Pfannenberg Sizing Software (PSS)

The optimum solution is one click away.

Planners and engineers need security in the configuration of optimum thermal management and signaling solutions. With the Pfannenberg Sizing Software (PSS), we offer you a free and user-friendly tool which immediately provides you with a qualified device recommendation. By using the software, you can avoid oversizing (expensive) and undersizing (hazardous) right at planning stage or when reviewing the design.



Safety for every situation.

Individual circumstances often make it more difficult to select the right solution. This is why PSS contains an open library in which it is quite easy to enter a client's specific components. In this way, we ensure that we cover the **whole range of possible areas of use** and can offer solutions for any application in the field of thermal management and chilling.

PSS is also a useful tool for selecting Pfannenberg signaling devices in order to choose the optimum solution from the extensive range of Pfannenberg products.

Furthermore: PSS not only selects the suitable devices for achieving **machine safety** and for defining the need for alarms, but also makes a **recommendation for the optimum positioning** – for both visual and audible signaling devices.

PSS is available online as app and as download from:

www.pfannenberg.com/pss



ECOOL-Plant – the control centre for your thermal management.

We developed ECOOL-Plant in order to make machine operation and servicing as easy as possible. A system software which you can use not only to access cooling unit status information but also to set parameters.

The features of ECOOL-Plant enable you to communicate directly with the cooling units or to integrate the software into the user interface of your machine controls.

ECOOL-Plant is an important tool for service technicians, enabling them to read status information on the cooling unit and to parametrise it. Amongst the information provided by the software are temperature profile

data and the life cycle of the components. This information serves as an important indicator of necessary adjustments or maintenance intervals.

Machine builders (OEMs) implement ECOOL-Plant into the user interface of the machine controls. This means that the machine operator is always up to speed with the controls and the temperature conditions and can respond in good time in the event of discrepancies.

ECOOL-Plant is compatible with all cooling units fitted with Multi Controller (MC).

Pfannenberger Global Services

Whenever you need us, we are there for you. Worldwide.

You can rely on the availability of our products and solutions anywhere in the world - because we have developed a global and comprehensive support network for you to ensure that your production systems run smoothly.



Repair service.

Is the performance of your cooling system declining?

Don't worry: our repair service team will be there to help you promptly – in Germany and worldwide. Benefit from our global partner network with its on-site service which eliminates the need for expensive transportation and return of your products.

Spare parts.

If need be, rely on our rapid delivery of wear and spare parts. No matter where in the world you need these parts: we deliver original replacement parts at short notice.

Choose the service level yourself.

Besides a broad range of products and services, we offer you the opportunity to choose an individual service level for each component requiring servicing. All you have to set up an individual list of components to be serviced as part of the maintenance contract. We would be happy to advise on your selection.

Product development.

You have product innovations in mind but lack the resources or experience? We would be glad to support you with our R&D service. Use

the complete range of services of an experienced engineering team – needs-based and cost-efficient – so that you can continue concentrating on your core competencies.

Product validation.

You would like to test a product? Our test laboratories are at your disposal. Economise on test capacities in your company and benefit at any time from access to extensive, professional test equipment plus expert staff.

Naturally, we support you with commissioning and maintenance as well. Simply give us a call.

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